EL-MOASSER

Mathematics

By a group of supervisors

PARENTS' GUIDE

GPS

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5th PRIMARY
FIRST TERM

GENERAL NOTES
for parents

Dear parents...

This guide is intended to help you work with your child to improve his or her high ordered thinking (H.O.T.) in mathematics.

It contains activities which are arranged according to the daily practice at school. Each of them has been prepared in harmony with what your child learned at school, and focusing on specific skills.

You will find in the pages of this guide, hints for more home activities.

Each activity is clearly labeled with the skill it teaches, and with some additional information, and further activities or experiments written especially for you.

The book is designed in an artistic and beautiful way, to make your child appreciate colorful illustrations and have fun doing the different exercises.

For a better use of this guide, and for getting better results, here are some remarks and suggestions for you, parents :

- Try to make your child's learning time secure and happy.
- Do your best to transmit the message that learning is challenging, enjoyable, and rewarding.
- When you are working with your child using this guide, encourage him / her to talk and to explain (Why? How? ...)
- Connect math to daily life, and encourage your child to tell or show you how he or she uses math in daily life.
- Praise your child's successes and encourage his or her efforts.
- Offer positive help when your child makes a mistake, and treat errors as opportunities to help your child learn something new.

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GPS

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Bloom's Revised Pyramid

Produce new original work
Design - Construct - Formulate

Justify a stand or decision
Conclude - Decide - Correct the mistakes

Make connections among ideas
Prove - Deduce - Classify - Analyze

Use information in new situations
Solve - Find - Complete - Calculate

Explain ideas or concepts in your own words
Compare - Explain - Give examples

Recall facts and basic concepts
State - Define - List

Higher Order Thinking Skills

Lower Order Thinking Skills

Note :

The questions within each exercise are classified according to the levels of Bloom's pyramid and are referred to as follows:

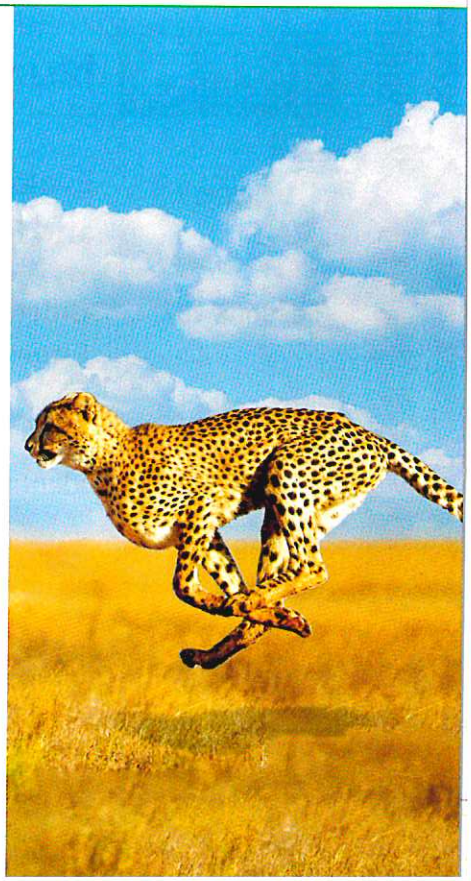
● REMEMBER ● UNDERSTAND ○ APPLY PROBLEM SOLVING (ANALYZE - EVALUATE - CREATE)

Index of Primary 5

UNIT 3 Multiplication with Whole Numbers

Concept 1 Multiplying by a 2-Digit Number

UNIT 4 Division with Whole Numbers



Concept 1 Models for Division

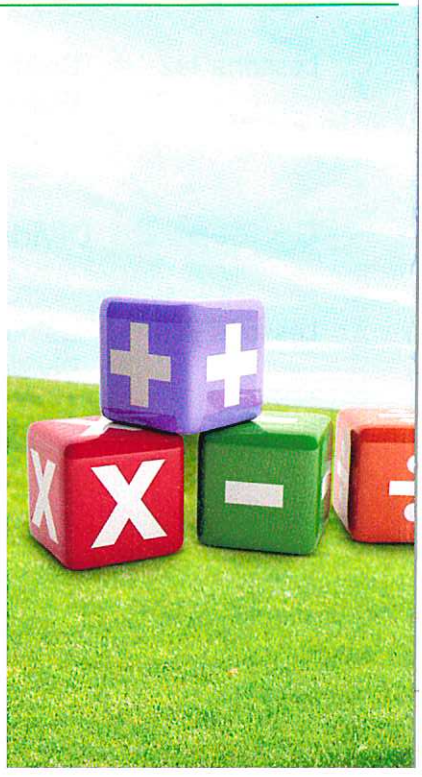
Concept 2 Dividing by 2-Digit Divisors

UNIT 5 Multiplication and Division with Decimals

Concept 1 Multiplying Decimals

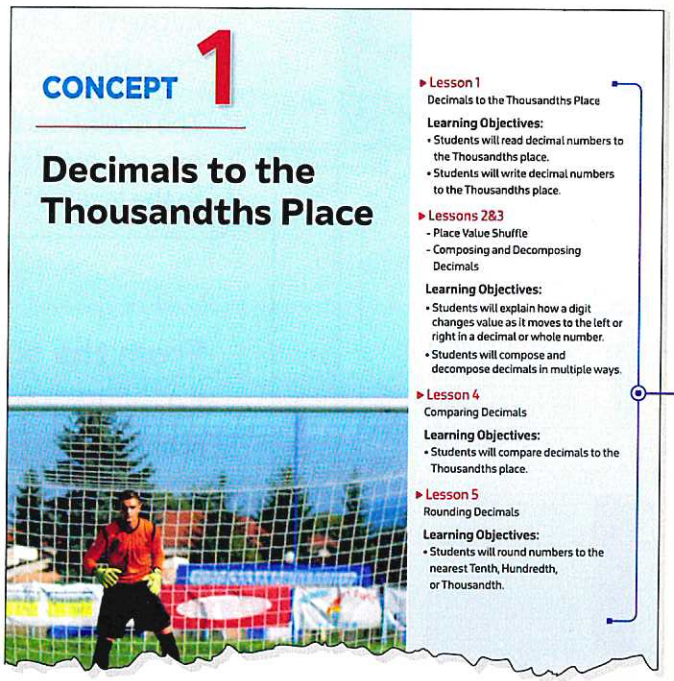
Concept 2 Dividing Decimals

UNIT 6 Numerical Expressions and Patterns



Concept 1 Evaluating Numerical Expressions and Patterns

HOW TO USE THIS GUIDE ?



CONCEPT 1

Decimals to the Thousandths Place

▸ Lesson 1
Decimals to the Thousandths Place

Learning Objectives:
- Students will read decimal numbers to the Thousandths place.
- Students will write decimal numbers to the Thousandths place.

▸ Lessons 2&3
- Place Value Shuffle
- Composing and Decomposing Decimals

Learning Objectives:
- Students will explain how a digit changes value as it moves to the left or right in a decimal or whole number.
- Students will compose and decompose decimals in multiple ways.

▸ Lesson 4
Comparing Decimals

Learning Objectives:
- Students will compare decimals to the Thousandths place.

▸ Lesson 5
Rounding Decimals

Learning Objectives:
- Students will round numbers to the nearest Tenth, Hundredth, or Thousandth.

Objectives

Describe the skills your child will learn in each lesson of the unit.

Title

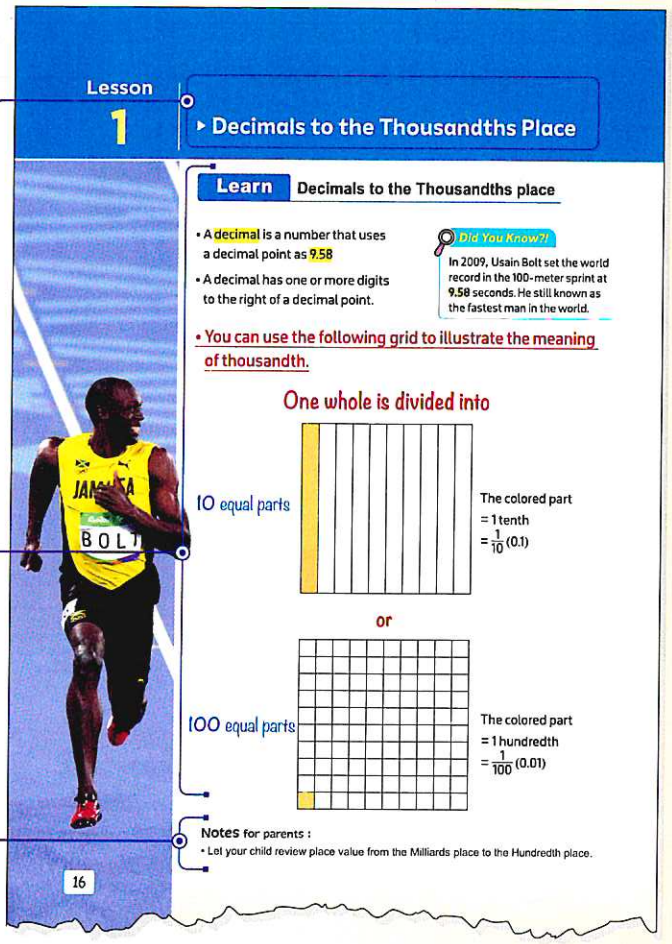
The lesson title describes the skill your child will learn in this lesson, and the lessons are arranged according to the curriculum of the school book.

Learn

Explaining for the concept or the skill that your child should learn.

Notes for parents

Extra activities to share with your child at home.



Lesson 1 ▸ Decimals to the Thousandths Place

Learn Decimals to the Thousandths place

- A decimal is a number that uses a decimal point as 9.58
- A decimal has one or more digits to the right of a decimal point.

Did You Know?!
In 2009, Usain Bolt set the world record in the 100-meter sprint at 9.58 seconds. He still known as the fastest man in the world.

- You can use the following grid to illustrate the meaning of thousandth.

One whole is divided into

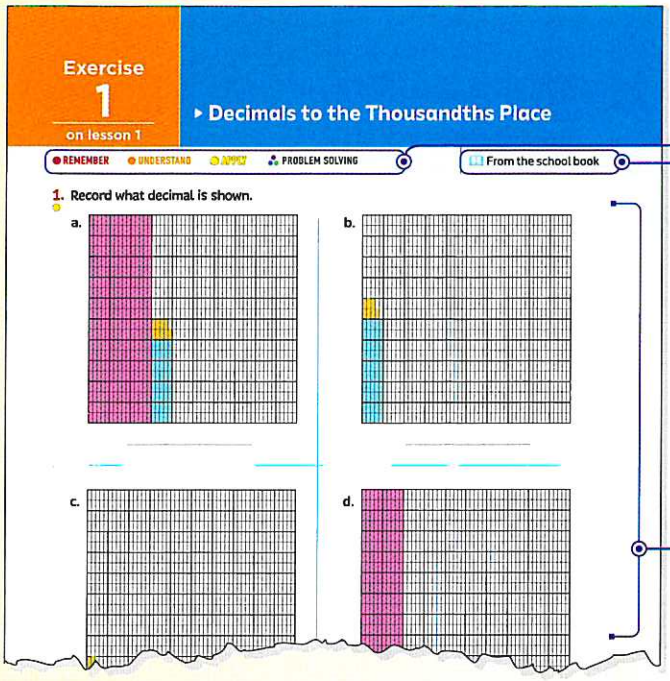
10 equal parts — The colored part = 1 tenth = $\frac{1}{10}$ (0.1)

or

100 equal parts — The colored part = 1 hundredth = $\frac{1}{100}$ (0.01)

Notes for parents :
- Let your child review place value from the Milliards place to the Hundredth place.

16



Bloom's Taxonomy of cognitive levels

The questions within each exercise are classified according to the levels of Bloom's Pyramid.

From the school book

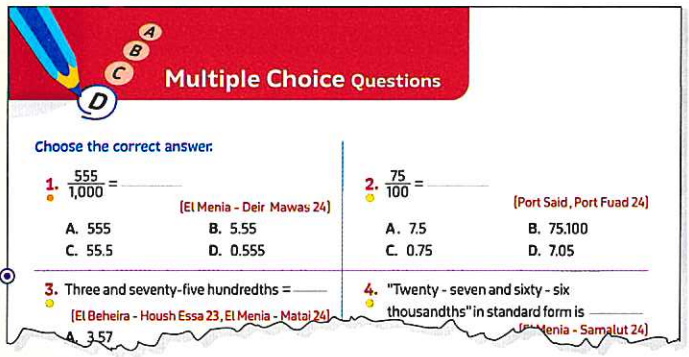
Selected questions from the school book.

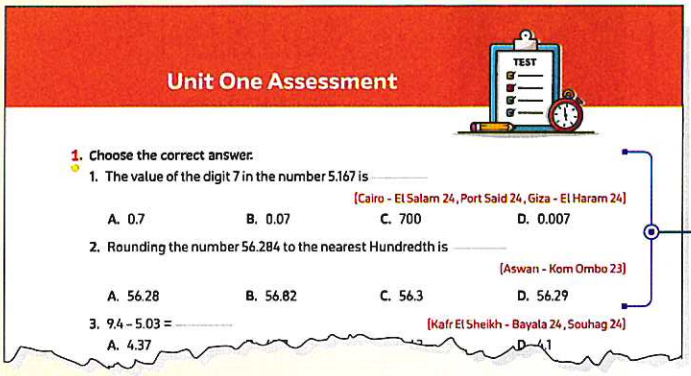
Exercise

Miscellaneous questions on the concept or the skill of the lesson.

Multiple Choice Questions

Multiple choice questions to review the concept or the skill of the lesson to reinforce the learning of your child.





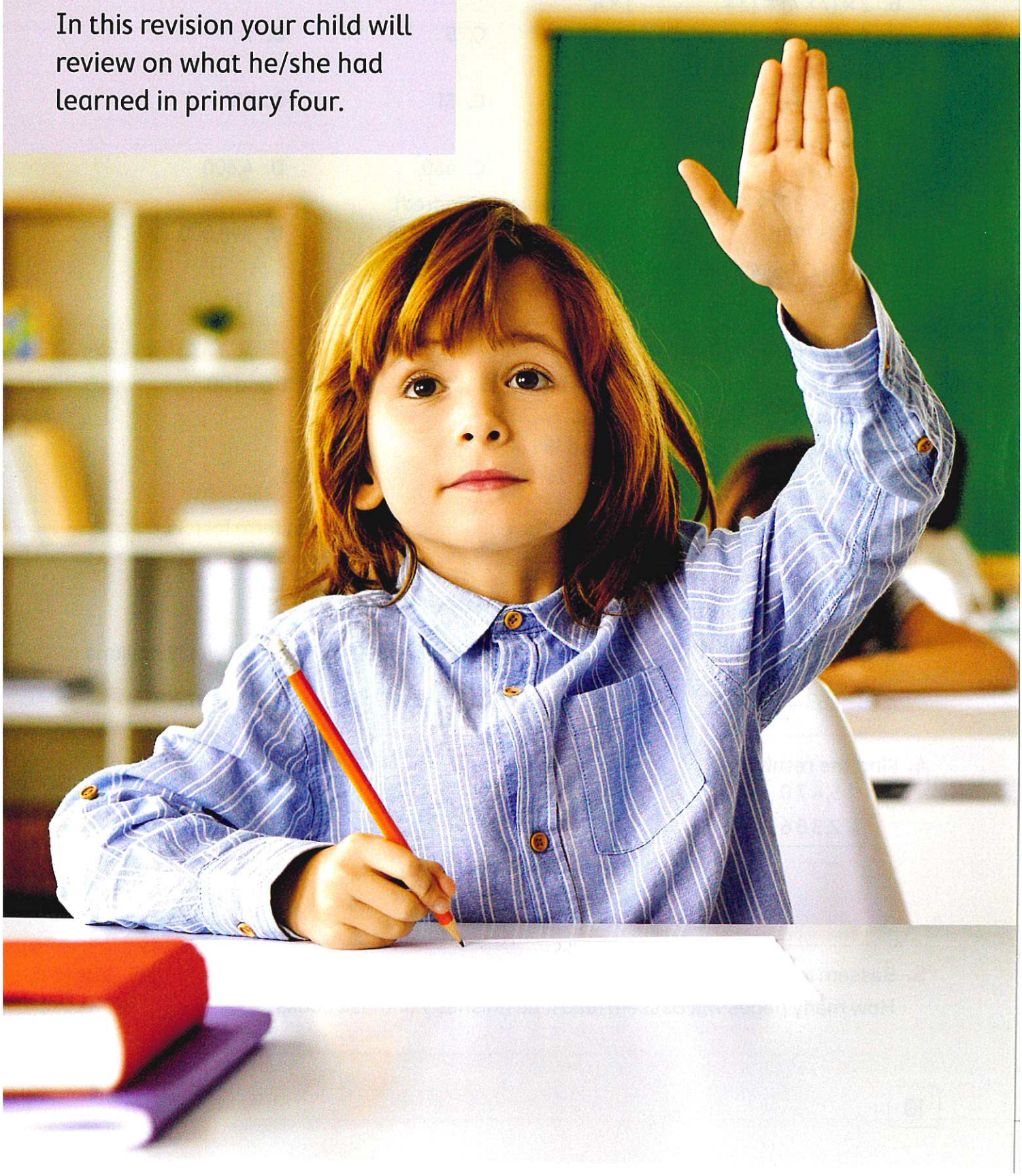
Unit's Assessment

After finishing each unit, use the assessment page.

This assessment will give you feedback about your child's level through this unit.

REVISION

In this revision your child will review on what he/she had learned in primary four.



Revision 1

1. **Choose the correct answer.**

a. In the number 325.41, which digit is in the Hundredths place ?

A. 1 **B.** 2 **C.** 3 **D.** 4

b. $2 \times [7 \times 4] = [2 \times$ _____ $] \times 4$

A. 2 **B.** 4 **C.** 5 **D.** 7

c. $255 \div 5 =$ _____

A. 11 **B.** 50 **C.** 51 **D.** 55

d. $4.6 =$ _____ tenths.

A. 0.46 **B.** 46 **C.** 460 **D.** 4,600

e. Round 387,932 = _____ [to the nearest Hundred].

A. 387,900 **B.** 388,000 **C.** 387,930 **D.** 390,000

f. The G.C.F of 48 and 56 is _____

A. 6 **B.** 8 **C.** 9 **D.** 12

2. **Complete the following.**

a. _____ is a common multiple of 4 and 5 , and lies between 10 and 30.

b. $800 \times 3 =$ _____ **c.** $64{,}731 + 59{,}189 =$ _____

d. The difference between 214 and 189 is _____

e. Skip count by 8 [8 , _____ , 24 , _____ , _____ , 48 , _____]

f. In the bar model

100	
35	x

, the equation which you can form for it is _____

3. **Put (< , > or =).**

a. 0.45 ◯ 0.5

b. 9,000 thousands ◯ 9 millions

c. 82,063 – 14,589 ◯ 35,896 + 31,568

d. 187×4 ◯ $700 + 40 + 8$

4. **Find the result.**

a.
$$\begin{array}{r} 5{,}470 \\ +\ 2{,}386 \\ \hline \quad\quad \end{array}$$

b.
$$\begin{array}{r} 27 \\ \times\ \ 4 \\ \hline \quad \end{array}$$

c.
$$3\overline{)735}$$
$$\begin{array}{l} -\ \_\_ \\ \hline \quad \\ -\ \_\_ \\ \hline \quad \\ -\ \_\_ \\ \hline \quad \end{array}$$

5. Bassem reads books in a series of mysteries. Each book has 128 pages.
How many pages will Bassem read if he finishes 9 of these books ?

_____

Revision 2

1. **Complete the following.**

a. The smallest prime number is _____

b. $7 + 0.1 + 0.05 =$ _____

c. If $m + 25 = 31$, then $m =$ _____

d. If $975 \div 3 = 325$, then the dividend is _____

e. $354 + [116 + 243] = [354 +$ _____ $] + 243$

f. The value of the digit 4 in the number 3.74 is _____

2. **Choose the correct answer.**

a. $\frac{3}{10}$ is equivalent to _____

A. 30 B. 0.30 C. 0.03 D. 0.003

b. 754,321 ◯ 98,564

A. < B. = C. >

c. $180 \div 2 =$ _____

A. 240 B. 900 C. 9 D. 90

d. $0.08 =$ _____

A. 0.8 B. $\frac{8}{10}$ C. $\frac{8}{100}$ D. 800

e. The place value of the digit 8 in the number 356.81 is _____

A. 8 B. Ones C. 0.8 D. Tenths

f. $17{,}856 \approx$ _____ (to the nearest Thousand).

A. 17,900 B. 20,000 C. 18,000 D. 17,860

3. **Write in word form.**

a. 14.3 _____

b. 6 Ones, 8 Hundredths _____

4. **Find the result.**

a. $5{,}761 + 12{,}888 =$ _____

b. $40 \times 30 =$ _____

c. $6{,}060 - 3{,}488 =$ _____

d. $1{,}278 \div 6 =$ _____

5. A train has 896 seats for passengers, if there are 8 carriages on the train and each carriage has the same number of seats, how many passengers can sit in each carriage ?

_____

Revision 3

1. **Complete.**

a. If $a - 13 = 7$, then $a =$ _____

b. $7 \times 243 = [7 \times 200] + [7 \times$ _____ $] + [7 \times 3]$

c. 32 tenths = _____ [decimal form]

d. $28{,}702 \approx$ _____ [to the nearest Ten Thousand]

e. 3 kg = _____ g

f. 15,000 mL = _____ L

2. **Choose the correct answer.**

a. Which number is the greatest ?

A. 549,300 **B.** 4,004,030 **C.** 5,490,003 **D.** 5,490,030

b. _____ is a multiple of 8.

A. 4 **B.** 16 **C.** 18 **D.** 20

c. Which of the following is the least number possible formed from the digits : 2 , 7 , 0 , 8 , 4 ?

A. 2,487 **B.** 20,847 **C.** 20,478 **D.** 87,420

d. The product of 62×9 is _____

A. 1,148 **B.** 114 **C.** 152 **D.** 558

e. The number 18 has _____ factors.

A. 3 **B.** 4 **C.** 6 **D.** 8

f. Which number is a factor of 14 ?

A. 3 **B.** 4 **C.** 6 **D.** 7

3. **Arrange the following numbers in an ascending order.**

6,785,000 , 5,700,726 , 7,456,232 , 6,670,785 , 5,700,624

4. **Put (< , > or =).**

a. $5{,}674 + 2{,}326$ ◯ $12{,}562 - 4{,}562$

b. 6×40 ◯ 70×3

c. $138 \div 6$ ◯ 25

d. The common multiple of all numbers ◯ the common factor of all numbers.

5. Find all the factors of each of 30 and 36, then find the greatest common factor of them.

Revision 4

1. Choose the correct answer.

a. The missing value in the area model representing 29×6 is _____

	20	9
6	120	?

A. 90 **B.** 54
C. 12 **D.** 180

b. In the bar model

37	
y	17

, y = _____

A. 2 **B.** 54 **C.** 20 **D.** 30

c. $3 \times 48 = 100 +$ _____

A. 44 **B.** 144 **C.** 56 **D.** 244

d. _____ is a prime number.

A. 1 **B.** 8 **C.** 9 **D.** 11

e. $100 \times$ _____ $= 1{,}400$

A. 1,300 **B.** 14 **C.** 140 **D.** 1,400

f. _____ is a multiple of 5

A. 24 **B.** 30 **C.** 18 **D.** 6

2. Find.

a. $35{,}896 + 31{,}568$

b. $81{,}063 - 14{,}519$

c. $240 \div 2$

d. 136×5

3. Complete the following.

a. The sum of 12,985 , 36,524 and 10,246 is _____

b. 7 km = _____ m

c. 16 is 8 times the number _____

d. 40 Thousands = _____ Hundreds

e. 9,000 mL = _____ L

f. $29 \times 0 =$ _____

4. Write each of the following numbers in standard form.

a. Seven and fifteen hundredths _____

b. $50 + 7 + 0.04$ _____

c. 9 Ones , 3 Tenths , 6 Hundredths _____

5. Ahmed's school has 9 classrooms. If each class donates 50 cans of food to charity. How many cans will be donated ? _____

THEME ONE

UNIT 1

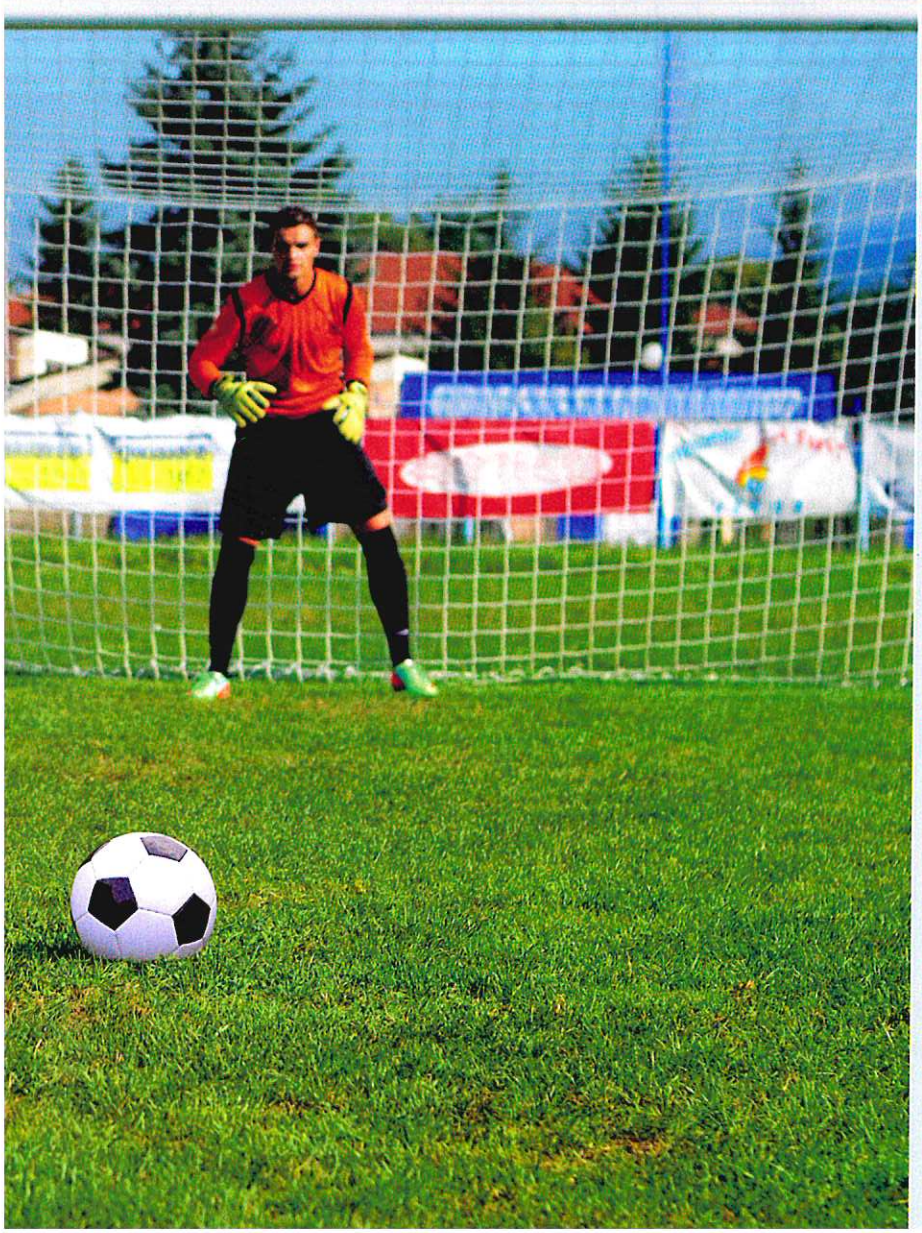
Number Sense and Operations

Decimal Place Value and Computation

- **Concept 1 :**
  Decimals to the Thousandths Place
- **Concept 2 :**
  Adding and Subtracting Decimals

CONCEPT 1

Decimals to the Thousandths Place



▶ Lesson 1

Decimals to the Thousandths Place

Learning Objectives:

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▶ Lessons 2&3

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▶ Lesson 4

Comparing Decimals

Learning Objectives:

- Students will compare decimals to the Thousandths place.

▶ Lesson 5

Rounding Decimals

Learning Objectives:

- Students will round numbers to the nearest Tenth, Hundredth, or Thousandth.

Fast Fact

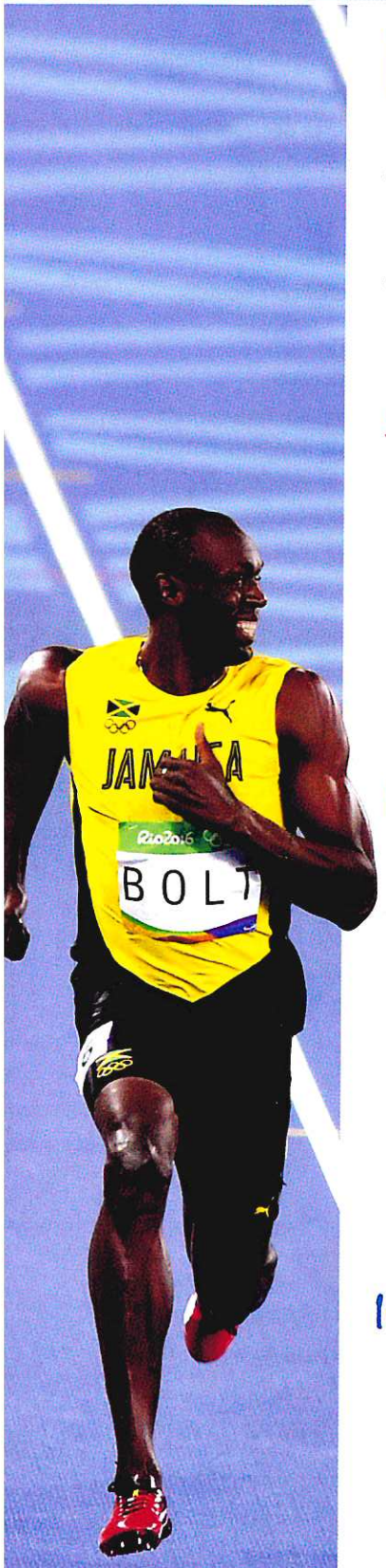
Each goal in a football game consists of two upright posts and joined at the top by a horizontal crossbar.

The distance between the posts is 7.32 m and the distance from the lower edge of the crossbar to the ground is 2.44 m.

Lesson

1

▸ Decimals to the Thousandths Place



Learn Decimals to the Thousandths place

- A decimal is a number that uses a decimal point as 9.58
- A decimal has one or more digits to the right of a decimal point.

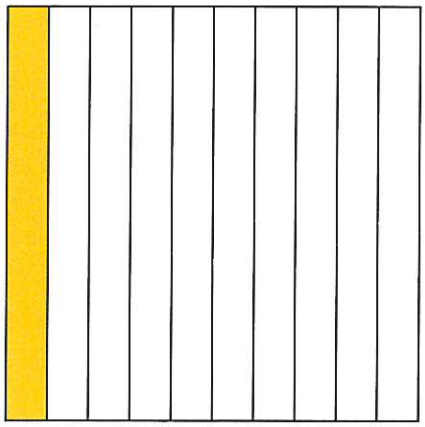
Did You Know?!

In 2009, Usain Bolt set the world record in the 100-meter sprint at **9.58** seconds. He still known as the fastest man in the world.

- You can use the following grid to illustrate the meaning of thousandth.

One whole is divided into

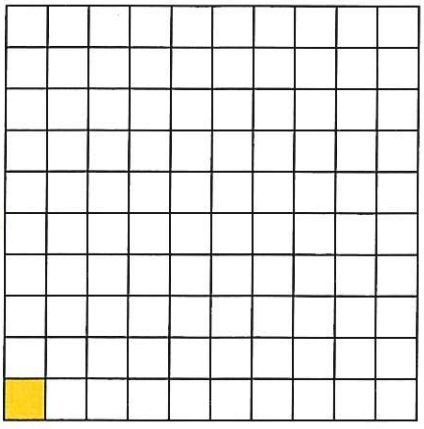
10 equal parts



The colored part
= 1 tenth
= $\frac{1}{10}$ (0.1)

or

100 equal parts



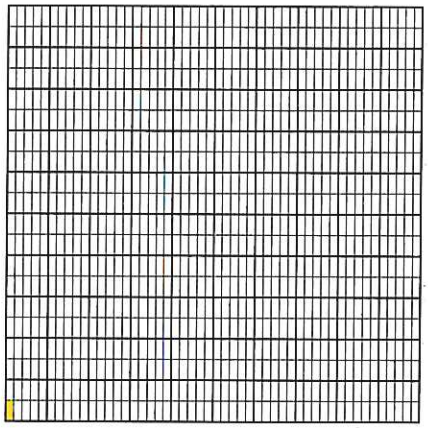
The colored part
= 1 hundredth
= $\frac{1}{100}$ (0.01)

Notes for parents :

- Let your child review place value from the Milliards place to the Hundredth place.

or

1,000 equal parts



The colored part = 1 thousandth
$= \frac{1}{1,000}$ (0.001)

Note that

- Each tenth could be divided into 100 equal parts, each part represents one thousandth.
- Each hundredth could be divided into 10 equal parts, each part represents one thousandth.

• The value of each digit in any number depends on its place in this number

For Example :

Notice the value of each digit in the number 3,249.578

3 is in the Thousands place.	2 is in the Hundreds place.	4 is in the Tens place.	9 is in the Ones place.	This is the decimal point.	5 is in the Tenths place.	7 is in the Hundredths place.	8 is in the Thousandths place.
3	2	4	9	.	5	7	8
Its value is 3,000	Its value is 200	Its value is 40	Its value is 9		Its value is 0.5 $(= \frac{5}{10})$	Its value is 0.07 $(= \frac{7}{100})$	Its value is 0.008 $(= \frac{8}{1000})$

You can use the large place-value chart to help you read and write decimals as follows :

Milliards	Millions			Thousands			Ones			·	Decimals		
O	H	T	O	H	T	O	H	T	O	·	Tenths	Hundredths	Thousandths
						3	2	4	9	·	5	7	8

Standard Form : 3,249.578

Word Form : Three thousand , two hundred forty-nine and five hundred seventy - eight thousandths.

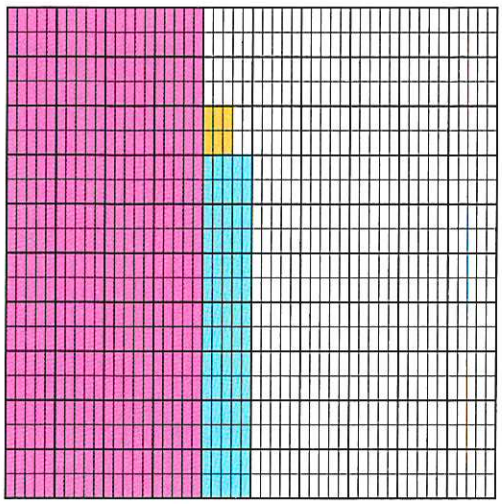
Unit Form : 3 Thousands , 2 Hundreds , 4 Tens , 9 Ones , 5 Tenths , 7 Hundredths , 8 Thousandths.

• Help your child read numbers from the Milliards place to the Thousandths place.

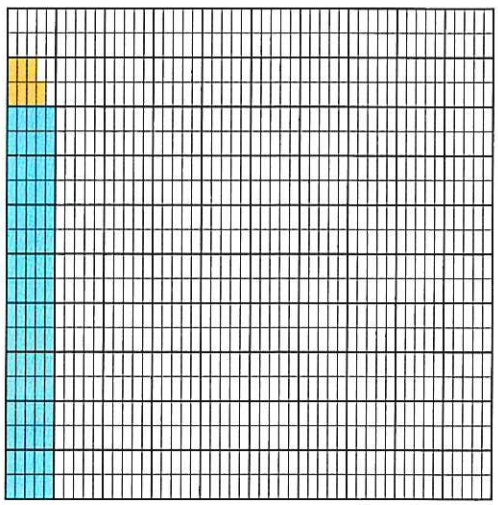
Example 1

Record what decimal is shown :

a.



b.



Solution

a. 4 Tenths , 7 Hundredths , 6 Thousandths

= 476 thousandths

$= 0.476 \left(\frac{476}{1,000}\right)$

"Four hundred seventy-six thousandths"

b. 8 Hundredths, 7 Thousandths

= 87 thousandths

$= 0.087 \left(\frac{87}{1,000}\right)$

"Eighty - Seven thousandths"

Example 2

Write each of the following in word form.

a. 305.183 | **b.** 84.005 | **c.** 3,024.8

Solution

a. Three hundred five and one hundred eighty-three thousandths.

b. Eighty-four and five thousandths.

c. Three thousand, twenty-four and eight tenths.

Example 3

In the number 6,354.792

a. What is the value of 6 ?

b. What is the value of 2 ?

c. What does the digit 4 represent ?

d. What is the value of the digit in the Hundredth place ?

Solution

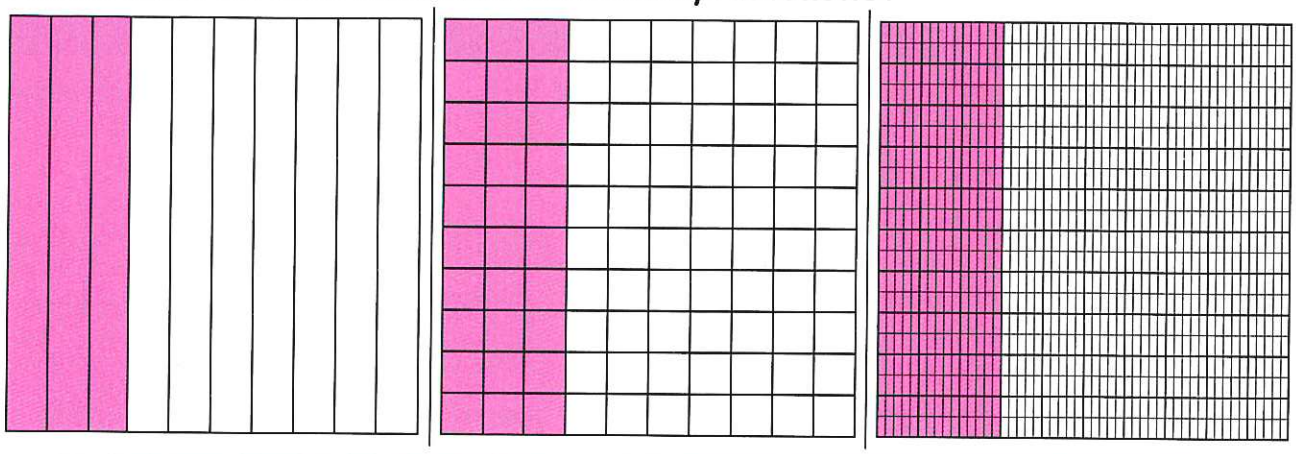
a. 6,000 **b.** 0.002 **c.** 4 Ones **d.** 0.09

Notes for parents :

- Help your child read and write decimal numbers to the Thousandths place.

Remark

You can name the same amount in different ways as follows :



$\frac{3}{10}$ = $\frac{30}{100}$ = $\frac{300}{1,000}$

0.3 = 0.30 = 0.300

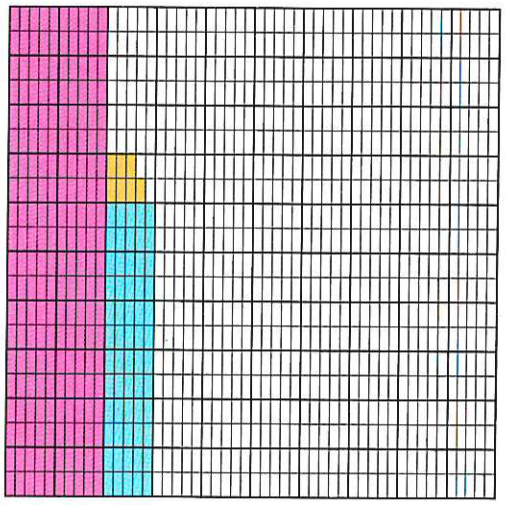
We deduce that :

If you put zeroes after the last decimal digit in a number , then the value of this number doesn't change.

Check your understanding

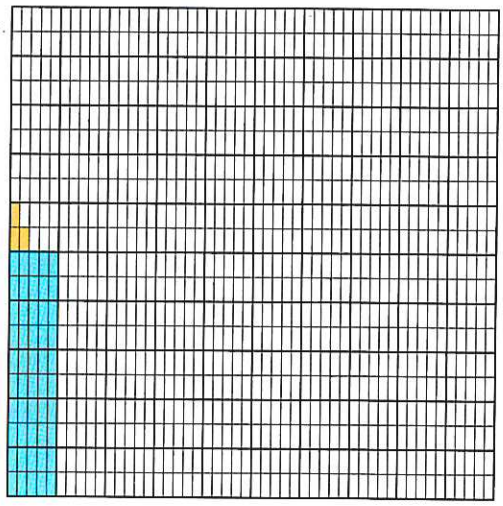
1. Record what decimal is shown :

a.



_____

b.



_____

2. Complete.

a. In 942.358 , the digit 8 is in the _____ place. Its value is _____

b. In 791.06 , the digit 0 is in the _____ place. Its value is _____

c. In 302.91 , the digit 1 is in the _____ place. Its value is _____

Notes for parents :

• Give your child a decimal like 0.8 and ask him/her to name this decimal in different ways.

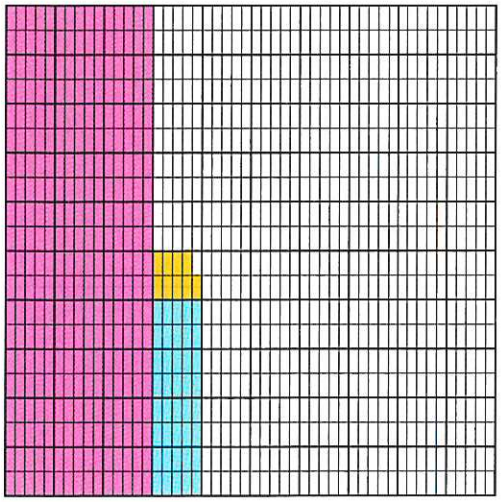
Exercise 1 on lesson 1

▸ Decimals to the Thousandths Place

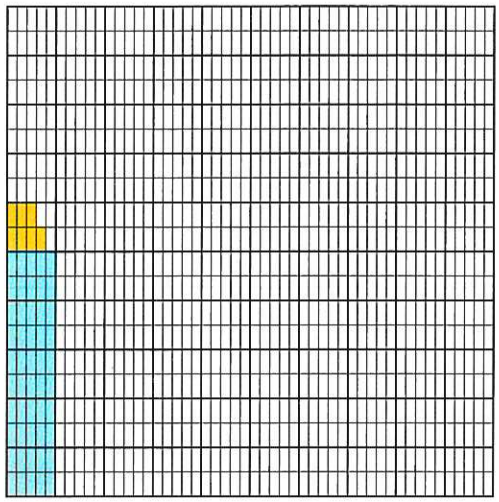
REMEMBER UNDERSTAND APPLY PROBLEM SOLVING | From the school book

1. Record what decimal is shown.

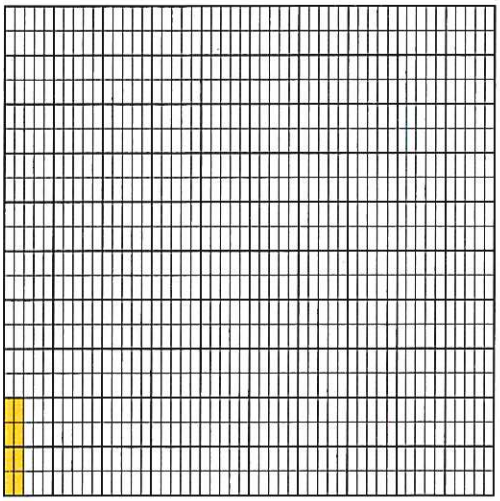
a.



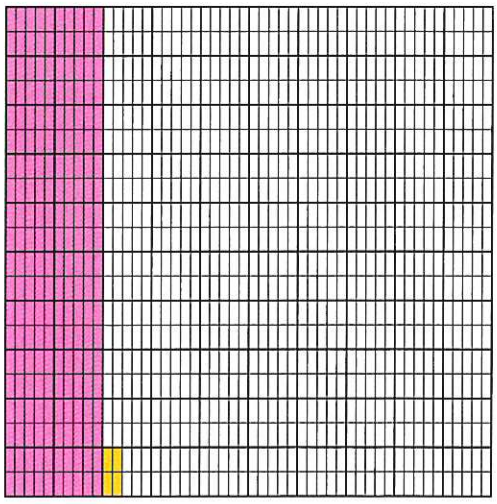
b.



c.



d.



2. Write each of the following in word form.

a. 504.21 _____

b. 4.231 _____

c. 49.08 _____

d. 0.534 _____

e. 4,030.7 _____

f. 4.029 _____

g. 17.107 _____

h. 1.802 _____

i. 0.608 _____

j. 8.002 _____

[Cairo - El Basateen & El Salam 24]

3. Write each of the following in standard form.

a. 24 hundredths _____

b. 35 thousandths _____

c. 8 Thousandths _____

d. 7 and 14 thousandths _____

e. 4 and 4 thousandths _____

f. 1 and 5 tenths _____

g. 9 and 700 thousandths _____

h. 20 and 40 thousandths _____

i. 7 thousand and 48 hundredths _____

j. 3 million and 142 thousandths _____

k. 2 milliard and 3 thousandths _____

l. 4 Tenths, 8 Thousandths _____

m. 5 Ones, 2 Thousandths _____

n. Two hundred thirty - five thousandths _____

[Ismailia - El Kasaseen 24, Kafr El Sheikh - Bayala 24]

o. Three and twenty-five thousandths _____ [El Beheira 23]

p. Two and one hundred nine thousandths _____

q. Fifteen and fifteen thousandths _____ [Alexandria - El Montaza 24]

r. Thirty - six and twenty - five thousandths _____ [Souhag - Akhmem 24]

s. Four and three hundredths _____ [Cairo - El Maadi 24]

4. In the number 729.458

a. What is the value of 4 ?

b. What is the value of 8 ?

c. What does the digit 2 represent ?

d. What does the digit 9 represent ?

e. What is the value of the digit in the Hundredths place ?

5. **Complete.**

a. 5 Tenths = _____ hundredths. [Cairo - El Mokatam 24 , Kafr El Sheikh - Bayala 24]

b. The value of the digit 6 in the number 2.612 is _____ [Giza – Abo El Nomrous 23]

c. The place value of the digit 5 in the number 3.514 is _____ [Cairo - West 24 , Souhag - Tima 24]

d. In 35.627 , the digit 7 represents _____ [Giza - Awseem 24]

e. The place value of the digit 4 in 61.24 is _____ [Souhag - Girga 24]

f. The value of the digit 5 in 3.215 is _____ [El Menia - Bani Mazar 24]

g. The value of the digit "0" in the number 16.205 is _____ [Giza - El Omraniya 24]

h. The value of the digit 2 in the number 5.264 is _____ [El Beheira - Rasheed 24]

i. The value of the digit 9 in the decimal number 91.85 is equal to _____ [Cairo - Nasr City 24]

6. How many whole numbers, tenths, hundredths and thousandths does the number 0.007 have ?

_____

7. 🕮 The Purple Heron is tall at 70 to 90 centimeters, but it weighs only 0.50 to 1.35 kilograms. Below are the weights of three Purple Herons.

For each number, record the following :

a. The digit that is in the Tenths place.

b. The digit that is in the Ones place.

c. The digit that is in the Hundredths place.

Bird One	0.65 kilogram
Bird Two	1.27 kilograms
Bird Three	0.875 kilogram

8. 🕮 **Math around Egypt : Gas Price Decimals**

Look at the list of different petrol prices in Egypt.

a. Which type of petrol is the least expensive ?

b. Which type of petrol is the most expensive ?

Gas Prices per Liter, April 2021

80 Octane petrol : 6.75 L.E.

92 Octane petrol : 8.00 L.E.

95 Octane petrol : 9.00 L.E.

Multiple Choice Questions

Choose the correct answer.

1. $\frac{555}{1{,}000}$ = _____ [El Menia - Deir Mawas 24]

A. 555 B. 5.55
C. 55.5 D. 0.555

2. $\frac{75}{100}$ = _____ [Port Said , Port Fuad 24]

A. 7.5 B. 75.100
C. 0.75 D. 7.05

3. Three and seventy-five hundredths = _____ [El Beheira - Housh Essa 23 , El Menia - Matai 24]

A. 3.57 B. 3.75
C. 375 D. 35.7

4. "Twenty - seven and sixty - six thousandths" in standard form is _____ [El Menia - Samalut 24]

A. 27.66 B. 66.27
C. 27.066 D. 270.66

5. 2 Tenths , 5 Hundredths = _____ [Cairo - Al Sayeda Zeinab 24]

A. 0.205 B. 0.25
C. 0.025 D. 0.52

6. 71 tenths = _____ [Kafr El Sheikh - Bayala 24 , El Monofia , Sers El Laian 24]

A. 0.71 B. 7.1
C. 71 D. 710

7. 1,234 hundredths = _____ [Alexandria - Montaza 24]

A. 1.234 B. 12.34
C. 123.4 D. 0.1234

8. The value of 4 in the number 3.124 is _____ [El Menofia - Ashmoon 24]

A. 4 B. 0.4
C. 0.04 D. 0.004

9. The value of the digit 5 in the number 3.514 is _____ [Luxor 24 , Port Said 24]

A. 5 B. 0.5
C. 0.05 D. 0.005

10. The value of the digit 3 in the number 14.239 is _____ [El Fayoum 24]

A. 30 B. 0.3
C. 0.03 D. 0.003

11. The place value of the digit 3 in the number 15.32 is _____ [Aswan 23]

A. Ones. B. Hundreds.
C. Tenths. D. Thousandths.

12. Which of the following doesn't equal four hundred thousandths ?

A. 0.004 B. 0.40
C. 0.4 D. 0.400

13. The decimal fraction 0.053 reads _____ [Cairo - Al Khalifa and Al Mokattam 23]

A. fifty-three hundredths.
B. fifty-three hundreds.
C. thirty-five hundredths.
D. fifty-three thousandths.

14. 0.300 = _____ [Alexandria - Agmi 24]

A. 3 Tenths B. $\frac{300}{100}$
C. $\frac{30}{10}$ D. $\frac{3}{100}$

Lessons
2 & 3

- Place Value Shuffle
- Composing and Decomposing Decimals

Learn 1 Place value shuffle

1 If a whole number or a decimal is multiplied by [10], then each digit from this number shifts to the left one spot on the place-value chart and the value of each digit increases ten times.

For Example : 714 × 10

Millions			Thousands			Ones			·	Decimals	
H	T	O	H	T	O	H	T	O	·	Tenths	Hundredths
						7	1	4	·	0	0
					7	1	4	0	·	0	0

- Record 714 on the place-value chart.
- Shift each digit to the left one spot to get the number "7,140"
- Then 714 × 10 = 7,140
- The value of the whole number "714" increased when multiplying by 10
- The value of 7 increased when multiplying by 10 from 700 to 7,000
- The value of 1 increased when multiplying by 10 from 10 to 100
- The value of 4 increased when multiplying by 10 from 4 to 40

Another Example : 7.14 × 100

Millions			Thousands			Ones			·	Decimals	
H	T	O	H	T	O	H	T	O	·	Tenths	Hundredths
								7	·	1	4
							7	1	·	4	0
						7	1	4	·	0	0

Note that

When multiplying by [100] each digit shifts to the left two spots, then the value of each digit increases 100 times.

- Then 7.14 × 100 = 714

Notes for parents :

- Let your child explain how a digit changes value as it moves to left in a decimal or a whole number.

2 If a whole number or a decimal is divided by [10] , then each digit from this number shifts to the right one spot on the place-value chart and the value of each digit decreases ten times.

For Example : $615 \div 10$

Millions			Thousands			Ones			·	Decimals	
H	T	O	H	T	O	H	T	O	·	Tenths	Hundredths
						6	1	5	·		
							6	1	·	5	

- Record 615 on the place-value chart.
- Shift each digit to the right one spot to get the number 61.5
- Then $615 \div 10 = 61.5$
- The value of the whole number "615" decreased when dividing by 10
- The value of 6 decreased when dividing by 10 from 600 to 60
- The value of 1 decreased when dividing by 10 from 10 to 1
- The value of 5 decreased when dividing by 10 from 5 to 0.5

Another Example : $61.5 \div 100$

Ones			·	Decimals		
H	T	O	·	Tenths	Hundredths	Thousandths
	6	1	·	5		
		6	·	1	5	
		0	·	6	1	5

Note that

When dividing by [100] each digit shifts to the right two spots, then the value of each digit decreases 100 times.

- Then $61.5 \div 100 = 0.615$

Remark

Dividing any number by 10 is the same as multiplying this number by $\frac{1}{10}$

So, $362 \div 10 = 362 \times \frac{1}{10}$

- Let your child explain how a digit changes value as it moves to the right in a decimal or a whole number.

Example 1

Use the place-value charts to solve each problem.

a. 8.7×10

b. $1.35 \times 1{,}000$

c. $2.5 \div 10$

d. $6.2 \div 100$

Solution

a.

Thousands			Ones			·	Decimals		
H	T	O	H	T	O	·	Tenths	Hundredths	Thousandths
					8	·	7		
				8	7	·	0		

$8.7 \times 10 = 87$

b.

Thousands			Ones			·	Decimals		
H	T	O	H	T	O	·	Tenths	Hundredths	Thousandths
					1	·	3	5	
				1	3	·	5	0	
			1	3	5	·	0	0	
		1	3	5	0	·	0	0	

$1.35 \times 1{,}000 = 1{,}350$

c.

Thousands			Ones			·	Decimals		
H	T	O	H	T	O	·	Tenths	Hundredths	Thousandths
					2	·	5		
					0	·	2	5	

$2.5 \div 10 = 0.25$

d.

Thousands			Ones			·	Decimals		
H	T	O	H	T	O	·	Tenths	Hundredths	Thousandths
					6	·	2		
						·	6	2	
					0	·	0	6	2

$6.2 \div 100 = 0.062$

Notes for parents :

- Help your child solve more problems on multiplying and dividing by 10 or 100.

Check your understanding

Use the place-value charts to solve each problem. Fill in the blanks to show how the value of each digit also changed.

a. 85×10

Thousands	Ones			·	Decimals	
O	H	T	O	·	Tenths	Hundredths
		—	—	·	———	———
		—	—	·	———	———

- The value of the whole number ——— [increased / decreased]
- The value of 5 [increased / decreased] when multiplying by 10 from ——— to ———
- The value of 8 [increased / decreased] when multiplying by 10 from ——— to ———

b. $942 \div 100$

Thousands	Ones			·	Decimals	
O	H	T	O	·	Tenths	Hundredths
	—	—	—	·	———	———
	—	—	—	·	———	———

- The value of the whole number ——— [increased / decreased]
- The value of 9 [increased / decreased] when dividing by 100 from ——— to ———
- The value of 2 [increased / decreased] when dividing by 100 from ——— to ———

c. 6.31×100

Thousands	Ones			·	Decimals	
O	H	T	O	·	Tenths	Hundredths
		—	—	·	———	———
		—	—	·	———	———

- The value of the whole number ——— [increased / decreased]
- The value of 3 [increased / decreased] when multiplying by 100 from ——— to ———
- The value of 1 [increased / decreased] when multiplying by 100 from ——— to ———

d. $74.8 \div 10$

Thousands	Ones			·	Decimals	
O	H	T	O	·	Tenths	Hundredths
	—	—	—	·	———	———
	—	—	—	·	———	———

- The value of the whole number ——— [increased / decreased]
- The value of 7 [increased / decreased] when dividing by 10 from ——— to ———
- The value of 8 [increased / decreased] when dividing by 10 from ——— to ———

- Let your child discover how the decimal point moves when multiplying and dividing by 10 or 100

Learn 2 Composing and decomposing decimals

- **Composing** decimals means [put together]
- **Decomposing** decimals means [broken apart]
- **You can decompose 843.572 in different ways using place-value chart :**

Thousands	Ones			·	Decimals		
O	H	T	O	·	Tenths	Hundredths	Thousandths
	8	4	3	·	5	7	2

▸ 1st way [expanded form] :

$843.572 = 800 + 40 + 3 + 0.5 + 0.07 + 0.002$

▸ 2nd way :

$843.572 = 843 + 0.572$

▸ 3rd way :

$843.572 = 843 + 0.5 + 0.07 + 0.002$

Example 2

Record the number 504.82 in the place-value chart and decompose this number in expanded form then decompose it in two other ways.

Thousands	Ones			·	Decimals		
O	H	T	O	·	Tenths	Hundredths	Thousandths
	—	—	—	·	———	———	———

- 1st way [expanded form] : ———————————
- 2nd way : ———————————
- 3rd way : ———————————

Solution

Thousands	Ones			·	Decimals		
O	H	T	O	·	Tenths	Hundredths	Thousandths
	5	0	4	·	8	2	

- 1st way [expanded form]: $504.82 = 500 + 4 + 0.8 + 0.02$
- 2nd way : $504.82 = 500 + 4 + 0.82$
- 3rd way : $504.82 = 504 + 0.8 + 0.02$

You can choose any other answers.

Notes for parents :

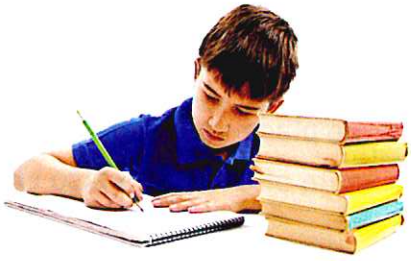
- Let your child begin by reviewing how to write number in expanded form and learn that number can be decomposed in many different ways.

Example 3

Decompose the following numerals using expanded form.

a. 640.078

b. Twenty-three and forty-two thousandths.



Solution

a. $640.078 = 600 + 40 + 0.07 + 0.008$

b. $23.042 = 20 + 3 + 0.04 + 0.002$

Example 4

Compose each of the following.

a. $4{,}000 + 80 + 7 + \frac{1}{10} + 0.002$

b. $420 + 0.2 + 0.07 + 0.009$

c. $5{,}900 + 0.3 + \frac{8}{1{,}000} + 70 + 2$

Solution

a. 4,087.102 **b.** 420.279 **c.** 5,972.308

Check your understanding

Complete the following.

1. Compose : 452.087

   Decompose : _____

2. Compose : 204.005

   Decompose : _____

3. Compose : _____

   Decompose : $540 + 0.2 + 3 + 0.007 + \frac{9}{100}$

- Help your child compose and decompose decimals in multiple ways.

Exercise 2
on lessons 2&3

- Place Value Shuffle
- Composing and Decomposing Decimals

● REMEMBER ● UNDERSTAND ○ APPLY PROBLEM SOLVING | From the school book

Place value shuffle

1. ○ **Use the place-value charts to solve each problem. Fill in the blanks to show how the value of each digit also changed.**

a. $85 \times 10 =$ _____

Thousands	Ones			.	Decimals	
0	H	T	O	.	Tenths	Hundredths
				.		
				.		

- The value of the whole number _____ [increased/decreased] when multiplying by 10
- The value of the _____ [first digit] _____ [increased/decreased] when multiplying by 10 from _____ to _____
- The value of the _____ [second digit] _____ [increased/decreased] when multiplying by 10 from _____ to _____

b. 📖 $57 \div 10 =$ _____

Thousands	Ones			.	Decimals	
0	H	T	O	.	Tenths	Hundredths
				.		
				.		

- The value of the whole number _____ [increased/decreased] when dividing by 10
- The value of the _____ [first digit] _____ [increased/decreased] when dividing by 10 from _____ to _____
- The value of the _____ [second digit] _____ [increased/decreased] when dividing by 10 from _____ to _____

c. 📖 $6.5 \times 10 =$ _____

Thousands	Ones			.	Decimals	
0	H	T	O	.	Tenths	Hundredths
				.		
				.		

- The value of the whole number _____ [increased/decreased] when multiplying by 10
- The value of the _____ [first digit] _____ [increased/decreased] when multiplying by 10 from _____ to _____
- The value of the _____ [second digit] _____ [increased/decreased] when multiplying by 10 from _____ to _____

d. $7.3 \times 100 =$ _____

Thousands	Ones			.	Decimals	
0	H	T	O	.	Tenths	Hundredths
				.		
				.		

- The value of the whole number _____ [increased/decreased] when multiplying by 100
- The value of the _____ [first digit] _____ [increased/decreased] when multiplying by 100 from _____ to _____
- The value of the _____ [second digit] _____ [increased/decreased] when multiplying by 100 from _____ to _____

e. 📖 $345 \div 10 =$ _____

Thousands	Ones			.	Decimals	
0	H	T	O	.	Tenths	Hundredths
				.		
				.		

- The value of the whole number _____ [increased/decreased] when dividing by 10
- The value of the _____ [first digit] _____ [increased/decreased] when dividing by 10 from _____ to _____
- The value of the _____ [second digit] _____ [increased/decreased] when dividing by 10 from _____ to _____
- The value of the _____ [third digit] _____ [increased/decreased] when dividing by 10 from _____ to _____

2. **Form the place-value chart to solve each problem.**

a. $75 \times 10 =$ _____

b. $43 \times 100 =$ _____

c. $2.5 \times 10 =$ _____

d. $14.52 \times 10 =$ _____

e. $218 \div 10 =$ _____

f. $4.9 \div 10 =$ _____

g. In the problem $74.8 \div 10$. The value of the digit 4 decreased from 4 to _____

[El Monofia - Sers El Laian 24]

Composing and Decomposing Decimals

3. **In the following problem, record the number in the place-value chart and decompose this number in expanded form and then in two other ways.**

a. 📖 34.527

Thousands	Ones			.	Decimals		
O	H	T	O	.	Tenths	Hundredths	Thousandths

- 1st way [expanded form] : _____
- 2nd way : _____
- 3rd way : _____

b. 📖 21.045

Thousands	Ones			.	Decimals		
O	H	T	O	.	Tenths	Hundredths	Thousandths

- 1st way [expanded form] : _____
- 2nd way : _____
- 3rd way : _____

c. 302.504

Thousands	Ones			.	Decimals		
O	H	T	O	.	Tenths	Hundredths	Thousandths

- 1st way [expanded form] : _____
- 2nd way : _____
- 3rd way : _____

d. 231.128

Thousands	Ones			.	Decimals		
0	H	T	O	.	Tenths	Hundredths	Thousandths

- 1st way (expanded form) : _____
- 2nd way : _____
- 3rd way : _____

e. 508.17

Thousands	Ones			.	Decimals		
0	H	T	O	.	Tenths	Hundredths	Thousandths

- 1st way (expanded form) : _____
- 2nd way : _____
- 3rd way : _____

4. Write each of the following in standard form.

a. $5 + 0.3 + 0.01 + 0.007 =$ _____ [Giza - Awseem 24]

b. $10 + 3 + 0.2 + 0.06 =$ _____ [Alexandria - First Montaza 23]

c. $10 + 8 + 0.3 + 0.009 =$ _____ [El Monofia - Shiben El Kom 23]

d. $8 + 0.2 + \frac{6}{100} + 0.009 =$ _____ [Cairo 23]

e. $2 + 0.9 + \frac{8}{100} + \frac{2}{1{,}000} =$ _____ [El Menia - Deir Mowas 23]

f. $5{,}000 + 40 + 9 + 0.2 + 0.007 =$ _____

g. $700 + 0.4 + 0.009 =$ _____

h. $9 + 0.003 + 0.5 + 10 =$ _____ [Cairo - El Maadi 24]

i. $40 + 0.8 + 0.009 + 500 =$ _____

j. $0.003 + 0.2 + 0.01 + 91{,}000 =$ _____ [Cairo - El Sherouk 23]

k. $6{,}000 + 70{,}000 + 0.2 + 4 + 0.09 + 0.005 =$ _____

l. $70 + 8{,}000 + 0.009 + 0.1 + 3 =$ _____

5. **Decompose each of the following in expanded form.**

a. 59.784 = _____ [Cairo - El Sahel 24]

b. 800.57 = _____ [Luxor 24]

c. 156,327.194 = _____ [Aswan 23]

d. Two and forty-one thousandths = _____

e. Seventy-nine thousandths = _____

f. 8 tens , 4 ones , 3 tenths , 6 hundredths , 9 thousandths = _____

g. 4 hundreds , 7 hundredths , 8 thousandths = _____

6. **Complete each of the following.**

a. 4.208 = _____ + 0.2 + 0.008

b. 70.106 = 70 + 0.1 + _____

c. 32.308 = _____ + 0.3 + 2 + 30 [Ismailia - Fayed 24]

d. _____ = 120 + 0.204

e. _____ = 4 + 0.005 + 0.3

f. 34.012 = 34 + _____

g. _____ = 4 + 30 + 400 + 0.008 + 0.02

h. Seventy and eight thousandths = _____ + _____

i. Sixteen and seven tenths = _____ + _____ + _____

j. 283 thousandths = _____ + 0.2 + 0.08

k. 57 thousandths = 0.007 + _____

l. 15.7 tenths = 1 + _____ + 0.07

m. 1,482 hundredths = 14 + _____

Multiple Choice Questions

Choose the correct answer.

1. $4.7 \times 100 =$ _____

[El Monofia - Menof 24, Sers El Laian 24]

A. 47 B. 470
C. 0.047 D. 0.47

2. $5.26 \times 100 =$ _____

[Ismailia 23]

A. 5,260 B. 0.526
C. 526 D. 52.6

3. 75 ◯ 7.5×10

[Alexandria - El Gamarek 24]

A. < B. >
C. =

4. When dividing 316 by 10, then the value of 6 becomes _____

[El Monofia - Ashmoon 24]

A. 0.6 B. 60
C. 0.06 D. 600

5. 5,000 not equals _____

[El Menia - Mallawi 24, Giza - Awseem 23]

A. $5 \times 1{,}000$ B. 50×100
C. 500×10 D. 500×100

6. $28.4 \div$ _____ $= 2.84$

[Aswan - Kom Ombo 23]

A. 10 B. 100
C. 1,000 D. 10,000

7. $0.008 + 0.07 + 20 =$ _____

[Cairo - EL Sharouk 24, Rod El Farg 24]

A. 20.807 B. 20.078
C. 20.78 D. 87.02

8. 6 Ones + 5 Tenths + 7 Thousandths = _____

[Aswan 23]

A. 0.756 B. 6.507
C. 657 D. 6,507

9. The standard form of $1 + 0.7 + 0.07$ is _____

[El Fayoum 24, Cairo - West 24, Alex. - El Montaza 24]

A. 1.71 B. 1.77
C. 77.1 D. 17.7

10. $35.605 = 35 +$ _____

[Giza - Omrania 24]

A. 605 B. 0.65
C. 0.605 D. 0.05

11. $0.2 +$ _____ $= 7.2$

[El Kalyoubia 23]

A. 7 B. 0.7
C. 70 D. 0.07

12. The number fifteen and fifteen hundredths in expanded form is _____

[Giza - El Haram 24]

A. $10 + 5 + 0.1 + 0.005$
B. $10 + 5 + 0.05 + 0.001$
C. $10 + 5 + 0.1 + 0.05$
D. $10 + 5 + 0.01 + 0.005$

Lesson

4 ▸ Comparing Decimals

Learn How to compare two decimals

You can use place-value charts to compare decimals.

▸ Examples :

Compare 2.948 and 2.957

Ones			·	Decimals		
H	T	O	·	Tenths	Hundredths	Thousandths
		2	·	9	4	8
		2	·	9	5	7

- Begin with the digit in the greatest place value.
- Compare ones : 2 ones = 2 ones
- Compare tenths : 9 tenths = 9 tenths
- Compare hundredths : 4 hundredths < 5 hundredths

So, 2.948 < 2.957

Compare 0.26 and 0.206

Ones			·	Decimals		
H	T	O	·	Tenths	Hundredths	Thousandths
		0	·	2	6	0
		0	·	2	0	6

- Begin with the digit in the greatest place value.
- Compare ones : 0 ones = 0 ones
- Compare tenths : 2 tenths = 2 tenths
- Compare hundredths : 6 hundredths > 0 hundredths

So, 0.26 > 0.206

Example 1

Use place-value chart to compare the following decimals :

a. 52.008 and 52.8 **b.** 3.02 and 3.019 **c.** 67.5 and 67.500

Notes for parents :

- Remind your child to begin comparing with the greatest place value.

Solution

a.

Ones			·	Decimals		
H	T	O	·	Tenths	Hundredths	Thousandths
	5	2	·	0	0	8
	5	2	·	8	0	0

$5 = 5$, $2 = 2$, $0 < 8$ Since, $0 < 8$

So, 52.008 < 52.8

b.

Ones			·	Decimals		
H	T	O	·	Tenths	Hundredths	Thousandths
		3	·	0	2	0
		3	·	0	1	9

$3 = 3$, $0 = 0$, $2 > 1$ Since, $2 > 1$

So, 3.02 > 3.019

c.

Ones			·	Decimals		
H	T	O	·	Tenths	Hundredths	Thousandths
	6	7	·	5	0	0
	6	7	·	5	0	0

$6 = 6$, $7 = 7$, $5 = 5$, $0 = 0$ $0 = 0$

So, 67.5 = 67.500

Line up the decimal points.
Compare the digits, beginning with the greatest place value.

Example 2

Compare 2.135 and 2.137

Solution

To compare 2.135 and 2.137, follow the following steps :

Step 1	Step 2	Step 3	Step 4
Compare the ones.	Compare the tenths.	Compare the hundredths.	Compare the thousandths.
2.135	2.135	2.135	2.135
↓	↓	↓	↓
2.137	2.137	2.137	2.137
the same number of ones	the same number of tenths	the same number of hundredths	$5 < 7$

So , $2.135 < 2.137$

• Ask your child how is comparing decimals like comparing whole numbers.

Example 3

Compare using "<, > or =".

a. 0.395 ◯ $\frac{385}{1{,}000}$ **b.** 28 thousandths ◯ 0.28

c. 4 ones , 4 hundredths , 5 thousandths ◯ 4.054

Solution

a. Since, $\frac{385}{1{,}000} = 0.385$ So, $0.395 > 0.385$

b. Since, 28 thousandths = 0.028 So, $0.028 < 0.28$

c. Since, 4 ones, 4 hundredths, 5 thousandths = 4.045 So, $4.045 < 4.054$

Check your understanding

Compare using ">, < or =".

a. 3.204 ◯ 3.24

b. 19.2 ◯ 19.200

c. 20.7 ◯ 20.077

d. 1.01 ◯ 1.099

e. 9.08 ◯ 9.079

f. 14.010 ◯ $14\frac{9}{10}$

g. 4.12 ◯ 4 + 0.1 + 0.007

h. 5 thousandths ◯ 0.500

Notes for parents :

• Ask your child to explain the strategies he/she uses to compare decimals.

Exercise 3
on lesson 4

▸ Comparing Decimals

● REMEMBER ● UNDERSTAND ○ APPLY PROBLEM SOLVING | 📖 From the school book

1. Rewrite the decimals in the chart. Use the symbols "> , < or =".

a. 4.08 ◯ 4.8

Ones			.	Decimals		
H	T	O	.	Tenths	Hundredths	Thousandths

b. 15.3 ◯ 15.300

Ones			.	Decimals		
H	T	O	.	Tenths	Hundredths	Thousandths

c. 230.03 ◯ 230.009

Ones			.	Decimals		
H	T	O	.	Tenths	Hundredths	Thousandths

2. Compare the decimal numbers using the symbols "> , < or =".
Draw a place value chart to help you, if needed.

a. 0.2 ◯ 0.193

b. 0.013 ◯ 0.031

c. 0.007 ◯ 0.07

d. 📖 45.057 ◯ 45.100

e. 0.10 ◯ 0.100

f. 📖 98.013 ◯ 98.101

g. 📖 50.009 ◯ 50.100

h. 📖 10.1 ◯ 10.011

i. 34.56 ◯ 3.456

j. 0.48 ◯ 0.480

k. 📖 2.01 ◯ 2.099

l. 📖 34.5 ◯ 34.500

m. 87.3 ◯ 87.03

n. 2.197 ◯ 2.179

o. 2.19 ◯ 2.190

p. 3.011 ◯ 3.001

3. 📖 **At the Fayoum Basin, temperatures vary greatly. The numbers are the temperatures recorded on one day in May. All numbers are in degrees Celsius. Compare each set of numbers using the symbols "> , < or =".**

a. 29.9° _____ 30.2°

b. 36.5° _____ 35.6°

c. 40.5° _____ 41.0°

d. 35.2° _____ 34.7°

e. 38.80° _____ 38.8°

4. Compare the numbers using "> , < or =".

a. 2.71 ◯ $2\frac{8}{100}$

b. 2.007 ◯ $7\frac{2}{1,000}$

c. 1.002 ◯ $\frac{1,002}{1,000}$

d. 16.24 ◯ $16\frac{224}{1,000}$

e. 4.000 ◯ $\frac{400}{1,000}$

f. 99.257 ◯ 1,234 tenths

g. 3 thousandths ◯ $\frac{30}{100}$

h. Eighteen thousandths ◯ 0.02

i. 8 tenths ◯ 0.799

j. 0.402 ◯ 402 thousandths

k. 5.102 ◯ 5 + 0.1 + 0.02

l. 4.904 ◯ 4 + 0.9 + 0.004

m. 8 + 0.009 ◯ 8 + 0.1 + 0.001

n. 407.05 ◯ 400 + 7 + 0.005

o. 7 ones , 5 thousandths ◯ 7.05

p. 2 ones , 3 tenths , 4 thousandths ◯ 2.34

q. 8.004 ◯ 4 ones , 8 thousandths

r. $3\frac{4}{1,000}$ ◯ 3 ones , 4 hundredths

5. **Circle all the decimal numbers that are greater than 4.3**

3.4 , 4.03 , 4.34 , 4.300 , 3.99 , 4.7 , 4.003

6. **Circle all the decimal numbers that are smaller than 2.104**

2.102 , 2.401 , 2.14 , 2.199 , 2.11 , 2.7 , 2.014

7. 📖 **Select the largest number :**

1.401 , 1.341 , 1.440 , 1.055 , 1.3 , 1.30 , 1.28 , 1.49

8. 📖 **Select the smallest number :**

20.09 , 20.1 , 20.001 , 20.011 , 20.10 , 20.010 , 20.9 , 20.21

9. **Order from least to greatest.**

a. 1.401 , 1.055 , 1.3 , 1.28 [Cairo - Heliopolis 23]

b. 1.662 , 1.616 , 1.661 , 1.166

c. 0.096 , 2.56 , 1.26 , 0.27 [El Menia 23]

d. 2.547 , 9.258 , 1.253 , 4.325 [Cairo - Helwan 24]

e. 0.004 , 0.071 , 0.7 , 0.11 , 0.05 [El Monofia - Shebin El Koum 24]

f. 80.21 , 80.012 , 8.102 , 8.012 , 80.09

10. Youssef ran 2.2 kilometers during track practice and Nader ran 2.099 kilometers.

Who ran the greater distance ?

11. 📖 Give an example of two decimal numbers where the number with more decimal digits is smaller than the other number.

12. 📖 Give an example of two decimal numbers where the number with more decimal digits is equal to the other number.

Multiple Choice Questions

Choose the correct answer.

1. 1.27 ◯ 1.72 [Giza - Abo El Nomrous 24]

A. $<$ B. $>$

C. $=$ D. $\geq$

2. 25.12 ◯ 25.056 [El Beheira 23 , Cairo 24]

A. $>$ B. $<$

C. $=$ D. $\leq$

3. 36.5 ◯ 35.6 [Port Said 23]

A. $<$ B. $>$

C. $=$ D. Others

4. 456.25 ◯ 45.625 [Kafr El Sheikh 24]

A. $<$ B. $=$

C. $>$

5. 5.36 $>$ _____ [Cairo – Al Khalifa and Al Mokattam 23]

A. 5.37 B. 5.362

C. 5.366 D. 3.561

6. 7.54 $<$ _____ [Alexandria - West 24]

A. 7.145 B. 7.216

C. 7.6 D. 7.399

7. 5 Tenths ◯ 0.099 [Giza 24]

A. $>$ B. $<$

C. $=$ D. $\leq$

8. 19 hundredths ◯ 19 thousandths

A. $>$ B. $<$

C. $=$

9. 5.68×10 ◯ 56.8×100 [Cairo - Al Mostaabal 24]

A. $>$ B. $<$

C. $=$ D. $\leq$

10. 3.408 ◯ $\frac{348}{100}$

A. $>$ B. $<$

C. $=$

11. The greatest decimal from the following is _____ [El Monofia - Tala 24]

A. 0.6 B. 0.06

C. 0.006 D. 0.606

12. 14.1 7 $>$ 14.158

A. 3 B. 4

C. 5 D. 6

13. Which of the following is true ?

A. $0.532 > 0.537$ B. $0.1 + 3 < 1.3$

C. $1.019 > 1.1$ D. $\frac{18}{10} = 1.8$

14. Which of the following is NOT true ?

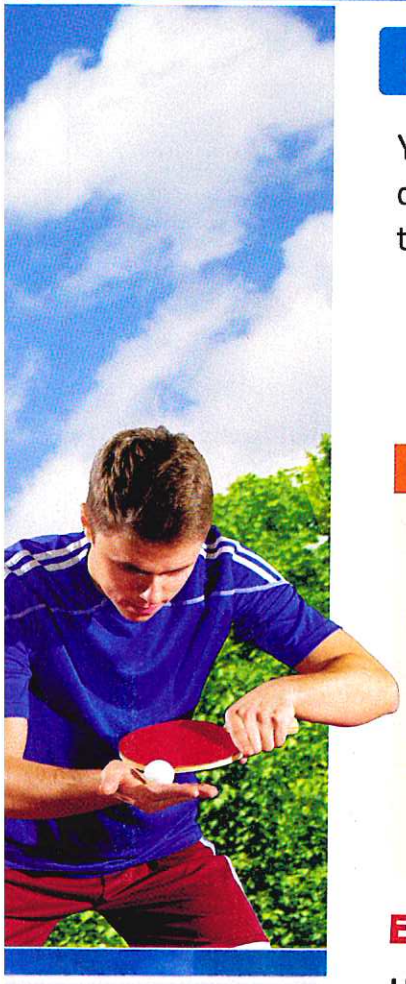
A. $14.14 > 14.014$ B. $\frac{143}{100} = 1.43$

C. $2.051 > 2.501$ D. $2.005 < 5.002$

Lesson

5

▸ Rounding Decimals



Learn Different strategies to round decimals

You can round (approximate) decimal numbers using one of the following strategies :

1. Midpoint strategy.
2. Rounding rule strategy.

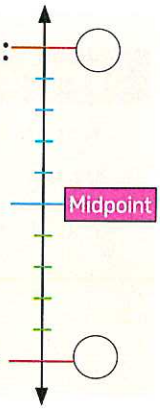
Did You Know?!

*Table tennis is one of the world's most popular games. It became an Olympic sport in 1988. A table tennis ball weighs between **2.4** grams and **2.53** grams ≈ **2.5** grams*

First Midpoint strategy

To round decimals using midpoint strategy, do as follows :

1. Draw a vertical number line.
2. Put the two numbers that the given number lies between them.
3. Put their midpoint.
4. If the given number is at or above the midpoint, round up and if the given number is below the midpoint, round down.



Example 1

Use midpoint strategy to round each of the following.

a. 19.7 (to the nearest whole number or Unit).

b. 4.62 (to the nearest Tenth).

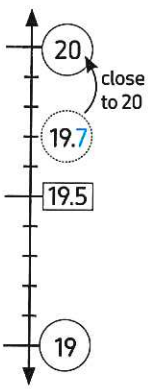
c. 8.765 (to the nearest Hundredth).

Solution

a. • 19.7 is between 19 and 20

• 19.5 is the midpoint between the two numbers 19 and 20

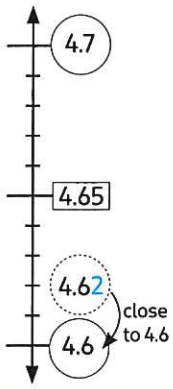
• 19.7 is closer to 20 because 0.7 is above the midpoint , then $19.7 \approx 20$



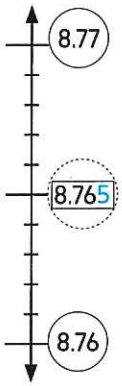
Notes for parents :

• Remind your child with midpoint and rounding rule strategies he/she learned in Primary 4.

b. • 4.62 is between 4.6 and 4.7
• 4.65 is the midpoint between the two numbers 4.6 and 4.7
• 4.62 is closer to 4.6 because 0.02 is below the midpoint, then $4.62 \approx 4.6$



c. • 8.765 is between 8.76 and 8.77
• 8.765 is the midpoint between the two numbers 8.76 and 8.77
• 8.765 is closer to 8.77 because 0.005 is at the midpoint, then $8.765 \approx 8.77$



Second Rounding rule strategy

To round decimals using rounding rule strategy, do as follows :

1. Underline the digit in the place you want to round the decimal number to it.
2. Look at the digit to its right and circle it.

If

This circled digit is

Less than 5	Equal to 5 or more
Leave out the circled digit and the other digits to the right.	Increase the underlined digit by one, and leave out the other digits to the right.

Example 2

Use rounding rule strategy to round the decimal number 18.5376 to the nearest whole number, Tenth, Hundredth and Thousandth.

Solution

- $18.\underline{5}(5)376 \approx 19$ [to the nearest whole number] (5 = 5)
- $18.\underline{5}(3)76 \approx 18.5$ [to the nearest Tenth] (3 < 5)
- $18.53(7)6 \approx 18.54$ [to the nearest Hundredth] (7 > 5)
- $18.537(6) \approx 18.538$ [to the nearest Thousandth] (6 > 5)

Remarks

- *Rounding to the nearest Tenth, the result should include at most 1 decimal digit*
- *Rounding to the nearest Hundredth, the result should include at most 2 decimal digits and so on.*

Notes for parents :

- Remind your child to round up if the digit to the right of the place value he/she wants to round is equal to or greater than 5

Example 3

Round each number to the place of the underlined digit :

a. 28.12 | **b.** 6.247 | **c.** 12.5928 | **d.** 47.051

e. 5.9184 | **f.** 0.6697 | **g.** 402.601 | **h.** 0.995

Solution

a. $28.\underline{1}2 \approx 28$ (1 < 5)

b. $6.\underline{2}47 \approx 6.2$ (4 < 5)

c. $12.592\underline{8} \approx 12.593$ (8 > 5)

d. $47.0\underline{5}1 \approx 47.1$ (= 5)

e. $5.918\underline{4} \approx 5.92$ (8 > 5)

f. $0.669\underline{7} \approx 0.670$ (7 > 5)

g. $402.\underline{6}01 \approx 403$ (6 > 5)

h. $0.9\underline{9}5 \approx 1.00$ (= 5)

Example 4

a. Write down the smallest decimal, less than one, that includes only the digits 3 , 6 , 4 and 2 , then round that number to the nearest Hundredth and to the nearest Thousandth.

b. Write down the greatest decimal, less than one, that includes 4 digits which are 5 , 9 , 2 and 7 , then round that number to the nearest Hundredth and to the nearest Thousandth.

Solution

a. To write the smallest decimal less than one, put the decimal point (0.), then write the given digits arranged ascendingly from the left to the right.

- The smallest decimal less than one = 0.2346
- $0.23\underline{4}6 \approx 0.23$ (to the nearest Hundredth)
- $0.234\underline{6} \approx 0.235$ (to the nearest Thousandth)

b. To write the greatest decimal, less than one, put the decimal point (0.) , then write the given digits arranged descendingly from the left to the right.

- The greatest decimal less than one = 0.9752
- $0.97\underline{5}2 \approx 0.98$ (to the nearest Hundredth)
- $0.975\underline{2} \approx 0.975$ (to the nearest Thousandth)

Check your understanding

Round each number to the place of the underlined digit.

a. $8.1\underline{4}37 \approx$ _____ | **b.** $5\underline{2}.5 \approx$ _____ | **c.** $35.\underline{1}072 \approx$ _____

d. $17.\underline{9}7 \approx$ _____ | **e.** $55.\underline{5}24 \approx$ _____ | **f.** $1.56\underline{9}8 \approx$ _____

g. $2.43\underline{5}5 \approx$ _____ | **h.** $\underline{0}.215 \approx$ _____ | **i.** $1.5\underline{9}5 \approx$ _____

- Remind your child how he/she write the smallest and the greatest decimal formed from given digits.

Exercise 4

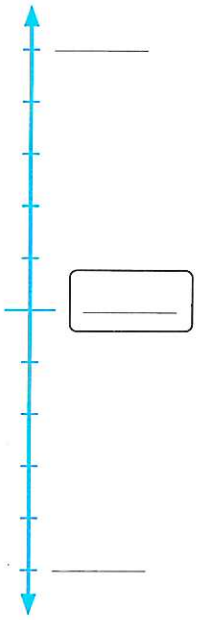
on lesson 5

▸ Rounding Decimals

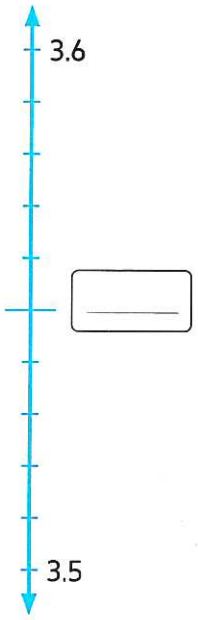
REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. **Label the midpoint of the number line. Place the given decimal number at its proper location.**

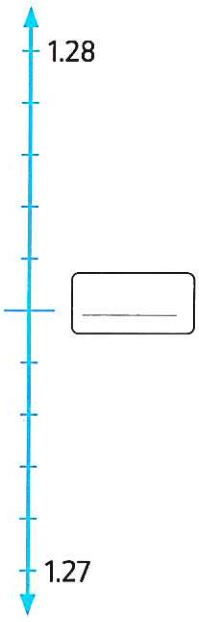
a. Approximate the number 7.7 to the nearest Unit.



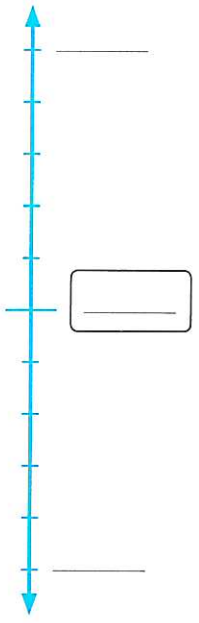
b. Round 3.54 to the nearest Tenth.



c. Round 1.277 to the nearest Hundredth.



d. Round 3.4562 to the nearest Thousandth.



2. Round each of the following numbers to the nearest whole number.

a. $0.9 \approx$ _____ [El Monofia - Ashmoon 24]

b. $0.215 \approx$ _____

c. $0.512 \approx$ _____

d. $9.9 \approx$ _____

e. $27.68 \approx$ _____ [Port said - East 24]

f. $18.58 \approx$ _____ [Giza - El Agouza 23]

g. $600.601 \approx$ _____

h. $0.999 \approx$ _____

i. $0.009 \approx$ _____

3. Round each of the following numbers to the nearest Tenth.

a. $8.378 \approx$ _____ [Alexandria 23]

b. $21.729 \approx$ _____ [Qena - Farshut 24]

c. $90.09 \approx$ _____

d. $0.208 \approx$ _____

e. $73.85 \approx$ _____ [El Monofia - Tala 24]

f. $2.465 \approx$ _____ [Giza 24]

g. $476.23 \approx$ _____ [Ismailia 23]

h. $0.07 \approx$ _____

i. $502\frac{37}{100} \approx$ _____

4. Round each of the following numbers to the nearest Hundredth.

a. $1.277 \approx$ _____ [Port Said - Port Fouad 24]

b. $65.567 \approx$ _____ [El Beheira 23]

c. $91.364 \approx$ _____ [El Monofia - Tala 23, Qena 24 , Souhag - Tama 24]

d. $0.737 \approx$ _____

e. $0.996 \approx$ _____

f. $3\frac{8}{1000} \approx$ _____

5. Round each of the following numbers to the nearest Thousandth.

a. $2.0509 \approx$ _____

b. $0.0474 \approx$ _____

c. $4.6798 \approx$ _____

d. $19.9996 \approx$ _____

e. $0.0004 \approx$ _____

f. $0.9986 \approx$ _____ [Cairo - El Salam 24]

6. Round each of the following to the place of the underlined digit.

a. $36.\underline{9}16 \approx$ _____

b. $5.5\underline{4}8 \approx$ _____

c. $\underline{1}.98 \approx$ _____

d. $0.0\underline{8}7 \approx$ _____

e. $0.\underline{0}81 \approx$ _____

f. $20.3\underline{6}7 \approx$ _____

g. $3.9\underline{9}8 \approx$ _____

h. $\underline{0}.09 \approx$ _____

i. $\underline{0}.8 \approx$ _____

j. $\underline{1}.499 \approx$ _____

k. $1.\underline{0}88 \approx$ _____

l. $1.02\underline{2}9 \approx$ _____

7. **Complete the following table as you round each decimal to the stated place value.**

	Number	Round to the nearest			
		Whole number (unit)	Tenth	Hundredth	Thousandth
a.	123.3569	123	123.4	123.36	123.357
b.	528.2025	_____	_____	_____	_____
c.	43.5426	_____	_____	_____	_____
d.	21.84792	_____	_____	_____	_____
e.	0.5297	_____	_____	_____	_____
f.	0.0546	_____	_____	_____	_____
g.	4.2688	_____	_____	_____	_____

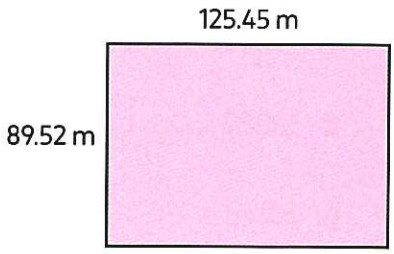
8. 📖 Mazen is planning a trip from Cairo to the waterfall region in Wadi El Rayan. He will travel 147.72 kilometers. Round the distance to the nearest Tenth.

_____

9. 📖 Mazen stops to have a snack and stretch after driving 73.255 kilometers. Round the distance to the nearest Hundredth.

_____

10. 📖 A farmer is building a new fence for her sheep field. She wants to build a fence around the whole field. Estimate how much fencing you think she will need by rounding each dimension to the nearest Tenth. Explain your thinking.



_____

11. Write the greatest decimal less than one which consists of 6 , 4 , 3 and 5 , then round it to the nearest Tenth and Hundredth.

12. Write the smallest decimal less than one which consists of 2 , 5 , 1 and 7 , then round it to the nearest Hundredth and Thousandth.

13. Name two decimals with digits in the Thousandths place that should be rounded to the Tenth place as 0.3

14. Write three decimals , if we round each of them to the nearest Hundredth becomes 12.25

15. Write three decimals , if we round each of them to the nearest Thousandth becomes 86.398

16. **Discover directly the error in each rounded result to the nearest Hundredth, give reason.**

a. $73.625 \approx 73.62$

b. $200.081 \approx 200.07$

17. 📖 **Read the passage , and then answer the question.**

There are several cascades along the stream between the two lakes in Wadi El Rayan. The distance between the falls is approximately 30 to 35 meters , and the width of the island dividing the cascades is between 20 and 50 meters.

A geologist measured the exact distance between two of the falls at 31.45 meters and between two others at 36.921 meters. If both distances were rounded to the nearest whole number, would they fall into the range given in the passage ? Explain your thinking.

Challenge

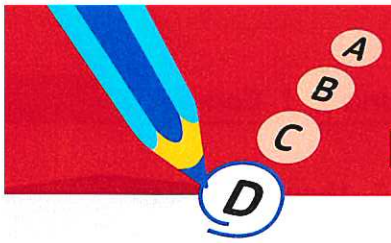
18. **Complete with suitable digits.**

a. $2.7 \square 8 \approx 2.79$ [to the nearest Hundredth]

b. $20.12 \square 6 \approx 20.123$ [to the nearest Thousandth]

c. $9.23 \square 6 \approx 9.237$ [to the nearest Thousandth]

d. $19.\square\square 5 \approx 20.00$ [to the nearest Hundredth]



Multiple Choice Questions

Choose the correct answer.

1. Rounding 0.9 to the nearest whole number is _____

[Souhag - Gerga 24]

A. 0.9 B. 0

C. 2 D. 1

2. 2.153 ≈ _____ [to the nearest Tenth]

[Cairo - Hadayek El Quba 24, Giza - Awseem 24]

A. 2.1 B. 2.15

C. 2.14 D. 2.2

3. 21.345 ≈ _____

[to the nearest Hundredth] [Cairo 23]

A. 21 B. 21.3

C. 21.34 D. 21.35

4. 12.0189 ≈ _____

[round to nearest Thousandth]

[Alexandria - Agami 24]

A. 12.089 B. 12.018

C. 12.019 D. 10.000

5. 193.2 ≈ _____ [to the nearest Ten]

[El Monofia - Shebin El Kom 24]

A. 190 B. 200

C. 193 D. 193.4

6. 8.391 ≈ 8.4

[rounded to the nearest _____]

[Port Said - North 24]

A. Hundredth B. Tenth

C. Thousandth D. Tens

7. 82.4973 ≈ 82.497

[to the nearest _____]

A. whole number B. Tenth

C. Hundredth D. Thousandth

8. 9.3 ≈ 9 [to the nearest _____]

[El Menia - Deir Mawas 24]

A. Unit B. Tenth

C. Hundredth D. Thousandth

9. 42.15 ≈ _____

[to the nearest one decimal place]

[El Monofia – Menof 24, Ashmoon 24, Sers El Laian 24]

A. 42.1 B. 42.2

C. 42.15 D. 42.05

10. 3.649 ≈ _____

[to the nearest 2 decimal places]

[El Kalyoubia 23]

A. 3.74 B. 3.65

C. 3.54 D. 4.6

11. $2\frac{7}{1{,}000} \approx$ _____

[to the nearest Hundredth]

A. 2 B. 2.1

C. 2.01 D. 2.007

12. 999.9 ≈ _____

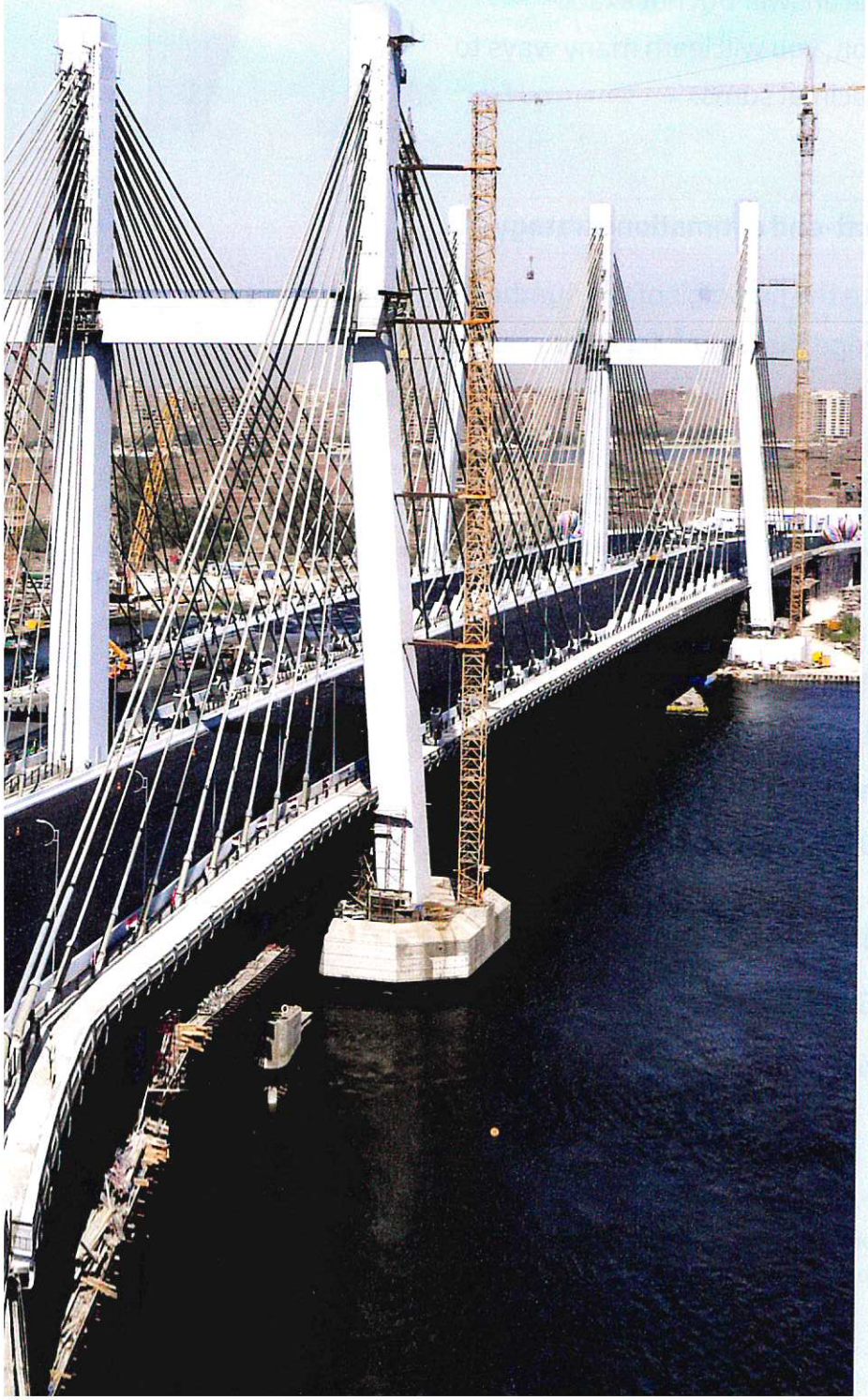
[to the nearest whole number]

A. 990 B. 999

C. 1,000 D. 900

CONCEPT 2

Adding and Subtracting Decimals



▶ Lessons 6&7
- Estimating Decimal Sums
- Modeling Decimal Addition

Learning Objectives:

- Students will estimate sums of decimal numbers.
- Students will model decimal addition.

▶ Lessons 8 to 10
- Modeling Decimal Subtracting
- Estimating Decimal Differences
- Subtracting to the Thousandths Place

Learning Objectives:

- Students will model decimal subtraction.
- Students will estimate differences of decimal numbers.
- Students will apply strategies to subtract decimals to the Thousandths place.
- Students will check the reasonableness of their answers.

▶ Lesson 11
- Decimal Story Problems

Learning Objectives:

- Students will add and subtract decimal numbers to the Thousandths place to solve story problems.

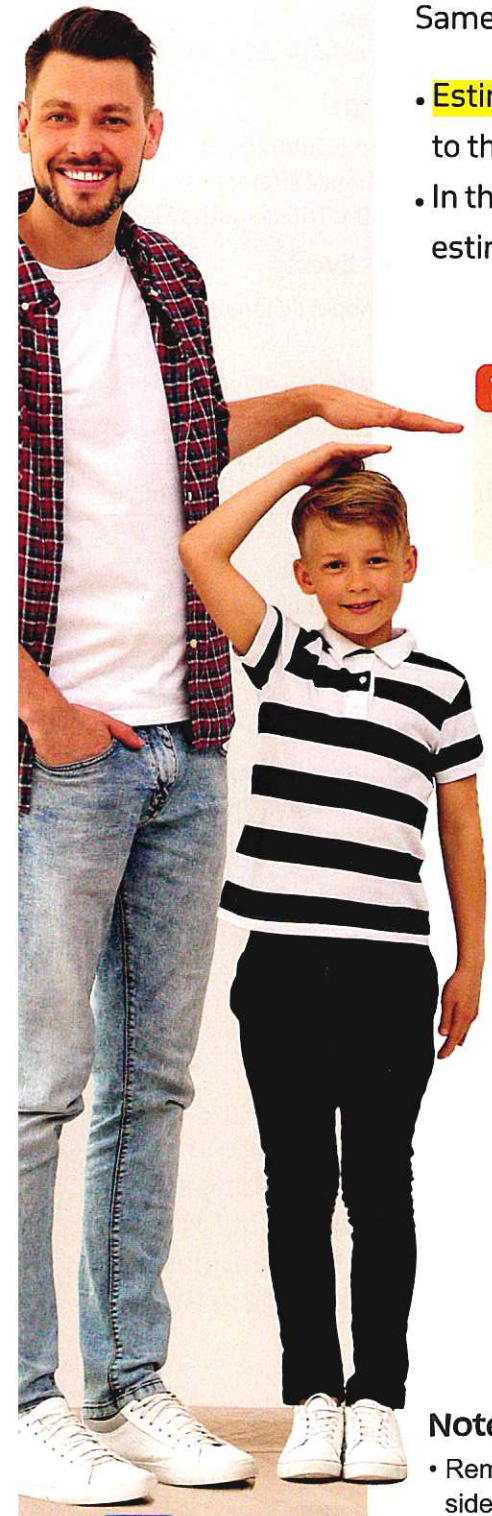
Fast Fact

The Tahya Misr Bridge in Cairo is 540 meters long and 67.3 meters wide. It holds the world record for the widest cable-stayed bridge in the world.

Lessons
6 & 7

- Estimating Decimal Sums
- Modeling Decimal Addition

Learn 1 Estimating decimal sums



Sameh measured the tallness of his son.
He found that his son is 1.15 meters tall.
Sameh said that his son is about 1 meter tall.

- Estimation is a way to get a number that is close to the actual answer but not exact.
- In this lesson, you will learn many ways to estimate decimal sums.

1 Front-end estimation strategy

- Write the first digit of the number from the left as it is.
- Change the rest of digits into zeroes.

For Example :

- 12.18 is closer to 10.00 = 10
- 417.59 is closer to 400.00 = 400

Example 1

Estimate each of the following sums by using front-end estimation.

a. 3.41 + 5.22 **b.** 41.925 + 52.236

Solution

a. 3.41 + 5.22 Estimate : 3 + 5 = 8

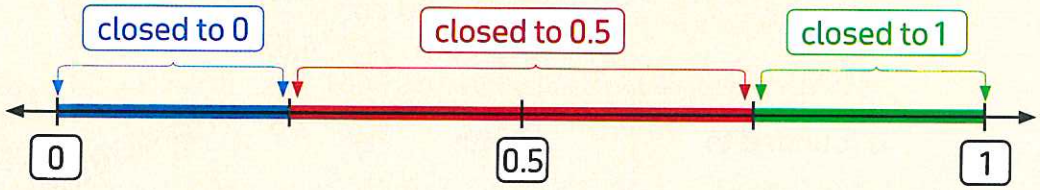
b. 41.925 + 52.236 Estimate : 40 + 50 = 90

Notes for parents :

- Remind your child that he/she just looks at the first digit of the number from the left side, or the highest place value when estimating using front-end strategy.

2 Benchmark decimals strategy

- The benchmark numbers are 0 , $\frac{1}{2}$, 1
- The benchmark decimal for one-half is 0.5 = 0.50 = 0.500



For Example :

- Each of : 0.1 , 0.01 , 0.001 is closer to 0
- Each of : 0.9 , 0.99 , 0.999 is closer to 1
- Each of : 0.52 , 0.46 , 0.611 , 0.395 is closer to 0.5

Example 2

Estimate each of the following sums by using benchmark decimals.

a. 0.41 + 0.58

b. 0.6 + 0.391

c. 12.492 + 13.659

d. 14.999 + 3.01

Solution

a. 0.41 + 0.58

Estimate : 0.5 + 0.5 = 1

b. 0.6 + 0.391

Estimate : 0.5 + 0.5 = 1

c. 12.492 + 13.659 = 12 + 0.492 + 13 + 0.659

Estimate : 12 + 0.5 + 13 + 0.5 = 26

d. 14.999 + 3.01 = 14 + 0.999 + 3 + 0.01

Estimate : 14 + 1 + 3 + 0 = 18

Hint

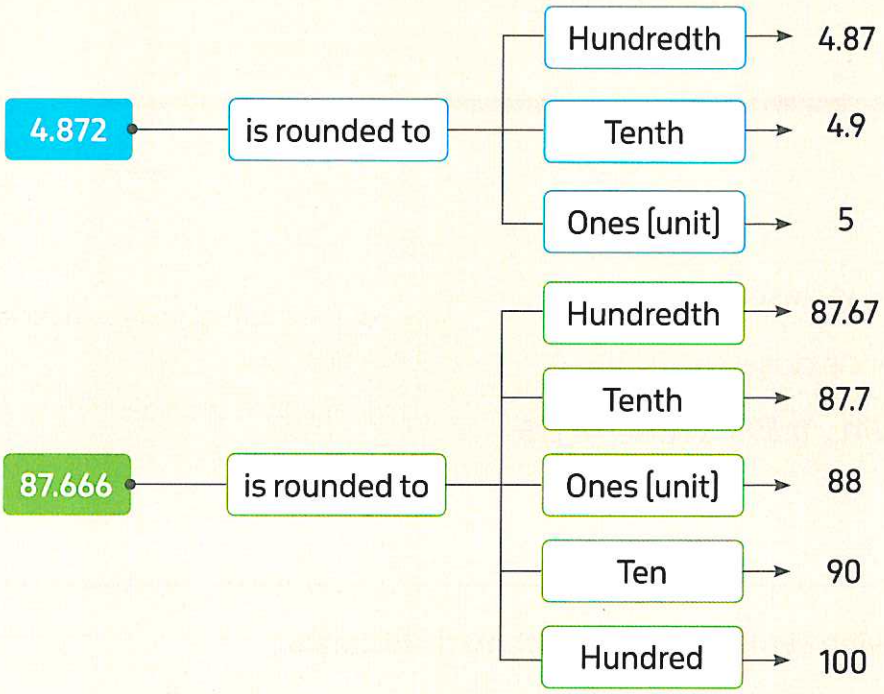
You can separate wholes and parts before using benchmark decimals.

- Remind your child that benchmark decimals are common decimals that he/she can use to judge and compare other decimals.

3 Rounding strategy

You can round decimals in many ways to the nearest Hundredth, Tenth, Ones (unit), Ten, Hundred and so on.

For Example :



Example 3

Estimate the sum 45.561 + 14.047 by using rounding.

Note that

Rounding to the lowest place value will give you the most accurate estimation.

Solution

- 45.561 + 14.047 Estimate : 50 + 10 = 60 (to the nearest Ten)
- 45.561 + 14.047 Estimate : 46 + 14 = 60 (to the nearest Ones)
- 45.561 + 14.047 Estimate : 45.6 + 14.0 = 59.6 (to the nearest Tenth)
- 45.561 + 14.047 Estimate : 45.56 + 14.05 = 59.61 (to the nearest Hundredth)

Check your understanding

Estimate each of the following sums by using more than one strategy.

a. 4.39 + 7.12 _____

b. 62.815 + 37.109 _____

c. 15.98 + 24.021 _____

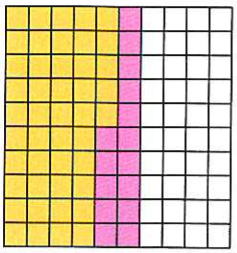
Notes for parents :

- Remind your child to round up if the digit to the right of the place value he/she wants to round is equal to or greater than 5, and round down if it is less than 5.

Learn 2 Modeling decimal addition

To evaluate : 0.45 + 0.15

- **Use two different colors to create a model of the expression : 0.45 + 0.15**



45 Hundredths + 15 Hundredths = 60 Hundredths
So, 0.45 + 0.15 = 0.60

To add decimal numbers

1. Put the decimal points under each other.
2. Put zeroes to the right of the last decimal digit, so that each number has the same number of digits after the decimal point.
3. Add by starting from the right to the left.

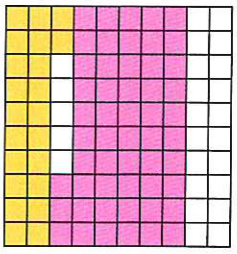
- **Use the place-value chart.**

Ones			·	Decimals	
H	T	O	·	Tenths	Hundredths
		0	·	4	5
		0	·	1	5
		0	.	6	0

$$\begin{array}{r} \overset{1}{} \\ 0.45 \\ +\ 0.15 \\ \hline 0.60 \end{array}$$

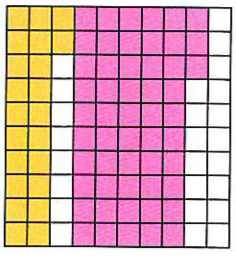
To evaluate : 0.22 + 0.53

- **Use the model.**



22 Hundredths + 53 Hundredths = 75 Hundredths
So, 0.22 + 0.53 = 0.75

Another way of modeling decimal addition :



- **Use the place-value chart.**

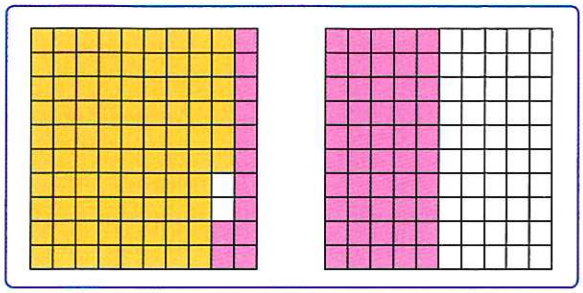
Ones			·	Decimals	
H	T	O	·	Tenths	Hundredths
		0	·	2	2
		0	·	5	3
		0	.	7	5

$$\begin{array}{r} 0.22 \\ +\ 0.53 \\ \hline 0.75 \end{array}$$

- Make sure that when your child adds decimals, he/she puts the decimal points under each other.

To evaluate : 0.86 + 0.62

- **Use the model.**



86 Hundredths
+ 62 Hundredths
= 148 Hundredths
So, 0.86 + 0.62 = 1.48

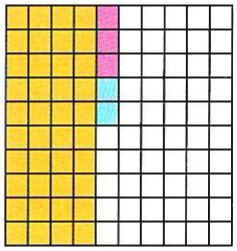
- **Use the place-value chart.**

Ones			·	Decimals	
H	T	O	·	Tenths	Hundredths
		0	·	8	6
		0	·	6	2
		1	.	4	8

$$\begin{array}{r} {\scriptstyle 1} \\ 0.86 \\ +\ 0.62 \\ \hline 1.48 \end{array}$$

To evaluate : 0.4 + 0.03 + 0.02

- **Use the model.**



4 Tenths + 3 Hundredths + 2 Hundredths
= 40 Hundredths + 3 Hundredths + 2 Hundredths
= 45 Hundredths
So, 0.4 + 0.03 + 0.02 = 0.45

- **Use the place-value chart.**

Ones			·	Decimals	
H	T	O	·	Tenths	Hundredths
		0	·	4	0
		0	·	0	3
		0	·	0	2
		0	.	4	5

$$\begin{array}{r} 0.40 \\ +\ 0.03 \\ +\ 0.02 \\ \hline 0.45 \end{array}$$

Notes for parents :

- Remind your child that there are more than one model for any addition statement.

To evaluate : 2,923.42 + 4,581.3

It is impossible to use the model

So, use the place-value chart.

Thousands	Ones			·	Decimals	
O	H	T	O	·	Tenths	Hundredths
2	9	2	3	·	4	2
4	5	8	1	·	3	0
7	5	0	4	.	7	2

① ①
2,923.42
+ 4,581.30
7,504.72

Example 4

Add each of the following.

a. 3.13 + 5.49 **b.** 127.3 + 16.45 **c.** 14.72 + 7.5 + 0.231

Solution

a.
①
3.13
+ 5.49
8.62

b.
①
127.30
+ 16.45
143.75

c.
①①
14.720
+ 7.500
+ 0.231
22.451

Note

You can add decimals horizontally as follows :

① 3.13 + 5.49 = 8.62

Check your understanding

Add the following.

a. 0.21 + 0.575

b. 213.01 + 27.992

c. 3 Hundredths + 4 Thousandths = _____

d. 13 Hundredths + 65 Thousandths = _____

- Let your child learn that the modeling decimal adding strategy is impossible to use when adding large numbers.

Exercise 5
on lessons 6&7

▸ Estimating Decimal Sums
▸ Modeling Decimal Addition

● REMEMBER ● UNDERSTAND ○ APPLY PROBLEM SOLVING | From the school book

1. Estimate each of the following sums.

○

a. 0.52 + 0.49

Estimate _____

b. 3.451 + 8.091

Estimate _____

c. 7.99 + 4.011

Estimate _____

d. 9.98 + 4.56

Estimate _____

e. 42.998 + 42.091

Estimate _____

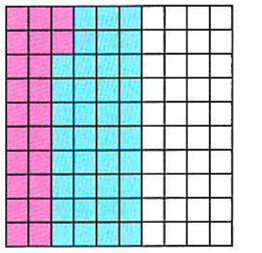
f. 4.981 + 5.019

Estimate _____

2. Write an expression to match each of the following models, then use each model to evaluate the expression.

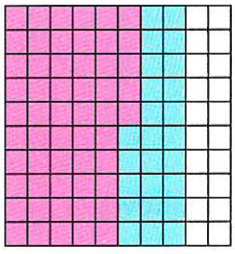
●

a.



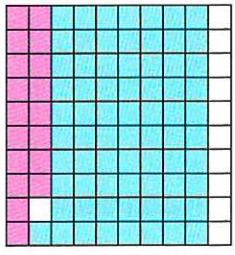
_____ + _____ = _____

b.



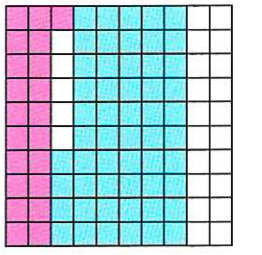
_____ + _____ = _____

c.



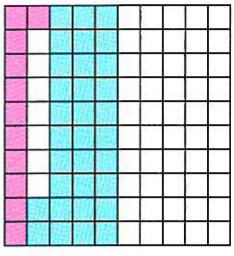
_____ + _____ = _____

d.



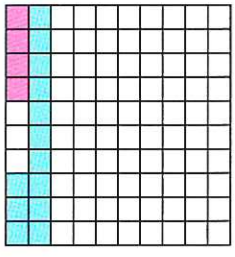
_____ + _____ = _____

e.



_____ + _____ = _____

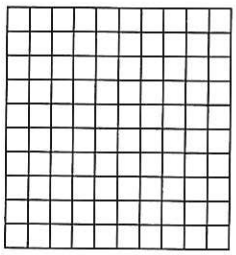
f.



_____ + _____ = _____

3. Complete each of the following.

a. • Estimate 0.13 + 0.23 _____



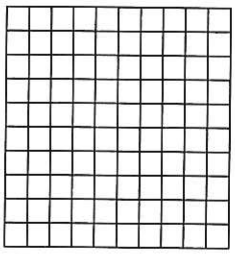
• Use two different colors to create a model of the expression 0.13 + 0.23

• Record 0.13 and 0.23 in the place-value chart.

Thousands	Ones			.	Decimals	
0	H	T	O	.	Tenths	Hundredths

• Evaluate : 0.13 + 0.23 = _____

b. • Estimate 0.05 + 0.05 _____



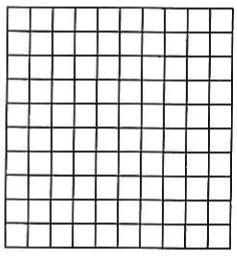
• Use two different colors to create a model of the expression 0.05 + 0.05

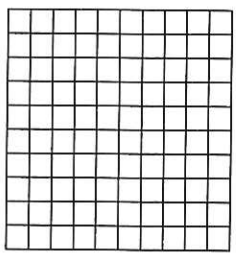
• Record 0.05 and 0.05 in the place-value chart.

Thousands	Ones			.	Decimals	
0	H	T	O	.	Tenths	Hundredths

• Evaluate : 0.05 + 0.05 = _____

c. • Estimate 0.45 + 0.84 _____





• Use two different colors to create a model of the expression 0.45 + 0.84

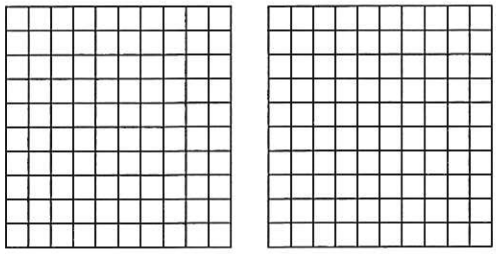
• Record 0.45 and 0.84 in the place-value chart.

Thousands	Ones			.	Decimals	
0	H	T	O	.	Tenths	Hundredths

• Evaluate : 0.45 + 0.84 = _____

d. • Estimate 0.92 + 0.89 _____

• Use two different colors to create a model of the expression 0.92 + 0.89



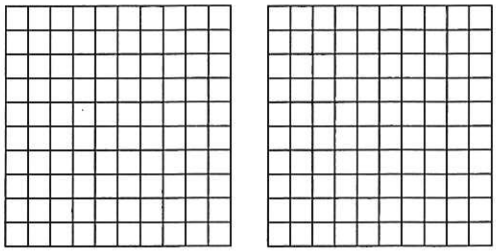
• Record 0.92 and 0.89 in the place-value chart.

Thousands	Ones			.	Decimals	
O	H	T	O	.	Tenths	Hundredths

• Evaluate : 0.92 + 0.89 = _____

e. • Estimate 0.97 + 0.42 _____

• Use two different colors to create a model of the expression 0.97 + 0.42



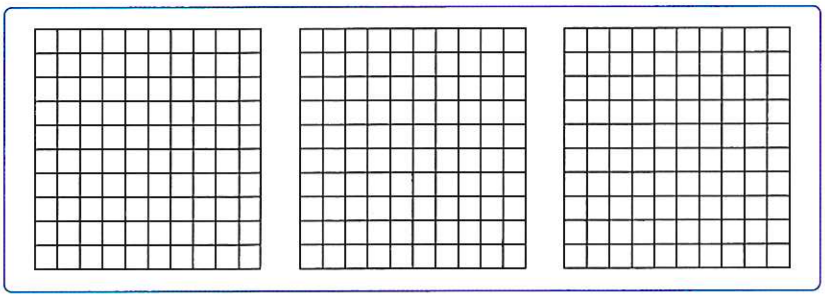
• Record 0.97 and 0.42 in the place-value chart.

Thousands	Ones			.	Decimals	
O	H	T	O	.	Tenths	Hundredths

• Evaluate : 0.97 + 0.42 = _____

f. • Estimate 1.9 + 0.62 _____

• Use two different colors to create a model of the expression 1.9 + 0.62



• Record 1.9 and 0.62 in the place-value chart.

Thousands	Ones			.	Decimals	
O	H	T	O	.	Tenths	Hundredths

• Evaluate : 1.9 + 0.62 = _____

4. Find the result of each of the following.

a. $0.231 + 0.754$ = _____	**b.** $2.53 + 0.19$ = _____	**c.** $4.89 + 0.87$ = _____
d. $16.34 + 8.79$ = _____	**e.** $7.51 + 6.492$ = _____	**f.** $967.63 + 91.2$ = _____
g. $48.42 + 59.096$ = _____	**h.** $35.001 + 14.999$ = _____	**i.** $4.15 + 8.6 + 9.283$ = _____

5. Find the result of each of the following.

a. $35.46 + 123.32$ = _____ [Giza - South 24]

b. $4.8 + 4.08$ = _____ [Port Said 24]

c. $45.321 + 23.65$ = _____ [Kafr El Sheikh 24]

d. $12.06 + 14.9$ = _____ [Souhag - Akhmeem 24]

e. $62.6 + 8.214$ = _____ [El Menia - Bani Mazar 24]

f. $45.9 + 13.33$ = _____ [Alexandria - Montaza 24]

g. $38.73 + 24.5$ = _____ [El Monofia - El Bagour 24]

h. $24.66 + 17.34$ = _____ [Aswan 24]

i. $1.007 + 9$ = _____

j. $13 + 2.75$ = _____

k. $213.01 + 27.99$ = _____

l. $12.179 + 11\frac{1}{4}$ = _____

6. Find the result of each of the following.

a. $37.42 + 43.01 + 19.15$ = _____

b. $28.65 + 17.3 + 2.05$ = _____

c. $6 + 3.65 + 4.912$ = _____

d. $53.245 + 1.97 + 213.8$ = _____

7. Complete the missing digits.

a.
$$\begin{array}{r} 3.\square 7 \\ +\ 6.5\square \\ \hline \square.89 \end{array}$$

b.
$$\begin{array}{r} 1.\square 6 \\ +\ 3.3\square \\ \hline \square.33 \end{array}$$

c.
$$\begin{array}{r} 97.48 \\ +\ 43.\square\square \\ \hline \square\square\square.93 \end{array}$$

8. **Complete the following.**

a. 4 Thousandths + 3 Thousandths = _____ Thousandths. [El Menia - Mallawi 24]

b. The sum of 3.127 + 8.65 = _____ [Luxor 24]

c. The sum of 2.817 + 1.183 = _____ [Giza - Awseem 24]

d. 9 Hundredths + 56 Hundredths = _____ Hundredths. [Cairo - Heliopolis 23]

e. 2 Thousandths + 3 Hundredths = _____ Thousandths. [Cairo - El Sherouk 23]

f. 8 Thousandths + 95 Hundredths = _____ Thousandths. [Ismailia 24]

g. 5 Tenths + 5 Thousandths = _____ Thousandths. [Cairo - El Marg 23]

9. Noha saved 18.57 pounds and her sister saved 19.3 pounds. Find the sum they saved ?

[Cairo - El Sayeda Zeinab 24]

10. Bassem bought two watermelons, the mass of the first is 2.62 kg and the mass of the second is 2.71 kg. What is the sum of their masses together ?

[Alexandria - El Gamarek 24]

11. If Mona's mass is 55.45 kg. Then if her mass increased after a month by 3.15 kg , what is her mass ?

[El Menia - Samalout 24]

12. 🕮 If a farmer can lift 94.635 liters of water a minute in his shadoof, about how many liters can he lift in 4 minutes ?

13. 🕮 Samar wanted to ride her bike 40 kilometers this week. By Thursday , she had ridden 34.99 kilometers. On Friday, she rode 4.01 kilometers. Estimate to see if she has met her goal.

Estimate : _____

14. 🕮 Taha has 54.20 L.E. His brother has 45.75 L.E. They want to combine their money to purchase a box of apples for 100 L.E. Estimate to see if they have enough money.

Estimate : _____

Multiple Choice Questions

Choose the correct answer.

1. The benchmark of 0.99 is _____ [Cairo - El Sahel 24]

A. 0 B. 0.5
C. 1 D. 1.5

2. The estimate of the sum of 35.762 + 63.014 is _____ [Cairo - Al Khalifa and Al Mokattam 23]

A. 99 B. 80
C. 98.76 D. 110

3. 4.6 + 0.06 = _____ [Cairo - Ain Shams 24]

A. 4.66 B. 4.6
C. 5.2 D. 4.12

4. 0.05 + 0.05 = _____ [Port Said 23]

A. 0.55 B. 0.1
C. 10 D. 5.5

5. 2 + 0.05 ☐ 1.7 + 0.7 [El Menia - Mallawi 24]

A. < B. = C. >

6. 1.7 + 0.2 ☐ 1.33 + 0.51

A. < B. = C. >

7. 20 + 0.078 = _____ [Cairo - El Sherouk 23]

A. 20.078 B. 20.78
C. 20.708 D. 20.807

8. 16.9 + 2.185 = _____ [Alexandria - Agmi 24]

A. 19.085 B. 18.194
C. 18.085 D. 17.084

9. 7 Tenths + 3 Tenths = _____ [Cairo - El Salam 23]

A. 1 B. 10
C. 100 D. 1,000

10. 4 Thousandths + 3 Thousandths = _____ Thousandths. [Port Said 23]

A. 7,000 B. 7
C. 0.7 D. 0.07

11. 4 Hundredths + 35 Thousandths = _____

A. 0.39 B. 0.039
C. 0.07 D. 0.075

12. 3 Hundredths + 5 Tenths = _____ Hundredths. [Kafr El Sheikh - Bayala 24]

A. 8 B. 35
C. 53 D. 3

Lessons 8 to 10

- Modeling Decimal Subtracting
- Estimating Decimal Differences
- Subtracting to the Thousandths Place

Learn 1 Estimating decimal differences

You can use the strategies of estimation that you studied in the previous lesson to estimate decimal differences as the following example.

Example 1

Estimate each of the following.

a. 39.79 – 20.027 **b.** 18.95 – 11.7 **c.** 0.88 – 0.72

Solution

a. 39.79 – 20.027 estimate : 40 – 20 = 20
[if you round to the nearest Ten]

b. 18.95 – 11.7 estimate : 19 – 12 = 7
[if you round to the nearest Ones]

c. 0.88 – 0.72 estimate : 0.9 – 0.7 = 0.2
[if you round to the nearest Tenth]

0.88 – 0.72 estimate : 1 – 1 = 0
[if you round to the nearest Ones]

Check your understanding

Estimate each of the following.

a. 0.92 – 0.76 **b.** 17.01 – 13.9 **c.** 140.61 – 99.43

Notes for parents :

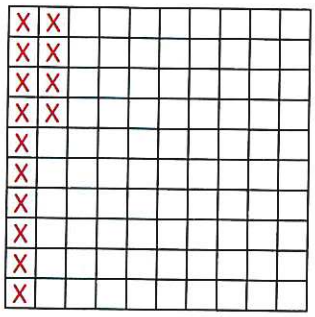
- Remind your child that estimation is a way to get a number that is close to another number but not exact.

Learn 2 Modeling Decimal Subtracting

To evaluate : 0.52 – 0.14

1. Shade a model to represent the minuend (0.52).
2. Add X's to represent the subtrahend (0.14).
3. Count the shaded squares without (X) which is the difference.

- **Use the model.**



52 Hundredths – 14 Hundredths = 38 Hundredths
So, 0.52 – 0.14 = 0.38

To subtract decimal numbers

1. Put the decimal points under each other.
2. Put zeroes to the right of the last decimal digit, so that each number has the same number of digits after the decimal point.
3. Subtract by starting from the right to the left.

- **Use the place-value chart.**

Ones			·	Decimals	
H	T	O	·	Tenths	Hundredths
		0	·	5	2
		0	·	1	4
		0	·	3	8

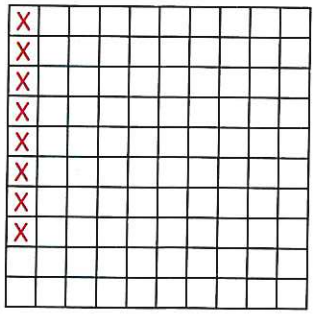
$$\begin{array}{r} {\scriptstyle 4\ 12} \\ 0.\ \cancel{5}\ \cancel{2} \\ -\ 0.\ 1\ 4 \\ \hline 0.\ 3\ 8 \end{array}$$

- **You can subtract the previous numbers horizontally as follows :**

$$0.\overset{4}{\cancel{5}}\overset{12}{\cancel{2}} - 0.14 = 0.38$$

To evaluate : 0.3 – 0.08

- **Use the model.**



30 Hundredths – 8 Hundredths = 22 Hundredths
So, 0.30 – 0.08 = 0.22

- **Use the place-value chart.**

Ones			·	Decimals	
H	T	O	·	Tenths	Hundredths
		0	·	3	0
		0	·	0	8

$$\begin{array}{r} {\scriptstyle 2\ 10} \\ 0.\ \cancel{3}\ \cancel{0} \\ -\ 0.\ 0\ 8 \\ \hline 0.\ 2\ 2 \end{array}$$

Note that

Adding zeroes to the right of the last decimal digit does not change its value.

- Remind your child to put the decimal points under each other when subtracting decimals.

To evaluate : 3,204.4 – 1,823.015

• It is impossible to use the model. **So,** use the place-value chart.

Thousands	Ones			·	Decimals		
0	H	T	O	·	Tenths	Hundredths	Thousandths
3	2	0	4	·	4	0	0
1	8	2	3	·	0	1	5
1	3	8	1	.	3	8	5

$$\begin{array}{r} {\scriptstyle 2\ \ 1\ 10\ \ \ 3\ 9\ 10} \\ {\scriptstyle 11} \\ 3,\ 2\ 0\ 4.\ 4\ 0\ 0 \\ -\ 1,\ 8\ 2\ 3.\ 0\ 1\ 5 \\ \hline 1,\ 3\ 8\ 1.\ 3\ 8\ 5 \end{array}$$

Example 2

Subtract each of the following.

a. 5.43 – 2.21 **b.** 8.6 – 6.51 **c.** 20 – 11.624

Solution

a.

$$\begin{array}{r} 5.\ 4\ 3 \\ -\ 2.\ 2\ 1 \\ \hline 3.\ 2\ 2 \end{array}$$

b.

$$\begin{array}{r} {\scriptstyle 5\ 10} \\ 8.\ 6\ 0 \\ -\ 6.\ 5\ 1 \\ \hline 2.\ 0\ 9 \end{array}$$

c.

$$\begin{array}{r} {\scriptstyle 1\ 9\ 9\ 9\ 10} \\ 2\ 0.\ 0\ 0\ 0 \\ -\ 1\ 1.\ 6\ 2\ 4 \\ \hline 8.\ 3\ 7\ 6 \end{array}$$

Check your understanding

Subtract each of the following.

a. 2.325 – 0.214

b. 12.78 – 3.5

c. 97 Thousandths – 49 Thousandths.

d. 7 Hundredths – 32 Thousandths.

Notes for parents :

• Remind your child that adding zeroes to the right of the last decimal digit does not change its value.

Exercise 6

on lessons 8 to 10

- Modeling Decimal Subtracting
- Estimating Decimal Differences
- Subtracting to the Thousandths Place

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Estimate each of the following.

a. 2.62 – 1.59 estimate _____

b. 2.419 – 1.240 estimate _____

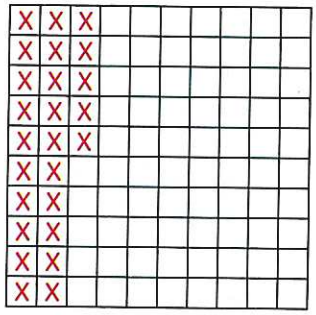
c. 35.9 – 10.8 estimate _____

d. 214.024 – 113.78 estimate _____

e. 0.951 – 0.729 estimate _____

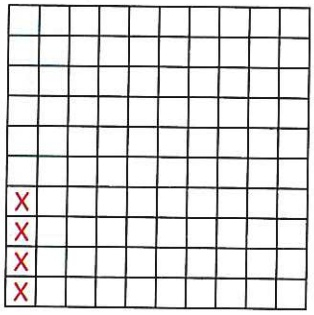
2. Write an expression to match each of the following models, then use each model to evaluate the expression.

a.



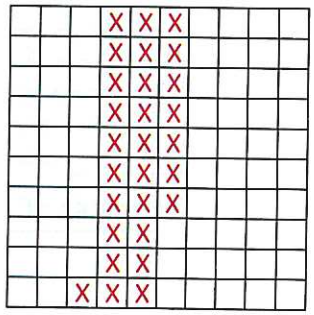
_____ – _____ = _____

b.



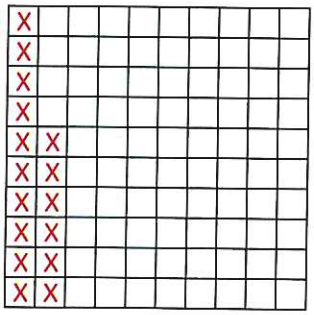
_____ – _____ = _____

c.



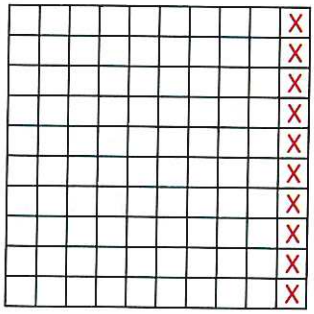
_____ – _____ = _____

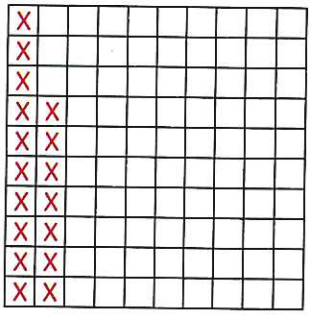
d.



_____ – _____ = _____

e.

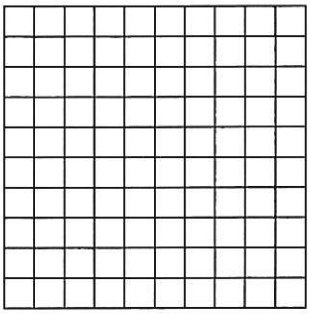




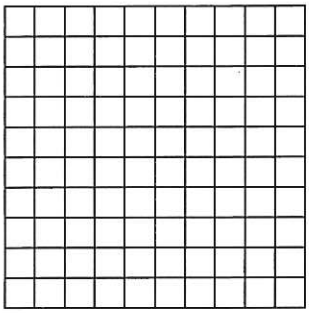
_____ – _____ = _____

3. Create a model to match each of the following expressions and evaluate each of them.

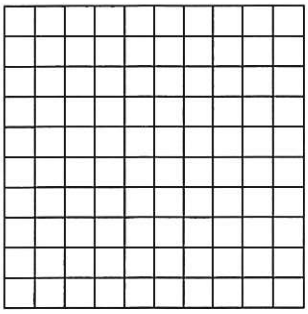
a. $0.67 - 0.49 =$ _____



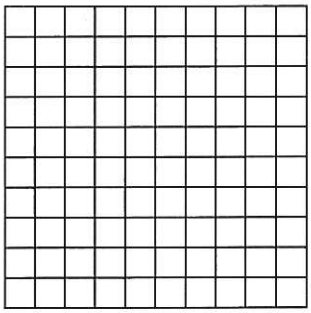
b. $0.1 - 0.09 =$ _____

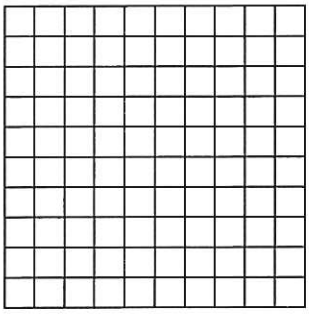


c. $0.39 - 0.13 =$ _____



d. $1.23 - 1.02 =$ _____





4. Find the result of each of the following.

a.

$$\begin{array}{r} 0.781 \\ -\ 0.531 \\ \hline \end{array}$$

b.

$$\begin{array}{r} 0.593 \\ -\ 0.194 \\ \hline \end{array}$$

c.

$$\begin{array}{r} 0.5 \\ -\ 0.375 \\ \hline \end{array}$$

d.

$$\begin{array}{r} 3,218.975 \\ -\ \ 218.853 \\ \hline \end{array}$$

e.

$$\begin{array}{r} 4,524.62 \\ -\ 2,498.124 \\ \hline \end{array}$$

f.

$$\begin{array}{r} 4,611.3 \\ -\ 1,982.45 \\ \hline \end{array}$$

5. **Find the result of each of the following.**

a. $4.185 - 3.4 =$ _____

[El Menia - Matai 24]

b. $4.66 - 2.09 =$ _____

[Aswan - Kom Ombo 23]

c. $8.659 - 4.32 =$ _____

[Cairo - El Marg 23]

d. $63 - 12.3 =$ _____

[Cairo - Rod El Farg 24]

e. $0.9 - 0.889 =$ _____

f. $12.74 - 0.359 =$ _____

g. $5.27 + 8.39 - 3\frac{14}{100} =$ _____

h. $512 + 88.35 - 67.035 =$ _____

6. 🕮 **Complete the table.**

The expression	Estimating difference	Actual difference
a. $4.45 - 4.32 =$	_____	_____
b. $0.97 - 0.82 =$	_____	_____
c. $5.05 - 4.15 =$	_____	_____
d. $29.98 - 11.99 =$	_____	_____

7. **Complete.**

a. $1.6 +$ _____ $= 9.6$

b. _____ $+ 3.9 = 6.5$

c. _____ $+ 54.8 = 77.59$

d. $85.47 +$ _____ $= 100$

e. $6.27 -$ _____ $= 3.286$

f. _____ $- 3\frac{3}{5} = 7.634$

g. $33.3 -$ _____ $= 12.008$

h. _____ $- 41.41 = 3.8$

[Cairo - Al Mokattam 24]

8. **Find the missing digits.**

a.

$$\begin{array}{r} 5.69 \\ -\ 4.\square\square \\ \hline \square.45 \end{array}$$

b.

$$\begin{array}{r} 9.51\square \\ -\ \square.\square\square 1 \\ \hline 4.242 \end{array}$$

c.

$$\begin{array}{r} 113.57\square \\ -\ 13.\square\square 8 \\ \hline \square\square\square.17\square \end{array}$$

d.

$$\begin{array}{r} 5.\square 8\square \\ -\ 1.413 \\ \hline \square.3\square 7 \end{array}$$

e.

$$\begin{array}{r} 299.\square\square\square \\ -\ \square\square.457 \\ \hline 243.\square 3\square \end{array}$$

f.

$$\begin{array}{r} \square\square.\square\square \\ -\ 23.97 \\ \hline 18.95 \end{array}$$

9. **Put the suitable relation (< , = or >).**

a. 3.5 – 2.1	◯	3.5 + 2.1 [Alexandria - First Montaza 23]	**b.** 1.471 – 0.53	◯	0.951
c. 7.32 – 1.93	◯	6.78 – 0.42	**d.** 58.003 – 57.03	◯	1 + 0.973
e. 99.89 – 90.09	◯	10 – 1.01	**f.** 4.722 – 0.009	◯	8 – 3.228
g. 6.18 + 3.82	◯	87.56 – 77.5	**h.** 0.2 – 0.05	◯	4.9 – 4.75

10. **Evaluate each difference. Then identify each digit's place value.**

a. 98 Thousandths – 5 Thousandths = _____ Thousandths

Place value : _____ Hundredths and _____ Thousandths

b. 📖 57 Thousandths – 12 Thousandths = _____ Thousandths

Place value : _____ Hundredths and _____ Thousandths

c. 📖 32 Thousandths – 15 Thousandths = _____ Thousandths

Place value : _____ Hundredths and _____ Thousandths

d. 📖 5 Hundredths – 24 Thousandths = _____ Thousandths [Assuit 24]

Place value : _____ Hundredths and _____ Thousandths

e. 7 Hundredths – 17 Thousandths = _____ Thousandths

Place value : _____ Hundredths and _____ Thousandths

f. 8 Tenths – 42 Thousandths = _____ Thousandths

Place value : _____ Tenths, _____ Hundredths and _____ Thousandths

Multiple Choice Questions

Choose the correct answer.

1. $2.419 - 1.240 =$ _____ [Aswan 23]

A. 1.230 B. 1.179
C. 1.239 D. 3.659

2. Estimate $56.25 - 20.98$ is _____ [Cairo - El Sahel 24]

A. 31 B. 36
C. 35 D. 25

3. 7 Tenths – 7 Hundredths = _____ [Cairo - El Basateen and El Salam 24]

A. 0 B. 0.63
C. 0.693 D. 0.963

4. 7 Tenths – 63 Hundredths = _____ Hundredths. [Cairo - El Nouzha 23]

A. 70 B. 700
C. 7 D. 7.000

5. 7 Hundredths – 7 Thousandths = _____ Thousandths. [Cairo - Al Khalifa and Al Mokattam 23]

A. 7 B. 0
C. 63 D. 77

6. $55.5 - 5.55 =$ _____ [Ismailia 24]

A. 49.59 B. 49.95
C. 50.5 D. 5.05

7. $4.45 - 4.32 \bigcirc 1.01 + 0.3$ [Assiut 24]

A. > B. <
C. =

8. $3.2 + 4.05 \bigcirc 7.05 + \frac{1}{2}$ [Giza - Awseem 23]

A. > B. <
C. =

9. $94.\square 8 - 9.82 = 84.46$

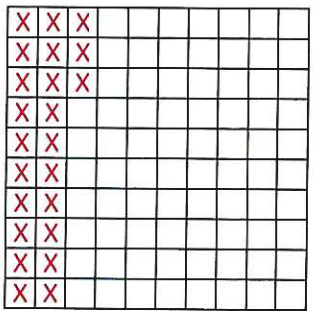
A. 1 B. 2
C. 3 D. 4

10. $15 - 3.5 =$ _____ [Aswan - Edfo 24]

A. 11.5 B. 11
C. 12.5 D. 12

11. Which of the following expressions represents the model?

A. $0.23 - 0.04$
B. $0.4 - 0.23$
C. $0.04 - 0.023$
D. $40 - 23$



12. $13.58 -$ _____ $= 9.89$ [El Monofia - Quessna 24]

A. 3.69
B. 4.31
C. 38.85
D. 30.69

Lesson

11

Decimal Story Problems

Learn How to solve story problems?

1. Read carefully and determine what is being asked.
2. Plan and write an equation or expression to solve the story problem.
3. Solve the problem and be sure to include units in your answer.
4. Check the reasonableness of your answers.

Read to understand
Plan
Solve
Check

Example 1

Soha saved 17.25 L.E. and her brother Amgad saved 8.5 L.E.

Find the sum they saved.

Solution

The sum they saved = 17.25 + 8.5 = 25.75 L.E.

Example 2

Wael has 14.75 pounds and his sister Mariam has 950 piasters.

Find the difference between what they have in pounds.

Solution

The difference = 14.75 pounds – 950 piasters

= 14.75 pounds – 9.5 pounds = 5.25 pounds

Example 3

Waleed bought a pair of trousers for 89.6 L.E. and a shirt for 30.75 L.E., if he gave 200 L.E. to the shopkeeper,

how much change remained with Waleed ?

Solution

- The price of pair of trousers and shirt = 89.6 + 30.75 = 120.35 L.E.
- The change remained with Waleed = 200 – 120.35 = 79.65 L.E.

Notes for parents :

- Some story problems have hidden question or questions that must be answered before you can solve the problem. You have to determine what operation to use and what strategies you will use to help you figure out how to solve the problem.

Exercise 7

on lesson 11

▸ Decimal Story Problems

● REMEMBER ● UNDERSTAND ○ APPLY PROBLEM SOLVING

From the school book

1. Ola saved 23.75 pounds and her sister saved 57.34 pounds.

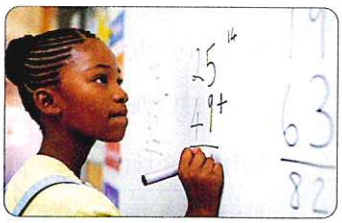
Find the total with them. [El Fayoum 24]

2. Salma has 90.5 pounds, she bought a toy by 64.75 pounds

How much money is remaining with Salma ? [El Kalyoubia 23]

3. Mona had 78.4 L.E. She spent 52.74 L.E.

Find the remainder with her. [El Beheira 24]



4. A merchant has 38.5 meters of cloth and sold 15.5 meters of it. [Aswan - Edfo 24]

How much does he have left ?

5. Fares bought 9.8 kilograms of apples, 4.6 kilograms of fig.

Find the total weight of apple and fig together ?

[Cairo - El Zaiton 23]

6. The fuel tank in the car was filled with 35 liters of gasoline, and at the end of the day 15.5 liters of fuel remained in the tank.

How much fuel did the car consume for that day in liters ?

[El Monofia - Menof 24, Sers El Laian 24]

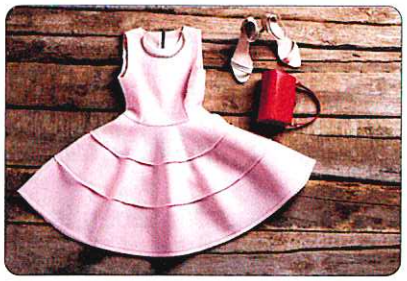
7. Hatem climbed 5.6 m and Nagy climbed 2.9 m.

What is difference between them ?

[El Monofia - Shebin El Kom 24]

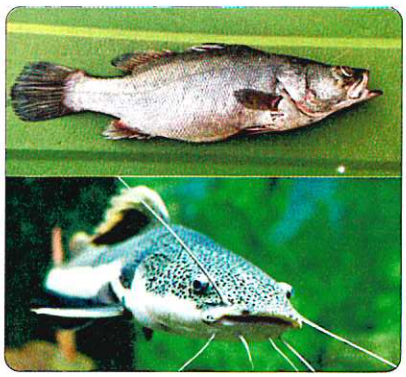
8. Hanaa has 200 pounds. She wants to buy a pair of shoes for 99.8 L.E. , a bag for 45.75 L.E. and a dress for 70.25 L.E.

Can she buy all what she wants ? Why ?



9. 🕮 Nile perch is 110 centimeters long and more than 5 years old. It weighs 113.39 kilograms and the vundu catfish weighs 38.1 kilograms and is 188 centimeters long.

What is the total mass of both the Nile perch and the vundu catfish ?



10. 🕮 **Read the passage and then respond to the questions.**

You will now travel from Khartoum to Juba in South Sudan to see the source of the White Nile. This trip is 1,941.2 kilometers. Juba is also on the bank of the White Nile.
From Juba, you will travel on to Jinja, Uganda. It is a distance of 687.9 kilometers.
Jinja is located near the source of the White Nile.
How long is your journey from Khartoum to Jinja ?

a. Copy the place-value chart and record the addends.

Thousands	Ones			.	Decimals		
O	H	T	O	.	Tenths	Hundredths	Thousandths
				.			
				.			

b. Write and solve an addition equation using the two decimal numbers.

_____ + _____ = _____

11. 🕮 **Read the passage and answer the questions.**

Tahya Misr Bridge

The Tahya Misr Bridge was built in 2016 in Cairo. It serves as a connector across the Nile from northern and eastern Cairo to western Cairo. The bridge is 540 meters long and 67.3 meters wide. It holds the world record for the widest cable-stayed bridge in the world The longest cable-stayed bridge is the Jiaxing-Shaoxing Sea Bridge in China. It is 11.7 meters thinner than the Tahya Misr Bridge. How wide is the Jiaxing-Shaoxing Sea Bridge ?

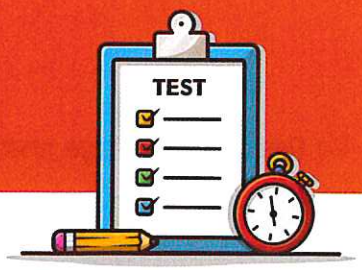
12. 🕮 The total length of the Tahya Misr Bridge is 16.7 kilometers. If Rami travels the length of the Tahya Misr Bridge and then returns, how many kilometers in total did he travel ? Write an equation and your answer.

13. 🕮 The total length of the Tahya Misr Bridge is 16.7 kilometers. Salem rode his bike along the pedestrian section of the bridge. He rode 3.25 kilometers before he had a flat tire. How many more kilometers does he need to travel ?

14. 🕮 The Tahya Misr Bridge was built using 200 cranes. The cranes varied in size and weighed between 6.44 and 544.3 tons (1 ton = 1,000 kilograms). What is the difference between the lightest crane and the heaviest crane ?

15. 🕮 Rashad and his father went on a fishing trip to Lake Nassar. They each caught a huge vundu catfish. The first one weighed 53.25 kilograms and the smaller one weighed 46.8 kilograms. How much did the fish weigh in all ?

Unit One Assessment



1. Choose the correct answer.

1. The value of the digit 7 in the number 5.167 is _____ [Cairo - El Salam 24, Port Said 24, Giza - El Haram 24]

   A. 0.7 **B.** 0.07 **C.** 700 **D.** 0.007

2. Rounding the number 56.284 to the nearest Hundredth is _____ [Aswan - Kom Ombo 23]

   A. 56.28 **B.** 56.82 **C.** 56.3 **D.** 56.29

3. 9.4 – 5.03 = _____ [Kafr El Sheikh - Bayala 24, Souhag 24]

   A. 4.37 **B.** 43.7 **C.** 4.43 **D.** 4.1

4. 10 × 150 = _____ Hundreds [Giza - South 24]

   A. 15 **B.** 150 **C.** 1,500 **D.** 1.5

5. A car covers 2.5 km in one minute, then the distance covered in 3 minutes = _____ km [Cairo - El Salam 23]

   A. 7.5 **B.** 5.7 **C.** 7 **D.** 5.4

6. 3.6 + 5.411 = _____ [Ismailia - El Kasasen 24]

   A. 5.447 **B.** 8.1011 **C.** 8.417 **D.** 9.011

7. The benchmark number of the decimal fraction 0.8 is _____ [Cairo - Helwan 24]

   A. zero **B.** 0.25 **C.** 0.5 **D.** 1

2. Complete the following.

1. 9.865 ≈ _____ [rounding to the nearest Tenth] [Giza 24]
2. 8 + 0.2 + 0.03 + 0.006 = _____ [in standard form] [El Beheira 23]
3. 39.543 ≈ _____ [to the nearest one decimal place] [Cairo - El Maadi 24]
4. 5 Tenths + 63 Thousandths = _____ Thousandths [Ismailia - Fayeed 24]
5. Thirty – seven and five tenths is written as _____ [Qena 24]
6. 56.98 ÷ 10 = _____ [El Beheira - Kafr El Dawar 24]
7. 2 × _____ = 200,000 [Port Said 23]
8. 36.479 ≈ 36.5 [to the nearest _____] [Giza - Awseem 23]

3. Choose the correct answer.

1. The place value of 8 in 85.324 is _____ [Souhag 23]

   A. Tenths. **B.** Tens. **C.** Hundredths. **D.** Hundreds.

2. 1.5 – 0.75 = _____ [Alexandria - West 23]

   A. 0.75 **B.** 7.5 **C.** 1.8 **D.** 1.25

3. 0.3 ◯ 3 Thousandths. [Cairo - El Marg 23]

   A. < **B.** > **C.** =

4. 34.6 x _____ = 34,600 [Ismailia 24, El Beheira 23]

   A. 10 **B.** 100 **C.** 1,000 **D.** 10,000

5. The number [fifteen and fifteen thousandths] in expanded form is _____ [Giza - El Haram 24]

   A. 10 + 5 + 0.1 + 0.005 **B.** 10 + 5 + 0.05 + 0.001

   C. 10 + 5 + 0.01 + 0.005 **D.** 10 + 5 + 0.1 + 0.05

6. When divide 316 by 10, then the value of 6 becames _____ [El Monofia - Ashmoon 24]

   A. 0.6 **B.** 60 **C.** 0.06 **D.** 600

7. 0.02 = _____ [Alexandria - Agami 24]

   A. $\frac{2}{10}$ **B.** 2 thousandths. **C.** 20 thousandths. **D.** $\frac{20}{100}$

4. Answer the following questions.

1. Decompose the number 78.096 in expanded form. [Cairo - El Sayeda Zeinab 24]

2. Aya saved 17.25 pounds. Her sister saved 8.75 pounds. **Find the total with them.** [Souhag - Tama 24]

3. Arrange from least to greatest. [Qena - Farshout 24]

   A. 0.58 **B.** 8.05 **C.** 5.8 **D.** 8.005

4. A road of 6.975 km length, if the train travelled 2.939 km from this road,
   What is the remaining distance of the road ? [Ismailia - El Kasaseen 24]

THEME ONE

Number Sense and Operations

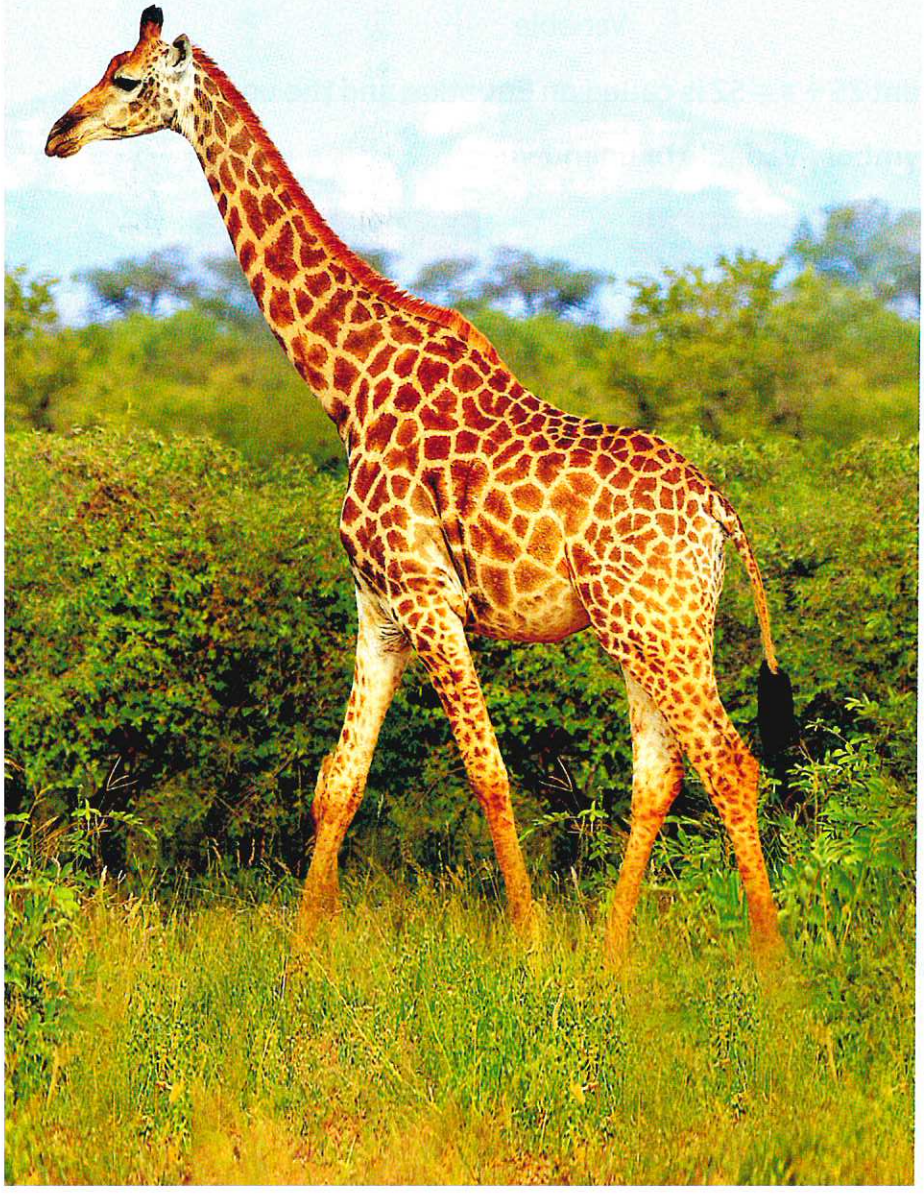
UNIT 2

Number Relationships

- **Concept 1 :** Expressions, Equations and the Real World
- **Concept 2 :** Factors and Multiples

CONCEPT 1

Expressions, Equations and the Real World



▶ Lesson 1

Expressions, Equations and Variables

Learning Objectives:

- Students will explain the difference between expressions and equations.
- Students will explain why there might be an unknown in an expression or equation.
- Students will use letters or symbols to represent unknowns in expressions and equations.

▶ Lessons 2&3

- Variables in Equations
- Telling Stories with Numbers

Learning Objectives:

- Students will apply the relationship between addition and subtraction to find the value of the unknown in an equation.
- Students will write story problems involving addition and subtraction of decimal numbers.
- Students will solve equations involving decimal numbers to the Thousandths place.

Fast Fact

Giraffes are the world's tallest living land animals. An adult male can grow to around **5.5m**. - that's taller than three adult humans!

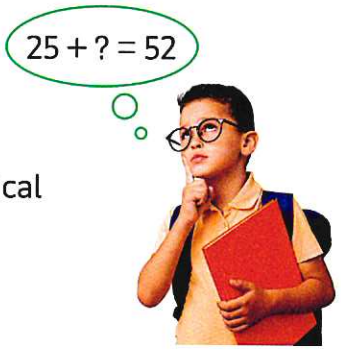
Lesson 1

▸ Expressions, Equations and Variables

Learn Mathematical expressions and equations

Sameh saved 25 L.E. to buy his favourite meal which costs 52 L.E.

How much does Sameh need to save more ?



You can translate this problem into a mathematical statement contains a missing number as

$25 + ? = 52$

If you replace the missing number ? by any letter [x , y , a , b ,...] , you will get :

$25 + x = 52$

↓

Variable

The statement 25 + x = 52 is called an Equation and the used letter "x" is called a symbol , variable or unknown.

Mathematical Expression

Mathematical expression is a statement contains numbers or numbers and symbols separated by one or more operations as : [+ , – , × and ÷] and doesn't contain the equal sign "=".

▸ **Examples :**

- $7.4 + 2.5 - 1.5$
- $49 - x - 24.5$
- $10 \times 3 \div 5$
- $42 \div k$
- $2.5 + m$
- $15 \div 3 \times 2$

Equation

A mathematical sentence with an equal sign. The amount on one side of the equal sign has the same value as the amount on the other side.

▸ **Examples :**

- $4 + 3 = 7$
- $24.8 - x = 17.5$
- $36.5 + 14.1 = k$
- $4.2 + 1.5 = 8.9 - 3.2$
- $7.36 + 1.036 + 2.5 = b$

Notes for parents :

- Ask your child to explain the difference between expression and equation.

Example 1

Read the following mathematical statements, then sort them into equations, expressions or neither.

- 13.35 + x = 16.25
- 25.06 + 6.2 + 5
- 42 + k – 3.15
- 55 – m = 17
- Sara bought a shirt for 145.75 L.E. and a skirt for 189.5 L.E.
- 30 × m = 300
- y = 2.55 + 3.13 + 7.15
- Sum of two numbers is 85.25 and one of them is 25.15
  What is the other ?
- 2.5 + 3.6 = 1.8 + 4.3
- z ÷ 2 + 5

Solution

Equations	Expressions	Neither
• 13.35 + x = 16.25 • 55 – m = 17 • 30 × m = 300 • y = 2.55 + 3.13 + 7.15 • 2.5 + 3.6 = 1.8 + 4.3	• 25.06 + 6.2 + 5 • 42 + k – 3.15 • z ÷ 2 + 5	• Sara bought a shirt for 145.75 L.E. and a skirt for 189.5 L.E. • Sum of two numbers is 85.25 and one of them is 25.15. What is the other ?

Check your understanding

Write "equation, expression or neither" between the two brackets.

a. Hany saves 15 L.E. every day. How much does Hany save in a week ? [_____]

b. 2.45 + 13.12 – 5 [_____]

c. 1.8 + x = 2.8 [_____]

d. 3.6 + 1.4 = 5 [_____]

e. 35.45 – k = 15 [_____]

f. The sum of two numbers is 13.8 [_____]

- Explain that the equation doesn't change if the symbol is changed. For example, the two equations 2.5 + x = 3.4 and 2.5 + y = 3.4 are equivalent.

Equations in real world :

You can use many equations in your daily life, sometimes you need to write equations to help you solve story problems.

Example 2

Youssef has 90 L.E. Youssef and his sister Sandy have together 150 L.E.

If their sister Eman has 110 L.E.,

write an equation to represent each of the following :

a. The sum of money that Youssef and Eman have.

b. The money that Sandy has.

MATH IDEA

The symbol x represents the total money that Youssef and Eman have.

MATH IDEA

The symbol y represents the money that Sandy has.

Solution

a. $90 + 110 = x$

b. $150 - 90 = y$

or $90 + y = 150$

or $150 - y = 90$

Check your understanding

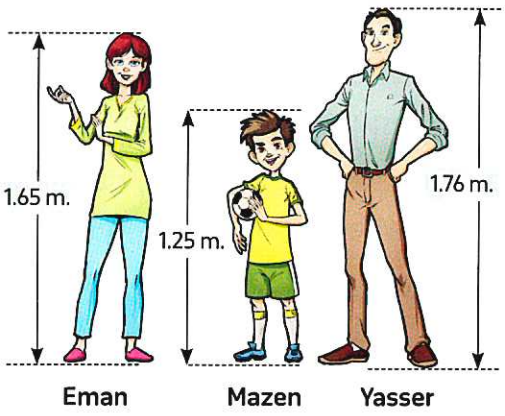
Yasser, Eman and Mazen, their heights are shown.

a. Write an equation to represent the sum of heights of Eman and Mazen.

_____

b. In the equation $1.65 + x = 1.76$, what does the symbol x represent ?

_____



Notes for parents :

- Let your child use letters to represent unknowns in equations.

Exercise 8

on lesson 1

Expressions, Equations and Variables

REMEMBER UNDERSTAND APPLY PROBLEM SOLVING | From the school book

1. Write equation, expression or neither between the two brackets.

a. 3.6 + 1.6 = x [ ]

b. 14.78 – 3.4 [ ]

c. 7.5 + 3.65 [ ]

d. 25.6 – 9 [ ]

e. 14 × 7 = x [ ]

f. 9 – x = 3.5 [ ]

g. 4.7 + 3.6 = M [ ]

h. 345.45 – 123.8 = x [ ]

i. 6.4 + 3.2 + 8 [ ]

j. 3.5 + 2.456 = 2.5 + 3.456 [ ]

k. 125 – 27.3 [ ]

l. 14.2 – 3.575 [ ]

m. 56 – x = 47.5 [ ]

n. 37.125 – 13.7 [ ]

o. 3.4 + l [ ]

p. Amir had 3.5 kg of apples and 2.7 kg of figs. [ ]

q. Aya ran a total of 8 km last week. She ran 3.75 km on Monday. How much did she run the rest of the week? [ ]

r. 7.3 + 4.5 + 2.3 = A [ ]

2. Write an equation with a variable to represent each of the following.

a. The sum of a number and 6.5 is 9 [ ]

b. A number if added to 1.7 the sum is 2.8 [ ]

c. If 9.23 is subtracted from a number , then the result is 23.15 [ ]

d. Sum of two numbers is 17.35 and one of them is 14.15 [ ]

3. A class contains 40 pupils, 25 from them are boys, write two equations to find the number of girls.

[1] _____ [2] _____

4. **In the toy store, Sameh saw the opposite three toys. Sameh had 42 L.E. , then he wrote some equations, what does the variable represent in each equation ?**

a. $64.5 + 36.75 = x$

b. $45.25 - 36.75 = y$

c. $64.5 - 42 = b$

d. $a + 42 = 45.25$

e. $64.5 + 45.25 + 36.75 = d$

f. $45.25 + 36.75 - 42 = m$

Multiple Choice Questions

Choose the correct answer.

1. Which of the following is a mathematics expression ? [Cairo - El Salam 23]

A. $m + 6 = 9$ **B.** $1.2 - m = 0.2$ **C.** $3 + 6 = 9$ **D.** $m + 44$

2. Which of the following represents an equation ? [Cairo - El Sahel 24, El Beheira 23]

A. $4.8 + 2.5$ **B.** $x - 3.14 = 5$ **C.** $y + 4.8$ **D.** $9 - b$

3. All the following are equations except _____ [El Monofia - Shebin El kom 24]

A. $l \times 5 = 3$ **B.** $3.4 + 2$ **C.** $4.7 \times 3.6 = p$ **D.** $35 \div p = 7$

4. $m + 8.5 = 10$ is called _____ [Souhag 23]

A. a multiplication **B.** a division **C.** an expression **D.** an equation

5. The mathematical phrases : $7.5 + 3.6 = m$ represents _____ [Aswan - Kom Ombo 23]

A. an equation **B.** a variable **C.** an expression **D.** an inequality

6. $y + 12$ is called _____ [El Kalyoubia 23]

A. a mathematical expression **B.** an equation

C. a place value **D.** a value

7. In $2.3 + x = 5.8$, the variable is _____ [Giza - South 24]

A. 2.3 **B.** x **C.** 5.8 **D.** 3.5

8. Basma wanted to write an equation with a variable to represent "12.5 plus a number equals 15". Which of the following would be correct ?

A. $12.5 + 15 = x$ **B.** $12.5 + x = 15$ **C.** $15 + x = 12.5$ **D.** $x - 15 = 12.5$

9. If we subtract 5.23 from a number to get 9.42 , then the suitable equation is _____

A. $5.23 - x = 9.42$ **B.** $9.42 - 5.23 = x$ **C.** $x - 5.23 = 9.42$ **D.** $x + 5.23 = 9.42$

10. Ayman wants to write an equation represents "Adding a number to 7.5 to get the result 9.8" , then the suitable equation is _____ [Cairo - El Basaten and El Salam 24]

A. $7.5 + 9.8 = x$ **B.** $9.8 + x = 7.5$ **C.** $7.5 + x = 9.8$ **D.** $75 + x = 98$

11. Suzan walked 1.63 km. in the first day and 1.72 km. in the second day, then the equation which represents the walked distance in the two days is _____

A. $1.72 - 1.63 = d$ **B.** $d = 1.63 + 1.72$ **C.** $d + 1.63 = 1.72$ **D.** $1.72 - d = 1.63$

12. **If Gulf of Suez is 275 km long and Aqaba Gulf is 180 km long**

1. Mariam wrote two equations to compare the lengths of the two gulfs. Here are her equations.

   • $180 + x = 275$ • $x = 275 - 180$

   What does the letter x represent in these equations ?

   A. The length in kilometers of one gulf.
   B. The difference in kilometers between the two lengths.
   C. The width of Sinai Peninsula.
   D. The distance in kilometers between the gulfs.

2. If Mariam were to solve both of these equations correctly, what would be true ?
   Select the two correct answers.

   A. The value of x would be the same.
   B. The answer to $275 - 180$ would be 85 km.
   C. The difference between the two lengths would be 95 km.
   D. The distance in kilometers between the gulfs would be 95 km.

---

13. Adham was comparing the heights of sand dunes in the northern part of Sinai Peninsula in meters. He wrote the equation $x = 27 - 18$

What does the x represent ?

A. The height of one of the dunes in Sinai.
B. The sum of the heights of two dunes in Sinai.
C. The difference between the tallest and shortest sand dunes.
D. The distance between the tallest and shortest sand dunes.

---

14. If Farha knew that the sum of the heights of two sand dunes is 46 meters and one of the dunes is 18.25 m high, which equation could she write to find the unknown height ? Select the two correct answers.

A. $18.25 + x = 46$ **B.** $18.25 + 46 = x$
C. $46 - 18.25 = x$ **D.** $x - 18.25 = 46$

---

15. Ehab wrote the equation $42.7 + 38.3 = x$. If each of the numbers represents the height of one of the dunes, **what does x represent ?**

A. The height difference between the dunes.
B. The sum of the heights of both dunes.
C. The height of the taller dune.
D. The distance between the dunes.

Lessons **2 & 3**

- Variables in Equations
- Telling Stories with Numbers

Learn 1 Variables in equations

Solving equation means finding the value of the variable in the equation.

- **You can solve equation in many ways :**

1 Mental math

Example : $15 + x = 18$

What number should be added to 15 to get 18 ?

The answer is 3

, then $x = 3$

2 Inverse operation

Example : $y - 3.45 = 1.32$

$y - 3.45 = 1.32$

Inverse operation

, then $y = 1.32 + 3.45 = 4.77$

3 Using bar model

Example : $4.76 - b = 2.25$

4.76	
b	2.25

$b = 4.76 - 2.25 = 2.51$

Example 1

Solve the following equations.

a. $3.2 + p = 10$

b. $2.13 + 3.45 + h = 7.85$

c. $5.83 - k = 3.454$

d. $m - 2.1 = 3.4$

Solution

You can use any way to solve an equation.

a. Using mental math strategy :

$3.2 + p = 10$

, the number if we add to 3.2 you get 10 is the number 6.8

, then $p = 6.8$

Check your answer

Replace the variable "p" by 6.8

, $3.2 + 6.8 = 10$

, then the solution is correct.

Notes for parents :

- If your child struggles to see the relationship between the numbers, review fact families.

b. Using inverse operation strategy :

$2.13 + 3.45 + h = 7.85$

$5.58 \quad + h = 7.85$

(− 5.58)

$h = 7.85 - 5.58$

$h = 2.27$

Check your answer
Replace the variable "h" by 2.27
, 2.13 + 3.45 + 2.27 = 7.85
, then the solution is correct.

c. Using part-to-whole bar model strategy :

$5.83 - k = 3.454$

5.83	
k	3.454

$k = 5.830 - 3.454 = 2.376$

Check your answer
Replace the variable "k" by 2.376
, 5.83 − 2.376 = 3.454
, then the solution is correct.

d. Using part-to-whole bar model strategy :

$m - 2.1 = 3.4$

m	
2.1	3.4

$m = 2.1 + 3.4 = 5.5$

Check your answer
Replace the variable "m" by 5.5
, 5.5 − 2.1 = 3.4
, then the solution is correct.

Check your understanding

Solve each of the following equations.

a. $6.45 + x = 10.48$

b. $k - 6.18 = 2.59$

c. $2.85 + 3.152 + n = 7$

d. $3.36 + 2.12 = 1.834 + h$

Notes for parents :

- Let your child check his/her answer using fact family.

Example 2

Hany was travelling to Alexandria from his home which is at a distance 243.865 km. He covered a distance 115.782 km.

What is the remaining distance to Alexandria ?

Solution

- The total distance = 243.865 km. [Whole]
- The covered distance = 115.782 km. [Part]
- The remaining distance = x km. [Part]
- The equation is x + 115.782 = 243.865
- Subtract to find the part [x]

x = 243.865 – 115.782 = 128.083 km.

243.865	
115.782	x

Another solution using inverse operation

x + 115.782 = 243.865

(–)

x = 243.865 – 115.782
= 128.083

- **Check your answer :**

① ①
128.083 + 115.782 = 243.865 [Yes it is correct]

Check your understanding

1. A truck carries 1.35 tons of fruits and 2.456 tons of vegetables. What is the total load of the truck ?

2. Hany has 73.25 L.E. He spent 10.75 L.E. Find the remainder with him ?

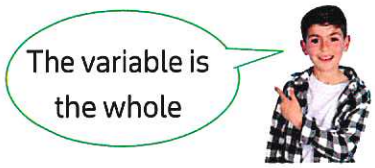
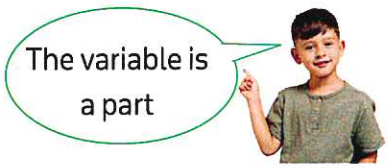
- Help your child write the equation to represent a story problem with an unknown quantity.

Learn 2 Telling a story

If you are given the two equations:

① $3.526 + 2.045 = x$ ② $y + 1.85 = 2.04$

How do you tell a story modeled by each equation ?

	① $3.526 + 2.045 = X$	② $y + 1.85 = 2.04$
Step 1 Use the part-to-whole bar model.	<table><tr><td colspan="2">x</td></tr><tr><td>3.526</td><td>2.045</td></tr></table>	<table><tr><td colspan="2">2.04</td></tr><tr><td>y</td><td>1.85</td></tr></table>
Step 2 Determine the type of the variable [whole or part].	 You can tell a story where two numbers are known and ask for their sum.	 You can tell a story where the sum of two numbers and one of them are known and ask for the other number.
Step 3 There are a lot of ways to tell a story. "Think and create".	Example : Amgad walked 3.526 km from home to school, then he walked 2.045 km from school to club. What is the total distance did Amgad walk ?	Example : Karim has a wodden board of length 2.04 m. He divided it into two parts, one of them is of length 1.85 m. What is the length of the other part ?

Check your understanding

Write a story problem for the equation, then solve it.

$x + 1.357 = 2.18$

Notes for parents :

- Help your child write his / her own story for each equation in this page.

Exercise 9
on lessons 2&3

▸ Variables in Equations
▸ Telling Stories with Numbers

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. **Complete the following.**

a. From the opposite bar model , the value of b = _____

6.5	
b	3.2

[Port Said - East 24]

b. By using the opposite bar model , the value of m is _____

m	
19.6	3.2

c. By using the opposite bar model , the value of m = _____

20.6	
m	7.62

[Ismailia 24]

d. The equation which represents the opposite bar model is _____

10.1	
7.5	p

[Alexandria - Agmi 24]

2. **Solve the following equations, create a bar model to solve each of the following problems.**

a. $a - 3.4 = 2.17$

[Cairo – El Nouzha 23]

b. $2.45 + y = 9$

[Cairo - El Sahel 24]

c. $1.2 = 2.4 - r$

d. $66.85 + k = 90.98$

[Kafr El Sheikh - Bayala 24]

e. $2.15 + n = 5.24$

[Aswan 23]

f. $7.648 - d = 3.92$

[Aswan – Kom Ombo 23]

3. **Solve each of the following equations using inverse operation strategy.**

a. $76.85 + q = 90.96$

b. $k + 2.40 = 3.04$ [Giza 24, Aswan 23]

c. $t - 2.45 = 0.26$ [Giza - Awseem 24]

d. $10.94 - m = 9.04$ [Cairo - Al Mokatam 24]

e. $1.46 + n = 2.461 + 3.015$

f. $28.34 - 5.35 = z + 14.83$

g. $2.563 - b = 1.03 + 0.568$

4. **Solve the following equations. Use a place-value chart, if needed.**

a. $8.23 + p = 10.24$

$p =$ _____

b. $t - 2.45 = 0.26$

$t =$ _____

c. $2.45 + n = 5.24$

$n =$ _____

d. $v + 42.89 = 100.01$

$v =$ _____

e. $h - 6.82 = 1.23$

$h =$ _____

f. $j - 12.40 = 3.01$

$j =$ _____

g. $5.52 + 2.01 + m = 9.21$

$m =$ _____

h. $2.30 + 3.10 = 1.50 + v$

$v =$ _____

5. **Complete the following.**

a. If $a + 34.5 = 50$, then $a =$ _____ [Giza 24]

b. If $x + 3.12 = 9.73$, then $x =$ _____ [El Monofia - Al Bagour 24]

c. If $6.5 + k = 9.8$, then $k =$ _____ [El Beheira - Rasheed 24]

d. If $6.25 + y = 10.25$, then $y =$ _____ [Giza - 6th October 24]

e. In the equation : $5.24 = m + 2.45$, the value of $m =$ _____ [Ismailia - Fayeed 24]

f. If $y - 3.25 = 6.02$, then $y =$ _____ [Alexandria - Montaza 24]

g. If $4.6 - k = 2.2$, then $k =$ _____ [El Monofia - Shebin El kom 24]

Story problems on solving equations

6. In each of the following story problems, write an equation match it, then solve.

a. The weight of Mariam is 35.235 kg and the weight of Luci is 42.012 kg. What is their weight together ?

_____

_____

b. Nada bought a sandwich for 36.85 L.E and 250 mL of juice for 7.5 L.E.
What is the cost of the meal ?

_____

_____

c. 🕮 Ola needed 10 meters of wood to build a garden bed. She found 3.5 m in her garage. How many more meters of wood does she need for the bed ?

_____

_____

d. 🕮 Bassem is taking a bus from Cairo to Ras Muhammad National Park to visit the coral reefs. The total journey is 492.64 kilometers. After 396.48 km, the bus stops in El Tor to pick up more passengers. How far is El Tor from Ras Muhammad National Park ?

_____

_____

e. 🕮 Bassem and his friend Jana were snorkeling in Ras Muhammad National Park on the coral reef. Bassem saw a hawksbill sea turtle that was 0.78 meter long. Jana saw a green turtle that was 0.58 m longer. How long was the green turtle ?

_____

_____

f. Sameh stood on the balance carrying a bag of weight 10.953 kg, the balance reading was 93.215 kg. What is the weight of Sameh ?

g. 🕮 At the market, Bassem bought two melons for a total weight of 2.64 kilogram. If one melon weighed 1.36 kg, what was the weight of the other melon ?

h. 🕮 In Jana's backpack , she has a water bottle that weighs 1.5 kilograms, books that weigh 2.451 kg and a snack. Her filled backpack weighs 4.535 kg. How much does her snack weigh ?

i. 🕮 Nagi is training for a race. Each day of the week he runs 3.5 kilometers. If he runs for 10 days, how far will he have run ?

j. 🕮 Ezz ran three days last week. He ran 5.24 kilometers on Monday and 6.50 km on Wednesday. If he ran a total of 15 km for the week, how much did he run in the third day ? What would the variable in the problem represent ? Solve the problem.

7. **What is the story ?**

Write a story problem for each of the following equations, then solve it.

a. $5.25 + 3.8 = n$

b. $7.85 - 3.685 = y$

c. $x + 2.75 = 12.5$

d. $124.6 - 72.25 = m$

e. $34.750 - s = 15.25$

f. $56.125 - d = 3.853$

Multiple Choice Questions

Choose the correct answer.

1. The value of variable x in the equation : $x + 4.5 = 8$ is _____ [El Menia – Deir Mawas 23]

A. 35 B. 4.5 C. 3.5 D. 5.5

2. The operation used to find the value of z in the equation $8 - z = 6$ is _____ [Alexandria – El Gamarek 24]

A. subtraction B. addition C. multiplication D. division

3. If $8.23 + p = 10.24$, then p = _____ [Giza – Awseem 24]

A. 18.47 B. 2.47 C. 2.01 D. 24.1

4. The solution of the equation : $m - 5.9 = 4.1$ is m = _____ [Alexandria - West 24]

A. 9.10 B. 10 C. 1.8 D. 6.13

5. If $8 - x = 3.2$, then x = _____ [El Monofia – Shebin El kom 24]

A. 48 B. 0.48 C. 4.8 D. 8.4

6. By using the bar model, the value of m is _____

3.16	
m	2.8

A. 2.8 B. 1.64

C. 1.8 D. 0.36 [Cairo - Al Khalifa and Al Mokattam 23]

7. For the equation : $7.325 - x = 4.127$, which of the following part-to-whole bar models is suitable ?

A.

x	
7.325	4.127

B.

7.325	
x	4.127

C.

4.127	
7.325	x

D.

x	
4.127	3.198

8. A square whose side length is 10 cm., then the equation of its perimeter is _____ [El Monofia - Tala 24]

A. $P = 10 + 4$ B. $P = 10 \div 4$ C. $P = 10 \times 4$ D. $10 = P \times 4$

9. To find the length [L] of a rectangle with 4 cm wide and 24 cm^2 area, you will use the equation _____ cm. [El Monofia - Tala 24]

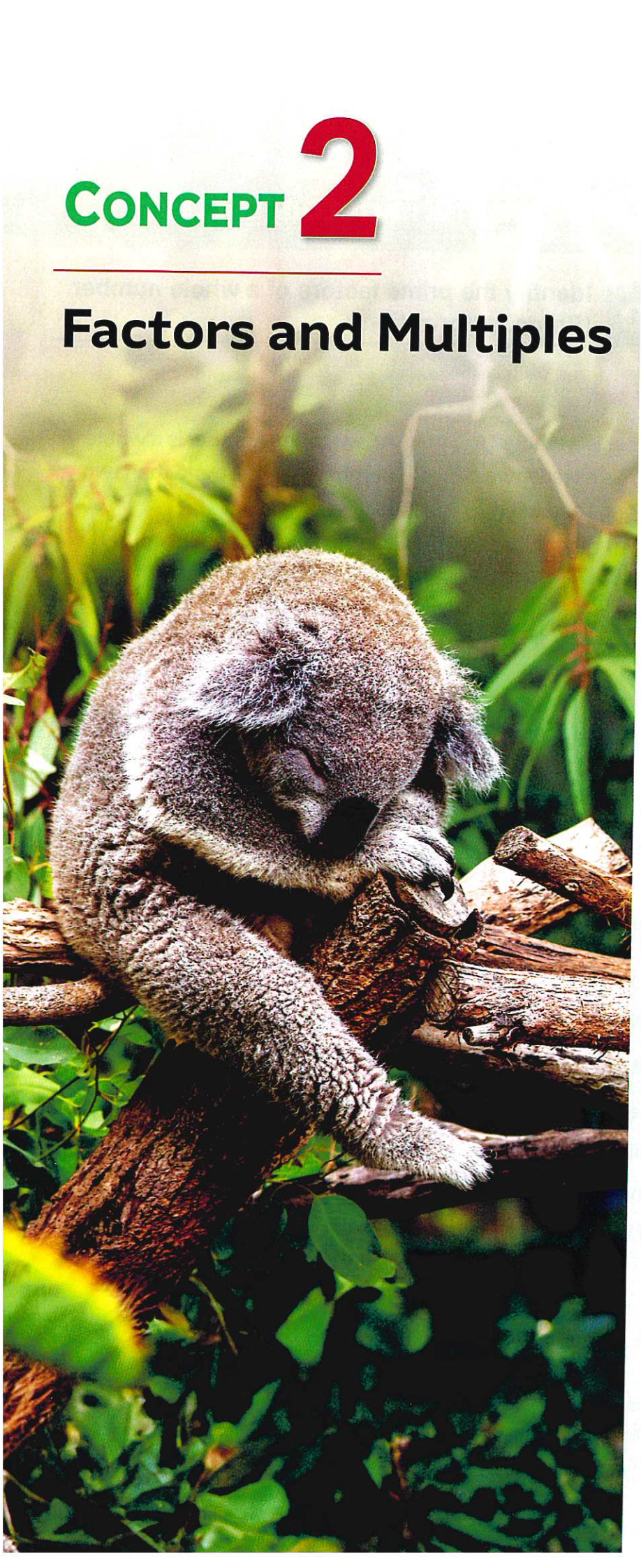
A. $L = 24 \times 4$ B. $24 = L \div 4$ C. $L = 24 \div 4$ D. $4 = L \times 24$

10. Nada's weight was 93.738 kg. She decided to make a diet, her weight becomes 78.135 kg. What weight does Nada lose ?

A. 14.923 kg. B. 12.731 kg. C. 10.423 kg. D. 15.603 kg.

CONCEPT 2

Factors and Multiples



▸ Lessons 4&5

- Prime Factorization
- Greatest Common Factor (G.C.F)

Learning Objectives:

- Students will use a factor tree to identify the prime factors of a given number.
- Students will use factor trees to identify common factors of two whole numbers.
- Students will use factor trees to identify the greatest common factor of two whole numbers.

▸ Lessons 6&7

- Identifying Multiples
- Least Common Multiple (L.C.M)

Learning Objectives:

- Students will explain the meaning of multiples.
- Students will identify the common multiples of two whole numbers up to 12
- Students will explain the meaning of the least common multiple.
- Students will identify the least common multiple of two whole numbers up to 12

▸ Lesson 8

Factors or Multiples ?

Learning Objectives:

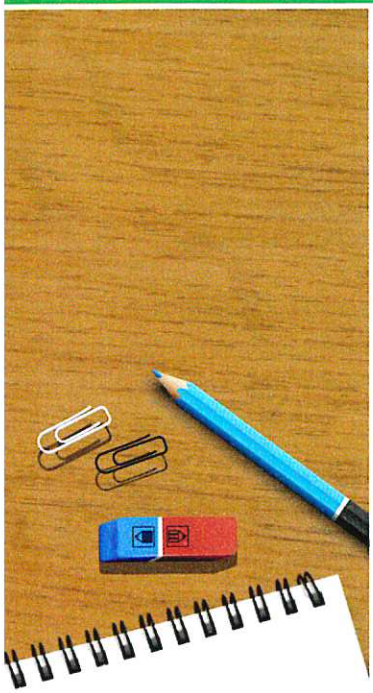
- Students will explain the difference between factors and multiples.
- Students will identify the greatest common factor and least common multiple of two given numbers.

Fast Fact

Believe it or not, Koalas can sleep up to 18 hours a day ! How many hours do they sleep per week ?

Lessons 4 & 5

- Prime Factorization
- Greatest Common Factor (G.C.F)



Learn 1 Identify the prime factors of a whole number (Prime factorization)

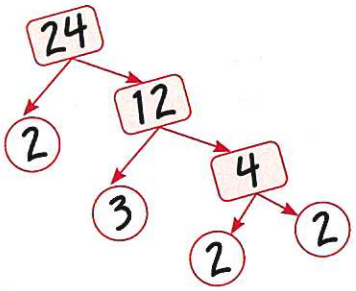
Remember

A Prime number is a whole number that has exactly two different factors, 1 and itself.
Examples of prime numbers :
2 , 3 , 5 , 7 , 11 , 13 , 17

A Composite number is a whole number that has more than two factors.
Examples of composite numbers :
4 , 6 , 9 , 12 , 25 , 30

How can you write a number as a product of prime factors ?

Every composite number can be written as a product of its prime factors. This product is called the prime factorization of the number. You can use a "factor tree" to find the prime factorization.



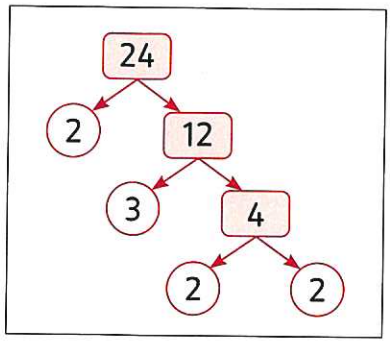
For Example :

To write 24 as a product of its prime factors (prime factorization) :

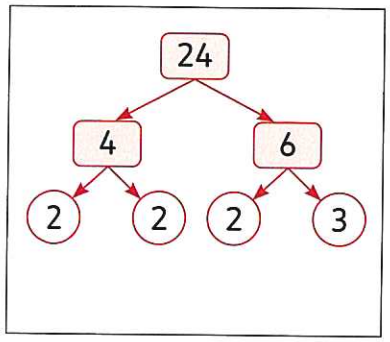
- Write 24 as a product of two factors.
- Write each composite factor as a product.
- Continue until all branches end in prime number.
- Circle the prime factors and put a square around the composite factors.
- The prime factorization of 24 is a multiplication string of the circled prime factors.

Notes for parents :

- Give your child a group of numbers and ask him/her to identify the prime numbers and the composite numbers



Or



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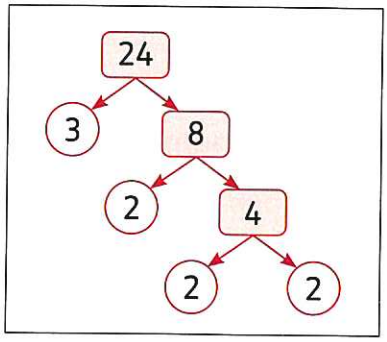


The prime factorizotion of

$24 = 2 \times 2 \times 2 \times 3$

so, the prime factors of 24 are 2, 2, 2 and 3

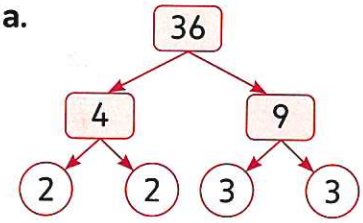
Example 1

Find the prime factorization of each of the following numbers.

a. 36 **b.** 28 **c.** 48

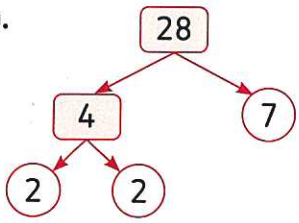
Solution

a.



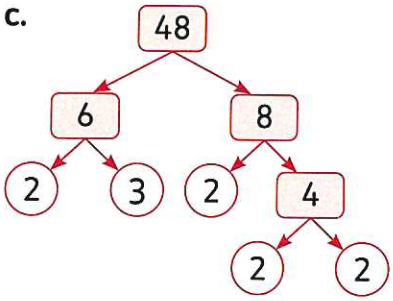
$36 = 2 \times 2 \times 3 \times 3$

b.



$28 = 2 \times 2 \times 7$

c.



$48 = 2 \times 2 \times 2 \times 2 \times 3$

Check your understanding

Find the prime factorization of each of the following numbers.

a. 16 **b.** 45 **c.** 30

- Help you child by starting his/her factor pairs tree with at least one prime number, so that only one branch continues-this makes it visually easier to manage. Remind him / her to circle the prime numbers as he / she gets. This will help him / her list all the prime factors and also write the prime factorization.

Product of prime factors

Given that 2 , 2 and 3 are the prime factors of a number.

What is this number ?

The number = The product of all the given prime factors

, then the number = 2 × 2 × 3 = 12

What is its composite factors ?

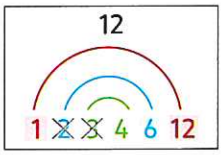
Composite factor = Product of 2 or more factors from the prime factors

- 2 × 2 = 4
- 2 × 3 = 6
- 2 × 2 × 3 = 12

, then 4 , 6 and 12 are the composite factors of 12

Notice

You can find all none prime factors of 12 using (factor rainbow or factor T-chart), then cancel the prime factors from them.



12	
1	12
2	6
3	4

Join "1" to the list

Notice

The none prime factors of 12 are : 1 , 4 , 6 and 12

Example 2

Find the product of the prime factorization listed, then list all other factors of the product.

a. 2 × 2 × 7 **b.** 2 × 3 × 5 **c.** 2 × 2 × 2 × 3

Solution

a. Product = 2 × 2 × 7 = 28 Other factors are : 1 , 4 , 14 and 28

b. Product = 2 × 3 × 5 = 30 Other factors are : 1 , 6 , 10 , 15 and 30

c. Product = 2 × 2 × 2 × 3 = 24 Other factors are : 1 , 4 , 6 , 8 , 12 and 24

Check your understanding

Find the number whose prime factorization is given, then find the other factors for each of the following.

a. 2 × 3 × 3 × 3 **b.** 2 × 5 × 5 **c.** 3 × 3 × 7

Notes for parents :

- Remind your child that not all odd numbers are prime numbers.

Learn 2 How can you find the greatest common factor (G.C.F) of two numbers ?

How can you find the greatest common factor of 18 and 24 (G.C.F) ?

You can find the greatest common factor in two ways :

First way using listing method :

1. Find the factors of each number.
2. Determine the common factors of these numbers.
3. Get the greatest factor of the common factors.

18		24	
①	18	①	24
②	9	②	12
③	⑥	③	8
		4	⑥

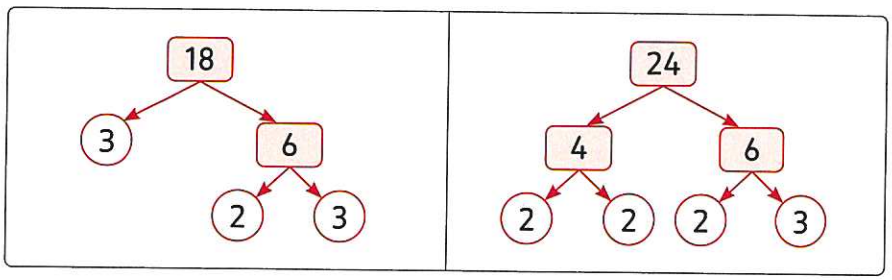
Remember

- *A common factor of two numbers is a factor of each of these numbers.*
- *The greatest common factor (G.C.F) of two numbers is the greatest number that is a factor of both.*

- **Factors of 18 :** 1 , 2 , 3 , 6 , 9 , 18
- **Factors of 24 :** 1 , 2 , 3 , 4 , 6 , 8 , 12 , 24
- **Common factors :** 1 , 2 , 3 , 6
- **The greatest common factor [G.C.F] :** 6

Second way using prime factorization :

1. Factorize each number to its prime factors.
2. Find the common prime factors.
3. Find the product of these common prime factors.



$18 = 2 \times 3 \times 3$

$24 = 2 \times 3 \times 2 \times 2$

G.C.F = $2 \times 3 = 6$

Note

If there are no common prime factors, the G.C.F is 1

For Example :

① G.C.F of 3 and 17 is 1

② G.C.F of 8 and 9 is 1

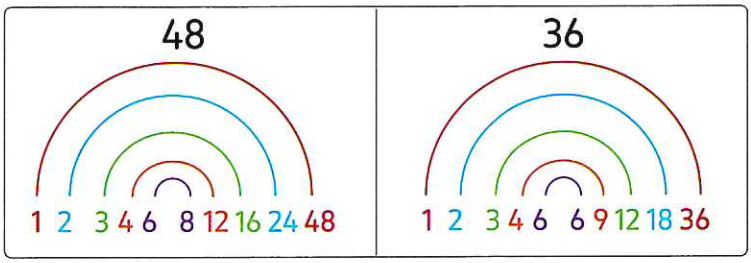
- In primary 4, your child found common factors and explored the concept of greatest common factor (G.C.F). This lesson provides more practice with factor trees and the opportunity to explore how to find the G.C.F as well as other factors from the prime factorization.

Example 3

Find the factors of 48 and 36, then find.

a. The common factors. **b.** The greatest common factor [G.C.F]

Solution



- Factors of 48 : 1 , 2 , 3 , 4 , 6 , 8 , 12 , 16 , 24 , 48
- Factors of 36 : 1 , 2 , 3 , 4 , 6 , 9 , 12 , 18 , 36

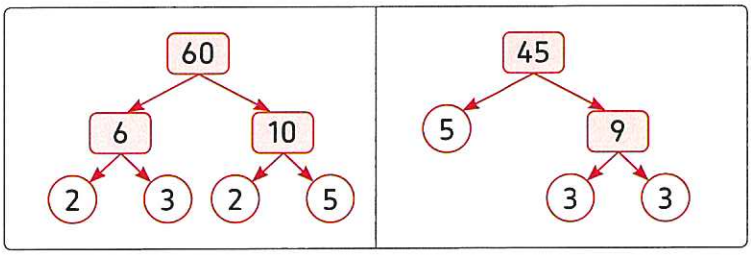
a. The common factors are : 1 , 2 , 3 , 4 , 6 and 12

b. G.C.F = 12

Example 4

Factorize 60 and 45 to their prime factors, then find the G.C.F

Solution



$60 = 2 \times 2 \times 3 \times 5$

$45 = 3 \times 5 \times 3$

G.C.F = 3 × 5 = 15

check your understanding

Find the G.C.F of 36 and 54

Notes for parents :

- Your child may still prefer to make lists to find the common factors and the greatest common factor, but understanding the prime factorization is important as your child moves into more complex factors.

Exercise 10
on lessons 4&5

- Prime Factorization
- Greatest Common Factor (G.C.F)

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

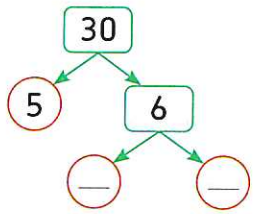
Prime factorization

1. Complete with "Prime" or "Composite".

a. 2 is _____	b. 4 is _____	c. 29 is _____	d. 3 is _____
e. 5 is _____	f. 6 is _____	g. 7 is _____	h. 11 is _____
i. 13 is _____	j. 12 is _____	k. 16 is _____	l. 23 is _____

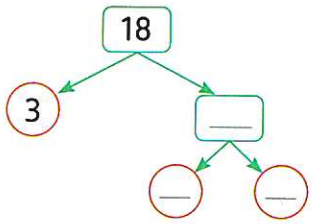
2. Factorize each number to its prime factors.

a.



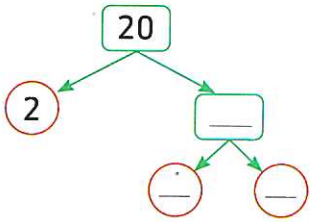
30 = ___ × ___ × ___

b.



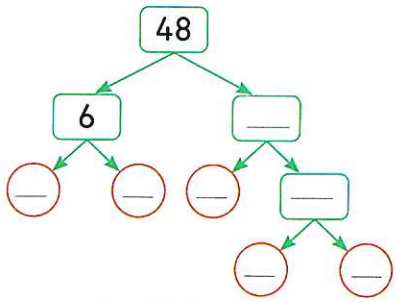
18 = 3 × ___ × ___

c.



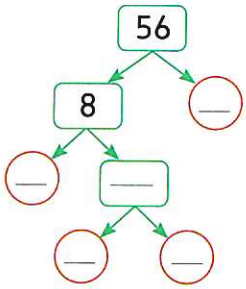
20 = 2 × ___ × ___

d.



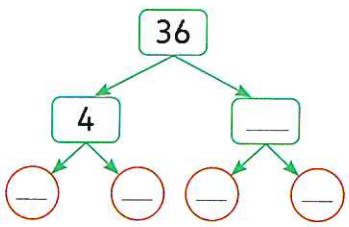
48 = ___ × ___ × ___ × ___ × ___

e.



56 = ___ × ___ × ___ × ___

f.



36 = ___ × ___ × ___ × ___

3. Factorize each of the following numbers to its prime factors.

a. 8	b. 15	c. 21	d. 32
e. 75	f. 42	g. 49	h. 72
i. 80	j. 90	k. 99	l. 17

4. Find the product of the prime factorization listed, then list all other factors of the product.

a. $2 \times 2 \times 2 =$ _____
Other factors are : _____

b. 📖 $2 \times 2 \times 5 =$ _____
Other factors are : _____

c. $2 \times 3 \times 3 =$ _____
Other factors are : _____

d. $2 \times 5 \times 5 =$ _____
Other factors are : _____

e. 📖 $2 \times 3 \times 7 =$ _____
Other factors are : _____

f. 📖 $2 \times 2 \times 2 \times 7 =$ _____
Other factors are : _____

g. $2 \times 2 \times 3 \times 3 =$ _____
Other factors are : _____

h. $3 \times 3 \times 7 =$ _____
Other factors are : _____

5. Complete.

a. _____ is the only even prime number. [Cairo – west 24, Ismailia – El kasasin 24]

b. The prime number has two factors which are _____ and _____

c. 1 is not a prime number because _____

d. The 2-digit prime number which is less than 13 is _____

e. The prime numbers between 60 and 70 are _____

f. The prime factors of 14 are _____

g. The prime factor of 19 is _____

h. The prime factors of 60 without repetition are _____

i. The number whose all prime factors are 2 , 3 and 5 is _____
[Giza – Awseem 24, Cairo – El Maadi 24, El Monofia – Ashmoon 24]

j. The greatest factor of the number 72 is _____

k. The greatest prime factor of the number 28 is _____

l. The smallest factor of the number 21 is _____

m. The smallest prime factor of the number 42 is _____

6. 🕮 At the northern edge of the Gulf of Suez lies the Suez Canal. The Suez Canal extends 193 kilometers and cuts thousands of miles from the shipping routes between Europe and Asia.

1. It takes 12 to 16 hours for a ship to go through the canal. Akram was curious. If a ship takes 12 hr. and travels 193 kilometers, can it go an equal distance each hour ? To solve the problem, he needs to know if 12 is a factor of 193. He makes a factor tree starting with 1 and 193. Basem told him the factor tree would not help him answer his question. Is Basem correct or incorrect ? Why ?
2. Is 193 prime or composite ?
3. Is 12 a factor of 193 ? How do you know ?
4. Is 1 prime or composite or neither ? Why ?

Greatest common factor (G.C.F)

7. Find the common factors and the greatest common factor (G.C.F) of :

a. 4 and 6

Factors of 4 : _____

Factors of 6 : _____

Common factors : _____ G.C.F : _____

b. 10 and 30

Factors of 10 : _____

Factors of 30 : _____

Common factors : _____ G.C.F : _____

c. 40 and 45

Factors of 40 : _____

Factors of 45 : _____

Common factors : _____ G.C.F : _____

d. 54 and 18

Factors of 54 : _____

Factors of 18 : _____

Common factors : _____ G.C.F : _____

e. 48 and 60

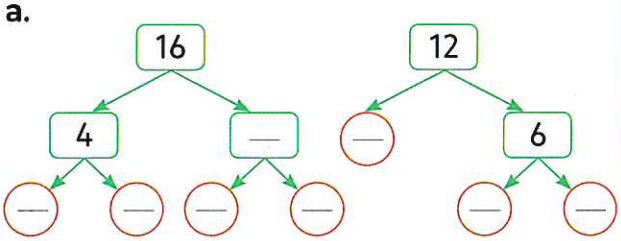
Factors of 48 : _____

Factors of 60 : _____

Common factors : _____ G.C.F : _____

8. Find the prime factorization, then find the G.C.F

a.

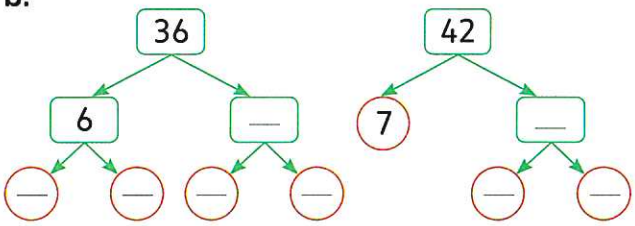


16 = _____

12 = _____

G.C.F = _____

b.

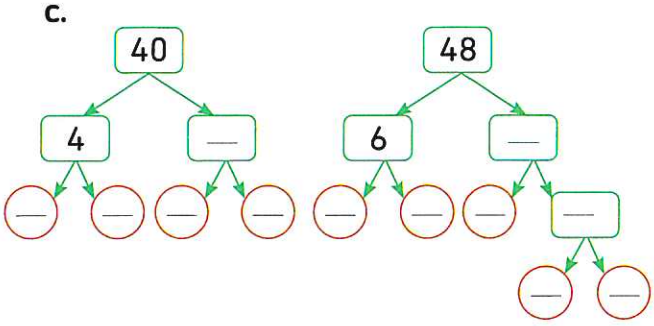


36 = _____

42 = _____

G.C.F = _____

c.

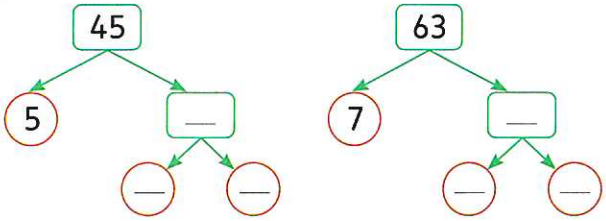


40 = _____

48 = _____

G.C.F = _____

d.



45 = _____

63 = _____

G.C.F = _____

9. **Factorize the following numbers to their prime factors, then find the G.C.F of them.**

a. 45 and 27

b. 36 and 24 [Alexandria – Agmi 24]

c. 42 and 28 [Alexandria – Agmi 24 , Aswan – Kom Ombo 23]

d. 39 and 78

e. 35 and 28 [El Kalyoubia 23]

10. **Find the G.C.F of the given numbers.**

a. 8 and 12 [Cairo – El Sherouk 23 , El Maadi 24 , Giza – El Haram 24]

b. 12 and 18 [Cairo – Heliopolis 23 , El Sahel 24 , El Beheira – Rasheed 24]

c. 40 and 50

d. 10 and 15 [El Monofia – Shebin El kom 24 , Port Said 24]

e. 8 and 24 [El Menia – Deir Mawas 23]

f. 45 and 81

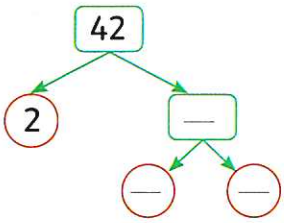
g. 33 and 11

11. **Two numbers, the prime factors of the first are 3 , 3 and 5 and the prime factors of the second are 2 , 2 , 3 and 5 , then :**

- The first number = _____
- The second number = _____
- Their G.C.F = _____

12. **Greatest common factors (G.C.F) :** Work independently to complete the problems.

1. List the factors of 42
2. Complete the factor tree for 42 and write out the prime factorization.



3. Find the value of n : $n = 2 \times 2 \times 7$
4. What are the common factors of 42 and n ?
5. What is the greatest common factor of 42 and n ?

---

13. **a.** Shadi and Taha went diving to the steamship. They each stopped at intervals of equal depths to check their gear. Shadi dove to the stern at 30 meters below the surface. What are all the options of intervals he could take ? [Stopping every 1 m is not practical, nor is going the entire distance.]

A. 2 m , 3 m , 5 m

B. 2 m , 3 m , 5 m , 6 m

C. 2 m , 3 m , 5 m , 6 m , 10 m , 15 m

D. 2 m , 3 m , 5 m , 6 m , 10 m , 12 m

b. Taha dove to the hull at a depth of 15 meters. What are the options of intervals he could take ? [Stopping every 1 m is not practical, nor is going the entire distance.]

A. 3 m , 5 m

B. 2 m , 3 m , 5 m

C. 2 m , 3 m , 5 m , 6 m

D. 2 m , 3 m , 5 m , 6 m , 10 m

c. **Challenge :** If both divers stop at equivalent equal intervals, what is the greatest distance they can both dive before stopping ?

A. 2 m

B. 3 m

C. 5 m

D. 10 m

14. **Use what you know about factors and common factors to solve each problem.**

a. Sylvia has 21 pencils and 14 erasers. She wants to put them in groups. What is the greatest number of groups that can be made so that each group has the same number of items ? How many pencils will be in each group ? How many erasers will be in each group ?

b. There are 40 girls and 32 boys who want to participate in lap on teams. If each team must have the same number of girls and the same number of boys, what is the greatest number of teams that can participate ? How many girls will be in each team ? How many boys will be in each team ?

Challenge

15. Find the common factors of 36 , 24 and 48

16. Find the G.C.F of 24 , 40 and 56

Multiple Choice Questions

Choose the correct answer.

1. The prime number has _____ factor(s). [Aswan - Kom Ombo 23]
A. 1 B. 2 C. 3 D. 4

2. The smallest prime number is _____ [Kafr El Sheikh 24]
A. 1 B. 2 C. 3 D. 5

3. The smallest odd prime number is _____ [Kafr El Sheikh 24 , Giza - Abo El Nomrous 24]
A. 1 B. 2 C. 3 D. 5

4. _____ is the only even prime number. [Giza - South 24 , Cairo - El Marg 23]
A. 0 B. 1 C. 2 D. 3

5. The number 11 has _____ factor(s). [El Monofia - Tala 23 , Giza - Awseem 23]
A. 1 B. 2 C. 3 D. 4

6. Which of the following is a prime number ? [Cairo - El Sayeda Zeinab 24 , New 24]
A. 1 B. 3 C. 9 D. 15

7. The prime number between 44 and 50 is _____
A. 45 B. 46 C. 47 D. 49

8. The number 9 has _____ factor (s). [Cairo - Ain Shams 24]
A. 1 B. 2 C. 3 D. 4

9. 7 is a factor of _____ [Cairo - El Sayeda Zeinab 24]
A. 43 B. 42 C. 59 D. 45

10. The number whose all factors are 1 , 2 , 4 and 8 is _____ [Alexandria - Agmi 24]
A. 64 B. 24 C. 8 D. 16

11. Which of the following is a composite number ?
A. 1 B. 31 C. 33 D. 43

12. Which of the following is NOT a prime number ?
A. 2 B. 5 C. 7 D. 9

13. All the following numbers are composite except _____
A. 66 B. 67 C. 68 D. 69

14. Which statement is true ?
A. 1 is a factor of only odd numbers.
B. 1 is not a factor of any number.
C. 1 is a factor of all number.
D. 1 is a factor of only 0.

15. The prime factors of the number 18 are _____ [El Menia - Deir Mawas 23 , Cairo - El Sherouk 23]
A. 2 , 2 and 3 B. 2 , 3 and 3 C. 6 and 2 D. 4 and 3

16. The prime factors of the number 28 are _____ [Cairo – El Marg 23]
A. 2 , 2 and 5 **B.** 2 , 2 and 7 **C.** 14 and 2 **D.** 7 and 4

17. 2 , 5 and 7 are prime factors of _____
A. 25 **B.** 35 **C.** 65 **D.** 70

18. 3 , 2 and 7 are prime factors of _____
A. 14 **B.** 21 **C.** 42 **D.** 44

19. 🕮 What is the best explanation for the difference between prime and composite numbers ?
A. A prime number has only 2 factors : 1 and itself. A composite number has more than two factors.
B. A prime number has only 1 as a factor and a composite number has two factors.
C. A prime number has only 2 factors. A composite number has 4 or more factors.
D. A prime number can be factored in more than one way. A composite number can be factored in only one way.

20. The G.C.F of 6 and 12 is _____ [Cairo - New 24]
A. 2 **B.** 3 **C.** 4 **D.** 6

21. The G.C.F of 10 and 15 is _____ [Giza – Abo El Nomrous 24 , El Monofia – Tala 23]
A. 10 **B.** 15 **C.** 5 **D.** 30

22. G.C.F of numbers 5 and 7 is _____ [El Monofia - Shiben El Kom 23]
A. 12 **B.** 35 **C.** 1 **D.** 0

23. The G.C.F of 20 and 30 is _____ [Cairo – El Nouzha 23 , El Beheira 23]
A. 1 **B.** 4 **C.** 5 **D.** 10

24. The common factor of all numbers is _____ [Ismailia – Fayeed 24 , Alexandria - West 23]
A. 0 **B.** 1 **C.** 2 **D.** 3

25. The common factor for all numbers added to 999 = _____ [Cairo - El Maadi 24]
A. 0 **B.** 1 **C.** 999 **D.** 1,000

26. 1 and 7 are the common factors of _____
A. 2 and 7 **B.** 2 and 14 **C.** 7 and 12 **D.** 7 and 14

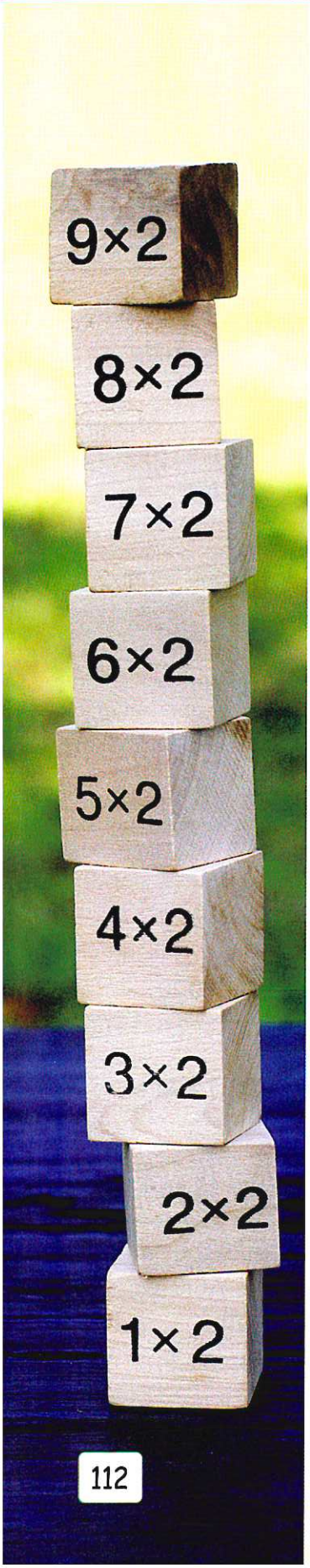
27. Which pair of numbers has the same greatest common factor as 42 and 12 ?
A. 9 and 6 **B.** 8 and 24 **C.** 16 and 60 **D.** 18 and 30

28. 🕮 Two groups took public transportation in Sharm El-Sheikh. Each ticket costs the same amount of money. One group spends 16 L.E. and the other group spends 12 L.E. At most, how much does the greatest possible cost of each ticket ? [Hint : Use the G.C.F].
A. 2 L.E. **B.** 4 L.E **C.** 6 L.E. **D.** 8 L.E.
[El Monofia – Tala 23]

Lessons

6 & 7

- Identifying Multiples
- Least Common Multiple (L.C.M)



Learn 1 Identifying multiples

- In primary 4, you have learned what is a multiple and how to find multiples of a whole number and common multiples of two numbers.
- In this lesson, you will review what you have learned before, and expand your knowledge of common multiples to learn how to identify the least common multiple (L.C.M).

Remember what is a multiple ?

A multiple is the product of a given number and another whole number.

- You can find multiples of any number using many ways as :
  1. Multiplying by the whole numbers.
  2. Skip-counting on the number line.

For Example :

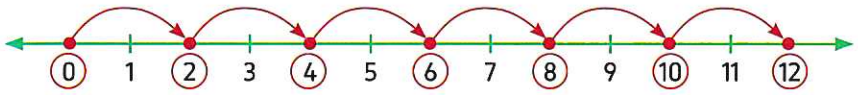
To find the multiples of 2, you can use any of these ways :

1 Multiply by 0 , 1 , 2 , 3 , 4 and so on.

$2 \times 0 = 0$, $2 \times 1 = 2$, $2 \times 2 = 4$, $2 \times 3 = 6$, $2 \times 4 = 8$, and so on.

Then the products 0 , 2 , 4 , 6 , 8 , ... are called the multiples of 2

2 Using skip-counting by 2s on the number line.



Then the multiples of 2 are 0 , 2 , 4 , 6 , 8 , 10 , 12 and so on.

Remarks

- Zero is a multiple of any number.
- The multiple of any number not equal to 0 is divisible by this number.

For Example :

$2 \times 5 = 10$ → 10 is a multiple of both 2 and 5

- 10 is divisible by 2
- 10 is divisible by 5

Notes for parents :

- Skip counting on the number chart helps your child notice the patterns to help him/her find the multiples more quickly.

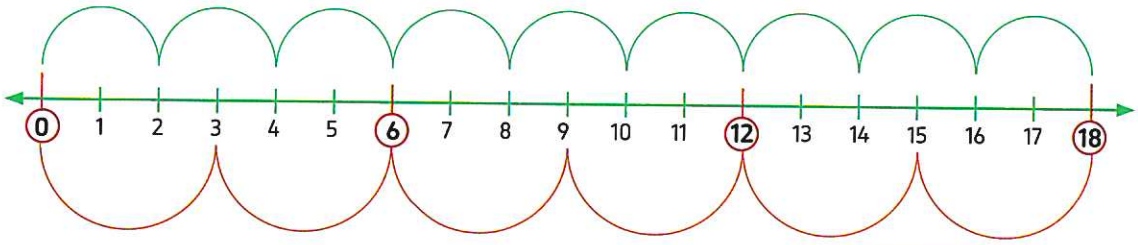
Remember common multiples :

- Common multiples are multiples of two or more numbers.

  i.e. They are multiples that the numbers have in common.

Finding common multiples using the number line :

Example : Use a number line to find common multiples of 2 and 3.



The common multiples of 2 and 3 are
0 , 6 , 12 , 18 ,... and so on.

Remark

Zero is a common multiple of all numbers.

Example 1

Find the multiples of each of the numbers 4 and 6 up to 50, then find the common multiples of them.

Solution

- The multiples of 4 are : 0 , 4 , 8 , 12 , 16 , 20 , 24 , 28 , 32 , 36 , 40 , 44 and 48
- The multiples of 6 are : 0 , 6 , 12 , 18 , 24 , 30 , 36 , 42 and 48
- The common multiples of 4 and 6 are : 0 , 12 , 24 , 36 and 48

Check your understanding

Find the multiples of each of 7 and 3 up to 50, then find the common multiples of them.

Solution

The multiples of 7 are : _____

The multiples of 3 are : _____

The common multiples are : _____

- Listing multiples help your child find common multiples.

Learn 2 Least common multiple (L.C.M)

Least Common Multiple (L.C.M)

The least common multiple [L.C.M] is the smallest multiple [other than 0] that two or more numbers have in common.

To find the L.C.M of two numbers or more, you can use one of the following two methods :

L.C.M by listing method

1. Find the multiples of each number.
2. Find the common multiples of these numbers.
3. Find the smallest multiple (other than zero) of them. Then it will be the L.C.M

For Example :

To find L.C.M of 6 and 9 :

1. • Multiples of 6 are : (0) , 6 , 12 , (18) , 24 , 30 , (36) , 42 , 48 , (54) ,...
   • Multiples of 9 are : (0) , 9 , (18) , 27 , (36) , 45 , (54) ,...
2. Common multiples of 6 and 9 (other than zero) are : 18 , 36 , 54 ,...
3. L.C.M of 6 and 9 is 18

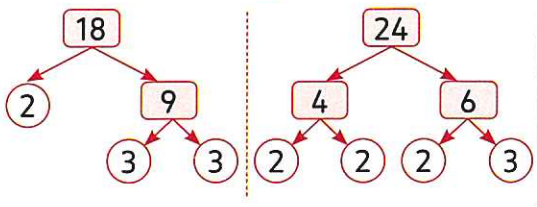
L.C.M by prime factorization

1. Find all the prime factors of each of the given numbers.
2. Array prime factorization of each number such that the similar factors lie on the same column.
3. Take a factor from each column, then find their product which is the L.C.M

For Example :

To find L.C.M of 18 and 24 :

1



2

$18 = 2 \times 3 \times 3$

$24 = 2 \times 3 \times 2 \times 2$

L.C.M = 2 × 3 × 3 × 2 × 2

3

L.C.M = 72

Notes for parents :

• Ask your child what is the meaning of the least common multiple.

Example 2

Find the least common multiple (L.C.M) of each of the following.

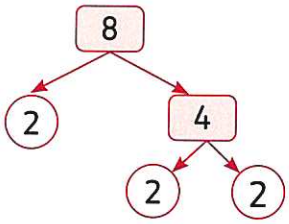
a. 8 and 6 **b.** 12 and 16 **c.** 4 , 12 and 8

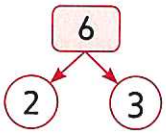
Solution

a. $8 = 2 \times 2 \times 2$

$6 = 2 \times 3$

$L.C.M = 2 \times 2 \times 2 \times 3 = 24$

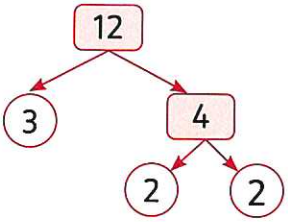


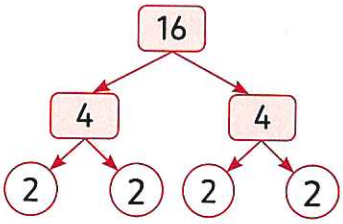


b. $12 = 2 \times 2 \times 3$

$16 = 2 \times 2 \times 2 \times 2$

$L.C.M = 2 \times 2 \times 3 \times 2 \times 2 = 48$



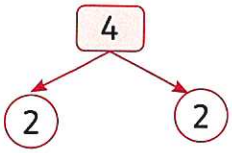


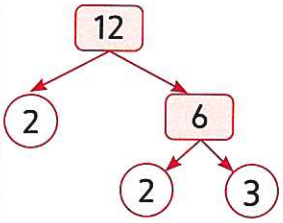
c. $4 = 2 \times 2$

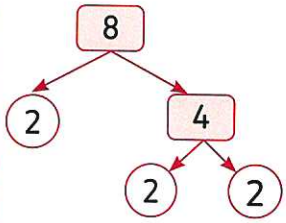
$12 = 2 \times 2 \times 3$

$8 = 2 \times 2 \times 2$

$L.C.M = 2 \times 2 \times 3 \times 2 = 24$





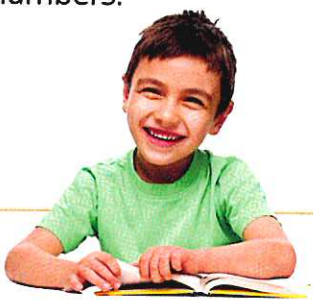


Notice

The L.C.M of two or more prime numbers is the product of these numbers.

For Example :

- L.C.M of 5 and 7 is $5 \times 7 = 35$
- L.C.M of 2 , 3 and 5 is $2 \times 3 \times 5 = 30$



- Let your child notice that prime factorization is the simplest way to find L.C.M of three numbers.

Check your understanding

1. Using listing method, find L.C.M of each of the following :

a. 6 and 5

- Multiples of 6 are : _____
- Multiples of 5 are : _____
- Common multiples : _____
- L.C.M = _____

b. 10 and 12

- Multiples of 10 are : _____
- Multiples of 12 are : _____
- Common multiples : _____
- L.C.M = _____

2. Using prime factorization, find L.C.M of each of the following.

a. 16 and 24 _____

b. 9 and 12 _____

Helpful Hints

1. The multiples of 2 are the numbers whose ones digit is 0 , 2 , 4 , 6 or 8
2. The multiples of 5 are the numbers whose ones digit is 0 or 5
3. The multiples of 10 are the numbers whose ones digit is 0
4. Zero is a multiple of any number.
5. Any number is a multiple of itself.
6. The product of two whole numbers [or more] is a multiple of each of these numbers.

   For Example : 35 is the product of 5 and 7 [5 × 7 = 35] ,

   so 35 is a multiple of 5 and also 35 is a multiple of 7
7. The common multiples of two prime numbers are multiples of their product.

   For Example : • All common multiples of 2 and 3 are multiples of 6

   • All common multiples of 3 and 5 are multiples of 15

Notes for parents :

• Direct your child to solve "check your understanding" problems. Review his/her answer.

Exercise 11
on lessons 6&7

▸ Identifying Multiples
▸ Least Common Multiple (L.C.M)

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

Multiples and common multiples

1. **Complete the following.**

a. List the first five multiples of 3 _____

b. List the first four multiples of 5 _____

c. List the first five multiples of 6 _____

d. List the first six multiples of 7 _____

e. List the first five multiples of 9 _____

f. List eight multiples of 10 _____

g. List the multiples of 8 up to 60 _____

h. List the multiples of 4 which lie between 15 and 40 _____

i. All the multiples of 5 between 14 and 44 are _____

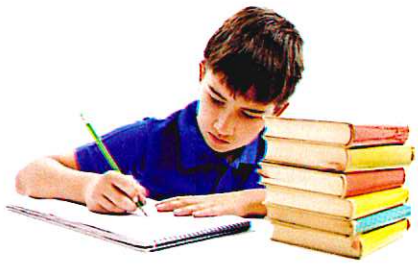
j. All the multiples of 2 that are less than 10 are _____

2. **Complete.**

a. $28 = 7 \times$ _____ hence 28 is a multiple of _____ and is also a multiple of _____

b. $42 = 6 \times$ _____ hence 42 is a multiple of _____ and is also a multiple of _____

c. $60 = 10 \times$ _____ hence 60 is a multiple of _____ and is also a multiple of _____



d. The number 12 is a multiple of 3 because : _____ = _____ × _____

e. The number 21 is a multiple of 7 because : _____ = _____ × _____

f. The number _____ is a multiple of 5 because : $40 = 5 \times$ _____

g. The number _____ is a multiple of 10 because : 150 = _____ × 15

3. a. **Find the multiples of each of the numbers 2 and 3 up to 20, then find the common multiples between them.**

The multiples of 2 are : _____

The multiples of 3 are : _____

The common multiples are : _____

b. Find the multiples of each of the numbers 5 and 4 up to 30, then find the common multiples between them.

The multiples of 5 are : _____

The multiples of 4 are : _____

The common multiples are : _____

4. 🕮 **Answer the following.**

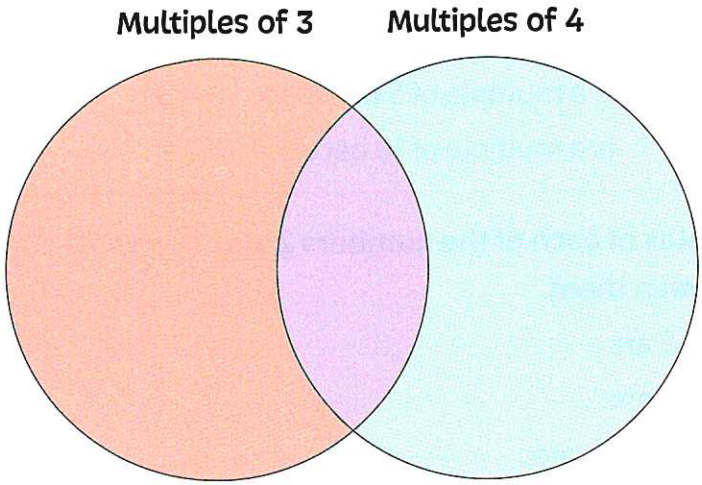
- List the first five multiples of 5 _____
- List the first ten multiples of 2 _____
- What common multiples of 2 and 5 did you list ? _____

5. 🕮 **Answer the following.**

- List the first five multiples of 8 _____
- List the first six multiples of 4 _____
- List the first five multiples of 6 _____
- What common multiples of 8, 4 and 6 did you list ? _____

6. 🕮 **Answer the following.**

- List the first twelve multiples of 3 _____
- List the first twelve multiples of 4 _____
- What common multiples of 3 and 4 did you list ? _____
- Use this information to fill in the Venn Diagram for the first 12 multiples of 3 and 4, placing the common multiples in the shared center.



7. **a.** Find a common multiple of 4 and 8 _____

b. Find a common multiple of 5 and 4 _____

c. Find two common multiples of 4 and 6 _____

d. Find two common multiples of 3 and 9 _____

8. **Write the common multiples of.**

a. 3 and 5 which are less than 50 _____

b. 2 and 3 which are less than 30 _____

c. 2 and 5 which are between 20 and 75 _____

9. **Complete.**

a. The common factor of all the whole numbers is _____ [El Monofia – El Bagour 24]

b. The common multiple of all the whole numbers is _____

[Cairo - El Basateen and El Salam 24]

c. If the common factor of two numbers is 12 , then these two numbers may be _____ and _____

d. If the common multiple of two numbers is 28 , then these two numbers may be _____ and _____

10. **a.** Select the three numbers that are NOT common multiples of 5 and 7.

A. 14 **B.** 21 **C.** 35

D. 55 **E.** 70 **F.** 105

b. Select the three numbers for which 24 and 32 are common multiples.

A. 2 **B.** 3 **C.** 4

D. 6 **E.** 7 **F.** 8

11. • Adel is buying cartons of eggs and bottles of juice at the supermarket to make breakfast for friends. Each carton contains 12 eggs. Complete the chart for Adel.

Cartons	1	2	3	4	5	6
Eggs	12					

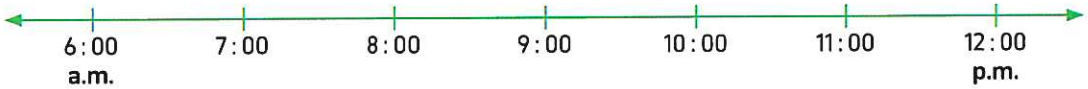
- The juice comes in packs of 9. Complete the chart for Adel

Packs	1	2	3	4	5	6
Juice	9					

- If Adel is buying enough eggs and juice for 36 people, how many cartons of eggs and packs of juice will he need to buy for each guest to have 1 egg and 1 juice ?

12. 📖 • Omar wants to visit Ras Abu Galum. During the week, a bus leaves for Ras Abu Galum at 3 a.m. Additional buses leave every 3 hours. The last bus leaves at 12 p.m. What times can Omar catch the bus ?

- On the weekend, the first bus leaves for Ras Abu Galum at 6 a.m. Additional buses leave every 2 hours until 12 p.m. What times can Omar catch the weekend bus ?



- What times can Omar always catch a bus, whether it is a weekday or the weekend ?

13. 📖 **a.** Doha and her little brother are laying out train tracks. Each train track is 12 centimeters long. How long are the first 5 pieces of track laid end to end ?

_____

_____

b. How many pieces of track would Doha and her brother need to make the same distance from the previous problem if the track pieces were 4 centimeters long ?

_____

_____

Least common multiple (L.C.M)

14. **a.** 📖 To find the L.C.M of 6 and 9 :

- Multiples of 6 : _____
- Multiples of 9 : _____
- Common multiples of 6 and 9 [other than 0] : _____
- [L.C.M] of 6 and 9 is : _____

b. 📖 To find the L.C.M of 10 and 5 :

- Multiples of 10 : _____
- Multiples of 5 : _____
- Common multiples of 10 and 5 [other than 0] : _____
- [L.C.M] of 10 and 5 is : _____

c. To find the L.C.M of 7 and 14 :

- Multiples of 7 : _____
- Multiples of 14 : _____
- Common multiples of 7 and 14 [other than 0] : _____
- [L.C.M] of 7 and 14 is : _____

d. 📖 To find the L.C.M of 5 and 11 :

- Multiples of 5 : _____
- Multiples of 11 : _____
- Common multiples of 5 and 11 [other than 0] : _____
- [L.C.M] of 5 and 11 is : _____

e. 📖 To find the L.C.M of 3 and 8 :

- Multiples of 3 : _____
- Multiples of 8 : _____
- Common multiples of 3 and 8 [other than 0] : _____
- [L.C.M] of 3 and 8 is : _____

f. To find the L.C.M of 6 , 10 and 15 :

- Multiples of 6 : _____
- Multiples of 10 : _____
- Multiples of 15 : _____
- Common multiples of 6 , 10 and 15 [other than 0] : _____
- [L.C.M] of 6 , 10 and 15 is : _____

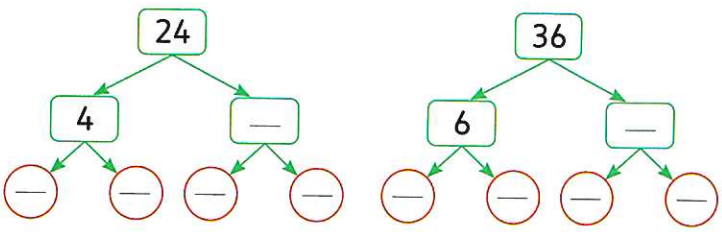
15. Find the least common multiple.

a. 24 and 36

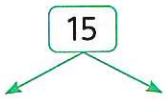
24 = ___ × ___ × ___ × ___

36 = _____

L.C.M = _____



b. 15 and 18



15 = _____

18 = _____

L.C.M = _____

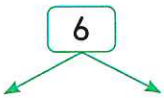
c. 32 and 48

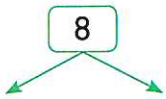
32 = _____

48 = _____

L.C.M = _____

d. 6 , 9 and 8





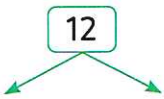
6 = _____

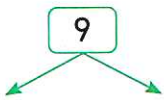
9 = _____

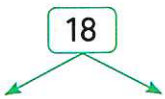
8 = _____

L.C.M = _____

e. 12 , 9 and 18







12 = _____

9 = _____

18 = _____

L.C.M = _____

16. **For each group of the following numbers, use the prime factorization of each number to find the L.C.M :**

a. 3 and 5

b. 6 and 14

c. 16 and 22

d. 8 and 12 [El Beheira 23 , Cairo – El Sherouk 23 , El Basateen and El Salam 24]

e. 10 and 12 [El Kalyoubia - Monshaet El Qunater 23]

f. 18 and 30 [Cairo – Al Khalifa and Al Mokattam 23]

17. 📖 **Use the given vocabulary to complete the following.**

(prime - factor - the number one - composite number - product - multiples)

a. A _____ is a number with more than one set of factor pairs.

b. A _____ is a number multiplied by another number to find a product.

c. Skip counting is a way to find _____ of a number.

d. _____ is a factor of all numbers.

e. A _____ number's only factor pair is one and itself.

f. A _____ is the answer to a multiplication problem.

18. 📖 Badr is buying kofta and aish baladi for his birthday party. The kofta is sold in packages of 3. The bakery sells the aish baladi in packages of 12. Badr wants to have exactly the same number of each. **What is the minimum number of kofta and aish baladi he should buy ?**

Package	1					
Kofta	3					

Package	1					
Aish Baladi	12					

19. 📖 Hend and Jana are biking around a small lake. Hend makes a complete lap around the lake in 6 minutes. It takes her younger sister, Jana, 8 minutes to finish one lap. If Hend and Jana continue to bike around the lake at the same rate, **how many minutes will it take for them to come together at the starting point again ?**

Lap	1					
Hend	6					

Lap	1					
Jana	8					

Multiple Choice Questions

Choose the correct answer.

1. 10 is a multiple of _____

A. 3 B. 4
C. 5 D. 6

[Alexandria – First Montaza 23]

2. _____ is a multiple of 5.

A. 6 B. 9
C. 37 D. 20

[Aswan 23]

3. Which of the following is a multiple of 9 ?

A. 3 B. 45
C. 56 D. 89

4. Which is NOT a multiple of 6 ?

A. 0 B. 30
C. 20 D. 42

5. Which of the following is NOT a multiple of 10 ?

A. 10 B. 20
C. 35 D. 50

6. Which of the following numbers is a common multiple of both 2 and 3 ? [Alex. – Agmi 24]

A. 27 B. 40
C. 24 D. 39

7. Which is NOT a common multiple of 9 and 6 ?

A. 18 B. 54
C. 36 D. 42

8. The multiple of any number is _____

A. 0 B. 1
C. 2 D. 3

[Ismailia 23]

9. The common multiples of 6 and 8 are the same as the multiples of which number ?

A. 10 B. 12
C. 20 D. 24

10. The L.C.M of 6 and 10 is _____

A. 60 B. 30
C. 15 D. 45

[Giza – Awseem 23 , El Monofia – Tala 23 , Menof 24]

11. The L.C.M of 5 and 10 is _____

A. 5 B. 10
C. 15 D. 20

[Alexandria – West 24 , Aswan – Kom Ombo 23]

12. What is the L.C.M of 8 and 18 ?

A. 8 B. 18
C. 24 D. 72

13. The L.C.M of 8 , 2 and 6 is _____

A. 48 B. 45
C. 80 D. 24

14. The L.C.M of 5 and 3 is _____

A. 20 B. 25
C. 35 D. 15

[El Monofia – Ashmoon 23 , Shebin El kom 24]

Lesson

8

▸ Factors or Multiples ?

Learn 1 Relation between factors and multiples

Father, mother and three sons take the bus whose ticket is 7 L.E. per one.

What is the total cost of the family ?

• To find the total cost multiply 7 × 5

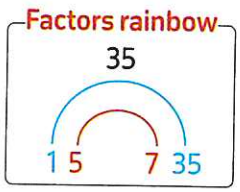
$$7 \times 5 = 35 \text{ L.E.}$$

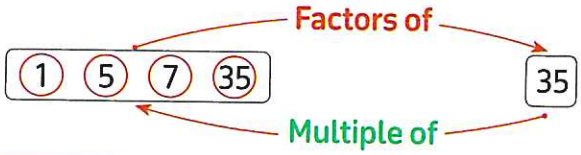
Factor of 35	Factor of 35	Multiple for each of 7 and 5

Remarks

• The factors of 35 are 1 , 5 , 7 and 35

• 35 is a multiple of each of 1 , 5 , 7 and 35





Factor

• One is a factor of all numbers.

• Each number except zero has a finite number of factors.

• Any number is divisible by each of its factors.

• Factor of a number is smaller than or equal to this number.

Multiple

• Zero is a multiple of all numbers.

• Each number except zero has an infinite number of multiples.

• Multiple is the product of two factors or more.

• Non-zero multiple of a number is greater than or equal to this number.

Notes for parents :

• Ask your child to explain the difference between a factor and a multiple.

Relation between G.C.F and L.C.M :

G.C.F
Greatest common factor

Deals with factors

Obtained by finding the greatest factor among the common factors of the numbers

L.C.M
Least common multiple

Deals with multiples

Obtained by finding the smallest multiple among the common multiples of the numbers

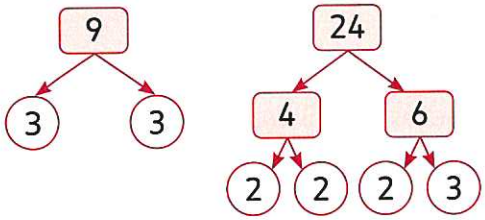
G.C.F × L.C.M = Product of the given two numbers

of two numbers — of these two numbers

Example 1

Find G.C.F and L.C.M for 9 and 24

Solution



$9 = 3 \times 3$

$24 = 3 \times 2 \times 2 \times 2$

G.C.F = 3 — Choose one factor from each two common factors

L.C.M = 3 × 3 × 2 × 2 × 2 — Choose one factor from each column

G.C.F = 3, L.C.M = 3 × 3 × 2 × 2 × 2 = 72

Notice

$$\begin{array}{r} 24 \\ \times\ 9 \\ \hline 216 \end{array} \qquad \begin{array}{r} 72 \\ \times\ 3 \\ \hline 216 \end{array}$$

i.e. G.C.F × L.C.M = Product of the two numbers

Check your understanding

Find G.C.F and L.C.M for each of the following.

a. 6 and 16

b. 14 and 21

Notes for parents :

- Ask your child to explain the difference between G.C.F and L.C.M.

Learn 2 G.C.F or L.C.M ... ?

To solve some story problems, you need to decide whether you have to find the G.C.F or L.C.M

What kinds of story problems might involve finding G.C.F ?

These problems usually involve dividing, distributing equally, cutting into pieces or breaking something into groups.

What kinds of story problems might involve finding L.C.M ?

These problems usually involve something repeated, multiple items, or when two things occur at the same time.

Example 2

The dimensions of a room are 12 and 8 meters. A contractor wants to tile the room using the least number of squared tiles. **What should the tile dimension be ?**

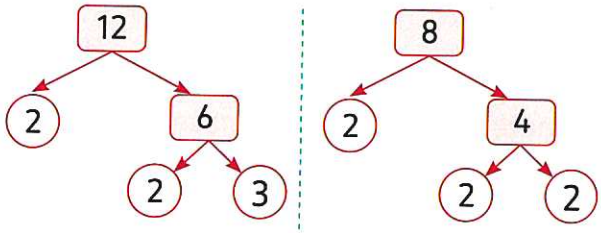
Solution

You will divide the room area into some squares, the least number of tiles is asked which means the dimensions of the tile must be the greatest possible that means you will find G.C.F of 12 and 8

$12 = 2 \times 2 \times 3$

$8 = 2 \times 2 \times 2$

G.C.F $= 2 \times 2 = 4$



, then the tile has to be a square of side length 4 meters.

Example 3

Two neon signs are turned on at the same time. Both signs blink as they are turned on. One sign blinks every 9 seconds. The other sign blinks every 15 seconds. **In how many seconds will they blink together again?**

• Ask your child when he/she decides to find G.C.F and L.C.M through the story problems.

Solution

To find when the two signs blink together again at the same time, you have to find L.C.M of 9 and 15

$9 = 3 \times 3$

$15 = 3 \times 5$

$L.C.M = 3 \times 3 \times 5 = 45$

, then the two signs will blink together again in 45 seconds.

Check your understanding

1. Farmer John and Farmer Jane are planning out their fruit orchard. Farmer John is planting the orange trees, and Farmer Jane is planting the cherry trees. Farmer John has 30 orange trees to plant, and Farmer Jane has 24 cherry trees to plant. They want to plant the trees so that each row has the same number of trees. What is the largest number of trees each row can have ?

2. Two types of cubic stone blocks, one is of edge length 2 meters and the other is of edge length 3 meters. It is wanted to make a column from each type such that the two columns are of the same height using the least number of stones. What is the height of each column ?

Notes for parents :

- Ask your child to read each story problem and decide whether he/she have to find the G.C.F or the L.C.M to solve the problem.

Exercise 12 on lesson 8

▸ Factors or Multiples ?

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. **Find the G.C.F and L.C.M for each of the following numbers.**

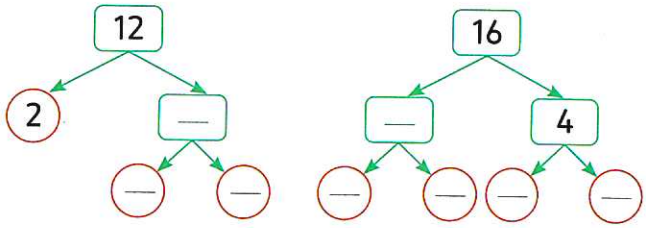
a. 12 and 16

12 = _____

16 = _____

G.C.F = _____

L.C.M = _____



[Kafr El Sheikh – Bayala 24]

b. 18 and 24

18 = _____

24 = _____

G.C.F = _____

L.C.M = _____

[Ismailia – El kasaseen 24]

c. 24 and 36

24 = _____

36 = _____

G.C.F = _____

L.C.M = _____

2. **Find the G.C.F and L.C.M for each of the following.**

a. 12 and 10 G.C.F = _____ [Giza 23] L.C.M = _____ [El Menia – Deir Mawas 23]

b. 9 and 5 G.C.F = _____ L.C.M = _____

c. 20 and 30 G.C.F = _____ L.C.M = _____ [Cairo – Hadaek El koba 24 , West 24]

d. 28 and 42 G.C.F = _____ [Aswan – Kom Ombo 23] L.C.M = _____

e. 11 and 2 G.C.F = _____ L.C.M = _____

f. 8 and 4 G.C.F = _____ [EL Monofia – Ashmoon 24] L.C.M = _____

g. 9 and 12 G.C.F = _____ [Giza – Awseem 23] L.C.M = _____

h. 18 , 30 and 45 G.C.F = _____ L.C.M = _____

3. Two numbers , the prime factors of the first are 3 , 3 and 5 and the prime factors of the second are 2 , 2 , 3 and 5 , then :

a. The first number = _____ **b.** The second number = _____

c. Their G.C.F = _____ **d.** Their L.C.M = _____

4. If $12 = 2 \times 2 \times 3$

, $30 = 2 \quad \times 3 \times 5$

Then G.C.F = _____

L.C.M = _____ [El Monofia - Shiben El Kom 23]

5. Two numbers , one of them is 12 , their GCF is 2 and their LCM is 60. Find the other number.

_____

_____

6. 🕮 Omnia has two strips of cloth. One is 35 centimeters wide , and the other is 75 cm. wide. She wants to cut both pieces into strips of equal width that are as wide as possible. How wide should she cut the strips ? Do you have to find the G.C.F or the L.C.M ?

What is the answer ?

_____

_____

7. 🕮 Omar exercises every 12 days. Rana exercises every 8 days. Both friends exercised together today. How many days will it be until they exercise together again ? Do you have to find the G.C.F or the L.C.M ? What is the answer ?

_____

_____

8. 🕮 Menna is giving her friends pencils and special erasers. The store sells pencils in boxes of 8 and erasers in boxes of 10. If Menna wants the same number of each , what is the minimum number of pencils that she will have to buy ? Do you have to find the G.C.F or the L.C.M ? What is the answer ?

_____

_____

9. 🕮 Nour is making snack bags for an upcoming trip. He has 6 oranges and 12 pieces of dried fruit. He wants the snack bags to be identical without any food left over. What is the greatest number of snack bags Nour can make ? Do you have to find the G.C.F or the L.C.M ? What is the answer ?

10. 🕮 Malak baked 30 servings of cakes and 48 servings of baklava for her family. She wants to divide the desserts into containers so that each person receives the same number of servings. How many containers will she need ? Do you have to find the G.C.F or the L.C.M ? What is the answer ?

11. 🕮 Ola sells baskets of figs that each hold 9. She also sells bags of pomegranates that each hold 7. If she sells the same number of each, what is the smallest quantity of each type of fruit that she sold ? Do you have to find the G.C.F or the L.C.M ? What is the answer ?

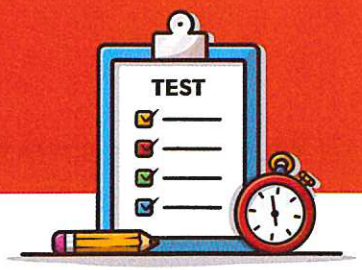
12. Marwa waters one of her plants every 4 days and another plant every 6 days. If she waters both plants today, when is the next time both plants will be watered on the same day ?

13. Sara has 16 red flowers and 24 yellow flowers. She wants to make bouquets with the same number of each color flower in each bouquet. What is the greatest number of bouquets she can make ?

Challenge

14. If the L.C.M of two numbers is 36 and their G.C.F is 3 , what could be these two numbers ?

Unit Two Assessment



1. Choose the correct answer.

1. Which of the following represents an equation ? [Ismailia 24]

   A. 1.3 + 5 **B.** x – 1.3 = 3 **C.** y + 5 **D.** 8 – m

2. If z – 0.6 = 0.4 , then z = _____ [Cairo – El Sayeda Zeinab 24]

   A. 1 **B.** 0.2 **C.** 2 **D.** 0.4

3. The prime factors of the number 18 are _____ [Port Said – East 24]

   A. 1 and 18 **B.** 2 , 3 and 3 **C.** 3 and 6 **D.** 2 and 9

4. The L.C.M of 4 and 6 is _____ [El Monofia – Quesna 24]

   A. 16 **B.** 18 **C.** 12 **D.** 24

5. Which of the following is a multiple of 5 ? [Alexandria – El Gamarek 24]

   A. 98 **B.** 65 **C.** 13 **D.** 93

6. The number 13 has _____ factor[s]. [Ismailia 24]

   A. 3 **B.** 5 **C.** 2 **D.** 1

7. Adel and Hany have 36 L.E. together, Adel only has 20 L.E., then the variable x in the equation x + 20 = 36 represents _____

   A. Adel's money. **B.** Hany's and Adel's money.

   C. Hany's money. **D.** the difference between Adel's and Hany's money.

2. Complete the following.

1. The variable in the equation : a + 3.1 = 7 is _____ [Alexandria – El Gamarek 24]

2. If 9.6 – k = 1.45 , then k = _____ [Giza 24]

3. The number whose prime factors are 2 , 2 , 3 and 5 is _____ [Alexandria – West 24]

4. The common factor of all numbers is _____

   [Kafr El Sheikh – Bayala 24 , El Monofia – El Bagour 24]

5. _____ is the only even prime number. [Cairo – El Nouzha 23]

6. From the following bar model

30.8	
a	19.5

, the value of a = _____ [El Monofia – Tala 23]

7. The prime number its sum of factors 8 is _____ [Ismailia – El Kasaseen 24]

8. The multiples of 4 which lie between 21 and 35 are _____

3. Choose the correct answer.

1. The value of variable x in the equation $x + 3.5 = 8$ is _____ [Cairo – Helwan 24, El Monofia – Shebin El kom 24]

   A. 3.5 **B.** 4.5 **C.** 5.4 **D.** 5.5

2. The smallest prime number in the following is _____ [El Menia 23]

   A. 2 **B.** 3 **C.** 5 **D.** 0

3. All the following are prime except _____ [Kafr El Sheikh 24]

   A. 2 **B.** 3 **C.** 7 **D.** 9

4. The G.C.F of the two numbers 3 and 9 is _____ [Cairo – Al Mokattam 24]

   A. 1 **B.** 2 **C.** 3 **D.** 4

5. The common factor of all numbers added to 999 = _____ [Cairo – El Maadi 24]

   A. 0 **B.** 1 **C.** 999 **D.** 1,000

6. Which of the following equations represent the mathematic operation [6 plus a number equal 11] ? [Cairo – El Salam 23]

   A. $B - 11 = 6$ **B.** $B - 6 = 11$ **C.** $6 + 11 = B$ **D.** $6 + B = 11$

7. Which of the following is an expression ? [Cairo 23]

   A. $2.5 + x = 8$ **B.** $2.5 + 1.4 = 1.6 + 1.3$

   C. Ramy saved 18 L.E. per day **D.** $x + 2.7 - 3.8$

4. Answer the following questions.

1. Find L.C.M and G.C.F for 6 and 15. [Ismailia 23]

2. A school has a case of 144 candy bars and a case of 24 sodas. If these are divided evenly among the students, **what is the greatest number of students will get candy and soda ? How many candy bars and sodas will each student get ?**

3. Find the value of x in the opposite area model.

x	
1.34	2.5

4. A mother has 1.352 kg. of flour. She wants to make a cake for her children. If the cake needs 2 kg. of flour, **how many more flour does she need ?**

THEME ONE

Number Sense and Operations

UNIT 3

Multiplication with Whole Numbers

▸ **Concept 1 :**
Multiplying by a 2-Digit Number

CONCEPT 1

Multiplying by a 2-Digit Number

▶ Lessons 1&2

- Using the Area Model to Multiply
- The Distributive Property of Multiplication

Learning Objectives:

- Students will multiply using the area model.
- Students will explain the relationship between the area model of multiplication and the Distributive Property of Multiplication.

▶ Lessons 3&4

- Multiplying by a 2-Digit Number Using the Algorithm.
- Multiplying Multi-Digit Numbers.

Learning Objectives:

- Students will multiply using the standard algorithm..
- Students will multiply 4-digit numbers by 2-digit numbers using the standard algorithm.
- Students will use estimation to check the reasonableness of their answer.

▶ Lesson 5

Multiplication Problems in the Real World

Learning Objectives:

- Students will solve multistep story problems involving multiplication.

Fast Fact

A baby dolphin is called a calf.

A calf eats **4 times** each hour during the first week of life.

How many times does it eat in a day during this time?

Lessons **1 & 2**

- **Using the Area Model to Multiply**
- **The Distributive Property of Multiplication**

Remember Multiplying by powers of 10

Maged saves 5 pounds per day.

Calculate the total savings after 100 days.

- You can use a basic fact and a pattern to find the product.

	TH	H	T	O
				5
			5	0
		5	0	0
	5	, 0	0	0

$5 \times 1 = 5$

$5 \times 10 = 50$ [Put 1 zero at the end]

$5 \times 100 = 500$ [Put 2 zeroes at the end]

$5 \times 1{,}000 = 5{,}000$ [Put 3 zeroes at the end]

⋮ Notice the pattern of zeroes.

So, Maged saved 500 pounds in 100 days.

Example 1

Fill in the blanks below.

a. $4 \times 100 =$ ☐

b. $20 \times 100 =$ ☐

c. $10{,}000 \times 7 =$ ☐

d. $8 \times 100{,}000 =$ ☐

e. ☐ $\times 13 = 1{,}300$

f. $1{,}000 \times$ ☐ $= 60{,}000$

Solution

a. $4 \times 100 = 400$

b. $20 \times 100 = 2{,}000$

c. $10{,}000 \times 7 = 70{,}000$

d. $8 \times 100{,}000 = 800{,}000$

e. 100

f. 60

Check your understanding

Complete each of the following.

a. $100 \times 6 =$ ☐

b. $80 \times 10 =$ ☐

c. $70 \times 10{,}000 =$ ☐

d. ☐ $\times 100 = 2{,}000$

e. $1{,}000 \times$ ☐ $= 9{,}000$

f. $150 =$ ☐ $\times 15$

Notes for parents :

- Explain that when multiplying by a power of ten the product has the same number of zeroes unless the basic fact has a zero.

Learn 1 Using the area model to multiply

A toys factory produces 193 boxes of toys per day.
There are 24 toys in each box.
Calculate the total number of toys per day.

Multiply : 193 × 24

You can use the area model as follows :

Expand : 193 = 100 + 90 + 3 and **Expand :** 24 = 20 + 4

24	193 → 100	90	3
20	20 × 100 = 2,000	20 × 90 = 1,800	20 × 3 = 60
4	4 × 100 = 400	4 × 90 = 360	4 × 3 = 12

193 × 24 = 2,000 + 1,800 + 60 + 400 + 360 + 12 = 4,632

So, the factory produces 4,632 toys per day.

Add the products :

2,000
+ 1,800
+ 60
+ 400
+ 360
+ 12
4,632

Notice that
When adding the products, order of products does not affect the total answer.

Example 2

Use the area model to solve the following.

a. 409 × 68 **b.** 17 × 54

Solution

a. • 409 = 400 + 9 • 68 = 60 + 8

	400	9
60	60 × 400 = 24,000	60 × 9 = 540
8	8 × 400 = 3,200	8 × 9 = 72

409 × 68 = 24,000 + 540 + 3,200 + 72 = 27,812

b. • 17 = 10 + 7 • 54 = 50 + 4

	10	7
50	50 × 10 = 500	50 × 7 = 350
4	4 × 10 = 40	4 × 7 = 28

17 × 54 = 500 + 350 + 40 + 28 = 918

Check your understanding

Solve each of the following problems using an area model.

a. 618 × 43

b. 82 × 306

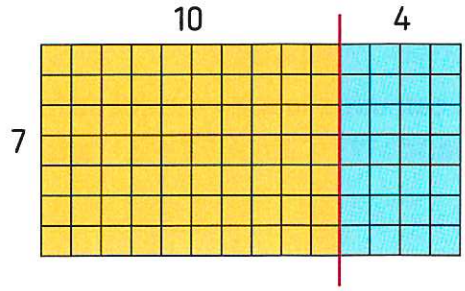
- While there are many ways to decompose a number, numbers should be decomposed using place value when using an area model for multiplication. For example, it is possible to decompose 23 in many different ways, including 17 and 6 , 10 and 13, or 14 and 9. However, 23 should be decomposed into 20 and 3 when using an area model for multiplication.

Learn 2 The Distributive Property of Multiplication

The Distributive Property states that multiplying a sum by a number is the same as multiplying each addend by that number and adding the products.

For Example :

To find 7 × 14 using the Distributive Property.



- Break apart 14 into [10 + 4].

$7 \times [10 + 4] = [7 \times 10] + [7 \times 4]$

$= 70 + 28 = 98$

- By using the area model.

	10	4
7	7 × 10 = 70	7 × 4 = 28

$$\begin{array}{r} 70 \\ +\ 28 \\ \hline 98 \end{array}$$

7 × 14 = 98

Notice that

14 can be broken apart in many ways such as : [7 + 7] , [6 + 8] , [5 + 9].....

Example 3

Use the Distributive Property to find the following products.Try to find another way to break apart. Represent the problems using an area model.

a. 46 × 27 **b.** 18 × 304

Solution

a. • Break apart 46 into 40 + 6

• Break apart 27 into 20 + 7

	20	7
40	40 × 20 = 800	40 × 7 = 280
6	6 × 20 = 120	6 × 7 = 42

$[40 + 6] \times [20 + 7] = [40 \times 20] + [40 \times 7] + [6 \times 20] + [6 \times 7]$

$= 800 + 280 + 120 + 42$

$= 1{,}242$

b. • Break apart 18 into 10 + 8

• Break apart 304 into 300 + 4

	300	4
10	10 × 300 = 3,000	10 × 4 = 40
8	8 × 300 = 2,400	8 × 4 = 32

$[10 + 8] \times [300 + 4] = [10 \times 300] + [10 \times 4] + [8 \times 300] + [8 \times 4]$

$= 3{,}000 + 40 + 2{,}400 + 32$

$= 5{,}472$

Notes for parents :

- Your child may incorrectly decompose that factors according to their digits rather than according to the values of their digits. He/She may decompose 14 as 1 and 4 rather than 10 and 4.

Example 4

Use the following area models to write the distribution equations.

a.

	20	7
9	180	63

b.

	40	8
70	2,800	560
3	120	24

c.

	100	2
50	5,000	100
3	300	6

d.

	600	30	1
30	18,000	900	30
4	2,400	120	4

Solution

a. $9 \times 27 = [9 \times 20] + [9 \times 7] = 180 + 63 = 243$

b. $73 \times 48 = [70 \times 40] + [70 \times 8] + [3 \times 40] + [3 \times 8]$

$= 2{,}800 + 560 + 120 + 24 = 3{,}504$

c. $53 \times 102 = [50 \times 100] + [50 \times 2] + [3 \times 100] + [3 \times 2]$

$= 5{,}000 + 100 + 300 + 6 = 5{,}406$

d. $34 \times 631 = [30 \times 600] + [30 \times 30] + [30 \times 1] + [4 \times 600] + [4 \times 30] + [4 \times 1]$

$= 18{,}000 + 900 + 30 + 2{,}400 + 120 + 4 = 21{,}454$

Example 5

Use the Distributive Property to solve 23×154.

Solution

$23 \times 154 = [20 + 3] \times [100 + 50 + 4]$

$= [20 \times 100] + [20 \times 50] + [20 \times 4] + [3 \times 100] + [3 \times 50] + [3 \times 4]$

$= 2{,}000 + 1{,}000 + 80 + 300 + 150 + 12$

$= 3{,}542$

- Your child get confused with how many zeroes to place at the end of a product. For example, your child may write $7 \times 2{,}000 = 1{,}400$ instead of $7 \times 2{,}000 = 14{,}000$. Your child may also write $5 \times 200 = 100$ instead of $5 \times 200 = 1{,}000$

Example 6

Find more ways to find the product of 32 × 48 using the Distributive Property and area model.

Solution

Know that : All the ways show the same product.

• **First way :** • Break apart 32 into 30 + 2
• Break apart 48 into 40 + 8

[30 + 2] × [40 + 8]
= [30 × 40] + [30 × 8] + [2 × 40] + [2 × 8]
= 1,200 + 240 + 80 + 16 = 1,536

	40	8
30	30 × 40 = 1,200	30 × 8 = 240
2	2 × 40 = 80	2 × 8 = 16

• **Second way :** • Break apart 32 into 20 + 10 + 2
• Break apart 48 into 40 + 8

[20 + 10 + 2] × [40 + 8]
= [20 × 40] + [20 × 8] + [10 × 40]
+ [10 × 8] + [2 × 40] + [2 × 8]
= 800 + 160 + 400 + 80 + 80 + 16 = 1,536

	40	8
20	20 × 40 = 800	20 × 8 = 160
10	10 × 40 = 400	10 × 8 = 80
2	2 × 40 = 80	2 × 8 = 16

• **Third way :** • Break apart 32 into 30 + 2
• Break apart 48 into 20 + 20 + 8

[30 + 2] × [20 + 20 + 8]
= [30 × 20] + [30 × 20] + [30 × 8]
+ [2 × 20] + [2 × 20] + [2 × 8]
= 600 + 600 + 240 + 40 + 40 + 16 = 1,536

	20	20	8
30	30 × 20 = 600	30 × 20 = 600	30 × 8 = 240
2	2 × 20 = 40	2 × 20 = 40	2 × 8 = 16

• **Try to find another ways as :** • Break apart 32 into 10 + 11 + 11
• Break apart 48 into 20 + 20 + 8

Check your understanding

Use the Distributive Property to find each of the following products.

a. 26 × 42

b. 34 × 629

Notes for parents :

• Ask your child to find more ways to find the product of 32 × 48.

Exercise 13
on lessons 1&2

▸ Using the Area Model to Multiply
▸ The Distributive Property of Multiplication

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Complete.

a. 5 × 1,000 = _____

b. 4 × 10 = _____

c. 6 × 100 = _____

d. 1,000 × 7 = _____

e. 2 × _____ = 2,000

f. 3 × _____ = 3,000 [Giza - Abo El Nomrous 24]

g. 1,000 × _____ = 8,000

h. 10,000 × _____ = 80,000 [Assiut 24]

i. _____ × 9 = 900,000

j. 80 × _____ = 8,000 [Alex. - Agmi 24]

k. If a × 6 = 600, then a = _____ [Cairo - El Mostabal 24]

2. Writing Expressions. Write an expression to complete each equation using powers of ten for each given number.

a. 3,000 = _____ × _____

b. 800 = _____ × _____

c. 400,000 = _____ × _____

d. 70,000 = _____ × _____

e. 50 = _____ × _____

3. Multiplying Tens. How many times will 10 need to be multiplied by itself to equal each given number?

a. 100

b. 1,000

c. 10,000

d. 100,000

4. Complete each of the following area models.

a.

	30	8
10		
6		

b.

	50	4
20		
3		

c.

	100	70	5
80			
2			

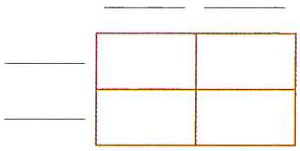
d.

	20	6
30	600	
4		24

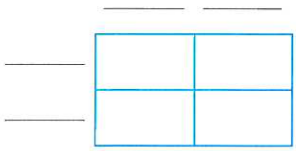
[Alexandria - El Gamarek 24]

5. **Expanding Equations.** **Create an area model for each of the following problems and find each product.**

a. $21 \times 64 =$ _____ [Cairo - New 24]



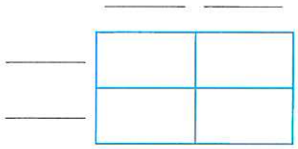
b. $103 \times 72 =$ _____



c. 📖 $374 \times 62 =$ _____

	70	
2	140	8

d. 📖 $506 \times 42 =$ _____



6. **Solve each of the following problems using an area model.**

a. $32 \times 12 =$ _____ [Qena 24]

b. $42 \times 51 =$ _____ [Kafr El Sheikh - Baiyla 24]

c. $7 \times 483 =$ _____

d. $8 \times 107 =$ _____

e. $732 \times 16 =$ _____

f. $460 \times 21 =$ _____

g. 📖 $572 \times 98 =$ _____

h. 📖 $201 \times 32 =$ _____

i. 📖 $659 \times 42 =$ _____

7. **Use the Distributive Property of Multiplication and area model to find the product of each of the following.**

a. $14 \times 27 =$ _____

$[10 \times 20] + [10 \times \_\_] + [\_\_ \times 20] + [4 \times \_\_] =$ _____

	20	7
10	200	70
4	80	28

b. 📖 $58 \times 42 =$ _____

$[40 \times \_\_] + [40 \times 8] + [\_\_ \times 50] + [2 \times \_\_] =$ _____

	50	8
40	2,000	320
2	100	16

c. $19 \times 62 =$ _____

$[10 \times \_\_] + [\_\_ \times 2] + [\_\_ \times 60] + [9 \times \_\_] =$ _____

	60	2
10	600	20
9	540	18

d. [20 × 30] + [— × —] + [— × —] + [4 × 7] = _____

	30	7
20	600	140
4	120	28

e.

	40	7
30	1,200	210
9	360	63

f.

	60	3
20	1,200	60
9	540	27

8. Complete the area model and evaluate.

a. [50 × 30] + [50 × 4] + [7 × 30] + [7 × 4] = _____

	30	4
50	_____	200
_____	210	_____

b. [40 × 40] + [40 × 8] + [9 × 40] + [9 × 8] = _____

	40	_____
_____	1,600	_____
9	_____	72

9. Decompose with Area Model. Eman is planting a garden. She wants to find the area of the garden to know how much topsoil she will need. The garden is 46 meters long and 24 meters wide. **How many different ways can you decompose the numbers to help her find the area ?**

46 × 24 = _____

	20	20	6
20			
4			

10. 🕮 **Flexible Numbers Solve.**

a. Here are three ways students thought to find the product : 14 × 83 . Record their work in an area model and evaluate. Remember the addends on each side must equal 83 and 14 respectively.

Mazen : [40 × 10] + [40 × 10] + [40 × 4] + [40 × 4] + [3 × 10] + [3 × 4]

	40	40	3
10			
4			

Lamiaa : [80 × 7] + [80 × 7] + [3 × 7] + [3 × 7]

	80	3
7		
7		

Reeda : [80 × 10] + [80 × 4] + [3 × 10] + [3 × 4]

	80	3
10		
4		

b. Here are three ways students thought to find the product : 33 × 26 using an area model. Write an expression for each model.

, then choose one of the area models to evaluate the expression.

	30	3
20		
6		

	20	10	3
20			
6			

	11	11	11
10			
10			
6			

c. Create an area model and evaluate : 42 × 34 = _____

11. **Use the Distributive Property to solve each problem.**

a. $7 \times 45 =$ _____ **b.** $2 \times 98 =$ _____ **c.** $13 \times 66 =$ _____

d. $24 \times 107 =$ _____ **e.** $48 \times 215 =$ _____ **f.** $6 \times 2{,}031 =$ _____

12. Ali walks 6 kilometers each day. If he walked 187 days a year **, how many kilometers would he walk ?** [Kafr El Sheikh - Baiyla 24]

13. What if Ali were to drive 60 kilometers each day ?
How many kilometers would he drive in 187 days ?

14. Ramy saved 225 pounds and Alaa saved 15 times as Ramy.
How much money did Alaa save ? [Alexandria - Agmi 24]

15. Sara bought 36 boxes of juice for 125 L.E. each.
How much money did Sara pay in all ?

16. Eslam ordered 387 books for his library. Each book costs 46 L.E.
How much money did Eslam pay in all ?

17. **Complete.**

a. $9 \times 27 = [9 \times \_\_\_\_] + [9 \times 7]$ [Cairo 24 , Port Said - North 24]

b. $14 \times 27 = [10 \times 20] + [10 \times 7] + [4 \times 20] + [4 \times \_\_\_\_]$ [Cairo - El Mokattam 24]

c. $234 \times 57 = [200 \times 50] + [200 \times 7] + [30 \times 50] + [30 \times \_\_\_\_] + [4 \times 50] + [4 \times 7]$ [Cairo 23]

d. $15 \times 46 = [10 \times \_\_\_\_] + [10 \times 6] + [5 \times 40] + [\_\_\_\_ \times 6]$

e. $328 \times 67 = [300 + \_\_\_\_ + 8] \times [30 + \_\_\_\_ + 7]$

f. $38 \times 14 = [30 \times \_\_\_\_] + [30 \times 7] + [8 \times \_\_\_\_] + [8 \times \_\_\_\_]$

g. $[25 \times 4] + [25 \times 6] = 25 \times \_\_\_\_$ [Cairo - Helwan 24]

h. $[70 \times 30] + [70 \times 5] + [4 \times 30] + [4 \times 5] = \_\_\_\_ \times \_\_\_\_$ [Kafr El Sheikh - Baiyla 24]

i. $\_\_\_\_ \times 35 = [30 \times 400] + [30 \times 70] + [30 \times 8] + [\_\_\_\_ \times 400] + [\_\_\_\_ \times 70] + [\_\_\_\_ \times 8]$

---

18. 📖 **Error Analysis :** Read the problem and complete the error analysis.

Badir thinks $206 \times 45 = 11{,}700$. Identify what Badir did correctly and incorrectly and then solve the problem.

	200	60	0
40	8,000	2,400	0
5	1,000	300	0

$$\begin{array}{r} 8,000 \\ +\ 1,000 \\ +\ 2,400 \\ +\ \ 300 \\ \hline 11,700 \end{array}$$

1. What did the student do correctly ?
2. What did the student do incorrectly ? Why do you think he made this error ?
3. Try to solve the problem correctly. Explain your thinking.

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19. 📖 **Math around Egypt : The Fennec Fox**

Use a model to solve the problem.

When a Fennec fox builds a den, it can have up to 15 different entrances.

How many entrances could 32 dens have ?

Fennec Fox

---

20. 📖 **Math around Egypt :**

Omar owns a travel company that takes visitors throughout the mountains of the Eastern Desert which is a mountain range that runs parallel to the Red Sea coast.

He has 12 buses. Each bus can hold 25 passengers.

How many passengers can Omar take each day if every bus is full ?

Multiple Choice Questions

Choose the correct answer.

1. The product of 63×100 is ———— [Aswan 24]

A. 6,300 B. 360
C. 630 D. 3,600

2. $7 \times$ ———— $= 70{,}000$ [El Beheira - Kafr El Dawar 24, El Menia - Samalout 24]

A. 1,000 B. 100
C. 10 D. 10,000

3. The missing number in the following area model is ———— [Port Said - Port Fouad 24]

	60	3
20	1,200	————
9	540	27

A. 60 B. 12
C. 27 D. 3

4. What is the unknown value in the area model? [El Beheira - Rasheed 24]

	400	70	5
30	?	2,100	150
5	2,000	350	25

A. 430 B. 120
C. 12,000 D. 1,200

5. $[100 + 70 + 5] \times [20 + 8] =$ ———— [Giza - 6th October 24]

A. 127×28 B. 175×28
C. 158×75 D. 157×82

6. $[3 \times 61] + [5 \times 61] =$ ———— $\times 61$ [El Menia - Deir Mawas 23]

A. 53 B. 35
C. 8 D. 6

7. $[40 \times 23] + [2 \times 23] =$ ———— $\times 23$ [Cairo - El Sherouk 23]

A. 24 B. 42
C. 8 D. 6

8. $[11 \times 3] + [11 \times 20] + [11 \times 100] = 11 \times$ ———— [Ismailia 23]

A. 123 B. 321
C. 213 D. 210

9. $4 \times 345 = [4 \times 300] + [4 \times 40] +$ ———— [Giza - El Omrania 24]

A. 4×5 B. 4×50
C. 4×500 D. 40×50

10. $[90 \times 50] + [90 \times 8] + [3 \times 50] + [3 \times 8]$ = ———— $\times$ ———— [Alexandria - Montaza 24]

A. 5×9 B. 93×58
C. 30×80 D. 8×9

11. A group of 40 people want to travel by bus each bus ticket costs 200 L.E. How much do they need to pay in all? [Giza - Haram 24]

A. 8,00 B. ,80 C. 5 D. 8,000

12. $24 \times 136 =$ ————

A. $[20 \times 100] + [20 \times 3] + [20 \times 6] + [4 \times 100] + [4 \times 30] + [4 \times 6]$

B. $[20 \times 100] + [20 \times 30] + [20 \times 6] + [4 \times 100] + [4 \times 30] + [4 \times 6]$

C. $[4 \times 1] + [4 \times 3] + [4 \times 6] + [2 \times 1] + [2 \times 3] + [2 \times 6]$

D. $[2 \times 100] + [2 \times 30] + [2 \times 6] + [4 \times 100] + [4 \times 30] + [4 \times 6]$

Lessons 3 & 4

- Multiplying by a 2-Digit Number Using the Algorithm
- Multiplying Multi-Digit Numbers

Learn 1 Multiplying numbers using the algorithm

An animator creates 24 pictures for each second of an animated cartoon.

How many pictures are drawn to make a cartoon that is 45 seconds long ?

Multiply : 24 × 45

Step 1

Multiply by ones.

$$\begin{array}{r} {\scriptstyle ②}\\ 24\\ \times\ 45\\ \hline 120 \end{array} \longleftarrow 5 \times 24$$

Step 2

Multiply by tens.

$$\begin{array}{r} {\scriptstyle ①}\\ {\scriptstyle ②}\\ 24\\ \times\ 45\\ \hline 120\\ 960 \end{array} \longleftarrow 40 \times 24$$

Step 3

Add the products.

$$\begin{array}{r} {\scriptstyle ①}\\ {\scriptstyle ②}\\ 24\\ \times\ 45\\ \hline 120\\ +\ 960\\ \hline 1,080 \end{array}$$

So, the animator creates 1,080 pictures to make a 45-second cartoon.

How to multiply 4-digit number by 2-digit number ?

Multiply : 1,625 × 24

Step 1

Multiply by ones.

$$\begin{array}{r} {\scriptstyle ②①②}\\ 1,625\\ \times\ 24\\ \hline 6,500 \end{array} \longleftarrow [4 \times 1,625]$$

Step 2

Multiply by tens.

$$\begin{array}{r} {\scriptstyle ①\ \ ①}\\ {\scriptstyle ②①②}\\ 1,625\\ \times\ 24\\ \hline 6,500\\ 32,500 \end{array} \longleftarrow [20 \times 1,625]$$

Step 3

Add the products.

$$\begin{array}{r} 1,625\\ \times\ 24\\ \hline {\scriptstyle ①}\\ 6,500\\ +\ 32,500\\ \hline 39,000 \end{array}$$

Notes for parents :

- Your child sometimes has difficulty demonstrating proper regrouping when using the standard algorithm for multiplication. He/She may omit writing the digit above the correct place or he/she may attempt to place two digits at a time in the product.

Example 1

Use standard algorithm strategy to find the result.

a. 26×17 | b. 429×25 | c. $1{,}342 \times 34$

Solution

a.
$$\begin{array}{r} {\scriptstyle (4)}\ 2\ 6 \\ \times\quad 1\ 7 \\ \hline 1\ 8\ 2 \\ +\ 2\ 6\ 0 \\ \hline 4\ 4\ 2 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle (1)\ (4)}\ 4\ 2\ 9 \\ \times\quad 2\ 5 \\ \hline 2,\ 1\ 4\ 5 \\ +\ 8,\ 5\ 8\ 0 \\ \hline 10,\ 7\ 2\ 5 \end{array}$$

c.
$$\begin{array}{r} {\scriptstyle (1)\ (1)}\ 1,\ 3\ 4\ 2 \\ \times\quad 3\ 4 \\ \hline 5,\ 3\ 6\ 8 \\ +\ 40,\ 2\ 6\ 0 \\ \hline 45,\ 6\ 2\ 8 \end{array}$$

Check your understanding

Use standard algorithm strategy to find the result.

a. 35×862

b. $74 \times 5{,}641$

c. $2{,}504 \times 16$

The relation between area model, and standard algorithm for multiplication :

For Example : **Multiply :** 23×41

The two strategies give the same result but standard algorithm is the most efficient.

Area model

	40	1
20	800	20
3	120	3

$20 + 3 = 23$

$800 + 120 = 920$

Standard Algorithm

$$\begin{array}{r} {\scriptstyle (1)}\ 2\ 3 \\ \times\quad 4\ 1 \\ \hline 2\ 3 \\ +\ 9\ 2\ 0 \\ \hline 9\ 4\ 3 \end{array}$$

Check your understanding

Find in the area model from the standard algorithm.

	___	4
30	___	___
___	___	___

$$\begin{array}{r} 5\ 4 \\ \times\quad 3\ 6 \\ \hline 3\ 2\ 4 \\ +\ 1,\ 6\ 2\ 0 \\ \hline 1,\ 9\ 4\ 4 \end{array}$$

• Ask your child to multiply any number by a two-digit number.

Learn 2 Estimating products

You will learn how to use rounding to estimate product.

Example

A merchant has 127 boxes of pens. Each box holds 36 pens.

About how many pens does the merchant have ?

Solution

Round to greatest place value

$$\begin{array}{rcr} 127 & \rightarrow & 100 \\ \times\ 36 & \rightarrow & \times\ 40 \\ \hline & & 4,000 \end{array}$$

The actual product

[using standard multiplication strategy]

$$\begin{array}{r} {\scriptstyle ②\ \ \ } \\ {\scriptstyle ⑦②\ \ } \\ 127 \\ \times\ \ 36 \\ \hline 762 \\ +\ 3,810 \\ \hline 4,572 \end{array}$$

Since 4,572 is close to 4,000 the answer is reasonable.

Check your understanding

Solve the following. First by estimate by round to the greatest place value, second use standard algorithm to find the actual product.

a. 872×23

Estimate : _____

Actual product : _____

b. $3,254 \times 49$

Estimate : _____

Actual product : _____

Notes for parents :

- Remind your child that although he/she has been learning different strategies for multiplication, mathematicians work towards being efficient in their calculations. It might take a long time to draw an area model to solve a problem, so they may choose to use an algorithm like partial products or the standard algorithm.

Exercise 14

on lessons 3&4

- Multiplying by a 2-Digit Number Using the Algorithm
- Multiplying Multi-Digit Numbers

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Find the result using standard algorithm.

a. 26×33

b. 48×32

[Qena - Neqada 24]

c. 367×29

d. 218×13

[Giza - 6th October 24]

2. Fill in the area model. Then, explain which parts of the area model and the standard algorithm match.

	70	6
20		
4		

$$\begin{array}{r} {\scriptstyle 1}\\ 76\\ \times\ 24\\ \hline 304\\ +1,520\\ \hline 1,824 \end{array}$$

3. Determine the values of the missing digits and then find the final product.

a.

$$\begin{array}{r} {\scriptstyle 4}\\ 67\\ \times\ 76\\ \hline 402\\ +\square 69\square\\ \hline \square \end{array}$$

[Assiut 24]

b.

$$\begin{array}{r} {\scriptstyle 6}\\ 49\\ \times\ 78\\ \hline 3\square 2\\ +3\square 30\\ \hline \square \end{array}$$

c.

$$\begin{array}{r} {\scriptstyle 1\ \ 1}\\ 563\\ \times\ 24\\ \hline 225\square\\ +1\square2\square0\\ \hline \square \end{array}$$

4. Find the result.

a. 7×134 [Cairo - Hadaek El Quba 24]

b. $3 \times 5{,}672$

c. $6 \times 3{,}407$

d. 76×82

e. 203×45 [Cairo - Ain Shams 24]

f. 234×53

g. 867×64

h. $13 \times 1{,}025$

i. $47 \times 8{,}640$

j. $51 \times 9{,}037$

k. $70 \times 8{,}617$

l. $2{,}987 \times 66$

5. Sara has 143 cards, each card has 8 stickers.

Find the total number of stickers with Sara. [El Monofia - Tala 24]

6. Radwa bought 35 meters of cloth , if the price of one meter is 131 pounds.

What is the total which Radwa paid ?

[El Beheira - Kafr El Dawar 24]

7. A group of 48 people want to travel by bus. Each bus ticket costs 175 L.E.

How much do they need to pay in all ? [Giza 23]

8. **Solve the following. First by estimate by round to the greatest place value, second use standard algorithm to find the actual product.**

a. Estimate

888 → ____

× 29 → × ____

b. Estimate

721 → ____

× 74 → × ____

c. Estimate

4,625 → ____

× 18 → × ____

9. **Estimate the product.**

a. 416 × 72

b. 871 × 27

c. 586 × 69

d. 490 × 71

e. 817 × 34

f. 999 × 94

10. Akram says that 34 × 69 will give you the same product as (34 × 70) – 34

Do you agree or disagree ? Why ?

Multiple Choice Questions

Choose the correct answer.

1. $20 \times 50 =$ _____ [El Beheira - Rasheed 24]

A. 100 B. 1,000 C. 2,500 D. 25

2. If $54 \times a = 18 \times 54$, then $a =$ _____ [Cairo - El Mostabal 24]

A. 972 B. 54 C. 18 D. 3

3. $19 \times 41 =$ _____ [El Monofia - Quesna 24]

A. 410 B. 977 C. 779 D. 974

4. $456 \times 21 =$ _____ [El Menia - Mallawi 24]

A. 3,437 B. 4,764 C. 1,386 D. 9,576

5. $160 \times 15 =$ _____ [Ismailia 24]

A. 24 Tens. B. 24 Hundreds.

C. 24 Thousands. D. 24 Hundredths.

6. $50 \times 120 =$ _____ Hundreds. [Cairo - El Basateen and El Salam 24]

A. 6 B. 60 C. 6,000 D. 600

7. What is the Ones digit of the product of 456×24 will be without solving whole problem ? [Giza - Awseem 24]

A. 3 B. 4 C. 5 D. 6

8. The estimation of 204×18 by rounding to the nearest Ten is _____

A. 210×10 B. 200×20 C. 200×10 D. 200×15

9. Estimate the product of 971×23 is _____ [Qena 24, Souhag - Gerga 24 - Cairo - Zaiton 23]

A. 20,000 B. 8,000 C. 2,000 D. 20

10. The missing number in the product is _____

A. 2,882

B. 10,122

C. 2,892

D. 2,880

$$\begin{array}{r} 723 \\ \times \quad 14 \\ \hline \\ \hline + 7,230 \\ \hline 10,122 \end{array}$$

Lesson 5

▸ Multiplication Problems in the Real World

Learn How to solve multistep problems ?

Some problems require more than one step.
To solve them, write out the steps you will use.

For Example :

Sayed sells pins and scarves.
He earned 6,000 pounds in just 4 months.
If he sold 80 pins for 15 pounds each,
how much did he earn from selling scarves ?

Read to understand

- What question do you need to answer ?

  How much did he earn from selling scarves ?

- What information do you have?

  the total amount he earned : 6,000 pounds, the number of pins sold : 80 pins : the amount paid for each pin : 15 pounds per pin.

Plan

- How can you find the amount he earned selling scarves ?

  Find the amount he earned selling pins. Then subtract that from 6,000 pounds

Solve

- **Step 1 :** *Find the amount he earned selling pins :*

  $80 \times 15 = 1{,}200$ pounds

- **Step 2 :** *Find the amount he earned selling scarves :*

  $6{,}000 - 1{,}200 = 4{,}800$ pounds

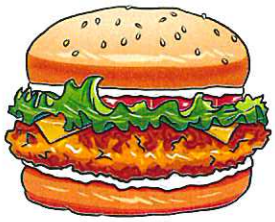
Sayed earned 4,800 pounds selling scarves.

Notes for parents :

- Remind your child that multistep problem is a problem that involves more than one operation.

Example 1

Ahmed has a restaurant in Cairo in Monday he sold 213 sandwish of chicken. in Tuesday he sold 225 sandwish of chicken. He makes each sandwish of chicken with 75 grams of chicken. How many grams of chicken did he use in Monday and Tuesday ?

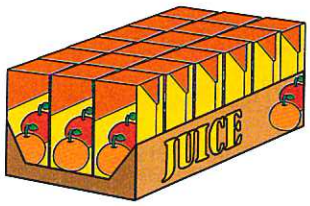


Solution

- The number of grams that sold in Monday = 213 × 75 = 15,975 grams.
- The number of grams that sold in Tuesday = 225 × 75 = 16,875 grams.
- The number of grams that sold in Monday and Tuesday = 15,975 + 16,875 = 32,850 grams.

Example 2

A merchant bought 137 boxes of soft drinks for 97 pounds each and 17 boxes of cookies for 45 pounds each.How much money did he pay ?



Solution

- The price of soft drinks = 137 × 97 = 13,289 pounds.
- The price of cookies = 17 × 45 = 765 pounds.
- The total price = 13,289 + 765 = 14,054 pounds.

Check your understanding

A pair of trousers costs 125 pounds, a shirt costs 140 pounds and a pair of shoes costs 135 pounds. Ahmed wants to buy 3 pairs of trousers, 2 shirts and a pair of shoes.

How much is the total cost ?

- Some word problems have hidden question or questions that must be answered before you can solve the problem. You have to determine what operation to use and what strategies will you use to help you figure out how to solve the problem.

Exercise 15
on lesson 5

▸ Multiplication Problems in the Real World

● REMEMBER ● UNDERSTAND ● APPLY PROBLEM SOLVING | 📖 From the school book

1. Sandwiches at the dinner are 24 pounds, a salad costs 3 pounds and a glass of juice is 8 pounds. A Family went to the diner and order 3 sandwiches, 2 salads and 3 glasses of juice.

a. How much will the family pay for the 3 sandwiches ? _____

b. How much will the family pay for the 2 salads ? _____

c. How much will the family pay for the 3 glasses of juice ? _____

d. How much is the total bill ? _____

---

2. Shirts in the seasons costs 185 pounds. Sweaters cost 270 pounds. Yara and her friends bought 12 shirts and 13 sweaters.

a. How much will they pay for the shirts ? _____

b. How much will they pay for the sweaters ? _____

c. How much is their bill ? _____

---

3. 📖 Mona has a restaurant in Al-Quesyr. It is a tourist city located on the coast of the Red Sea. In February, Mona sold 402 kebabs. In March, she sold 753 kebabs. She makes each kebab with 83 grams of meat. **How many grams of meat did she use in February and March ?**

---

4. 📖 Wael makes baklava. It needs 170 grams each of pistachios, walnuts, and hazelnuts. In order to make enough for restaurant customers, he needs to multiply his recipe by 18.

How many total grams of nuts will he need ?

5. A factory can produce 500 pairs of pants during a 10-hr. per day. If the factory produces 55 pairs per hour for the first 8 hr.
How many are left to produce during the rest of the day ?
How many pairs of pants can produce during 30 days ?

6. Petra saved 123 pounds, Logy saved 12 times as Petra, Mariam saved 15 times as Petra.
How much money they saved ?

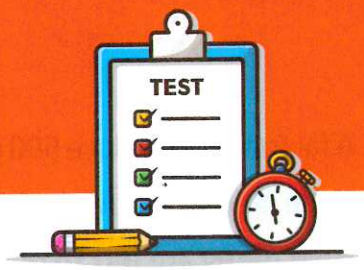
7. 📖 For Wael's baklava syrup, he needs 250 mL of honey, 15 mL of orange extract, and 30 mL of lemon juice per recipe.
How many total milliliters of liquid ingredients will he need for the sauce if he needs to make 18 batches ?

8. 📖 Mona uses 140 grams of sesame seeds to make 120 milliliters of tahini. She makes the recipe 20 times each week.
How many grams of sesame seeds does she use each week ?
How many milliliters of tahini does she make in 36 weeks ?

9. A factory produces 6,580 toys each month. Another factory produces 7,375 toys each month. **Find the difference of their product in one year.**

10. 📖 Mona uses 6 lemons for each liter of lemonade. She makes 8 liters of lemonade a day. After 365 days,
how many lemons has she used ?
How many liters of lemonade does she make in 365 days ?
Mona uses 1,133 grams of sugar daily.
How many grams does she use in 30 weeks ?

Unit Three Assessment



1. Choose the correct answer.

1. Estimate the product of 971 × 23 is _____ [Cairo – El Zaiton 23]

   A. 20,000 B. 8,000 C. 2,000 D. 20

2. 83 × 14 = _____ [Port Said 24]

   A. 1,126 B. 97 C. 83.14 D. 1,162

3. A merchant bought 136 boxes of juice for 25 L.E. each. How much money did he pay ?

   A. 3,400 L.E. B. 3,170 L.E. C. 3,200 L.E. D. 3,236 L.E.

4. 25 × 43 = [20 × 40] + [20 × 3] + [5 × 40] + [5 × _____] [Assiut 24]

   A. 40 B. 30 C. 20 D. 3

5. 160 × 15 = _____ [Ismailia 24]

   A. 24 Thousands. B. 24 Hundreds. C. 24 Tens. D. 24 Hundredths.

6. What is the unknown value in the area model of 47 × 23 ? [Alexandria - Montaza 24]

   A. 12 B. 120

   C. 1,200 D. 1.2

	40	7
20	800	140
3	?	21

7. 327 × 53 ◯ 199 × 43

   A. > B. < C. =

2. Complete the following.

1.
$$\begin{array}{r} 7,585 \\ \times \quad 73 \\ \hline 22,755 \\ \hline \\ \hline \end{array}$$

2. 130 × 30 = _____ [Giza – Awseem 23]

3. 40 × _____ = 40,000 [Alexandria - Agmi 24]

4. The product of 899 × 11 is closer to the product of _____ × _____ [Souhag 23]

5. Sara bought 36 books for 100 L.E. each. She paid = _____ L.E.

6. 4,231 × 3 = _____ [Giza – Awssem 23]

7. The Ones digit of the product of 2,786 × 84 will be _____

8. 78 × _____ = [3 × 8] + [20 × 8] + [3 × 70] + [20 × 70] [Giza – Abo El Nomrus 23]

3. Choose the correct answer.

1. The product of 193 × 19 near close to _____ [El Monofia - Menof 24, Sers El Lian 24]
   A. 4,000 B. 40 C. 400 D. 40,000
2. A pair of shoes costs 400 L.E., which is 4 times as much as a shirt costs , then the shirt costs = _____ L.E. [Aswan – Kom Ombo 23]
   A. 500 B. 396 C. 300 D. 100
3. The multiplication problem which expresses the opposite area model is _____

	60	5
40	2,400	200
3	180	15

   A. 46 × 35 B. 56 × 34
   C. 65 × 43 D. 43 × 605
4. 24 × 15 = _____ Tens
   A. 360 B. 36 C. 3.6 D. 3,600
5. 74 × _____ = [74 × 5] + [74 × 3] [Ismailia 24, Cairo – El Marg 23]
   A. 8 B. 15 C. 47 D. 74
6. _____ × 9 = 9,000 [El Menia - Mallawi 24, Souhag - Tama 24]
   A. 10 B. 100 C. 1,000 D. 10,000
7. 3 Hundreds × 7 Hundreds = _____ Hundreds.
   A. 210,000 B. 2,100 C. 21,000 D. 21

4. Answer the following questions.

1. Ahmed has 300 pounds to spend on new clothes. If he bought 12 pairs of socks for 18 pounds a pair.
   How much money will he have left to spend ?
   [Ismailia 24, Cairo – El Khalifa and El Mokattam 23]

2. Youssef walk every day 5 km, if he walk 154 days in the year.
   How many kilometers did he walk ? [El Kalyoubia 23]

3. Amir bought 4 books for 20 pounds each and bought 6 pens for 6 pounds each.
   How much money he will pay ? [El Menia - Bani Mazar 24]

4. Fill in the area model. Then explain which parts of the area model and the standard algorithm match.

	80	5
60	____	____
3	____	____

3

$$\begin{array}{r} 85 \\ \times\ 63 \\ \hline 255 \\ +\ 5,100 \\ \hline 5,355 \end{array}$$

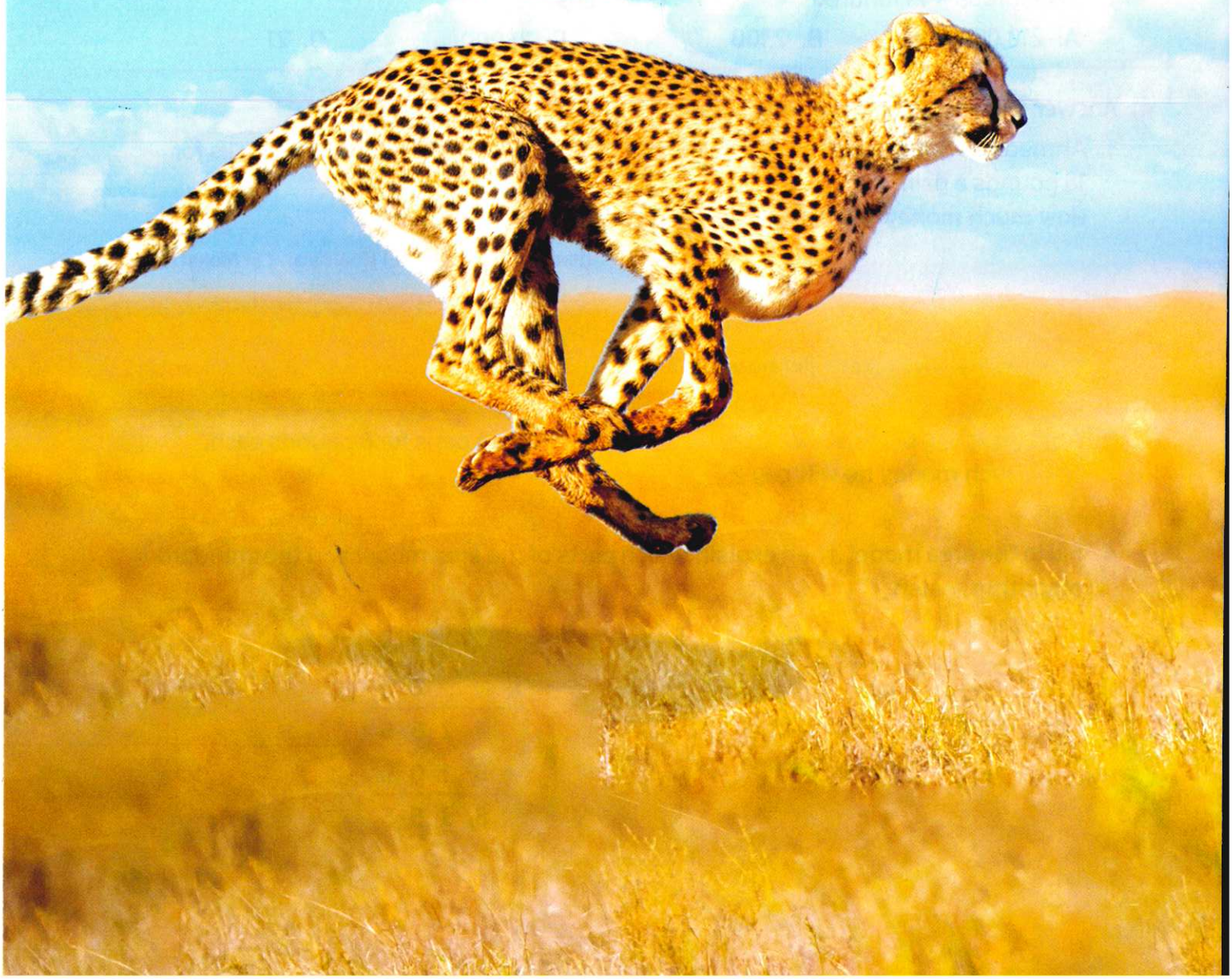
THEME TWO

Mathematical Operations and Algebraic Thinking

UNIT 4

Division with Whole Numbers

- **Concept 1 :** Models for Division
- **Concept 2 :** Dividing by 2-Digit Divisors



CONCEPT 1

Models for Division

▶ Lessons 1&2

- Dividing by a Two-Digit Number
- Estimating Quotients

Learning Objectives :

- Students will use the area model to solve division problems.
- Students will use estimations to check the reasonableness of their answers.

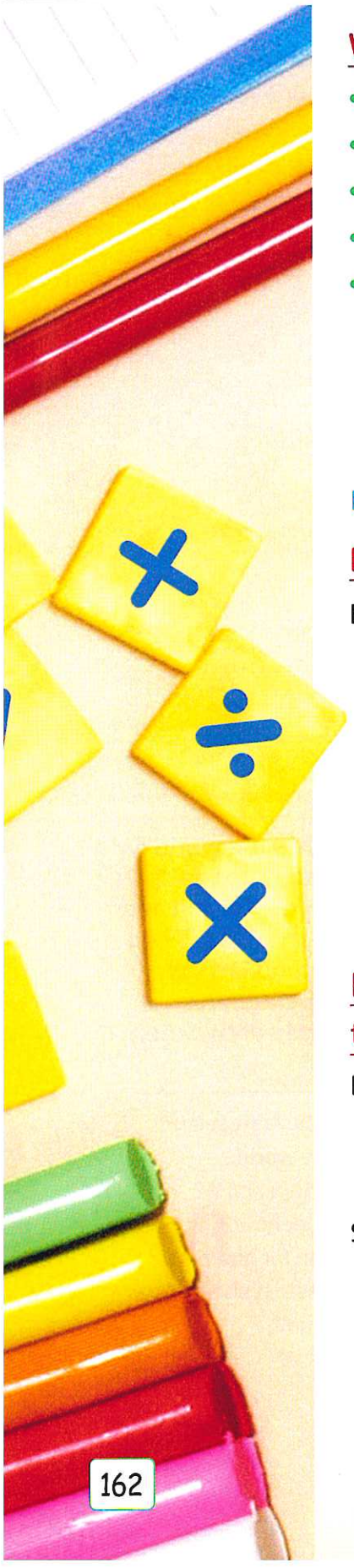
Fast Fact

▶ The ostrich is the world's largest bird. It stands up to a massive 2.7 m tall and weighs as much as 159 kg - that's around 1 m taller than the average man, and the mass of two men combined!

▶ Cheetah is the fastest land animal in the world. A cheetah can reach 112 kilometers per hour. If a cheetah ran for quarter an hour at its fastest speed, how far could it run ?

Lessons 1 & 2

▸ Dividing by a Two-Digit Number
▸ Estimating Quotients



What a division ?

- **Division :** The act of breaking into equal parts or groups.
- **Dividend :** The number being divided.
- **Divisor :** The number that divides.
- **Quotient :** The answer to a division problem.
- **Remainder :** The amount left over that is not enough to form another equal group.

$$\underset{\text{Dividend}}{28} \div \underset{\text{Divisor}}{3} = \underset{\text{Quotient}}{9} \quad \underset{\text{Remainder}}{R1}$$

Note that

The remainder is always less than the divisor.

Remember :

Basic facts, pattern and place value can help you divide.

Use the basic fact $2 \times 3 = 6$

$2 \times 3 = 6$

$2\,0 \times 3 = 6\,0$

$2\,0\,0 \times 3 = 6\,0\,0$

$2,\underline{0\,0\,0} \times 3 = 6,\underline{0\,0\,0}$

Three zeroes — Three zeroes

Use the basic fact $6 \div 3 = 2$

$6 \div 3 = 2$

$6\,0 \div 3 = 2\,0$

$6\,0\,0 \div 3 = 2\,0\,0$

$6,\underline{0\,0\,0} \div 3 = 2,\underline{0\,0\,0}$

Three zeroes — Three zeroes

Remember how to Divide by one-digit number by using the area model :

Divide : $615 \div 3$

	200	5
3	$3 \times 200 = 600$	$3 \times 5 = 15$

So , $615 \div 3 = 200 + 5 = 205$

Notes for parents :

- Remind your child that he/she practised solving devision problems with a 1-digit divisor using an area model in primary 4

Learn 1 Dividing by a two-digit number

A factory made 1,845 T-shirts in 15 days.
If the factory made the same amount daily
, how many T-shirts did the factory make each day ?
To determine the number of T-shirts in each day , we should divide 1,845 by 15

By using the area model

Step 1

Draw a long rectangle and write 15 on the smaller left side of the rectangle.

15 | |

Step 2

Try to use basic facts and pattern to get close to 1,845
$15 \times 1 = 15$, $15 \times 10 = 150$
, $15 \times 100 = 1{,}500$ [close to 1,845]
• Subtract $1{,}845 - 1{,}500 = 345$

	100	
15	1, 8 4 5 – 1, 5 0 0 3 4 5	

Step 3

There are 345 left to be divided by 15
$15 \times 2 = 30$
, $15 \times 20 = 300$ [close to 345]
• Subtract $345 - 300 = 45$

	100	20	
15	1, 8 4 5 – 1, 5 0 0 3 4 5	3 4 5 – 3 0 0 4 5	

Step 4

Since, there are 45 left to be divided by 15
$15 \times 1 = 15$, $15 \times 2 = 30$, $15 \times 3 = 45$ [the same number]
• Subtract : $45 - 45 = 0$

	100	20	3
15	1, 8 4 5 – 1, 5 0 0 3 4 5	3 4 5 – 3 0 0 4 5	4 5 – 4 5 0 0

Step 5

Add the 3 numbers 100 + 20 + 3 = 123
then : $1{,}845 \div 15 = 123$
The factory made 123 T-shirts daily.

• Ask your child to solve many exercises on division by two-digit number.

Example 1

Use the area model to solve each of the following problems.

a. 9,798 ÷ 71 **b.** 7,391 ÷ 35 **c.** 2,700 ÷ 90

Solution

a.

	100	10	10	10	8
71	9,798 − 7,100 2,698	2,698 − 710 1,988	1,988 − 710 1,278	1,278 − 710 568	568 − 568 000

Then , 9,798 ÷ 71 = 100 + 10 + 10 + 10 + 8 = 138

b.

	100	100	10	1
35	7,391 − 3,500 3,891	3,891 − 3,500 391	391 − 350 41	41 − 35 6 ← The remainder

Then , 7,391 ÷ 35 = (100 + 100 + 10 + 1) and remainder 6

= 211 R6

c.

	10	10	10
90	2,700 − 900 1,800	1,800 − 900 900	900 − 900 000

Then , 2,700 ÷ 90 = 10 + 10 + 10 = 30

Notice that

We can use mental math to divide 2,700 ÷ 90 by canceling from each side 0 , then , 270 ÷ 9 = 30

Check your understanding

1. Complete.

a. If 34 ÷ 8 = 4 R2 , the dividend is _____ and the remainder is _____

b. 203 ÷ 4 = 50 R _____

2. Solve the following problems using the area model.

a. 5,325 ÷ 25 **b.** 3,930 ÷ 12

Notes for parents :

• Remind your child to use multiplication to check his/her answer when he/she solved a division problem.

Learn 2 Estimating quotient

We can use estimation to check the reasonableness of our answers.

For Example : To estimate the quotient of 1,920 ÷ 16

Step 1 Round the dividend to the nearest thousand.

Step 2 Round the divisor to the nearest ten.

Step 3 $1{,}920 \div 16$

$2{,}000 \div 20 = 100$

Example 2

Estimate using compatible numbers.

Then, solve using an area model 4,641 ÷ 51

Solution

- **Estimate :** 4,641 → 5,000
- **Estimate :** 51 → 50

Then, 5,000 ÷ 50 = 100

- Finding the actual quotient using area model :

	80	10	1
51	4, 6 4 1 – 4, 0 8 0 5 6 1	5 6 1 – 5 1 0 5 1	5 1 – 5 1 0

Then, 4,641 ÷ 51 = 80 + 10 + 1 = 91

Estimation : 100 **Exactly :** 91

The answer is reasonable.

Check your understanding

Estimate using compatible numbers. Then, solve using an area model.

a. 3,024 ÷ 14 **b.** 7,550 ÷ 35

• Discuss the purpose of rounding versus basic facts to estimate by asking your child which method makes the problem easier to calculate mentally. Demonstrate how using a basic fact makes estimating easier for 4,641 ÷ 51 by having your child try to find each of these quotients mentally : 5,000 ÷ 50, 4,500 ÷ 50.

Exercise 16

on lessons 1&2

▸ Dividing by a Two-Digit Number
▸ Estimating Quotients

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. **Complete the following.**

1. The dividend in the following equation : 903 ÷ 3 = 301 is _____ [El Monofia - Tala 24]
2. The remainder of dividing 17 by 5 is _____ [Cairo – El Salam 23]
3. The quotient in 480 ÷ 10 = 48 is _____ [Souhag 23]
4. 34 ÷ 4 = 8 R _____ [Alexandria – First Montaza 23]
5. 0 ÷ 23 = _____ [Giza – Awseem 23]
6. 725 ÷ _____ = 725 [Alexandria - Montaza 24]

2. **Complete each set of multiplication and division equations.**

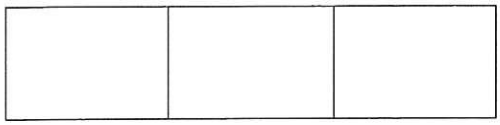
a. 3 × 5 = _____	b. 12 × 3 = _____	c. 4 × 2 = _____
3 × 50 = _____	12 × 30 = _____	40 × 20 = _____
3 × 500 = _____	12 × 300 = _____	400 × 200 = _____
d. 6 ÷ 3 = _____	e. 18 ÷ 6 = _____	f. 35 ÷ 7 = _____
60 ÷ 3 = _____	180 ÷ 6 = _____	350 ÷ 7 = _____
600 ÷ 3 = _____	1,800 ÷ 6 = _____	3,500 ÷ 7 = _____

3. **Use mental math to divide.**

a. 3,600 ÷ 9 = _____	b. 4,000 ÷ 5 = _____	c. 3,500 ÷ 5 = _____ [Kafr El Sheikh 24]
d. 140 ÷ 20 = _____ [Port Said - Port Fouad 24]	e. 5,600 ÷ 70 = _____	f. 2,400 ÷ 80 = _____
g. 8,100 ÷ 90 = _____	h. 6,300 ÷ 30 = _____	i. 12,000 ÷ 40 = _____

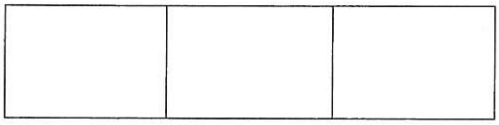
4. **Use the area model strategy to solve the division equations.**

a. 2,207 ÷ 7 = _____

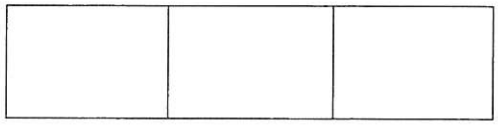


b. 3,872 ÷ 11 = _____ [Giza - 6th October 24]

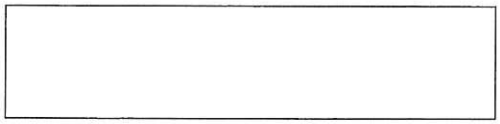
c. 1,625 ÷ 13 = _____



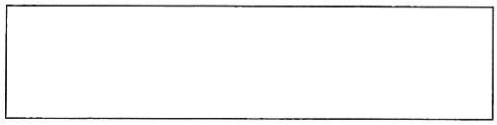
d. 7,896 ÷ 12 = _____



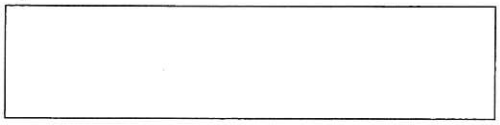
e. 1,035 ÷ 23 = _____



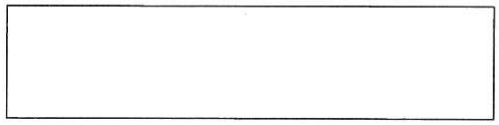
f. 1,428 ÷ 21 = _____



g. 4,410 ÷ 45 = _____



h. 5,479 ÷ 15 = _____



5. **Choose the correct area model that represents each problem and fill in any missing numbers. Then, use the area model to answer each problem.**

1. 9,234 ÷ 81 = _____

a.

	100	10	6
31	3,622 − 3,100 522	522 − 310 212	212 − 186 26

100 + 10 + 6 = 116 R26

2. 3,622 ÷ 31 = _____

b.

	100	50
_____	1,050 − 700 350	350 − 350 0

100 + 50 = 150

3. 1,050 ÷ 7 = _____

c.

	_____	_____	_____	_____
81	9,234 − 8,100 1,134	1,134 − 810 324	324 − 162 162	162 − 162 0

_____ + _____ + _____ + _____ = _____

6. Compatible Numbers. **Estimate using compatible numbers. Then, solve using an area model.**

a. 5,814 ÷ 47 = _____
Estimation : _____
Solution : _____

b. 6,397 ÷ 28 = _____
Estimation : _____
Solution : _____

c. 1,448 ÷ 48 = _____
Estimation : _____
Solution : _____

d. 7,061 ÷ 23 = _____
Estimation : _____
Solution : _____

e. 6,658 ÷ 69 = _____
Estimation : _____
Solution : _____

f. 1,064 ÷ 19 = _____
Estimation : _____
Solution : _____

7. Writing About Math. Error Analysis. Look at the problem, and analyze the student's area model. Identify what the student did incorrectly.

Divide : 2,852 ÷ 24 = _____

Student's area model : $24\overline{)2,852}$

	10	5	100	3
24	2,852 − 240 2,612	2,612 − 120 2,492	2,492 − 2,400 92	92 − 72 20

2,852 ÷ 24 = 20

Challenge

8. Which choice best completes the area model to find 1,754 ÷ 14 ?

A. 10
B. 20
C. 30
D. 100

	100	?	5	
14	1,754 − 1,400 354	354 − 74	74 − 70 04	R 4

Multiple Choice Questions

Choose the correct answer.

1. The divisor in $216 \div 43 = 5$ R 1 is _____ [Ismailia 23]

A. 216 B. 43 C. 5 D. 1

2. $640 \div$ _____ $= 640$ [Souhag 23]

A. 0 B. 1 C. 10 D. 100

3. In the opposite area model, which choice best represents the problem?

	100	10	5	1
15	1,740 − 1,500 240	240 − 150 90	90 − 75 15	15 − 15 00

A. $1{,}740 \div 15 = 1{,}151$ B. $1{,}740 \div 15 = 100 + 151$

C. $1{,}740 \div 15 = 116$ D. $1{,}740 \div 51 = 116$

4. Which area model best represents $2{,}583 \div 21$?

A.

	100	20	3
21	2,583 − 2,100 483	483 − 420 63	63 − 63 00

B.

	100	10	3
21	2,583 − 2,100 483	483 − 210 263	263 − 263 000

C.

	100	10	42
21	2,583 − 2,100 483	483 − 420 63	63 − 63 00

D.

	100	20	6
21	2,583 − 2,100 483	483 − 420 63	63 − 63 00

5. $29 \div 4 = 7$ R _____ [Cairo - El Marg 23]

A. 0 B. 1 C. 2 D. 3

6. $1{,}515 \div 15 =$ _____ [Cairo - El Mokattam 24, Ismailia 23]

A. 11 B. 101 C. 1,001 D. 15

7. $4{,}150 \div 29 = 143$ R _____ [Ismailia 24, Giza - Awssem 23]

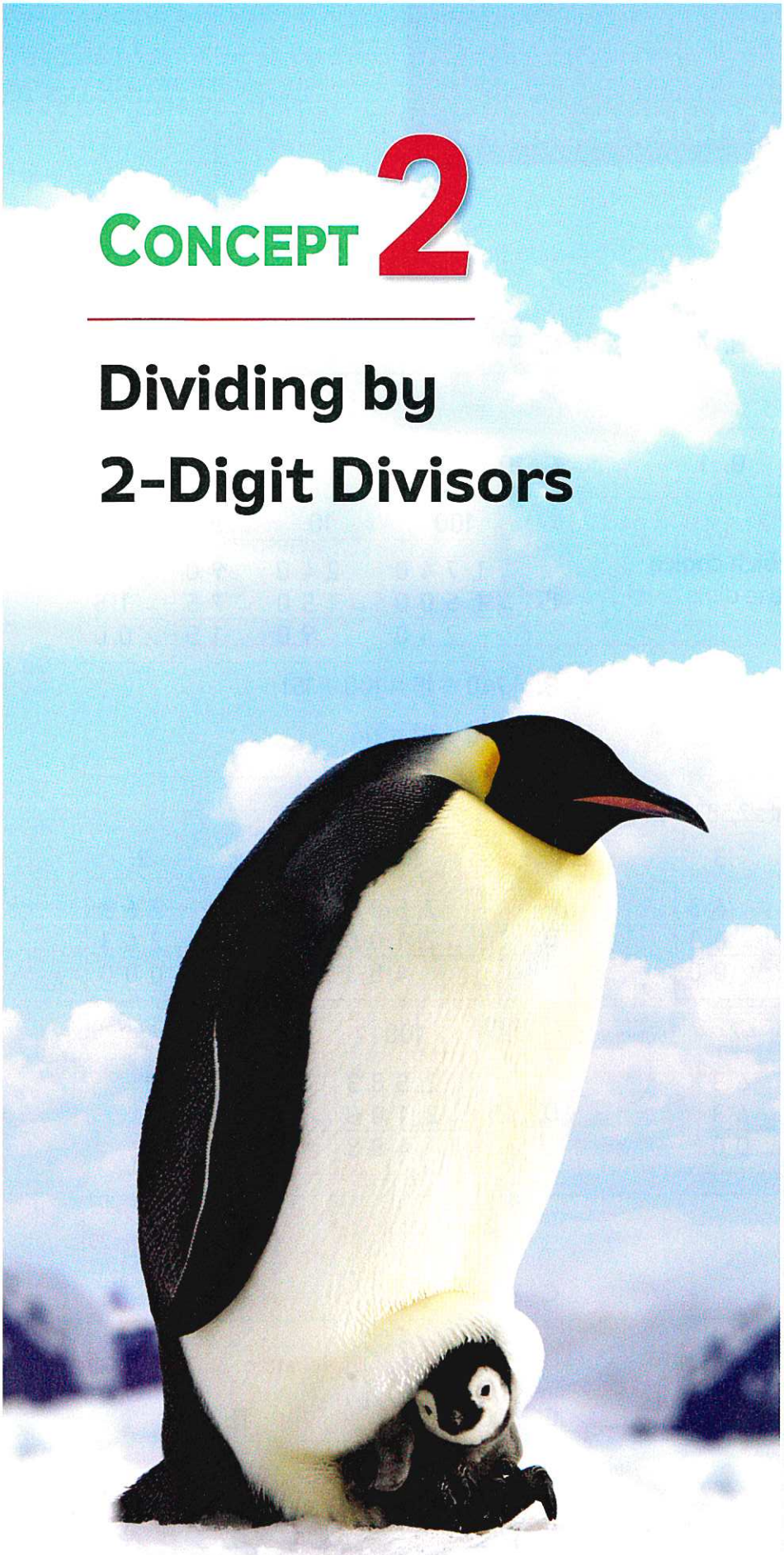
A. 4 B. 2 C. 1 D. 3

8. $2{,}002 \div 22 =$ _____

A. 19 B. 91 C. 109 D. 901

CONCEPT 2

Dividing by 2-Digit Divisors



▶ Lessons 3&4

- Using the Division Algorithm
- The Relation between Division and Multiplication

Learning Objectives:

- Students will use the standard algorithm to divide by a 2-digit divisor.
- Students will use the standard algorithm to divide by a 2-digit divisor.
- Students will use multiplication to check answers to division problems

▶ Lesson 5

Multistep Story Problems

Learning Objectives:

- Students will solve multistep story problems involving whole numbers and the four operations.

Fast Fact

The emperor penguin is the world's largest penguin. It can weigh up to 40 kg. In the Antarctic, an adult male emperor penguin will keep a single egg warm for about 63 days until the egg hatches.

About how many weeks will the penguin keep the egg warm ?

Lessons 3 & 4

- Using the Division Algorithm
- The Relation between Division and Multiplication

Learn 1 The Division algorithm

The price of 25 similar toys is 5,325 pounds. If you want to know the price of each toy,

you can divide $5{,}325 \div 25$ or $25\overline{)5,325}$

You can use the division algorithm strategy.

Step 1

$$\begin{array}{r} 0 \\ 25\overline{)5,325} \end{array}$$

- Divide 5 ÷ 25 but 5 < 25 then write 0 over 5

Step 2

$$\begin{array}{r} 02 \\ 25\overline{)5,325} \\ -\ 50 \\ \hline 3 \end{array}$$

- Divide 53 ÷ 25
- Write 2 over 3
- Multiply 2 × 25 = 50
- Write 50 under 53
- Subtract 53 – 50
- Compare 3 < 25

Step 3

$$\begin{array}{r} 021 \\ 25\overline{)5,325} \\ -\ 50 \\ \hline 32 \\ -\ 25 \\ \hline 7 \end{array}$$

- Bring down the tens [2]
- Divide 32 ÷ 25
- Write 1 over 2
- Multiply 1 × 25 = 25
- Write 25 under 32
- Subtract 32 – 25
- Compare 7 < 25

Step 4

$$\begin{array}{r} 0213 \\ 25\overline{)5,325} \\ -\ 50 \\ \hline 32 \\ -\ 25 \\ \hline 75 \\ -\ 75 \\ \hline 00 \end{array}$$

- Bring down the ones [5]
- Divide 75 ÷ 25
- Write 3 over 5
- Multiply 3 × 25 = 75
- Write 75 under 75
- Subtract 75 – 75
- Compare 0 < 25

, then the price of each toy is 213 pounds.

Draft

You can use this draft to estimate the result of dividing by 25

1 × 25 = 25

2 × 25 = 50

53 ←

3 × 25 = 75

4 × 25 = 100

Note

53 lies between 50 and 75 So, we take 2 when dividing 53 by 25

Notes for parents :

- To help your child remember all steps in the division algorithm, let him/her use the following mnemonic or make up one of his/her own: Don't Make Silly Careless Blunders (Divide, Multiply, Subtract, Compare, Bring Down).

▸ Other Examples :

a. With a remainder $3{,}594 \div 19$

$$\begin{array}{r} 0189 \\ 19\overline{)3,594} \\ -\ 19\downarrow \\ \hline 169 \\ -\ 152\downarrow \\ \hline 174 \\ -\ 171 \\ \hline 3 \end{array}$$

MATH IDEA

The order of division is as follows :

Divide
Multiply
Subtract
Compare
Bring down

Repeat this order until the division is complete.

Remember

The remainder should always be less than the divisor.

$3 < 19$

Draft

$19 \times 1 = 19$
35 ←
$19 \times 2 = 38$
$19 \times 3 = 57$
$19 \times 4 = 76$
$19 \times 5 = 95$
$19 \times 6 = 114$
$19 \times 7 = 133$
$19 \times 8 = 152$
169 ←
$19 \times 9 = 171$
174 ←

, then $3{,}594 \div 19 = 189$ R3

b. Zero in the quotient $4{,}316 \div 42$

Step 1

$$\begin{array}{r} 0 \\ 42\overline{)4,316} \end{array}$$

- Divide $4 \div 42$
- $4 < 42$
- then write 0 ↑ over 4

Step 2

$$\begin{array}{r} 01 \\ 42\overline{)4,316} \\ -\ 42 \\ \hline 1 \end{array}$$

- Divide $43 \div 42$
- Write 1 ↑ over 3
- Multiply $1 \times 42 = 42$
- Write 42 ↓ under 43
- Subtract $43 - 42$
- Compare $1 < 42$

Step 3

$$\begin{array}{r} 010 \\ 42\overline{)4,316} \\ -\ 42\downarrow \\ \hline 11 \\ -\ 0 \\ \hline 11 \end{array}$$

- Bring down the tens (1)
- $11 < 42$, you cannot divide.
- Write a 0 over 1.

Step 4

$$\begin{array}{r} 0102 \\ 42\overline{)4,316} \\ -\ 42 \\ \hline 11 \\ -\ 0\downarrow \\ \hline 116 \\ -\ 84 \\ \hline 32 \end{array}$$

- Bring down the ones (6)
- Divide $116 \div 42$
- Write 2 ↑ over 6
- Multiply $2 \times 42 = 84$
- Write 84 ↓ under 116
- Subtract $116 - 84$
- Compare $32 < 42$

Draft

$42 \times 1 = 42$
43 ←
$42 \times 2 = 84$
116 ←
$42 \times 3 = 126$

, then $4{,}316 \div 42 = 102$ R 32

Notes for parents :

- Remind your child of including the remainder as a part of the answer.

Example 1

Divide by using the standard algorithm.

a. $5{,}850 \div 26$

b. $4{,}995 \div 14$

Solution

a.

$$
\begin{array}{r}
225 \\
26\overline{)5,850} \\
-\ 52\downarrow \\
\hline
65 \\
-\ 52\downarrow \\
\hline
130 \\
-\ 130 \\
\hline
000
\end{array}
$$

$0 < 26$

, then $5{,}850 \div 26 = 225$

b.

$$
\begin{array}{r}
356 \\
14\overline{)4,995} \\
-\ 42\downarrow \\
\hline
79 \\
-\ 70\downarrow \\
\hline
95 \\
-\ 84 \\
\hline
11
\end{array}
$$

$11 < 14$

, then $4{,}995 \div 14 = 356$ R 11

Check your understanding

Divide by using the standard algorithm.

a. $1{,}716 \div 12$

b. $21\overline{)5,315}$

c. $24\overline{)5,034}$

- Remind your child to start division from the left.

Learn 2 The relation between division and multiplication.

You can use the idea that multiplication and division are inverse operations. Multiply the quotient by the divisor. Then add the remainder. The sum should equal the dividend.

Dividend = (Quotient × Divisor) + Remainder

The check for example 1 is shown below.

a. 5,850 ÷ 26 = 225

Check

$$\begin{array}{rl} 225 & \leftarrow \text{Quotient} \\ \times\ 26 & \leftarrow \text{Divisor} \\ \hline 1,350 & \\ +4,500 & \\ \hline 5,850 & \leftarrow \text{Dividend} \end{array}$$

✓

Dividend = Quotient × Divisor

b. 4,995 ÷ 14 = 356 R11

Check

$$\begin{array}{rl} 356 & \leftarrow \text{Quotient} \\ \times\ 14 & \leftarrow \text{Divisor} \\ \hline 1,424 & \\ +3,560 & \\ \hline 4,984 & \\ +\ 11 & \leftarrow \text{Remainder} \\ \hline 4,995 & \leftarrow \text{Dividend} \end{array}$$

✓

Dividend = (Quotient × Divisor) + Remainder

Example 2

Divide $14\overline{)1,697}$, then check your quotient with multiplication.

Solution

$$\begin{array}{r} 121 \\ 14\overline{)1,697} \\ -\ 14\downarrow \\ \hline 29 \\ -\ 28\downarrow \\ \hline 17 \\ -\ 14 \\ \hline 3 \end{array}$$

Check

$$\begin{array}{rl} 121 & \leftarrow \text{Quotient} \\ \times\ 14 & \leftarrow \text{Divisor} \\ \hline 484 & \\ +1,210 & \\ \hline 1,694 & \\ +\ 3 & \leftarrow \text{Remainder} \\ \hline 1,697 & \leftarrow \text{Dividend} \end{array}$$

✓

Check your understanding

Divide 2,916 ÷ 12, then multiply to check your answer.

Notes for parents :

- Help your child check his/her answer with multiplication.

Exercise 17

on lessons 3&4

- Using the Division Algorithm
- The Relation between Division and Multiplication

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Divide using the standard algorithm for division.

a. 32)192

b. 22)756

c. 43)1,376

d. 65)543

e. 46)8,014

f. 25)547

g. 18)5,009

h. 81)9,567

i. 11)6,203

j. 48)1,974

k. 29)725

l. 57)5,262

m. 15)5,314

n. 15)1,515

o. 18)1,818

2. **Solve the following problems. Check your answer.**

a. 1,116 ÷ 12

b. 276 ÷ 23

[Cairo - El Maadi 24]

c. 3,350 ÷ 25

[El Monofia - Quesna 24]

d. 4,251 ÷ 34

e. 2,736 ÷ 36

f. 5,356 ÷ 52

[Ismailia - El Kasaseen 24, Cairo - Hadaek El Quba 24]

3. **Compare using (< , = or >).**

a. 4,216 ÷ 34 ◯ 126

b. 9,225 ÷ 45 ◯ 200 + 5

c. 16,002 ÷ 63 ◯ 2 × 130

d. 9,050 ÷ 25 ◯ 300 + 52

e. 23,112 ÷ 72 ◯ 3 × 120

f. 14,640 ÷ 61 ◯ 20 × 12

4. A school distributed 840 books among 15 classes equally. **Find the number of books in each class.**

[El Monofia – Shiben El Kom 23]

5. A hotel consists of 180 rooms divided into some equal floors. Every floor has 15 rooms. **Find the number of floors.**

[El Beheira – Housh Essa 23]

6. If the price of 15 books is 600 pounds, then find the price of each book.

[Alexandria - Montaza 24]

7. A seller wants to put 1,596 pieces of chocolate in 14 boxes.

How many pieces in each box ?

[El Monofia - Shebin El Kom 24]

8. 🕮 **Solve the problems using the standard algorithm. Check your work using an area model.**

a. At her cafe, Rana sells cookies baked by a local bakery. She receives an order of 350 cookies. Rana packages the cookies in groups of 12 cookies per bag. Solve to find how many full bags containing 12 cookies each, Rana can sell from her order of 350 cookies and how many cookies are left over.

b. How could Rana package the cookies so that each bag contains the same number of cookies and she has none left over ?

9. 🕮 Ziad works in a clothing factory that produces shirts. He has 100 buttons and needs 16 buttons for each shirt. After dividing, he thinks he has enough to make 6 shirts and will have 4 buttons left over. Is Ziad correct in his thinking ? Why or why not ? Explain your thinking.

Challenge

10. **Complete.**

If 5,528 ÷ A = 15 R8 , then A × 15 = _____

Multiple Choice Questions

Choose the correct answer.

1. If 3,012 ÷ 12 = 251 , then 251 × 12 = _____

A. 3,013 [Giza 23]

B. 3,012

C. 3,014

D. 3,015

2. The division equation that matches 125 × 36 = 4,500 is _____

A. 4,500 – 125 = 36

B. 125 ÷ 36 = 4,500

C. 4,500 ÷ 36 = 125

D. 125 + 36 = 4,500

3. Which expression can be used to check the solution of the following division problem ?

8,668 ÷ 24 = 361 R 4

A. 24 × 361 B. 28 × 8,668

C. 361 × 4 + 24 D. 24 × 361 + 4

4. Quotient of 7,668 ÷ 54 is _____

[El Monofia – Shiben El Kom 23]

A. 142 B. 124

C. 214 D. 241

5. What is the value of M in the opposite division problem ?

$$15 \overline{)\ 5,1\,3\,0}\quad M$$

A. 324 B. 342

C. 234 D. 432

6. 9,363 ÷ 31 = _____

A. 302 R 1 B. 302 R 2

C. 302 D. 302 R 4

7. 1,376 ÷ 43 = _____

[Cairo - Hadaek El Quba 24]

A. 43 B. 23

C. 32 D. 320

8. If 26 × 352 = 9,152, then 9,155 ÷ 26 = _____

[El Monofia – Tala 23 , Giza – Awseem 23]

A. 352 B. 352 R 1

C. 352 R 2 D. 352 R 3

9. If 7,785 ÷ 31 = 251 R 4, then 31 × 251 + 3 = _____

A. 7,786 B. 7,785 C. 7,784 D. 7,783

10. A car its length 196 cm, a factory design a car sample its length 4 cm. How many times the car longer than the car sample ? [El Kalyoubia 23]

A. 47 B. 48 C. 49 D. 94

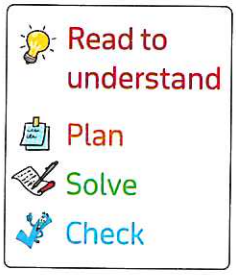
Lesson

5

Multistep Story Problems

Learn How to solve multistep story problems ?

Here are some guided steps you may use when solving problems.



Read to understand

- Read the story loudly more than one time carefully.
- Identify the details and quantities given.
- Identify the hidden question (if exists).
- Search for key words.

Plan

- Decide the operation (+ , – , × , ÷).
- Decide the strategy you can use to solve the problem.

Solve

- Solve the hidden question (if exists).
- How can you use the strategy to solve the problem ?

Check

- How do you know your answer is correct ?
- What other strategy could you use to solve the problem ?

Example 1

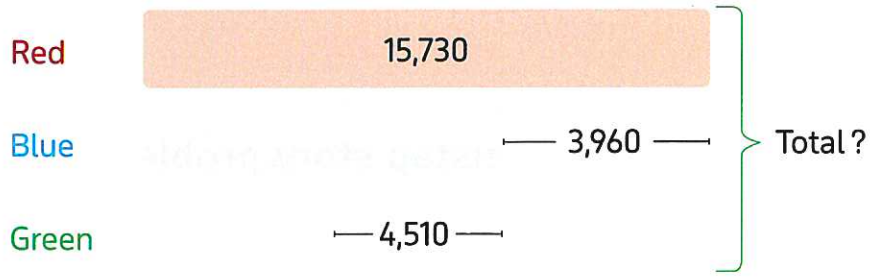
In one year, a school used 15,730 red papers, 3,960 fewer blue papers than red papers, and 4,510 fewer green papers than blue papers.

How many papers were used in all ?

Notes for parents :

- Remind your child that multistep problem is a problem that involves more than one operation.

Solution



Blue

16
4 ~~6~~ ~~13~~
15, ~~7~~ ~~3~~ 0
− 3, 9 6 0
11, 7 7 0

Green

0 11
~~1~~ ~~1~~, 7 7 0
− 4, 5 1 0
7, 2 6 0

Total

1 1 1
15, 7 3 0
+ 11, 7 7 0
+ 7, 2 6 0
34, 7 6 0

The school used 34,760 papers in all.

Example 2

Hany and his father are going on a road trip to his grandfather's house, which is 700 km away. On the first day, they travel 253 km. On the second day, they travel 307 km. How many kilometers will they need to travel to reach his grandfather's house ?

Solution

The left distance after the first day = 700 – 253 = 447 km.

The left distance after the second day = 447 – 307 = 140 km.

then, they need to travel 140 km to reach the grandfather's house.

Example 3

Ashraf has 1,578 L.E. He bought a book for 52 L.E., and by the left money he bought 14 shirts of the same kind. What is the cost of each shirt ?

Solution

The left money = 1,578 – 52 = 1,526 L.E.

The cost of each shirt = 1,526 ÷ 14 = 109 L.E.

```
   109
14)1,526
 - 14
  126
 - 126
    0
```

Notes for parents :

- Some story problems have hidden question or questions that must be answered before you can solve the problem. You have to determine what operation to use and what strategies will you use to help you figure out how to solve the problem.

Example 4

Amany wants to buy 150 m of cloth and there are two different kinds of the cloth. If the price of each 50 m from the first kind is 1,000 L.E. and the price of each 30 m from the second kind is 500 L.E.

How much money will be saved by buying the second kind?

Solution

First kind :

1,000	1,000	1,000
50 m	50 m	50 m

The price of the first kind = 1,000 + 1,000 + 1,000 = 3,000 L.E.

Second kind :

500	500	500	500	500
30 m	30 m	30 m	30 m	30 m

The price of the second kind = 500 × 5 = 2,500 L.E.

The saved money = 3,000 – 2,500 = 500 L.E.

Check your understanding

Amgad saved 550 pounds, Bassem saved 3 times as much as Amgad and Sameh saved 900 pounds more than Agmd. How many pounds were saved by all of them ?

_____

_____

- Ask your child to read the problem carefully and plan to solve it, then ask him/her to look back to check his/her answer.

Exercise 18
on lesson 5

▸ Multistep Story Problems

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. From the school book A baker made 140 servings of baklava for a party. If each baking tray holds 12 servings of baklava, how many trays will be needed to hold all the baklava ?

2. From the school book Mom baked a batch of 12 balah el sham. Two balah el sham fell on the floor. If 4 children split the remaining balah el sham equally, how many balah el sham will each child get ?

3. From the school book In one year, a textile factory used 11,650 meters of cotton, 4,950 fewer meters of silk than cotton, and 3,500 fewer meters of wool than silk. How many meters of fabric were used in all ?

4. From the school book An architect is designing a bridge. The architect has two choices for materials. Mighty Steel sells 5 metric tons (t) of steel for 100,000 L.E. Silver Strong Steel sells 3 t of steel for 70,000 L.E. If the architect needs 15 t of steel, how much money will be saved by purchasing from Mighty Steel ?

5. From the school book Computer Depot sold 762 reams of paper. Paper Palace sold 3 times as much paper as Computer Depot and 143 reams more than Office Supply Central. How many reams of paper were sold by all three stores combined ?

6. Zeinab ordered 12 packages of fabric squares to make a quilt. Each package has 18 fabric squares, and Zeinab used all the squares for her quilt. Reem made a quilt that was 13 squares wide by 13 squares long. How many fewer squares did Reem use than Zeinab for her quilt ?

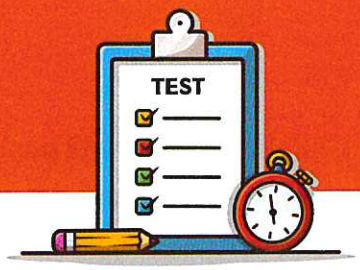
7. Nagi sold a total of 30 boxes of sports T-shirts at his store on Monday. These boxes contained only basketball T-shirts and football T-shirts. Each box contained 25 sports T-shirts. He earned 3 L.E. for each sports T-shirt he sold. He earned a total of 1,134 L.E. from the football T-shirts he sold. How much money did Nagi earn from the basketball T-shirts he sold ?

8. Malek and his family are going on a road trip to his grandmother's house, which is 465 kilometers away. On Friday, they traveled 124 km. On Saturday, they traveled 210 km. How many kilometers will they need to travel on Sunday to reach his grandmother's house ?

9. There are 1,354 animals in one barn. There are 574 goats, 346 cows and the rest are horses. If 89 horses were sold, how many horses are left in that barn ?

10. Amgad has 238 eggs in the warehouse. He collected another 122 eggs from his chickens yesterday. As he arranged all the eggs in trays, he accidentally dropped 28 eggs on the ground. How many unbroken eggs were left ? Among the eggs left, there were 126 brown eggs; How many were white eggs ?

Unit Four Assessment



1. Choose the correct answer.

1. The divisor in $63 \div 9 = 7$ is _____ [Cairo - El Sayeda Zeinab 24]

A. 9 B. 7 C. 63 D. zero

2. Using the opposite area model to divide $3,084 \div 12$, then the value of X is _____

	100	100	X	7
12	3,084	1,884	684	84
	− 1,200	− 1,200	− 600	− 84
	1,884	684	84	00

A. 100 B. 50

C. 10 D. 5

3. By using the following area model to divide, then the suitable division equation is _____

	100	10	1	1
13	1,456	156	26	13
	− 1,300	− 130	− 13	− 13
	156	26	13	00

A. $1,456 \div 13 = 1,102$

B. $1,456 \div 13 = 211$

C. $1,456 \div 13 = 112$

D. $100,102 \div 13 = 1,456$

4. If $3,012 \div 12 = 251$, then 251×12 = _____ [Giza 23]

A. 3,013 B. 3,012 C. 3,014 D. 3,015

5. If $51 \times 23 = 1,173$, then $1,179 \div 23 = 51$ R _____ [Cairo - El Mostabel 24]

A. 4 B. 5 C. 6 D. 7

6. $3,681 \div 35 = 105$ R _____

A. 3 B. 4 C. 5 D. 6

7. $1,212 \div 12$ = _____ [Giza 24, Alexandria – First Montaza 23]

A. 12 B. 11 C. 101 D. 1,001

2. Complete the following.

1. $144 \div 12$ = _____ [Giza 24, Cairo - Ain Shams 24]

2. If the price of 16 books is 560 pounds, then the price of each book equals _____ pounds.

3. Quotient × divisor + remainder = _____ [Ismailia 24]

4. $3,561 \div 1$ = _____

5. $0 \div 362$ = _____ [Giza - 6th October 24]

6. $120 \div 30$ = _____ [Alexandria - El Gamarek 24]

7. The quotient in opposite area model is _____

	60	4
÷ 35	2,240	140
	− 2,100	− 140
	140	000

[El Monofia – Shiben El Kom 23]

8. The quotient of 54 ÷ 5 = 10 , then the remainder is _____ [Giza – Abo El Nomros 23]

3. Choose the correct answer.

1. In the equation 24 ÷ 6 = 4 , the remainder is _____ [Cairo - El Basateen and El Salam 24]

A. 0 B. 1 C. 2 D. 4

2. A man bought 12 toys for 288 L.E. , then the price of each toy is _____ L.E.

A. 300 B. 24 C. 276 D. 42

3. 3,124 ÷ 3,124 = _____

A. 3,124 B. zero C. 124 D. 1

4. If 4,150 ÷ 29 = 143 R _____ [Cairo – El Nouzha 23]

A. 4 B. 2 C. 1 D. 3

5. 900 ÷ 30 = _____ [Port Said - North 24]

A. 300 B. 3 C. 3,000 D. 30

6. If 840 ÷ 24 = 35 , then 35 × 24 + 5 = _____

A. 840 B. 850 C. 845 D. 485

7. Using the opposite area model to divide 1,530 ÷ X , then the value of X is _____

	100	2
X	1,530	30
	1,500	− 30
	30	00

A. 1,530 B. 102

C. 30 D. 15

4. Answer the following questions.

1. Divide $57\overline{)5,262}$ "using the standard algorithm"
2. Divide 6,203 ÷ 11 "using the area model"
3. Ahmed bought 14 m of cloth for 224 L.E.
   Find the price of one meter. [El Monofia - Shebin El Kom 24]

_____

_____

4. There were 29 girls and 27 boys in a class. The teacher asked them to work in groups of 8
   How many groups there were ? [Cairo – El Marg 23]

_____

_____

THEME TWO

Mathematical Operations and Algebraic Thinking

UNIT 5

Multiplication and Division with Decimals

- **Concept 1 :** Multiplying Decimals
- **Concept 2 :** Dividing Decimals

CONCEPT 1

Multiplying Decimals

▶ Lessons 1 to 3
- Multiplying by Powers of Ten
- Multiplying Decimals by Whole Numbers
- Multiplying Tenths by Tenths

Learning Objectives:
- Students will explain patterns when multiplying whole numbers by powers of ten.
- Students will multiply a decimal by a whole number.
- Students will use models to represent decimal multiplication.
- Students will explain patterns when multiplying tenths by tenths.

▶ Lesson 4
- Multiply Decimals Using the Area of a Rectangle Model

Learning Objectives:
- Students will use the area model to multiply decimals.

▶ Lessons 5&6
- Multiplying Decimals through the Hundredths Place
- Multiplying Decimals through the Thousandths Place

Learning Objectives:
- Students will use the standard algorithm to multiply decimals through the Hundredths place.
- Students will use the standard algorithm to multiply decimals through the Thousandths place.

▶ Lessons 7&8
- Decimals and the Metric System
- Measurement, Decimals and Powers of Ten

Learning Objectives:
- Students will explain relationships between the metric system and decimals.
- Students will use decimals to represent equivalent measurements.
- Students will relate converting measurements in the metric system to multiplying by powers of ten.

▶ Lesson 9
- Solving Multistep Story Problems

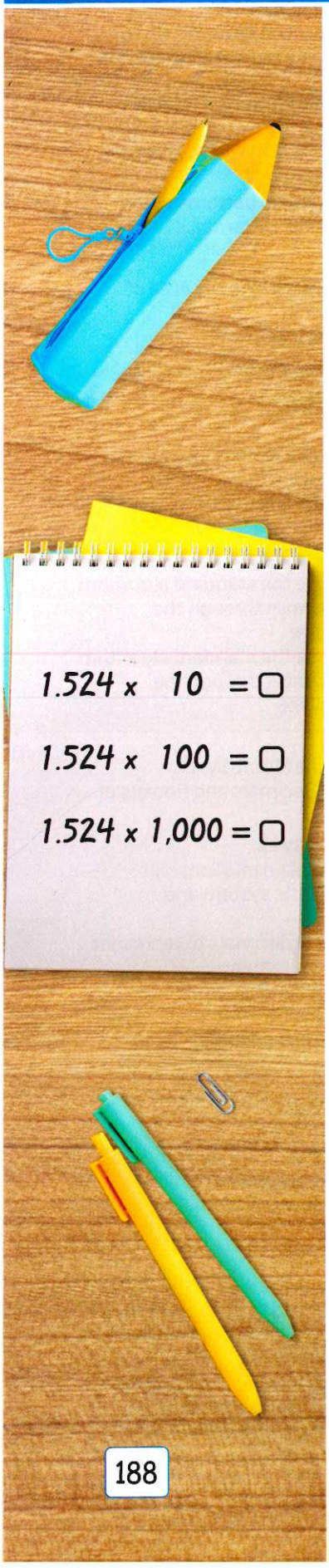
Learning Objectives:
- Students will solve multistep story problems involving addition, subtraction, and multiplication of decimals.

Fast Fact

Saturn is the second largest planet in our solar system. Saturn orbits the sun at an average speed of **10 km**, per sec. The average orbital speed of Earth is **3.1 times** as fast as that of Saturn. How fast does Earth orbit the Sun ?

Lessons 1 to 3

- Multiplying by Powers of Ten
- Multiplying Decimals by Whole Numbers
- Multiplying Tenths by Tenths



Learn 1 Multiplying by powers of ten

Rules

- To multiply by 10 / 100 / 1,000 → move the decimal point 1 place / 2 places / 3 places → to the right
- To multiply by 0.1 / 0.01 / 0.001 → move the decimal point 1 place / 2 places / 3 places → to the left

Examples for multiplying by 10 , 100 and 1,000

- $1.524 \times 10 = 15.24$
- $1.524 \times 100 = 152.4$
- $1.524 \times 1{,}000 = 1{,}524$

Hint
You don't need to show a decimal point at the end of a whole number.

Examples for multiplying by 0.1 , 0.01 and 0.001

- $361.8 \times 0.1 = 36.18$
- $361.8 \times 0.01 = 3.618$
- $361.8 \times 0.001 = 0.3618$

Hint
This decimal has 4 decimal places. It is a decimal at Ten-Thousandths.

Remarks

Sometimes you need to put one or more zeroes on the right (or on the left) of the number without changing its value.

For Example :

- $3.7 \times 100 = 3.70 \times 100 = 370$
- $3.7 \times 1{,}000 = 3.700 \times 1{,}000 = 3{,}700$
- $16.3 \times 0.001 = 0.016.3 \times 0.001 = 0.0163$

In the whole numbers, consider the decimal point at the right of Ones place [as : 35. , 645.]

For Example :

$450. \times 0.01 = 4.50 = 4.5$

Notes for parents :

- Your child may be confused which direction to move the decimal point when multiplying decimal numbers.

Example 1

Find the result of each of the following.

a.

$75.42 \times 10 =$ _____	$75.42 \times 0.1 =$ _____
$75.42 \times 100 =$ _____	$75.42 \times 0.01 =$ _____
$75.42 \times 1{,}000 =$ _____	$75.42 \times 0.001 =$ _____

b.

$39 \times 10 =$ _____	$39 \times 0.1 =$ _____
$39 \times 100 =$ _____	$39 \times 0.01 =$ _____
$39 \times 1{,}000 =$ _____	$39 \times 0.001 =$ _____

Solution

a.

$75.42 \times 10 = 754.2$	$75.42 \times 0.1 = 7.542$
$75.42 \times 100 = 7{,}542$	$075.42 \times 0.01 = 0.7542$
$75.420 \times 1{,}000 = 75{,}420$	$0075.42 \times 0.001 = 0.07542$

b.

$39.0 \times 10 = 390$	$39. \times 0.1 = 3.9$
$39.00 \times 100 = 3{,}900$	$039. \times 0.01 = 0.39$
$39.000 \times 1{,}000 = 39{,}000$	$0039. \times 0.001 = 0.039$

Note that

0.07542

- 4 is in the Ten Thousandths place.
- 2 is in the Hundred Thousandths place.

Check your understanding

Find the result of each of the following.

a. $57.32 \times 0.1 =$ _____	b. $0.0823 \times 1{,}000 =$ _____	c. $18 \times 0.001 =$ _____
d. $0.524 \times 10 =$ _____	e. $5.3 \times 0.01 =$ _____	f. $62 \times 100 =$ _____

- Make sure that your child put more zeroes if needed when multiplying by powers of ten.

Learn 2 Multiplying decimals by whole numbers

How to evaluate : 0.4 × 3 ?

You can solve this problem in many ways as the following.

First Way

$0.4 \times 3 = 4 \text{ tenths} \times 3$

$= 12 \text{ tenths}$

$= \frac{12}{10} = 1.2$

Second Way

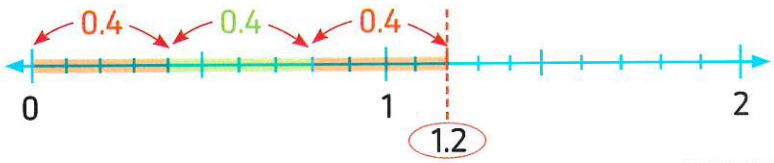
Multiply : $\begin{array}{r} 4 \\ \times\ 3 \\ \hline 12 \end{array}$, then $\begin{array}{r} 0.4 \\ \times\ 3 \\ \hline 1.2 \end{array}$ → 1 decimal place → 1 decimal place

Third Way

The multiplication can be represented as repeated addition

So, $0.4 \times 3 = 0.4 + 0.4 + 0.4 = 1.2$

You can use the number line to show that :



Example 2

Complete.

a. $0.5 \times 5 =$ _____

b. $0.5 \times 6 =$ _____

c. $0.015 \times 9 =$ _____

d. $4.15 \times 12 =$ _____

Solution

a. Since $5 \times 5 = 25$, then $0.5 \times 5 = 2.5$

b. Since $5 \times 6 = 30$, then $0.5 \times 6 = 3.0 = 3$

c. Since $15 \times 9 = 135$, then $0.015 \times 9 = 0.135$

d. Since $415 \times 12 = 4{,}980$, then $4.15 \times 12 = 49.80 = 49.8$

Check your understanding

Complete the following.

a. $7.5 \times 3 =$ _____

b. $7.5 \times 6 =$ _____

c. $6.05 \times 5 =$ _____

d. $0.74 \times 9 =$ _____

e. $5.68 \times 7 =$ _____

f. $7.2 \times 12 =$ _____

Notes for parents :

- Tell your child that multiplying decimals by a whole number is the same as multiplying whole numbers. He/She need to place a decimal point in his/her answer.

Example 3

Find the value of each letter in each of the following by using the expanded form :

a. $3{,}245.8 = 3 \times [A] + 2 \times [B] + 4\,[C] + 5 + 8\,[D]$

b. $30{,}604.07 = 3 \times [A] + 6 \times [B] + 4 + 7 \times [C]$

Solution

a. $3{,}245.8 = 3{,}000 + 200 + 40 + 5 + 0.8 = 3 \times [1{,}000] + 2 \times [100] + 4 \times [10] + 5 + 8 \times [0.1]$

, then **A = 1,000** , **B = 100** , **C = 10** , **D = 0.1**

b. $30{,}604.07 = 30{,}000 + 600 + 4 + 0.07 = 3 \times [10{,}000] + 6 \times [100] + 4 + 7 \times [0.01]$

, then **A = 10,000** , **B = 100** , **C = 0.01**

Example 4

Complete each of the following.

a. $25.6 \times$ _____ $= 2{,}560$ | **b.** $0.12 \times$ _____ $= 120$ | **c.** $3.4 \times$ _____ $= 0.34$

d. _____ $\times 0.1 = 1.7$ | **e.** _____ $\times \frac{1}{100} = 35$ | **f.** _____ $\times 100 = 2.4$

Solution

a. $25.60 \times 100 = 2{,}560$ | **b.** $0.120 \times 1{,}000 = 120$ | **c.** $3.4 \times 0.1 = 0.34$

d. $17 \times 0.1 = 1.7$ | **e.** $3{,}500 \times \frac{1}{100} = 35$ | **f.** $0.024 \times 100 = 2.4$

Example 5

A box of mangoes weighs 9.5 kg. What is the weight of 100 boxes ?

Solution

The weight of boxes = 9.5 × 100 = 950 kg

Check your understanding

1. Complete.

a. $0.243 \times$ _____ $= 24.3$ | **b.** _____ $\times 0.1 = 1.25$

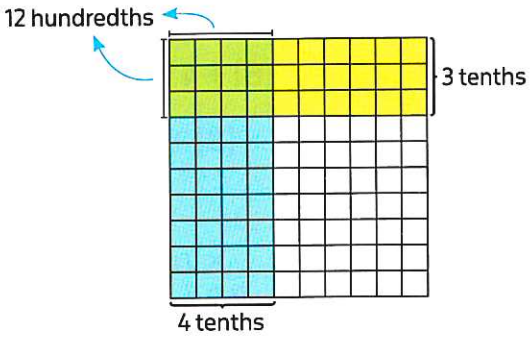
2. Ahmed runs a distance of 1.25 km per day. What is the distance that he runs in 100 days ?

_____

• Remind your child how he/she can write a decimal in expanded form.

Learn 3 Multiplying tenths by tenths (with arrays)

Example : How to evaluate : 0.4 × 0.3 ?



- **Use two different colors to create this model :**
  - The first number (0.4) is represented by coloring 4 columns by blue.
  - The other number (0.3) is represented by coloring 3 rows by yellow.
  - Count the squares colored twice in the array you created that they are 12 squares = 12 hundredths

So, $0.4 \times 0.3 = 0.12$

Note that

Product of two numbers in the tenths place would have a product in the hundredths place.

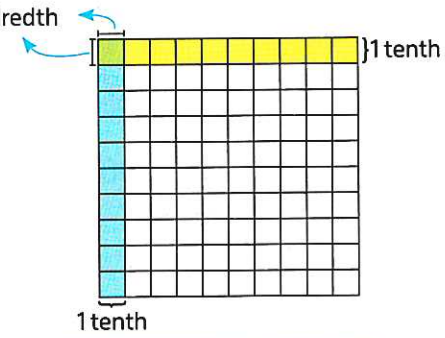
Example 6

Find each of the following using arrays.

a. 0.1×0.1 **b.** 0.5×0.2

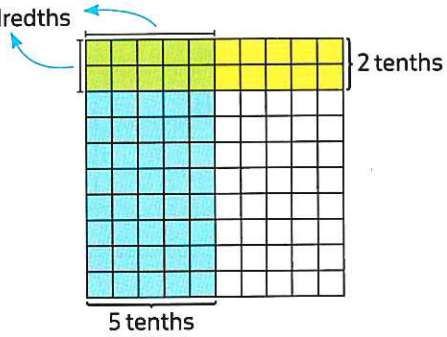
Solution

a.



$0.1 \times 0.1 = 0.01$

b.

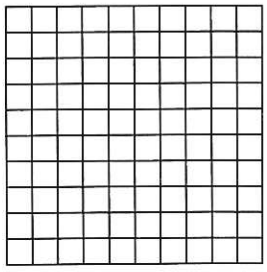


$0.5 \times 0.2 = 0.10 = 0.1$

Check your understanding

Using arrays to calculate :

$0.6 \times 0.7 =$



Notes for parents :

- Let your child use models to represent 0.7×0.6

Exercise 19
on lessons 1 to 3

- Multiplying by Powers of Ten
- Multiplying Decimals by Whole Numbers
- Multiplying Tenths by Tenths

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Complete.

a. $0.643 \times 100 =$ _____

b. 📖 $4.2 \times 10 =$ _____

c. $3.29 \times 10 =$ _____

d. $12.65 \times 10 =$ _____

e. 📖 $1.245 \times 100 =$ _____ [Alexandria - El Gamarek 24]

f. 📖 $360 \times 0.1 =$ _____

g. $0.045 \times 100 =$ _____

h. $3.2172 \times 1{,}000 =$ _____

i. $0.45 \times 1{,}000 =$ _____ [El Menia - Deir Mawas 24]

j. $1{,}000 \times 6.7 =$ _____

k. 📖 $14.14 \times 0.1 =$ _____ [Suez 23]

l. 📖 $7.4 \times 0.01 =$ _____

m. $4{,}215 \times 0.001 =$ _____

n. $26.71 \times 0.1 =$ _____

o. 📖 $602.1 \times 0.01 =$ _____

p. $42.5 \times 0.001 =$ _____

2. 📖 Multiply to complete the table.

×	3	30	300
0.001	a. _____	g. _____	m. _____
0.01	b. _____	h. _____	n. _____
0.1	c. _____	i. _____	o. _____
1	d. _____	j. _____	p. _____
10	e. _____	k. _____	q. _____
100	f. _____	l. _____	r. _____

3. Find each of the following.

a. 📖
$$\begin{array}{r} 2.5 \\ \times \quad 3 \\ \hline \quad\quad \end{array}$$

b. 📖
$$\begin{array}{r} 0.35 \\ \times \quad 5 \\ \hline \quad\quad \end{array}$$

c.
$$\begin{array}{r} 4.4 \\ \times \quad 6 \\ \hline \quad\quad \end{array}$$

d.
$$\begin{array}{r} 0.65 \\ \times \quad 7 \\ \hline \quad\quad \end{array}$$

4. Complete each table.

a.

$14.96 \times 1{,}000 =$	_____
$14.96 \times 100 =$	_____
$14.96 \times 10 =$	_____
$14.96 \times 1 =$	_____
$14.96 \times 0.1 =$	_____
$14.96 \times 0.01 =$	_____
$14.96 \times 0.001 =$	_____

b.

$25 \times 1{,}000 =$	_____
$25 \times 100 =$	_____
$25 \times 10 =$	_____
$25 \times 1 =$	_____
$25 \times 0.1 =$	_____
$25 \times 0.01 =$	_____
$25 \times 0.001 =$	_____

c.

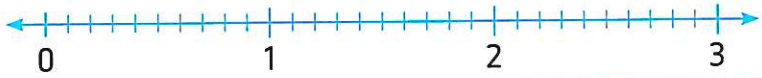
$5.7 \times 1{,}000 =$	_____
$5.7 \times 100 =$	_____
$5.7 \times 10 =$	_____
$5.7 \times 1 =$	_____
$5.7 \times 0.1 =$	_____
$5.7 \times 0.01 =$	_____
$5.7 \times 0.001 =$	_____

5. By using the number line evaluate each of the following.

a. 0.3×3

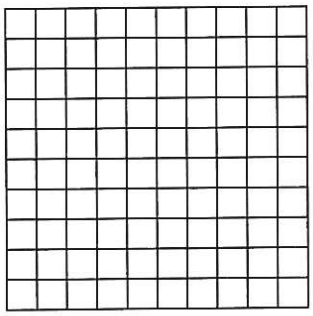
b. 0.3×4

c. 0.3×5

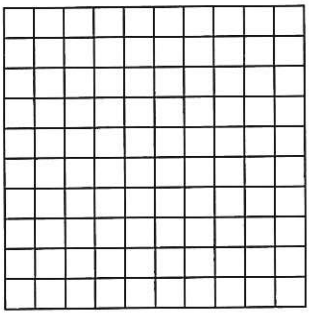


6. Use the base 10 grids to find the products.

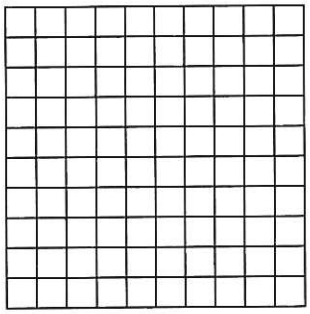
a. $0.1 \times 0.1 =$ _____



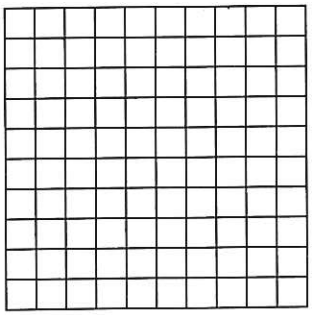
b. $0.3 \times 0.4 =$ _____



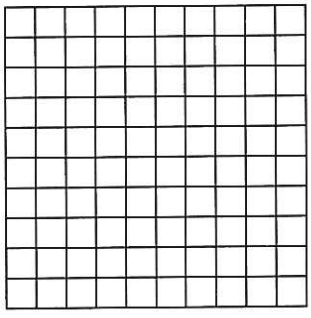
c. $0.5 \times 0.2 =$ _____



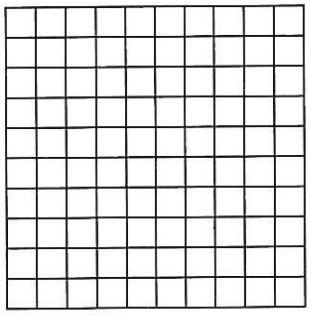
d. $0.9 \times 0.5 =$ _____



e. $0.7 \times 0.8 =$ _____



f. $0.5 \times 0.6 =$ _____



7. **Find the unknown letters in each of the following by using the expanded form.**

a. 496 = 4 × [A] + 9 × [B] + 6

b. 6,140 = 6 × [C] + 1 × [D] + 4 × [E]

c. 20,403 = 2 × [F] + 4 × [G] + 3

d. 78,594 = 7 × [H] + 8 × [I] + 5 × [J] + 9 × [K] + 4

e. 8,032 × 1,000 = [L]

f. 54.29 = 5 × [M] + 4 + 2 × [N] + 9 × [O]

g. 4.005 = 4 + 5 × [P]

h. 305.09 = 3 × [Q] + 5 + 9 × [R]

8. **Put the suitable relation (< or = or >).**

a. 4.72 × 10 ◯ 0.472 × 100

b. 4.4 × 0.1 ◯ 0.044 × 10

c. 72.15 × 10 ◯ 0.07215 × 1,000

d. 5 × 0.001 ◯ 0.05 × 0.01

e. 2.4 × 10 ◯ 0.24 × 100

f. 9.15 × 100 ◯ 91.5 × 100

9. **Complete.**

a. 25.69 × _____ = 256.9

b. 4.321 × _____ = 432.1 [El Menia - Matay 23]

c. _____ × 2.54 = 0.254

d. 7.5 × _____ = 750

e. 620.1 × _____ = 0.6201

f. 0.021 × _____ = 21

g. _____ × 10 = 29.4

h. _____ × 100 = 86.2 [Cairo - Nasr City 23]

10. **If 326 × 7 = 2,282 and 37 × 52 = 1,924, then complete the following without multiplying.**

a. 3.26 × 7 = _____

b. 0.0326 × 7 = _____

c. 32.6 × 7 = _____

d. 3.7 × 52 = _____

e. 0.37 × 52 = _____

f. 0.326 × 7 = _____

g. 0.0037 × 52 = _____

h. 37 × 5.2 = _____

i. 0.00326 × 7 = _____

11. Hoda's stride is 0.72 meters. How far, in meters, will Hoda walk after taking 1,000 stride ? Use words and numbers to explain how you found your answer.

_____

12. Marwa bought 10 pens, the price of each is 3.5 pounds.

What is the total amount that Marwa paid ? [Cairo - El Maadi 24]

_____

13. Ahmed bought 5 pens of the same kind, if the price of each pen is 4.5 pounds.

Find the total money Ahmed paid ? [El Monofia - Ashmoon 24, Port Said - Port Fouad 24]

_____

Multiple Choice Questions

Choose the correct answer.

1. If you multiplied a decimal number by 10, then the decimal point will move to ——

A. left B. right
C. not move D. other

[Giza - Abo El Nomrous 23]

2. 0.067 × 1,000 = ——

A. 6.7 B. 67
C. 0.067 D. 670

[Cairo - New 24, Giza 24]

3. 95.8 × 100 = —— [El Menia - Matay 24]

A. 0.958 B. 958
C. 9,580 D. 95,800

4. 85.3 × 0.01 = ——

A. 853 B. 8.53
C. 0.853 D. 85.03

[Cairo - El Sherouk 23, Giza - El Haram 24]

5. $35.2 \times \frac{1}{10}$ = —— [Giza - El Agouza 23]

A. 35.20 B. 35.02
C. 3.52 D. 30.52

6. 2 Thousandths × 4 = ——

A. 8 B. 0.8
C. 0.08 D. 0.008

[Cairo - El Nouzha 23, Giza - Math inspection 23]

7. 2 × 3 Thousandths = —— Thousandths

A. 5 B. 23
C. 6 D. 0.23

[Port Said - Port Fouad 24]

8. 100 × —— = 4.4

A. 0.44 B. 44
C. 440 D. 0.044

9. —— × 0.01 = 5.36

A. 0.536 B. 536
C. 53.6 D. 5.3600

[Cairo - Hadaek El Quba 24]

10. 2.51 × —— = 0.251

A. 0.1 B. 0.01
C. 0.001 D. 10

[El Monofia - Tala 23]

11. 12 × 0.2 = ——

A. 24 B. 2.4
C. 0.24 D. 240

[Kafr El Sheikh - Byala 24]

12. 91.2 × 0.01 ☐ 0.0912 × 10

A. > B. <
C. = D. ≥

[El Monofia - Quesna 24]

13. 0.1 × 0.1 = ——

A. 0.03 B. 0.02
C. 0.01 D. 0.2

[Giza - Abo El Nomrous 23]

14. 6.237 × 100 ≈ ——

(to the nearest whole number)

A. 6,237 B. 62
C. 624 D. 623

Lesson 4

Multiply Decimals Using the Area of a Rectangle Model

Learn 1 Using multiplication patterns

$9 \times 4 = 36$

So, $9 \times 400 = 3{,}600$	$0.9 \times 4 = 3.6$	$0.09 \times 4 = 0.36$
$90 \times 40 = 3{,}600$	$9 \times 0.4 = 3.6$	$0.09 \times 0.4 = 0.036$
$9 \times 40 = 360$	$0.9 \times 0.4 = 0.36$	$0.9 \times 0.04 = 0.036$
$90 \times 4 = 360$	$9 \times 0.04 = 0.36$	$0.09 \times 0.04 = 0.0036$

Note that

The number of zeroes (or decimal places) in the product must be the sum of the numbers of zeroes (or decimal places) in both initial numbers.

Example 1

Complete each of the following.

a. Given that : $26 \times 59 = 1{,}534$, then

1. $2.6 \times 5.9 =$ _____
2. $0.26 \times 5.9 =$ _____
3. $0.26 \times 0.59 =$ _____
4. $26 \times 0.059 =$ _____

b. Given that : $271 \times 35 = 9{,}485$, then

1. $27.1 \times 35 =$ _____
2. $27.1 \times 3.5 =$ _____
3. $2.71 \times 3.5 =$ _____
4. $0.271 \times 3.5 =$ _____

Solution

a. **1.** 15.34	**2.** 1.534	**3.** 0.1534	**4.** 1.534
b. **1.** 948.5	**2.** 94.85	**3.** 9.485	**4.** 0.9485

Check your understanding

Complete :

Given that : $12 \times 13 = 156$, then

1. $120 \times 13 =$ _____	**2.** $1.2 \times 1.3 =$ _____	**3.** $0.12 \times 1.3 =$ _____
4. $1.2 \times 13 =$ _____	**5.** $12 \times 0.13 =$ _____	**6.** $1.2 \times 0.13 =$ _____
7. $12 \times 1.3 =$ _____	**8.** $0.12 \times 13 =$ _____	**9.** $0.12 \times 0.13 =$ _____

Notes for parents :

- Let your child count zeroes in the product and compare with the sum of the numbers of zeroes in the two factors.

Learn 2 How to use the area model to multiply decimals ?

Example : How to evaluate : 1.4×7.8 ?

	1	0.4
7	7	2.8
0.8	0.8	0.32

$$\begin{array}{r} 7 \\ +\ 2.\ 8 \\ +\ 0.\ 8 \\ +\ 0.\ 3\ 2 \\ \hline 10.\ 9\ 2 \end{array}$$

So, $1.4 \times 7.8 = 10.92$

Example : How to evaluate : 38.2×0.51 ?

	30	8	0.2
0.5	15	4	0.10
0.01	0.30	0.08	0.002

$$\begin{array}{r} 15 \\ +\ 4 \\ +\ 0.\ 1\ 0 \\ +\ 0.\ 3\ 0 \\ +\ 0.\ 0\ 8 \\ +\ 0.\ 0\ 0\ 2 \\ \hline 19.\ 4\ 8\ 2 \end{array}$$

So, $38.2 \times 0.51 = 19.482$

Example 2

Find the missing number in each of the following area models, write the problem, then find the product.

a.

	40	?
60	?	180
?	200	15

_____ × _____ = _____

b.

	2	0.8
5	?	?
?	0.8	0.32

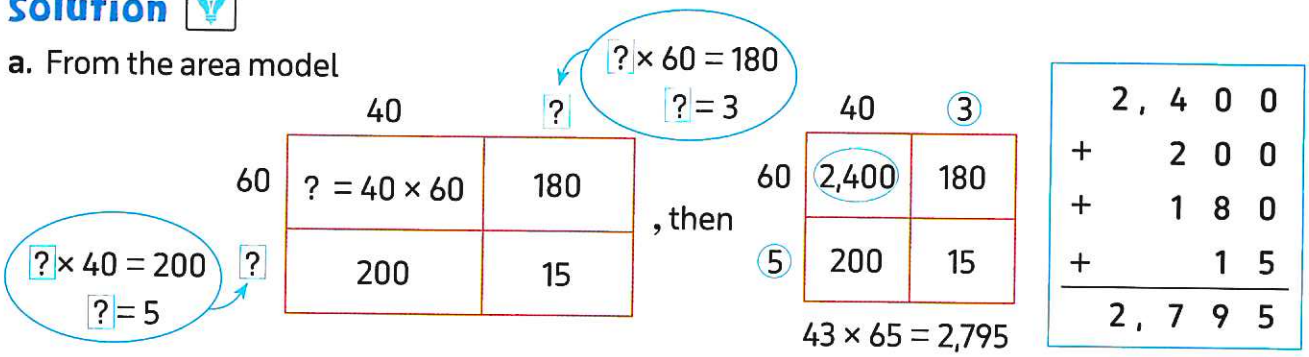
_____ × _____ = _____

Notes for parents :

- Remind your child how he/she multiply two whole numbers.

Solution

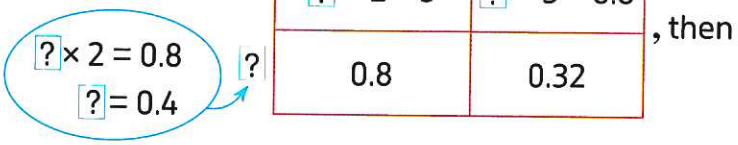
a. From the area model



43 × 65 = 2,795

$$\begin{array}{r} 2,400 \\ +\ \ 200 \\ +\ \ 180 \\ +\ \ \ \ 15 \\ \hline 2,795 \end{array}$$

b.



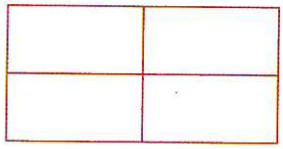
2.8 × 5.4 = 15.12

$$\begin{array}{r} 10 \\ +\ \ 4 \\ +\ \ 0.8 \\ +\ \ 0.32 \\ \hline 15.12 \end{array}$$

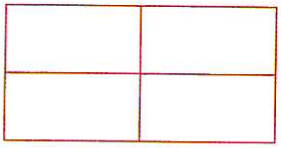
Check your understanding

Use the area model to complete each of the following.

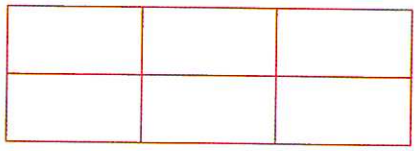
a. 2.5 × 8.6 = _____



b. 8.2 × 0.53 = _____



c. 41.6 × 0.25 = _____



d.

	30	___
40	___	8
___	150	1.0

_____ × _____ = _____

e.

	7	0.3
4	___	___
___	2.1	0.09

_____ × _____ = _____

• Let your child use palce value to decompose each factor into its parts.

Exercise 20
on lesson 4

▶ Multiply Decimals Using the Area of a Rectangle Model

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Look for patterns in each set of problems. Use the patterns to complete the unanswered problems.

a. 80 × 3 = 240

8 × 30 = 240

8 × 3 = _____

0.8 × 3 = _____

8 × 0.3 = 2.4

0.8 × 0.3 = _____

[Port Said - Port Fouad 24]

0.08 × 0.3 = _____

0.8 × 0.03 = _____

0.08 × 0.03 = _____

b. 18 × 42 = 756

180 × 42 = _____

1.8 × 4.2 = _____

0.18 × 4.2 = _____

1.8 × 0.042 = _____

18 × 0.42 = _____

0.018 × 42 = _____

0.18 × 0.42 = _____

18 × 4.2 = _____

c. 157 × 56 = 8,792

157 × 560 = _____

15.7 × 5.6 = _____

1.57 × 5.6 = _____

1.57 × 0.56 = _____

15.7 × 0.56 = _____

157 × 5.6 = _____

157 × 0.56 = _____

d. 7 × 600 = 4,200

7 × 60 = _____

7 × 6 = 42

7 × 0.6 = _____

7 × 0.06 = 0.42

0.7 × 0.6 = _____

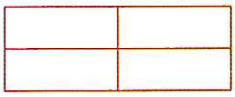
[Cairo - El Sayeda Zeinab 24]

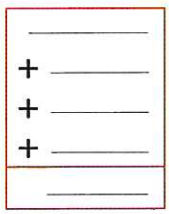
0.7 × 0.06 = _____

0.07 × 0.06 = _____

2. Use an area model to complete each of the following.

a. 1.3 × 6.8 = _____





b. 5.7 × 9.1 = _____

[El Monofia - Shebin El Kom 24]

c. 4.2 × 5.6 = _____

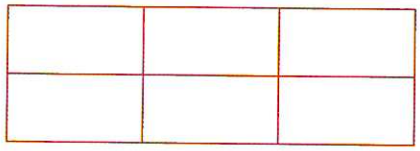
[Port Said - Port Fouad 24]

d. 8.3 × 2.6 = _____

e. 7.3 × 0.49 = _____

f. 2.1 × 0.67 = _____

g. 29.3 × 0.34 = _____



h. 3.55 × 0.75 = _____

i. 18.2 × 2.8 = _____ [Cairo - Hadaek El Quba 24]

j. 70.9 × 4.6 = _____

k. 1.74 × 3.5 = _____ [Ismailia 23]

l. 25 × 32.5 = _____ [Aswan 23]

3. **Look at the area models. Some of the numbers are missing. Use the information provided to fill in the blanks. Write the problem, and then find the product.**

a.

	20	8
50	1,000	?
?	80	32

Produact : _____

b.

	?	6
60	1,200	360
?	80	24

Product : _____

c.

	30	4
50	1,500	200
?	60	?

Product : _____

d.

	?	?	5
30	12,000	600	150
?	1,600	80	?

Product : _____

e.

	40	?
80	3,200	560
?	120	21

Product : _____

f.

	30	4	?
?	180	?	1.8
0.4	12	?	0.12

Product : _____

g.

	?	?	0.3
7	350	35	?
0.2	10	1	?

Product : _____

h.

	4	?	?
10	?	3	0.7
?	16	1.2	0.28

Product : _____

4. Complete.

a. If $19 \times 4 = 76$, then $1.9 \times 0.4 =$ _____

[El Beheira - Rasheed 24]

b. Since $11.3 \times 4.5 = 50.85$, then $1.13 \times 45 =$ _____

c. In the opposite area model, the value of $k + x =$ _____

	2	0.7
6	k	m
x	n	0.28

d. From the opposite area model, the value of $m + n =$ _____

	1	0.3	k
x	3	m	0.21
y	n	0.15	0.035

5. Malak works for a construction company. The company had 12 pallets of cinder blocks delivered for a building project. Each pallet weighed 1.36 metric tons.

Help Malak revise and complete the area model to figure out how much the cinder blocks weighed all together.

	1	0.3	0.06
10	10	30	6
2	2	6	12

Multiple Choice Questions

Choose the correct answer.

1. 3 × 2 Thousandths = _____ Thousandths

A. 5 B. 6
C. 32 D. 23

[Port Said 23]

2. 3 Tenths × 4 Tenths = _____

A. 12 Tenths B. 12 Hundredths
C. 12 Thousandths D. 12 Ones

[Cairo - El Salam 24, El Beheira 23]

3. The product 0.9 × 5 = _____

A. 0.45 B. 4.5
C. 5.4 D. 45

[El Beheira - Housh Essa 23]

4. 4.3 × 3.4 = _____

A. 14 B. 14.02
C. 14.62 D. 12.62

5. 2.85 × 4.1 = _____

A. 11.085 B. 10.685
C. 11.685 D. 12

6. 3.1 × 1.1 = _____ [El Monofia - Tala 23]

A. 34.1 B. 341
C. 0.341 D. 3.41

7. Since 35 × 47 = 1,645

, then 3.5 × 0.47 = _____

A. 164.5 B. 16.45
C. 1.645 D. 1,645

[Cairo - El Nouzha 23]

8. Since 7.5 × 4.3 = 32.25

, then 75 × 0.43 = _____

A. 3.225 B. 32.25
C. 322.5 D. 0.3225

9. If 9 × 4 = 36

, then 0.090 × 0.4 = _____

A. 36 B. 3.6
C. 0.36 D. 0.036

[Cairo - El Mokattam 24]

10. From the area model, m = _____

	4	0.3
2	8	0.6
0.5	m	0.15

A. 20 B. 0.02
C. 0.2 D. 2

[El Monofia - Shiben El Kom 23]

11. If the area model of a problem is

	2	0.3
3	x	0.9
0.5	1	y

, then x + y = _____

A. 6 B. 0.15
C. 6.15 D. 15.6 [Assiut 24]

12. If the area model of a problem is

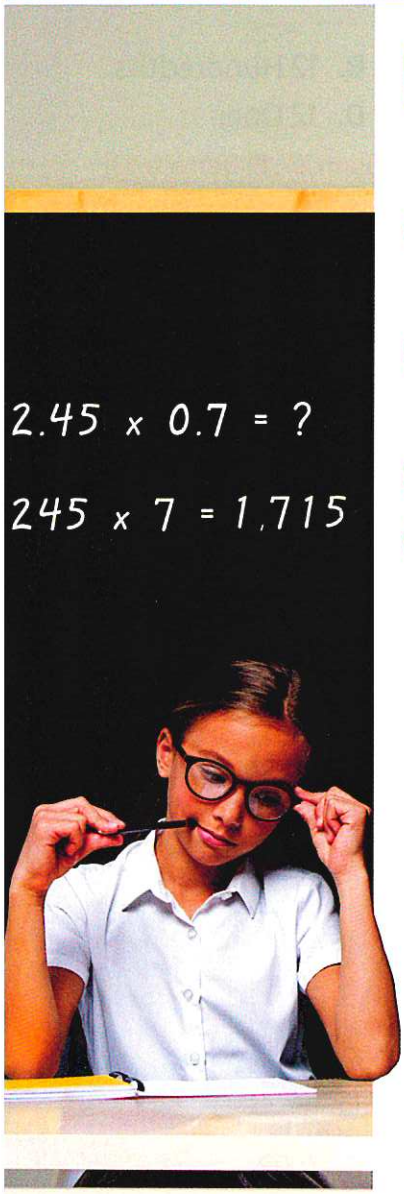
	L	0.8
5	15	k
m	n	0.24

, then L + m = _____

A. 3 B. 3.3
C. 15.24 D. 20.14

Lessons 5 & 6

- Multiplying Decimals through the Hundredths Place
- Multiplying Decimals through the Thousandths Place



Learn How to multiply two decimals ?

Just follow these steps :

1. **Ignore** the decimal point in each of the two numbers, in order to obtain two whole numbers.
2. **Multiply** the two whole numbers that you obtained by using standard algorithm or area model.
3. **Add** the number of decimal places in both initial numbers.
4. **Place** the decimal point in the product found in step 2 :
   The number of decimal places in the product must be the sum of the numbers of decimal places in both initial numbers.

For Example :

To multiply : 2.45×0.7 , you can follow the following steps :

1. **Ignore** the decimal point to obtain two whole numbers 245 and 7
2. **Multiply** the two whole numbers : $245 \times 7 = 1{,}715$
3. **Add** the number of decimal places in both initial numbers : $2 + 1 = 3$
4. **Place** the decimal point in the product : 1.715

$$\begin{array}{rl} 2.45 & \Rightarrow \text{2 decimal places} \\ \times\ 0.7 & \Rightarrow \text{1 decimal place} \\ \hline 1.715 & \Rightarrow \text{3 decimal places} \end{array}$$

Example 1

Multiply.

a. 0.46×0.9

b. 21.9×4.8

c. 0.02×0.4

d. 8.124×0.47

Notes for parents :

- Explain that the product should have as many decimal places as the sum of the decimal places in the factors.

Solution

You can multiply decimals directly as follows :

a.
$$\begin{array}{r} 0.46 \Rightarrow \text{2 decimal places} \\ \times\ 0.9 \Rightarrow \text{1 decimal place} \\ \hline 0.414 \Rightarrow \text{3 decimal places} \end{array}$$

b.
$$\begin{array}{r} 21.9 \Rightarrow \text{1 decimal place} \\ \times\ 4.8 \Rightarrow \text{1 decimal place} \\ \hline 1752 \\ +\ 8760 \\ \hline 105.12 \Rightarrow \text{2 decimal places} \end{array}$$

c.
$$\begin{array}{r} 0.02 \Rightarrow \text{2 decimal places} \\ \times\ 0.4 \Rightarrow \text{1 decimal place} \\ \hline 0.008 \Rightarrow \text{3 decimal places} \end{array}$$

Notice

We insert 2 zeroes to the left of 8 to make 3 decimal places.

d.
$$\begin{array}{r} 8.124 \Rightarrow \text{3 decimal places} \\ \times\ 0.47 \Rightarrow \text{2 decimal places} \\ \hline 56868 \\ +\ 324960 \\ \hline 3.81828 \Rightarrow \text{5 decimal places} \end{array}$$

Example 2

If the correct product of the problem $174 \times 68 = 118.32$ has been given without multiplying, place the decimal point correctly in one or both factors.

Solution

Since the decimal point of the product after 2 decimal places, then the sum of numbers of decimal places in both factors equals 2 decimal places as 17.4×6.8 or 1.74×68 or 174×0.68

Note that

There are more than one correct answer is possible.

Check your understanding

Multiply :

a. 0.62×5.3

b. 2.734×0.39

- Let your child find the sum of decimal places in the factors and put the decimal point in the product to match this number.

Exercise 21

on lessons 5&6

- Multiplying Decimals through the Hundredths Place
- Multiplying Decimals through the Thousandths Place

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Place the decimal point in the product. you may have to write zeroes in the product.

a. $1.2 \times 2.4 = 288$

b. From the school book $5.8 \times 7.4 = 4292$

c. From the school book $32.4 \times 5.3 = 17172$

d. $0.09 \times 0.3 = 27$

e. $1.75 \times 2.3 = 4025$

f. $15.85 \times 4.3 = 68155$

g. From the school book $15.4 \times 0.49 = 7546$

h. From the school book $11.68 \times 2.4 = 28032$

i. $3.14 \times 0.05 = 1570$

j. $0.24 \times 0.398 = 9552$

---

2. From the school book The correct product for each problem has been given. Without multiplying, use reasoning to place the decimal point correctly in one or both factors. More than one correct answer is possible.

a. $38 \times 64 = 24.32$

b. $532 \times 17 = 9.044$

c. $826 \times 43 = 3,551.8$

d. $18 \times 145 = 261$

---

3. Find the product for each multiplication problem using the standard algorithm.

a. From the school book

$$\begin{array}{r} 2.43 \\ \times\ 6.9 \\ \hline + \\ \hline \\ \hline \end{array}$$

b. From the school book

$$\begin{array}{r} 29.35 \\ \times\ 3.4 \\ \hline + \\ \hline \\ \hline \end{array}$$

c. From the school book

$$\begin{array}{r} 47.8 \\ \times\ 5.2 \\ \hline + \\ \hline \\ \hline \end{array}$$

d.

$$\begin{array}{r} 2.08 \\ \times\ 0.07 \\ \hline + \\ \hline \\ \hline \end{array}$$

e.

$$\begin{array}{r} 9.72 \\ \times\ 0.46 \\ \hline + \\ \hline \\ \hline \end{array}$$

f. From the school book

$$\begin{array}{r} 1.74 \\ \times\ 35 \\ \hline + \\ \hline \\ \hline \end{array}$$

g. From the school book

$$\begin{array}{r} 10.21 \\ \times\ 0.64 \\ \hline + \\ \hline \\ \hline \end{array}$$

h. From the school book

$$\begin{array}{r} 7.184 \\ \times\ 6.3 \\ \hline + \\ \hline \\ \hline \end{array}$$

i. 8.108 × 0.45 +

j. 2.467 × 41 +

k. 6.429 × 1.9 +

l. 8.375 × 20 +

m. 5.328 × 7.9 +

n. 6.461 × 0.28 +

o. 8.92 × 0.17 +

p. 12.87 × 7.3 +

4. **Compare the products of the following by putting (<, > or =).**

a. 0.318×1.5	◯	3.18×0.15	**b.** 0.75×0.02	◯	7.5×0.2
c. 13.6×0.4	◯	0.136×0.4	**d.** 7.3×0.28	◯	0.73×2.8
e. 0.342×1.2	◯	3.42×0.12	**f.** 172×0.003	◯	0.172×0.3
g. 48.2×3.7	◯	4.82×37	**h.** 42×1.532	◯	4.2×15.32
i. 2.06×1.5	◯	$2.06 \times 0.3 \times 0.5$			

5. **Solve the problem : 7.184×6.3 by two different ways by using.**

a. Area model.

b. Standard algorithm.

Multiple Choice Questions

Choose the correct answer.

1. If $31 \times 251 = 7{,}781$, then $3.1 \times 2.51 =$ _____

A. 7,781 B. 77.81
C. 7.781 D. 0.7781

[Cairo - El Maadi 24]

2. $0.676 \times 0.4 =$ _____

A. 0.27 B. 0.3068
C. 2.704 D. 0.2704

3. The decimal point in the product of 3.9×4.25 is after _____ place[s].

A. 1 B. 2
C. 3 D. 4

4. $8.43 \times 0.2 \approx$ _____ [Ismailia 24, Giza 23]

[to the nearest Hundredth]

A. 1.686 B. 1.68
C. 1.69 D. 100

5. $9.13 \times 3.5 \square 91.3 \times 0.35$

A. > B. <
C. = D. otherwise

[Ismailia 23]

6. $2.7 \times 0.0099 =$ _____

A. 0.002672 B. 0.02672
C. 0.02673 D. 0.2673

7. $0.025 \times 0.04 =$ _____

A. 0.01 B. 0.001
C. 0.0001 D. 0.00001

8. $4.012 \times 5.6 =$ _____

[to the nearest Tenth]

A. 22 B. 22.5
C. 22.47 D. 22.467

9. $4.325 \times 2.3 =$ _____

A. 9.9475 B. 9.9745
C. 9.95 D. 13.84

10. $1.5 \times 0.9 \square 1.52 \times 0.95$

A. > B. <
C. = D. otherwise

[El Monofia - Tala 24]

Lessons
7 & 8

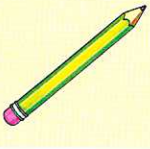
- Decimals and the Metric System
- Measurement, Decimals and Powers of Ten

Learn

Metric units of length

Metric units of length are meter (m), centimeter (cm), millimeter (mm) and kilometer (km)

An ant is about 3 millimeters

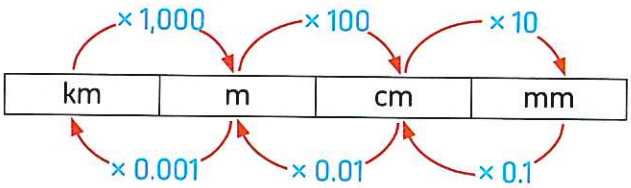


A pencil is about 20 centimeters

The length of a class is about 6 meters

The distance between Cairo and Alexandria is about 248 kilometers

• Converting metric units of length :



1 km = 1,000 m

1 m = 100 cm

1 cm = 10 mm

Unit of Measurement	In Millimeters	In Centimeters	In Meters
Millimeter	1	0.1	0.001
Centimeter	10	1	0.01
Meter	1,000	100	1

For Example :

- 7.54 m = 7.54 × 100 cm = 754 cm
- 14.16 mm = 14.16 × 0.1 cm = 1.416 cm
- 255.2 cm = 255.2 × 0.01 m = 2.552 m
- 4,620 m = 4,620 × 0.001 km = 4.62 km

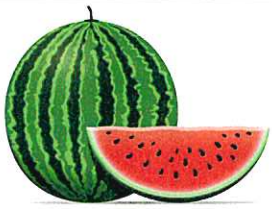
Notes for parents :

- Your child relate the metric system to the place value system and use decimals to represent equivalent measurements.

Metric units of mass

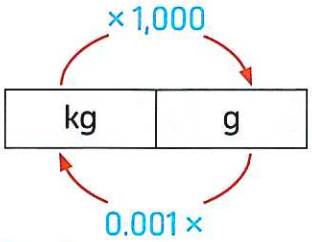
Metric units of mass are gram [g] and kilogram [kg]

A ring is about 4 grams.



A watermelon is about 8 kilograms.

• Converting metric units of mass :



1 kg = 1,000 g

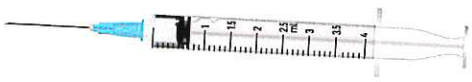
Unit of Measurement	In Grams	In Kilograms
Gram	1	0.001
Kilogram	1,000	1

For Example :

- 4.56 kg = 4.56 × 1,000 gm = 4,560 g
- 567 gm = 567 × 0.001 kg = 0.567 kg
- 2 kg – 500 gm = 2 × 1,000 gm – 500 gm
  = 2,000 gm – 500 gm = 1,500 gm

Metric units of capacity

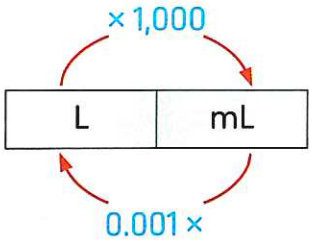
Metric units of capacity are liter [L] and milliliter [mL]



An injection is about 4 milliliters.

A bottle of milk is about 1 liter.

• Converting metric units of capacity :



1 L = 1,000 mL

Unit of Measurement	In Milliliters	In Liters
Milliliter	1	0.001
Liter	1,000	1

For Example :

- 12.4 mL = 12.4 × 0.001 L = 0.0124 L
- 4.25 L = 4.25 × 1,000 mL = 4,250 mL
- 3.4 L – 1,700 mL = 3.4 L – 1,700 × 0.001 L
  = 3.4 L – 1.7 L = 1.7 L

Notes for parents :

- Explain that, like our place value system, relationship in the metric system are based on 10 , 100, and 1,000, also known as powers of 10.

Example 1

Complete each of the following.

a. 17.3 mm = _____ cm

b. 4.17 km = _____ m

c. 45.8 cm = _____ m

d. 0.15 m = _____ mm

e. 0.08 kg = _____ g

f. 540 g = _____ kg

g. 0.043 L = _____ mL.

h. 7,800 mL = _____ L

Solution

a. 17.3 mm = 17.3 × 0.1 cm = 1.73 cm

b. 4.17 km = 4.17 × 1,000 m = 4,170 m

c. 45.8 cm = 45.8 × 0.01 m = 0.458 m

d. 0.15 m = 0.15 × 1,000 mm = 150 mm

e. 0.08 kg = 0.08 × 1,000 g = 80 g

f. 540 g = 540 × 0.001 kg = 0.54 kg

g. 0.043 L= 0.043 × 1,000 mL = 43 mL

h. 7,800 mL = 7,800 × 0.001 L = 7.8 L

Example 2

Compare, write [>, < or =] for each ☐.

a. 50 mL ☐ 0.05 L

b. 0.7 kg ☐ 697 g

c. 2,400 mm ☐ 4.2 m

d. 350 cm ☐ 3.4 m

Solution

a. Since 50 mL = 50 × 0.001 L = 0.05 L

So, 50 mL = 0.05 L

b. Since 0.7 kg = 0.7 × 1,000 g = 700 g

So, 0.7 kg = 700 g > 697 g

c. Since 2,400 mm = 2,400 × 0.001 m = 2.4 m

So, 2,400 mm = 2.4 m < 4.2 m

d. Since 350 cm = 350 × 0.01 m = 3.5 m

So, 350 cm = 3.5 m > 3.4 m

Check your understanding

Complete.

a. 4.007 km = _____ m

b. 6,750 mL = _____ L

c. 452 cm = _____ m

d. 40 g = _____ kg

e. 2.7 L = _____ mL

f. 4.21 m = _____ cm

g. 2.73 kg = _____ g

h. 2.5 L – 500 mL = _____ mL

- Explain that since metric measurements are related through powers of 10 , it is possible to write measurements using decimals.

Exercise 22

on lessons 7&8

- Decimals and the Metric System
- Measurement, Decimals and Powers of Ten

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. From the school book **Select the most appropriate unit of measurement from the given terms to measure the length of each object.**

millimeters centimeters meters kilometers

a. Pencil : Unit of measure _____

b. Height of building : Unit of measure _____

c. Length of dinner table : Unit of measure _____

d. Length of the Nile River : Unit of measure _____

e. Length of insect : Unit of measure _____

2. **Complete.**

a. 5.7 L = 5.7 × _____ = _____ mL

b. 2.589 m = 2.589 × _____ = _____ cm

c. 87.2 km = 87.2 × _____ = _____ m

d. 3.02 kg = 3.02 × _____ = _____ g

e. 140 g = 140 × _____ = _____ kg

f. 18.4 mm = 18.4 × _____ = _____ cm

g. 52 cm = 52 × _____ = _____ m

h. From the school book 142 cm = 142 × _____ = _____ m

i. From the school book 317 kg = 317 × _____ = _____ g

j. 370 mL = 370 × _____ = _____ L

k. 5.9 m = 5.9 × _____ = _____ mm

l. 527 cm= 527 × _____ = _____ mm

m. 8.657 m = 8.657 × _____ = _____ cm ≈ _____ cm [to the nearest cm.]

n. 7,400 mL = 7,400 × _____ = _____ L ≈ _____ [to the nearest liters]

o. 4.8 km – 1,800 m = _____ km

p. 570 mm + 1.43 m = _____ m

q. 5 L – 3,200 mL = _____ L

r. 15.6 kg + 2,600 g = _____ kg

3. 📖 **Choose the correct answer.**

a. 10,870 g = ——— kg

A. 1,087 **B.** 108.7 **C.** 10.87 **D.** 1.087

b. 3,465 mL = ——— L

A. 0.3465 **B.** 3.465 **C.** 34.65 **D.** 346.5

c. 22 cm = ——— m

A. 2,200 **B.** 220 **C.** 2.2 **D.** 0.22

d. 0.7 m = ——— cm [Aswan - Kom Ombo 23]

A. 7 **B.** 70 **C.** 700 **D.** 7,000

e. 17.6 kg = ——— g [Port Said 23]

A. 0.176 **B.** 1.76 **C.** 1,760 **D.** 17,600

f. 95 mm = ——— cm

A. 9.5 **B.** 950 **C.** 9,500 **D.** 95,000

g. 19,629 mL = ——— L

A. 1,962.9 **B.** 196.29 **C.** 19.629 **D.** 1.9629

h. 3.3 m = ——— cm

A. 33 **B.** 330 **C.** 3,300 **D.** 33,000

i. 700 g = ——— kg [El Beheira - Rasheed 24]

A. 7,000 **B.** 70 **C.** 7 **D.** 0.7

j. 694 mm = ——— cm

A. 6,940 **B.** 69.4 **C.** 6.94 **D.** 0.694

k. 2.5 L = ——— mL [El Monofia - Ashmoon 24, Port Said - Port Fouad 24]

A. 2,500 **B.** 250 **C.** 25 **D.** 0.25

l. 7.8 cm = ——— mm

A. 0.078 **B.** 0.78 **C.** 78 **D.** 780

4. **Put (<) , (>) or (=).**

a. 2,180 cm ◯ 2.18 m

b. 0.41 kg ◯ 416 g

c. 5 mL ◯ 0.005 L

d. 24 mm ◯ 0.24 cm

e. 0.088 m ◯ 8.7 mm

f. 7.1 L ◯ 715 mL

g. 8 g ◯ 0.08 kg

h. 0.01 km ◯ 7 m

5. **Order each of the following from least to greatest.**

a. 0.75 kg , 570 g , 0.8 kg , 790 g , 0.762 kg

b. 0.65 km , 590 m , 0.8 km , 705 m [Cairo - West 23]

c. 400.2 mL , 0.35 L , 427 mL , 0.3 L , 0.42 L

6. Study each problem. In each problem, mark whether the multiplication given to complete the conversion is correct. Select Y for yes and N for no. Then, complete all conversions by filling in each blank with the equivalent measurement (even if the conversion is incorrect).

a. 0.007 kg = _____ g 0.007 × 1,000 Y/N	**b.** 51 mm = _____ cm 51 × 10 Y/N	**c.** 230 cm = _____ m 230 × 0.01 Y/N	**d.** 4,800 mL = _____ L 4,800 × 0.1 Y/N
e. 4 cm = _____ m 4 × 0.01 Y/N	**f.** 500 mL = _____ L 500 × 1,000 Y/N	**g.** 5.67 m = _____ cm 5.67 × 10 Y/N	**h.** 782 mm = _____ cm 782 × 10 Y/N
i. 1.5 m = _____ cm 1.5 × 0.01 Y/N	**j.** 6,410 cm = _____ m 6,410 × 0.01 Y/N	**k.** 6,410 m = _____ km 6,410 × 0.001 Y/N	**l.** 350 cm = _____ m 350 × 0.01 Y/N
m. 0.8 cm = _____ mm 0.8 × 0.1 Y/N	**n.** 10.3 m = _____ cm 10.3 × 0.01 Y/N	**o.** 9,320 mm = _____ cm 9,320 × 10 Y/N	**p.** 9,320 cm = _____ m 9,320 × 0.01 Y/N

7. There are two categories of weightlifting : The Snatch and the Clean and Jerk. World Champion Egyptian weightlifter Mohamed Ehab wants to compare his personal best in these two categories. In the Snatch, he was able to lift 173 kilograms. He was able to lift 201,000 grams in the Clean and Jerk. Use multiplication and powers of 10 to explain which measurement is greater.

_____

_____

8. Yousra is a veterinarian. She needs to weigh a cat to see if it is healthy.
Yousra records that the cat weighs 3.648 kilograms. Her assistant records that the cat weighs 3,648.0 grams.
Do you agree with Yousra or her assistant ? Why ?

_____

_____

Multiple Choice Questions

Choose the correct answer.

1. 10.870 grams = _____ kg

A. 1,087 B. 108.7
C. 10,87 D. 1.087

[El Monofia - Ashmoon 24]

2. 36.2 mL = _____ L

A. 36,200 B. 362
C. 0.0362 D. 362

[Cairo - Hadaek El Quba 24]

3. 740 m = _____ km

A. 7.4 B. 0.74
C. 7,400 D. 74

4. 4.61 m = _____ cm

A. 46.1 B. 461
C. 4,610 D. 46,100

5. 40 g ◯ 0.04 kg

A. > B. <
C. =

6. 1.62 m ◯ 1,619 mm

A. > B. <
C. =

7. Which of the following is the greatest ?

A. 2,700 mm B. 3 m
C. 0.002 km D. 285.8 cm

8. 5 km, 45 m = _____ m

A. 545 B. 455
C. 4,505 D. 5,045

[Qena - Negada 24]

9. 6 cm and 5 mm = _____ mm

A. 650 B. 65
C. 6,500 D. 56

[Port Said - North 24]

10. 3.5 L – 1,500 mL = _____ L [Ismailia 23]

A. 2 B. 20
C. 200 D. 2,000

11. Amgad is a weightlifter. He needs to drink about 4,230 milliliters of water every day. How many liters of water does he need ? Select the multiplication problem that could be used to answer the question.

A. 4,230 × 1,000 B. 4,230 × 0.01
C. 4,230 × 100 D. 4,230 × 0.001

12. Aya ran a 5 kilometers race. How many meters did she run ? [Aswan 23]

A. 50 B. 500 C. 5,000 D. 0.005

13. There are _____ milliliters in 18 liters. [Giza - Awseem 23, Cairo - Al Khalifa and Al Mokattam 23]

A. 18 B. 180 C. 1,800 D. 18,000

Lesson 9

Solving Multistep Story Problems

Learn How to solve multistep story problems ?

Read to understand

- Read the story loudly more than one time carefully.
- Identify the details and quantities given.
- Identify the hidden question (if exists).
- Search for key words.

Read to understand
Plan
Solve
Check

Plan

- Decide the operation [+ , – , × , ÷].
- Decide the strategy you can use to solve the problem.

Solve

- Solve the hidden question (if exists).
- How can you use the strategy to solve the problem ?

Check

- How do you know your answer is correct ?
- What other strategy could you use to solve the problem ?

Example 1

Amira went to the supermarket, she bought 1.5 kg of tomato, 875 g of peas, 0.09 kg of spices and 2,750 g of cucumber. Find the weight [in grams] of what Amira bought.

Notes for parents :

- Remind your child that multistep problem is a problem that involves more than one operation.

Solution

This example wants to find the weight (in grams)

So, we convert each kilogram

into gram before adding.

1.5 kg tomato = 1.5 × 1,000 g = 1,500 g

0.09 kg spices = 0.09 × 1,000 g = 90 g

So, the total weight

= 1,500 + 875 + 90 + 2,750 = 5,215 g

Notice that

If you convert to grams, you would use more whole numbers, meaning the calculations would involve larger numbers. If you convert to kilograms, you would use more decimals. No matter to what unit you convert, the sum is the same but given in different units.

Example 2

Sandy bought 450 mL of mango juice. Her sister Marvina drank 0.26 liter.
What is the remaining quantity of the mango juice ?

Solution

Since 0.26 liter = 0.26 × 1,000 mL = 260 mL

So, the remaining quantity = 450 – 260 = 190 mL

Example 3

A trousers factory needs 1.12 m of fabric to produce one trousers. If the factory plans to produce 48 trousers and the fabric roll contains 2,000 cm. of fabric , how many rolls does the factory need ? And how long is the remaining part ?

Solution

The fabric needed to make 48 trousers = 48 × 1.12 m = 53.76 m

Each fabric roll contains 2,000 cm = 2,000 × 0.01 m = 20 m Since [20 × 2 < 53.76 < 20 × 3]

So, the number of rolls needed = 3 rolls

The length of fabric in 3 rolls = 3 × 20 = 60 m

The remaining part = 60 – 53.76 = 6.24 m

Check your understanding

Youssef wants to know how much he has grown this year. In January, he was 141.8 cm
By the end of the year, he was 1.6 meters tall. How much did Youssef grow this year ?

- Ask your child what strategy he/she decided to use, and why he/she chose it.

Exercise 23

on lesson 9

▸ Solving Multistep Story Problems

● REMEMBER ● UNDERSTAND ○ APPLY PROBLEM SOLVING | From the school book

1. If the heights of Nada, Habiba and Sara are 1.22 m, 124 cm and 1,230 mm, what is the total of their heights ?

2. If Nader's weight at the beginning of a year is 34.1 kg and his weight at the end of the same year is 32,460 g, how much weight did Nader lose ?

3. Mohamed bought 12 bottles of orange juice each contains 640 mL. Ibrahim bought 7 bottles of mango juice each contains $\frac{1}{2}$ liter.
How many liters do they have together ?

4. The length of a fabric roll is 4.56 m. A piece of length 114 cm is taken to make a blouse and another piece of length 980 mm to make a skirt. How long is the remaining part ?

5. Marwan is a computer engineer. The computer he is repairing is currently in three pieces that have a mass of 2 kilograms, 600 grams and 0.03 kg. His manager is waiting for the last piece, which has a mass of 1,750 g to arrive. What will the mass of the computer be when it is completely assembled ?

6. Rania is a nurse in a hospital. She is getting wrap bandages from the storage closet for her patients. She needs 1.35 meters of bandages for each of her 4 patients. There are 250 centimeters in each package.
How many packages does she need ?
How many, if any, will be left over ?

7. Dalia made a liter of sugar cane juice. She drank 320 milliliters. Her father drank 0.25 liters.
How much sugar cane juice is remaining ?

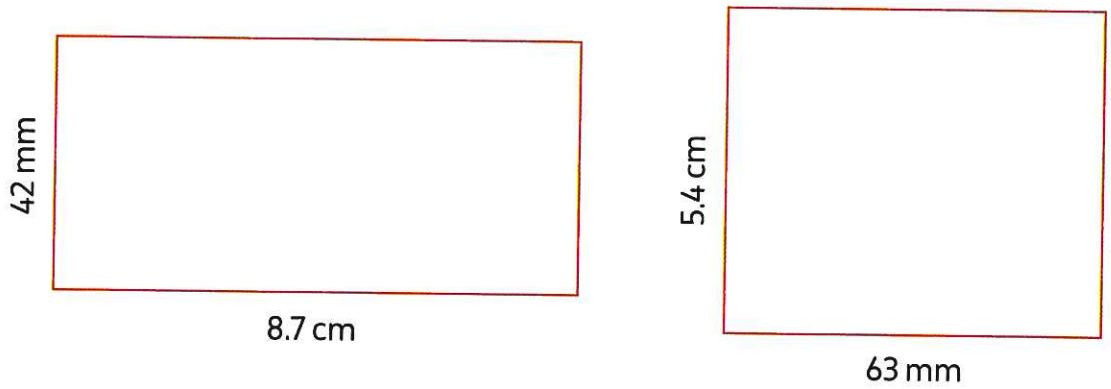
8. **a.** Ehab wants to know how much he has grown this year. In January, he was 138.2 centimeters. By the end of the year, he was 1.5 meters tall.
How much did Ehab grow this year ?

b. Ehab's twin sister Eman also wants to know how much she grew. In January, she was 1.34 meters. At the end of the year, she was 145 centimeters.

Who grew more, Ehab or Eman ?

How much more ?

9. The dimensions of the two rectangles are shown in the following figures.



Find :

a. The difference in perimeter of the two rectangles.

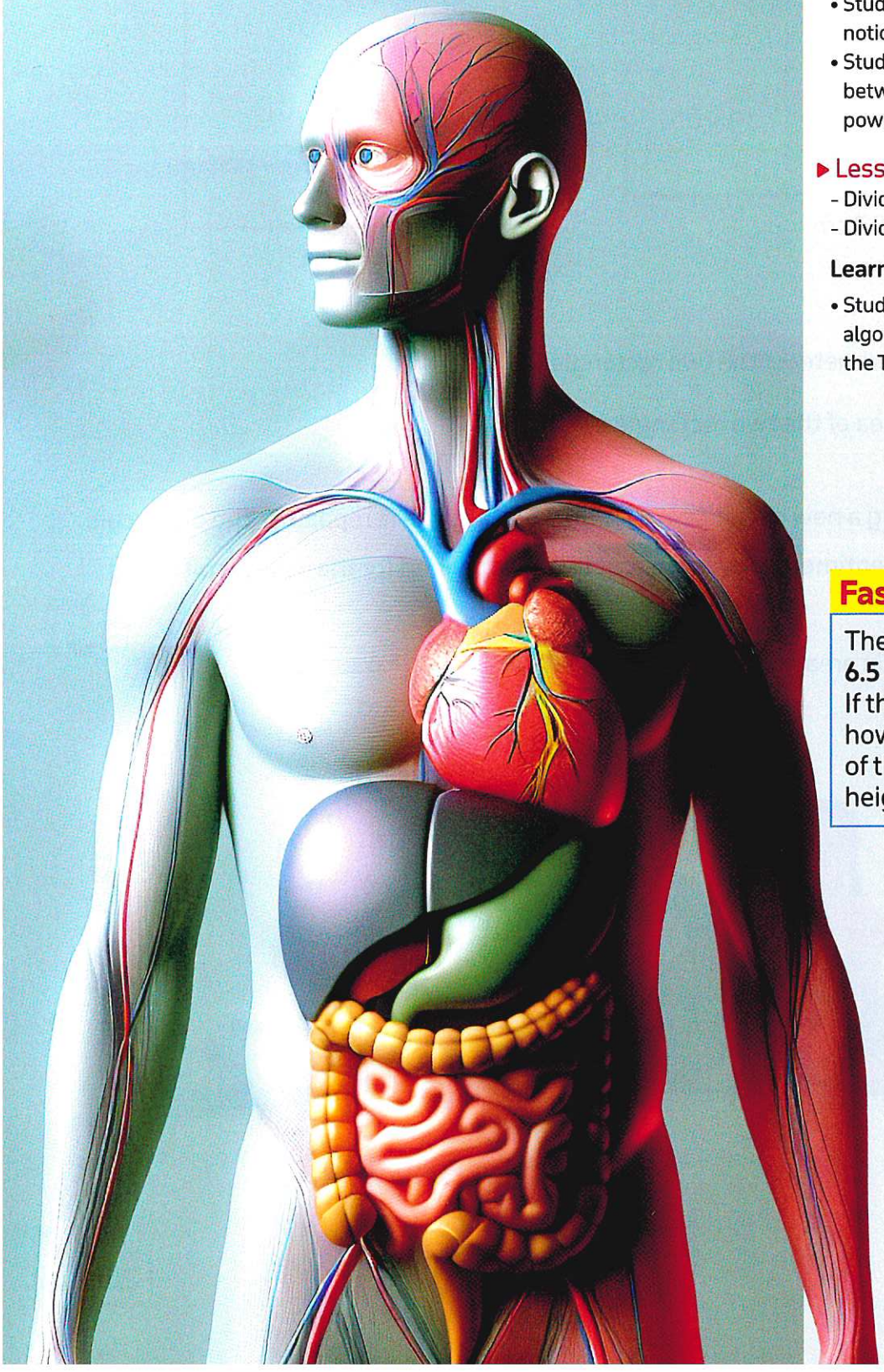
b. The difference in area of the two rectangles.

10. 🕮 Marwan is designing a new circuit board for the computer he is repairing. The old circuit board measured 7.25 centimeters by 36 millimeters. He planned for the new circuit board to be 80 mm by 5.5 cm.

What is the difference in area of the circuit boards ?

CONCEPT 2

Dividing Decimals



▶ Lessons 10&11
- Dividing by Powers of Ten
- Patterns and Relationships in Powers of Ten

Learning Objectives:
- Students will explain patterns they notice when dividing by powers of ten.
- Students will make connections between multiplying and dividing by powers of ten.

▶ Lessons 12&13
- Dividing Decimals by Whole Numbers
- Dividing Decimals by Decimals

Learning Objectives:
- Students will use the standard algorithm to divide decimals through the Thousandths place.

Fast Fact

The small intestine is about **6.5 m** long.
If the height of a child is **1.3 m**, how many times is the length of the small intestine as the height of the child ?

Lessons 10 & 11

- Dividing by Powers of Ten
- Patterns and Relationships in Powers of Ten

Learn 1 How to divide a number by powers of 10

A school has 350 pupils distributed among 10 calsses.

How many pupils are in each class ?

- Number of pupils in each class = 350 ÷ 10
  = 35 pupils

How do you divide a number by a power of 10 ?

- To divide by { 10 / 100 / 1,000 } move the decimal point { 1 place / 2 places / 3 places } to the (left)
- To divide by { 0.1 / 0.01 / 0.001 } move the decimal point { 1 place / 2 places / 3 places } to the (right)

For Example :

- 14.36 ÷ 10 = 1.436
- 005.87 ÷ 100 = 0.0587
- 25600.÷ 1,000 = 25.6

} Move the decimal point to the left ←

- 78.36 ÷ 0.1 = 783.6
- 239.80 ÷ 0.01 = 23,980
- 0.0063 ÷ 0.001 = 6.3

} Move the decimal point to the right →

Notice

It is possible to put zeroes on the left of the whole part or zeroes on the right of the last digit of the decimal part without changing value of the number.

For Example :

- 000235.36000 ....
- 000736.0000 ....

Notes for parents :

- Remind your child that when dividing by 10 ,100 , or 1,000 , move the decimal point one place to the left for each zero in the divisor.

Example 1

Find the result of each of the following.

a. $745.36 \div 100 =$ _____

b. $1{,}736.8 \div 10 =$ _____

c. $2{,}385 \div 0.01 =$ _____

d. $6{,}532 \div 1{,}000 =$ _____

e. $7.389 \div 0.1 =$ _____

f. $8.3 \div 0.001 =$ _____

Solution

a. $745.36 \div 100 = 7.4536$

b. $1736.8 \div 10 = 173.68$

c. $2385.00 \div 0.01 = 238{,}500$

d. $6532. \div 1{,}000 = 6.532$

e. $7.389 \div 0.1 = 73.89$

f. $8.300 \div 0.001 = 8{,}300$

Check your understanding

Find each of the following.

a. $89.36 \div 0.01 =$ _____

b. $256 \div 0.001 =$ _____

c. $9.03 \div 0.1 =$ _____

d. $736.8 \div 100 =$ _____

e. $23.68 \div 10 =$ _____

f. $681.3 \div 1{,}000 =$ _____

Notes for parents :

- Remind your child that he/she may need to insert zeroes. For example, $6.87 \div 100 = 0.0687$.

Learn 2 Dividing and multiplying by the powers of ten

- Dividing a number by { 0.1 / 0.01 / 0.001 } is equivalent to multipling it by { 10 / 100 / 1,000 }

For Example :

- 235.87 ÷ 0.1 = 2,358.7 , 235.87 × 10 = 2,358.7
- 235.87 ÷ 0.01 = 23,587 , 235.87 × 100 = 23,587
- 235.870 ÷ 0.001 = 235,870 , 235.870 × 1,000 = 235,870

÷ 0.1 ×10 ÷ 0.01 ×100 ÷ 0.001 ×1,000

- Dividing a number by { 10 / 100 / 1,000 } is equivalent to multipling it by { 0.1 / 0.01 / 0.001 }

For Example :

- 235.87 ÷ 10 = 23.587 , 235.87 × 0.1 = 23.587
- 235.87 ÷ 100 = 2.3587 , 235.87 × 0.01 = 2.3587
- 0235.87 ÷ 1,000 = 0.23587 , 0235.87 × 0.001 = 0.23587

÷10 ×0.1 ÷100 ×0.01 ÷1,000 ×0.001

Example 2

Solve the following problems, then draw lines between problems with the same answer.

785.6 ÷ 100	785.6 × 100
785.6 ÷ 0.1	785.6 × 0.1
785.6 ÷ 0.01	785.6 × 10
785.6 ÷ 1,000	785.6 × 0.01
785.6 ÷ 10	785.6 × 1,000
785.6 ÷ 0.001	785.6 × 0.001

- Make sure that your child understand that dividing by 0.1 , 0.01 , or 0.001 is equivalent to multiplying by 10 , 100 , or 1,000 respectivly.

Solution

785.6 ÷ 100 = 7.856	785.6 × 100 = 78,560
785.6 ÷ 0.1 = 7,856	785.6 × 0.1 = 78.56
785.6 ÷ 0.01 = 78,560	785.6 × 10 = 7,856
785.6 ÷ 1,000 = 0.7856	785.6 × 0.01 = 7.856
785.6 ÷ 10 = 78.56	785.6 × 1,000 = 785,600
785.6 ÷ 0.001 = 785,600	785.6 × 0.001 = 0.7856

Example 3

Complete each of the following.

a. 17.63 × _____ = 176.3

b. 56 × _____ = 0.056

c. 258.7 ÷ _____ = 258,700

d. 83.67 × _____ = 8,367

e. 96 ÷ _____ = 0.096

f. 34.56 ÷ _____ = 3,456

g. 45.38 × _____ = 4.538

h. 7,380 ÷ _____ = 73,800

Solution

a. 17.63 × 10 = 176.3

b. 56 × 0.001 = 0.056

c. 258.7 ÷ 0.001 = 258,700

d. 83.67 × 100 = 8,367

e. 96 ÷ 1,000 = 0.096

f. 34.56 ÷ 0.01 = 3,456

g. 45.38 × 0.1 = 4.538

h. 7,380 ÷ 0.1 = 73,800

Check your understanding

Use multiplication to find the same result of each of the following.

a. 73.85 ÷ 100

b. 893.5 ÷ 0.01

c. 1.32 ÷ 10

_____

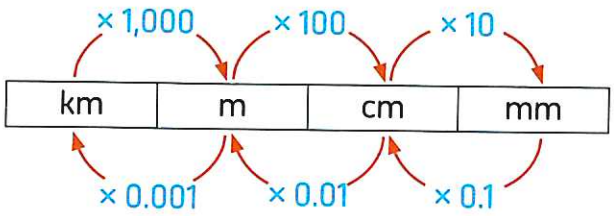
_____

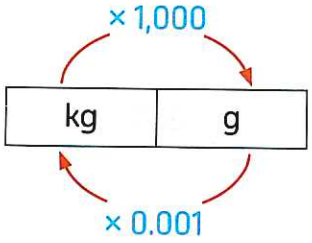
Notes for parents :

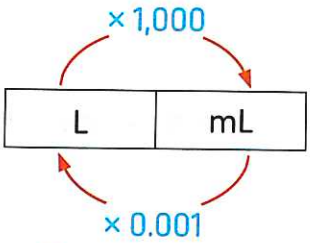
- Ask your child to explain when it is important to insert zeroes when moving the decimal point to the left or to the right.

Metric conversions with Multiplication and Division

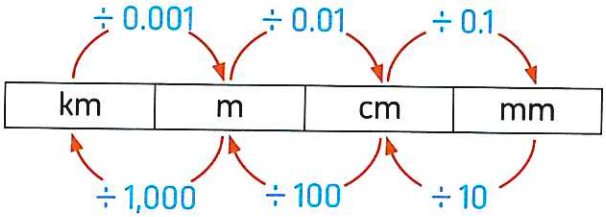
Using multiplication

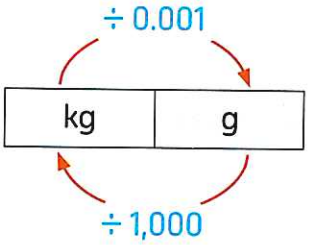


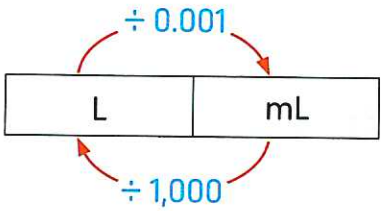




Using division







Example 4

Complete each conversion, then write a multiplication equation and a division equation with the same answer.

a. 512 cm = _____ m

512 × _____ = _____

512 ÷ _____ = _____

b. 0.7 kg = _____ g

0.7 × _____ = _____

0.7 ÷ _____ = _____

c. 2,345 mL = _____ L

2,345 × _____ = _____

2,345 ÷ _____ = _____

Solution

a. 512 cm = 5.12 m

512 × 0.01 = 5.12

512 ÷ 100 = 5.12

b. 0.7 kg = 700 g

0.7 × 1,000 = 700

0.7 ÷ 0.001 = 700

c. 2,345 mL = 2.345 L

2,345 × 0.001 = 2.345

2,345 ÷ 1,000 = 2.345

Check your understanding

Complete using multiplication and division to get the same result.

a. 25.6 mm = _____ cm

_____ × _____ = _____

_____ ÷ _____ = _____

b. 2.5 L = _____ mL

_____ × _____ = _____

_____ ÷ _____ = _____

c. 736 g = _____ kg

_____ × _____ = _____

_____ ÷ _____ = _____

- Ask your child to explain when he/she multiply or divide to convert from larger unit to smaller unit, and from smaller unit to larger one.

Exercise 24

on lessons 10&11

- Dividing by Powers of Ten
- Patterns and Relationships in Powers of Ten

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Find each of the following.

a. 2,500 ÷ 1 = _____
2,500 ÷ 10 = _____
2,500 ÷ 100 = _____
2,500 ÷ 1,000 = _____
2,500 ÷ 0.1 = _____
2,500 ÷ 0.01 = _____
2,500 ÷ 0.001 = _____

b. 6,700 ÷ 1,000 = _____
6,700 ÷ 100 = _____
6,700 ÷ 10 = _____
6,700 ÷ 1 = _____
6,700 ÷ 0.1 = _____
6,700 ÷ 0.01 = _____

c. 800 ÷ 100 = _____
800 ÷ 10 = _____
800 ÷ 1 = _____
800 ÷ 0.1 = _____
800 ÷ 0.01 = _____

d. 783 ÷ 10 = _____
783 ÷ 100 = _____
783 ÷ 1,000 = _____
783 ÷ 0.1 = _____
783 ÷ 0.01 = _____
783 ÷ 0.001 = _____

e. 235.68 ÷ 10 = _____
235.68 ÷ 100 = _____
235.68 ÷ 1,000 = _____
235.68 ÷ 0.1 = _____
235.68 ÷ 0.01 = _____
235.68 ÷ 0.001 = _____

f. 8.7 ÷ 10 = _____
8.7 ÷ 100 = _____
8.7 ÷ 1,000 = _____
8.7 ÷ 0.1 = _____
8.7 ÷ 0.01 = _____
8.7 ÷ 0.001 = _____

2. Find quotient of each of the following.

a. 32 ÷ 10 = _____
b. 27.3 ÷ 0.1 = _____
c. 5.7 ÷ 100 = _____
d. 5.7 ÷ 0.1 = _____
e. 23 ÷ 1,000 = _____
f. 2.16 ÷ 0.01 = _____
g. 71 ÷ 1,000 = _____
h. 15.08 ÷ 0.01 = _____
i. 0.4 ÷ 10 = _____
j. 12.8 ÷ 0.01 = _____
k. 0.4 ÷ 0.001 = _____
l. 7352.5 ÷ 1,000 = _____
m. 0.736 ÷ 0.1 = _____
n. 29.08 ÷ 0.1 = _____
o. 105 ÷ 1,000 = _____
p. 102.3 ÷ 0.01 = _____
q. 1.368 ÷ 100 = _____
r. 0.005 ÷ 0.01 = _____

3. Complete.

a. 7,368 ÷ _____ = 73.68
b. 9.8 ÷ _____ = 980
c. 32.68 ÷ _____ = 0.03268
d. _____ ÷ 0.01 = 567
e. _____ ÷ 1,000 = 253
f. _____ ÷ 100 = 2.5

4. 📖 **Solve the following problems, then draw lines between problems with the same answer.**

510.05 × 0.001 = _____	510.05 ÷ 0.001 = _____
510.05 × 0.01 = _____	510.05 ÷ 0.01 = _____
510.05 × 0.1 = _____	510.05 ÷ 0.1 = _____
510.05 × 10 = _____	510.05 ÷ 10 = _____
510.05 × 100 = _____	510.05 ÷ 100 = _____
510.05 × 1,000 = _____	510.05 ÷ 1,000 = _____

5. 📖 **Complete each equation with the correct power of 10. Be sure to look carefully at the given operation.**

a. 14.6 × _____ = 146	14.6 ÷ _____ = 146
b. 387.23 × _____ = 3.8723	387.23 ÷ _____ = 3.8723
c. 9.102 × _____ = 910.2	9.102 ÷ _____ = 910.2
d. 65 × _____ = 6,500	65 ÷ _____ = 6,500
e. 0.39 × _____ = 0.039	0.39 ÷ _____ = 0.039
f. 0.75 × _____ = 750	0.75 ÷ _____ = 750
g. 28.4 × _____ = 0.284	28.4 ÷ _____ = 0.284
h. 150.8 × _____ = 150,800	150.8 ÷ _____ = 150,800

6. **Complete.**

a. 89.36 ÷ 100 = 89.36 × _____	**b.** 7.5 ÷ 0.01 = 7.5 × _____
c. 0.005 ÷ 0.01 = 0.005 × _____	**d.** 675 ÷ 1,000 = 675 × _____
e. 2.732 × 0.1 = 2.732 ÷ _____	**f.** 25,600 × 0.01 = 25,600 ÷ _____
g. 33.56 × 100 = 33.56 ÷ _____	**h.** 600.5 × 10 = 600.5 ÷ _____

7. **Put (< , = or >).**

a. 2.36 × 100	◯	2.36 ÷ 0.01	**b.** 73.5 × 100	◯	73.5 ÷ 0.001
c. 73.6 × 0.1	◯	73.6 ÷ 100	**d.** 253 × 0.01	◯	25.3 ÷ 10
e. 0.923 × 1,000	◯	92.3	**f.** 58.3 ÷ 0.001	◯	583 × 1,000
g. 506.2 ÷ 10	◯	5,062	**h.** 37.8 × 10	◯	3.78 ÷ 0.1

8. **Complete each conversion. Then, write a multiplication equation and a division equation with the same answer.**

a. 712 mL = _____ L 712 × _____ = _____ 712 ÷ _____ = _____	**b.** 73.5 kg = _____ g 73.5 × _____ = _____ 73.5 ÷ _____ = _____	**c.** 23 m = _____ cm 23 × _____ = _____ 23 ÷ _____ = _____
d. 25,300 cm = _____ m 25,300 × _____ = _____ 25,300 ÷ _____ = _____	**e.** 300 g = _____ kg 300 × _____ = _____ 300 ÷ _____ = _____	**f.** 763.4 m = _____ km 763.4 × _____ = _____ 763.4 ÷ _____ = _____
g. 5,200 mm = _____ m 5,200 × _____ = _____ 5,200 ÷ _____ = _____	**h.** 125 L = _____ mL 125 × _____ = _____ 125 ÷ _____ = _____	**i.** 5,200 mm = _____ cm 5,200 × _____ = _____ 5,200 ÷ _____ = _____
j. 9,800 cm = _____ km 9,800 × _____ = _____ 9,800 ÷ _____ = _____	**k.** 2.45 mL = _____ L 2.45 × _____ = _____ 2.45 ÷ _____ = _____	**l.** 4.7 cm = _____ mm 4.7 × _____ = _____ 4.7 ÷ _____ = _____

9. The price of one chocolate bar is 5.25 LE. Find the price of 100 bar of chocolate.

_____

10. A box contains 10 bars of soap each of weight 125 g. Find the weight of the 10 bars in kg.

_____

11. Ahmed runs a distance of 2.35 km per day. What is the distance that he runs in 10 days ?

[El Dakahlia 23]

_____

12. 2.5 Liter of juice wanted to be poured into 10 glasses equally. Find the capacity of each glass.

_____

13. Temperatures must reach at least 1,100°C for glass to be blown or for earthenware clay to harden. Water boils at about one-tenth of that temperature. Select the choice that is closest to the temperature at which water boils.

A. 1,100 × 10 **B.** 1,100 ÷ 10 **C.** 1,100 × 0.1 **D.** 1,100 ÷ 0.1

Multiple Choice Questions

Choose the correct answer.

1. $57.3 \times 0.1 =$ _____ [Souhag 24]

A. 5,730 B. 573
C. 0.573 D. 5.73

2. $32.59 \div 0.1 =$ _____ [Ismailia 23]

A. 3.259 B. 32.59
C. 325.9 D. 3,259

3. $85.3 \div \frac{1}{100} =$ _____

A. 8,530 B. 8.53
C. 0.853 D. 85,300

[El Menia - Deir Mawas 23]

4. $56.6 \times 0.01 = 56.6 \div$ _____

A. 10 B. 1,000
C. 100 D. 0.1

[Kafr El Sheikh 24]

5. $423.1 \times$ _____ $= 4.231$

A. 100 B. 10
C. 0.01 D. 0.1

[El Menia - Bani Mazar 24]

6. _____ $\times 0.01 = 5.36$

A. 0.536 B. 536
C. 53.6 D. 5.3600

7. 2.8×0.01 _____ $2.8 \div 0.01$

A. < B. =
C. > D. otherwise

[El Monofia - Sars El Lian 24]

8. One hundredth of the number 76.93 = _____

A. $76.93 \div 0.01$ B. $76.93 \div 100$
C. 769.3 D. 7,693

9. 8,000 g = _____ kg [Aswan 24]

A. 800 B. 80
C. 8 D. 0.8

10. 30.5 km = _____ m

A. 30,500 B. 30.5000
C. 305 D. 3,050

11. 3,200 mL = _____ L [El Beheira 23]

A. 320 B. 32
C. 3.2 D. 0.23

12. There are 30,000 grams in _____ kilograms. [El Monofia - Tala 23]

A. 3 B. 3,000
C. 30 D. 300

13. Height of a building of ten floors where the height of each floor 280 cm is _____ m

A. 2,800 B. 280
C. 28 D. 2.8

14. A wooden bar of length 7.75 m is divided into 10 pieces of equal length, then length of each piece = _____ cm

A. 0.775 B. 77.5
C. 775 D. 7.75

Lessons
12 & 13

- Dividing Decimals by Whole Numbers
- Dividing Decimals by Decimals

Learn 1 Dividing decimals by whole numbers

Nana has 210 kg of sugar, she wants to distribute them equally among 40 bags.

What is the weight of sugar in each bag ?

The answer of this problem must not include remainder :

How can you evaluate 210 ÷ 40 ?

- Use the standard algorithm to evaluate $210 \div 40$

, then the quotient is 5 and the remainder is 10 which is not enough to be divided by 40, so we regroup 10 ones to be divisible by 40 as the following steps :

```
   5
40)210
 - 200
   10
```

- Place a decimal point to the right of Ones place in the dividend [210.]
- Place a zero in the Tenth place [210.0] and another zero in the Hundredth place [210.00], then the value of the dividend does't change.

```
   5.25
40)210.00
 - 200
   100
 -  80
   200
 - 200
   000
```

- Place a decimal point in the quotient directly above the decimal point in the dividend, then bring down the zero which in the Tenth place.

Complete the other steps of the standard algorithm.

- You can check the reasonableness with compatible number as $200 \div 40 = 5$ and 5.25 is close to 5
- You can check the answer by multiplication : $5.25 \times 40 = 210$

Remember that

The steps of standard algorithm
Divide
Multiply
Subtract
Compare
Bring down
Repeat this order until the division is completed.

Notes for parents :

- Let your child remember the steps of standard algorithm : Divide, multiply, subtract, compare, and bring down. Repeat until the devision is complete.

Example 1

Find : 155 ÷ 50

❶ The answer includes a remainder

❷ The answer does not include a remainder

Solution

❶ The answer includes a remainder

```
      3
50 ) 155
   - 150
     5
```

, then 155 ÷ 50 = 3 R5

❷ The answer does not include a remainder

```
     3.1
50 ) 155.0
   - 150
     50
   -  50
      00
```

, then 155 ÷ 50 = 3.1

• Infinite division

How can you evaluate 5.5 ÷ 3 to the nearest Hundredth ?

- Notice that in this case, the operation of division is infinite, so we call it **infinite division**.
- You can go on the operation of division, but you need the result of division rounded to the nearest Hundredth, so only divide until you reach three decimal places, then use the rules of rounding.

  then, 5.5 ÷ 3 ≈ 1.83 to the nearest Hundredth.
- The quotient of this problem is a repeating decimal.
- You can check the reasonableness with compatible number as 6 ÷ 3 = 2 and 1.833 is close to 2

```
     1.833
3 ) 5.500
  - 3
    25
  - 24
     10
  -  9
     10
  -  9
      1
```

Example 2

Use the standard algorithm to find the quotient of each of the following make sure that your answer does not include a remainder.

a. 58.05 ÷ 15

b. 3 ÷ 40

c. 223.1 ÷ 9 [to the nearest Hundredth]

d. 1.21 ÷ 6 [to the nearest Thousandth]

- Remind your child that placing a decimal and a zero to the right of ones place in the dividend does not change its value.

Solution

a.

$$\begin{array}{r} 3.87 \\ 15\overline{)\,58.05} \\ -45 \\ \hline 130 \\ -120 \\ \hline 105 \\ -\ 105 \\ \hline 000 \end{array}$$

, then $58.05 \div 15 = 3.87$

b.

$$\begin{array}{r} 0.075 \\ 40\overline{)\,3.000} \\ -280 \\ \hline 200 \\ -\ 200 \\ \hline 000 \end{array}$$

, then $3 \div 40 = 0.075$

c.

$$\begin{array}{r} 24.788 \\ 9\overline{)\,223.100} \\ -18 \\ \hline 43 \\ -\ 36 \\ \hline 71 \\ -\ 63 \\ \hline 80 \\ -\ 72 \\ \hline 80 \\ -\ 72 \\ \hline 8 \end{array}$$

, then $223.1 \div 9 \approx 24.79$
to the nearest Hundredth.

d.

$$\begin{array}{r} 0.2016 \\ 6\overline{)\,1.2100} \\ -12 \\ \hline 01 \\ -\ 0 \\ \hline 10 \\ -\ 6 \\ \hline 40 \\ -\ 36 \\ \hline 4 \end{array}$$

, then $1.21 \div 6 \approx 0.202$
to the nearest Thousandth.

Check your understanding

Use the standard algorithm to find the quotient of each of the following.

a. $342.7 \div 46$

b. $84.24 \div 78$

c. $30\overline{)\,4.8}$

d. $6\overline{)\,15.8}$

Notes for parents :

- Your child might misplace the decimal point in the quotient in relation to the decimal point in the dividend.

Learn 2 Dividing decimals by decimals

To divide by a decimal, you can use the same way of dividing whole numbers, by writing the divisor as a whole number.
Do this by **multiplying the divisor and the dividend by 10 , 100 , 1,000 , ... ect.** according to the number of places of the decimal part of the divisor.

For Example :

Divide : 32 ÷ 0.4

To divide 32 by 0.4, multiply the divisor by 10
[to change it into a whole number],
and then multiply also the dividend by 10
$0.4 \times 10 = 4$ and $32 \times 10 = 320$

So, $32 \div 0.4$
$=$
$320 \div 4$
$=$
80

Notice

You can move the decimal point in the dividend by the same number of places that you need to move the decimal point in the divisor to make the divisor a whole number.

For Example :

- $3.2 \div 0.4 = 32 \div 4 = 8$
- $0.42 \div 0.07 = 42 \div 7 = 6$
- $2.72 \div 0.8 = 27.2 \div 8 = 3.4$

Remark

You may need to **add a zero (or more)** to **the right** of the dividend so that you can move the decimal point.

For Example :

$14.1 \div 1.41 = 14.10 \div 1.41 = 1,410 \div 141 = 10$

Example 3

Find the quotient of each of the following :

a. $29.76 \div 6.4$

b. $0.1134 \div 0.18$

- Remind your child that he/she can place one zero or more to the right of the last decimal place of the number without changing its value.

Solution

a. The quotient $= 29.76 \div 6.4$

$= 297.6 \div 64$

$= 4.65$

The divisor has one decimal place. So, the decimal point moves one place to the right in both, the divisor and the dividend.

Divide by using standard algorithm

Draft

```
      4.65
64 ) 297.60
   - 256
     416
   - 384
     320
   - 320
       0
```

b. The quotient $= 0.1134 \div 0.18$

$= 11.34 \div 18$

$= 0.63$

Draft

```
      0.63
18 ) 11.34
   - 108
     054
   -  54
      0
```

Check your understanding

Find the quotient of the following :

a. $34.4 \div 0.4$

b. $3.175 \div 2.5$

c. $0.95 \overline{)\,12.584}$

d. $27.365 \div 8.42$

Notes for parents :

- Remind your child how he/she divide two numbers using standard algorithm.

Exercise 25

on lessons 12&13

- Dividing Decimals by Whole Numbers
- Dividing Decimals by Decimals

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Complete each of the following as in expample (a).

a. $3.5 \div 0.5 = 35 \div 5 = 7$

b. $4.2 \div 0.7 =$ ____ ÷ ____ = ____

c. $3.6 \div 0.9 =$ ____ ÷ ____ = ____

[El Monofia - El Bagour 24]

d. $0.28 \div 0.04 =$ ____ ÷ ____ = ____

e. $7.2 \div 0.8 =$ ____ ÷ ____ = ____

f. $6.2 \div 0.62 =$ ____ ÷ ____ = ____

[Kafr El Sheikh - Bayla 24]

g. $0.33 \div 0.11 =$ ____ ÷ ____ = ____

2. Find the quotient of each of the following.

a. $2.64 \div 0.2$

b. $7.80 \div 0.08$

[Qena - Farshout 24]

c. $25.56 \div 1.2$

[El Menia - Mallawi 24]

d. $4.384 \div 0.32$

e. $0.1932 \div 0.92$

f. $1.155 \div 0.35$

g. $17.01 \div 0.7$

[Giza - El Haram 24]

h. $3.375 \div 0.15$

i. $7.7728 \div 0.64$

3. Use the standard algorithm for division to find the quotient.

a. $5 \overline{)\,5\,1.\,6\,5}$ Quotient : ____

b. $6 \overline{)\,7\,3.\,0\,2}$ Quotient : ____

c. $16 \overline{)\,6\,2.\,2\,4}$ Quotient : ____

d. $30 \overline{)\,5\,8\,9.\,5}$ Quotient : ____

e. $2.2 \overline{)\,2\,6.\,4}$ Quotient : ____

f. $0.4 \overline{)\,9\,9}$ Quotient : ____

g. $0.04 \overline{)\,1.\,5}$ Quotient : ____

[Cairo - Hadaek El Quba 24]

h. $1.9 \overline{)\,9.\,9\,5\,6}$ Quotient : ____

i. $0.05 \overline{)\,1.\,4\,3}$ Quotient : ____

j. $7.3 \overline{)\,3.\,4\,3\,1}$ Quotient : ____

k. $0.5 \overline{)\,4\,4}$ Quotient : ____

l. $0.04 \overline{)\,0.\,5\,1}$ Quotient : ____

m. $0.7\overline{)7\ 0}$ Quotient : _____

n. $0.5\overline{)0.\ 9\ 1}$ Quotient : _____

o. $0.04\overline{)5\ 7.\ 6}$ Quotient : _____

p. $0.5\overline{)1.\ 3}$ Quotient : _____

4. Find the quotient of each of the following to the nearest Tenth.

a. $9 \div 35$ | b. $15 \div 38$ | c. $8 \div 7$ | d. $13 \div 77$

e. $121.1 \div 9$ | f. $546.8 \div 53$ | g. $53.27 \div 2.1$ | h. $24.31 \div 0.97$

5. Find to the nearest Hundredth the quotient of each of the following.

a. $46 \div 2.8$ | b. $7.4 \div 5.1$ | c. $7.034 \div 1.7$ | d. $0.4582 \div 5.2$

6. Carry out each of the following.

a. $8.5 \div 2.7$ [rounded to the nearest Tenth]

b. $13.029 \div 0.52$ [rounded to the nearest Hundredth]

c. $28.448 \div 1.2$ [rounded to the nearest Tenth]

d. $45.862 \div 3.5$ [rounded to the nearest Thousandth]

7. Put the suitable relation (< , = or >) in the blanks.

a. $38.12 \div 0.25$ ◯ $3.812 \div 2.5$

b. $55 \div 1.1$ ◯ $55 \div 0.11$

c. $462.3 \div 0.23$ ◯ $4{,}623 \div 2.3$

d. $756 \div 5.4$ ◯ $75.6 \div 0.054$

e. $0.46 \div 4.6$ ◯ 0.01

f. $53.7 \div 3.5$ ◯ $5.37 \div 0.35$

g. $845 \div 4.9$ ◯ $84.5 \div 49$

8. Complete.

a. $2 \div 0.3 \approx$ _____ [to the nearest Hundredth]

b. $5 \div 1.1 \approx$ _____ [to the nearest Hundredth]

c. $7 \div 1.2 \approx$ _____ [to the nearest Tenth]

d. $50.3 \div 0.6 \approx$ _____ [to the nearest Thousandth]

e. 39 days $\approx$ _____ weeks. [Ismailia 23]

f. 254 hours $\approx$ _____ days.

g. 67 months $\approx$ _____ years.

h. 47 days $\approx$ _____ [to the nearest week]

9. 📖 **Evaluate the student's work below. Explain the error (or errors) the student made. Then, perform the division correctly to find the quotient.**

Divide : $0.3\overline{)77.43}$

Student's work : $77.43 \div 0.3$ will have the same quotient as $7.743 \div 3$

$$
\begin{array}{r}
2.581 \\
3\overline{)7.743} \\
\underline{6} \\
17 \\
\underline{15} \\
24 \\
\underline{24} \\
3 \\
\underline{3}
\end{array}
$$

10. Hossam distributed 75.5 kg of flour on 5 bags equally. **What is the mass of each bag ?**

[El Monofia - Tala 24]

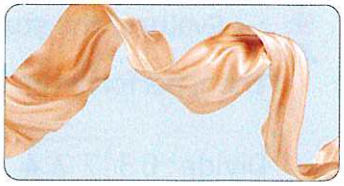
11. 📖 **Use the standard algorithm for division to find the quotients.**

1. An electrician has a wire of 150 m. He wants to divide it into 40 parts of equal length, such that the length of each part is a whole number. What is the length of one part ? How many meters will be left ?
2. The city council planted trees on a side of a 2,050-meters road. If 75 trees are planted at equal distances, such that the distance between each two trees represents a whole number. What is the distance between each two trees ? and what is the remaining distance ?

12. **Use the standard algorithm to find the quotients. (Note the quotient is a decimal) Check your answer for reasonableness.**

1. 📖 An electrician has a wire of 150 m. He wants to divide it into 40 parts of equal length. What is the length of one part ?
2. 📖 The city council planted trees on a side of a 2,050 meters road. If 75 trees are planted at equal distances. What is the distance between each trees ?
3. 📖 Emad, the electrician, has 4.5 meters of wire that is cut into 30 pieces that are all the same length. Find the length of each piece of wire.
4. 📖 Dalia wants to pour 20 liters of hibiscus equally into 50 cups. How much hibiscus [in liters] will be in each cup ?

5. The length of a roll of cloth is 59.5 metres. It was divided into equal parts where the length of each part is 3.5 metres. Find the number of these parts.



6. A train covered a distance of 221.65 km in 2.5 hours. Calculate the distance it covers in one hour.

7. A building has the height of 42 meters. If the height of each floor is 2.8 meters, then find the number of floors.

8. The area of a rectangle is 9.43 cm^2, and its width is 2.4 cm, Find its length and approximate it to the nearest Hundredth.

Challenge

13. Given that : 2,752 ÷ 43 = 64 , then find mentally.

a. 2,752 ÷ 4.3

b. 27.52 ÷ 4.3

c. 275.2 ÷ 0.064

d. 2.752 ÷ 43

14. Given that : 46 × 57 = 2,622 , then find mentally.

a. 26.22 ÷ 0.57

b. 26.22 ÷ 4.6

c. 262.2 ÷ 5.7

d. 262.2 ÷ 0.46

e. 26.22 ÷ 0.057

f. 2.622 ÷ 0.46

Multiple Choice Questions

Choose the correct answer.

1. $0.28 \div 0.4 =$ _____ $\div 4$

A. 2.8 B. 0.28
C. 28 D. 280

[Cairo - El Maadi 24]

2. $1.2 \div 0.12 =$ _____ [Cairo - West 24]

A. 10 B. 20
C. 12 D. 21

3. $80 \div 0.08 =$ _____ [Ismailia 23]

A. 10 B. 100
C. 1000 D. 8000

4. $4.2 \div 0.6 =$ _____

A. 0.7 B. 7
C. 70 D. 700

[Ismailia - El Kasaseen 24]

5. $32.5 \div$ _____ $= 100$ [Ismailia 23]

A. 3.25 B. 0.0325
C. 0.325 D. 325

6. $8.3 \div 3 \approx$ _____

[to the nearest Hundredth]

A. 2.7 B. 2.77
C. 2.8 D. 2.766

7. $462.3 \div 0.23$ ☐ $4{,}623 \div 2.3$

A. $>$ B. $<$ C. $=$

[El Monofia - Tala 23]

8. 30 days $\approx$ _____ weeks. [Souhag 23]

[to the nearest week]

A. 3 B. 4
C. 5 D. 6

9. $1.1 \div 1.3 \approx$ _____ [to the nearest Tenth]

A. 0.8 B. 0.9
C. 0.84 D. 0.85

10. $224.38 \div 65 =$ _____

A. 3.5 B. 3.45
C. 3.13 D. 3.452

11. $35 \div 0.7 =$ _____ [Cairo - Heliopolis 23]

A. 50 B. 70
C. 0.7 D. 0.5

12. $90 \div 0.03 =$ _____ [Port Said 23]

A. 3,000 B. 30
C. 300 D. 3

13. $1.5 \div 0.5 =$ _____

A. 5 B. 3
C. 0.5 D. 0.3

[Aswan - Kom Ombo 23]

14. $25.25 \div 0.25 =$ _____

A. 11 B. 101
C. 110 D. 111

[Giza - El Agouza 23]

Unit Five Assessment

1. Choose the correct answer.

1. $50.5 \div 0.5 =$ _____ [Kafr El Sheikh - Bayala 24]

   A. 1.01 **B.** 101 **C.** 11 **D.** 1.1

2. $0.5 \times 0.3 =$ _____ [El Beheira - Rasheed 24]

   A. 1.5 **B.** 15 **C.** 0.15 **D.** 0.015

3. $29.29 \div 29 =$ _____ [Cairo - El Maadi 24]

   A. 1.1 **B.** 1.01 **C.** 10.1 **D.** 0.101

4. 7.5 L – 1,500 mL = _____ L [Ismailia 24]

   A. 6 **B.** 60 **C.** 600 **D.** 6,000

5. If the area model of a problem is

	4	0.3
5	x	1.5
0.8	3.2	y

, then $x + y =$ _____

   A. 20 **B.** 20.24 **C.** 36.55 **D.** 4.8

6. $8.43 \times 0.2 \approx$ _____ [to the nearest Hundredth] [Cairo - El Nouzha 23]

   A. 1.686 **B.** 1.7 **C.** 1.69 **D.** 2

7. 7.18×3.5 _____ 71.8×0.35 [Ismailia 23]

   A. > **B.** < **C.** =

2. Complete the following.

1. $0 \div 31.56 =$ _____ [Port Said - East 24]
2. 230 meters = _____ centimeters [Port Said 23]
3. The quotient of $0.36 \div 0.6 =$ _____ [Cairo - El Sherouk 23]
4. $0.3 \div 0.2 =$ _____ [Giza - Awseem 23]
5. 43 days $\approx$ _____ weeks [to the nearest week] [Ismailia 24]
6. _____ $\times 0.001 = 5.234$
7. 2.5 L = _____ mL [El Monofia - Menof 24]
8. 6 cm and 5 mm = _____ cm

3. Choose the correct answer.

1. $461.12 \div 10 =$ _____ [Cairo - El Nouzha 23]

   A. 4.6112 B. 46.112 C. 461.12 D. 4611.2

2. $0.004 \times 1{,}000$ ◯ $40{,}000 \times 0.001$

   A. > B. < C. =

3. $6.345 \div 0.01 =$ _____ [Alexandria - West 23]

   A. 6,345 B. 0.06345 C. 634.5 D. 63,450

4. $2 \div 0.4 =$ _____ [Giza - Awseem 24, El Beheira 23]

   A. 2 B. 10 C. 5 D. 8

5. The divisor in the equation $1.8 \div 6 = 0.3$ is _____ [Qena - Farskout 24, El Menia 23]

   A. 0.3 B. 1.8 C. 6 D. 3

6. 735 cm = _____ m [El Beheira - Housh Essa 23]

   A. 73,500 B. 7.35 C. 73.5 D. 7,350

7. 300 g = _____ kg [Port Said 24]

   A. 3 B. 0.3 C. 30 D. 0.03

4. Answer the following questions.

1. Edward has 3.45 meters of wire that is cut into 15 equal pieces.
   Find the length of each piece of wire ? [Cairo - El Khalifa and El Mokattam 23]

2. Find the product of : 25×32.5 using any strategy. [Aswan 23]

3. Ahmed bought 8 pens of the same type, if the price of one pen is 3.5 pounds.
   How much money will Ahmed pay ? [El Menia - Deir Mawas 23]

4. Using any strategy to find : [with steps]
   $0.1134 \div 0.18$ [Ismailia 23]

THEME TWO

Mathematical Operations and Algebraic Thinking

UNIT 6

Numerical Expressions and Patterns

▶ **Concept 1 :**
Evaluating Numerical Expressions and Patterns

CONCEPT 1

Evaluating Numerical Expressions and Patterns

▶ Lessons 1&2

- Ordering of Mathematical Operations
- Numerical Expressions with Parentheses.

Learning Objectives:

- Students will use the order of operations to evaluate expressions with whole numbers and decimals.
- Students will identify how grouping symbols affect the order of operations.
- Students will evaluate an expression with groping symbols.

▶ Lesson 3

- Writing Expressions to Represent Scenarios

Learning Objectives:

- Students will write an expression to represent a written scenario.

▶ Lesson 4

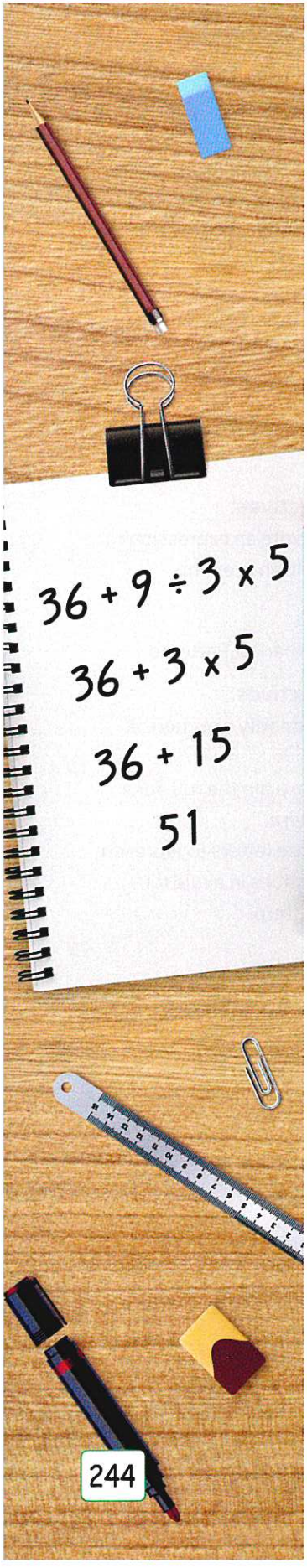
- Identifying Numerical Patterns

Learning Objectives:

- Students will identify a numerical pattern.
- Students will explain the rule for a numerical pattern.
- Students will use letters to represent unknown quantities in a rule for a numerical pattern.

Lessons **1 & 2**

- Ordering of Mathematical Operations
- Numerical Expressions with Parentheses



Learn

How do you evaluate a numerical expression with more than one operation ?

Two students evaluated the numerical expression : 36 + 9 ÷ 3 × 5 and got different answers.

Omar's Way	Sandy's Way
36 + 9 ÷ 3 × 5	36 + 9 ÷ 3 × 5
45 ÷ 3 × 5	36 + 3 × 5
15 × 5	36 + 15
75	51

To avoid getting more than one answer, mathematicians use the **Ordering of Mathematical Operations** given below. Sandy used the **CORRECT ORDER**. The value of the expression is **51**.

Ordering of Mathematical Operations

1. First do the operations inside parentheses and brackets.
2. Then, multiply and divide in order from left to right.
3. Finally, add and subtract in order from left to right.

Example 1

Use the order of mathematical operations to evaluate each expression.

a. 12 + (9 – 2) × 8

b. 53 × 2 + 54 ÷ 1.5

c. 40 ÷ 8 × 0.01 + 14.95

d. 2,514.6 – 23.4 ÷ 0.01 + 11.7

e. 288 – [12 + 3 × (28.5 × 2.1)]

Notes for parents :

- Ask your child which operation comes first when solving the problems : 12 ÷ (4 – 1) and 6 + 4 × 5.

Solution

a. $12 + (9 - 2) \times 8$ — Parentheses first

$= 12 + 7 \times 8$ — Then multiply

$= 12 + 56$ — Finally add

$= 68$

b. $53 \times 2 + 54 \div 1.5$ — There is no parentheses, so multiply and divide first

$= 106 + 36$ — Then add

$= 142$

c. $40 \div 8 \times 0.01 + 14.95$ — There is no parenthese, so divide from left to right

$= 5 \times 0.01 + 14.95$ — Then multiply

$= 0.05 + 14.95$ — Finally add

$= 15$

d. $2{,}514.6 - 23.4 \div 0.01 + 11.7$ — There is no parenthese, so divide first

$= 2{,}514.6 - 2{,}340 + 11.7$ — Then subtract from left to right

$= 174.6 + 11.7$ — Finally add

$= 186.3$

e. $288 - [12 + 3 \times (28.5 \times 2.1)]$ — Inside parentheses first

$= 288 - [12 + 3 \times 59.85]$ — Then multiply

$= 288 - [12 + 179.55]$ — Then brackets

$= 288 - 191.55$ — Finally subtract

$= 96.45$

Math Hint

1. For operations within parentheses
   a. multiply or divide from left to right
   b. add or subtract from left to right
2. For operations outside of parentheses
   a. multiply or divide from left to right
   b. add or subtract from left to right

Check your understanding

Use the order of mathematical operations to evaluate each expression.

a. $63 + 14 \times 25$ | **b.** $912 - 84.6 \div 0.1$ | **c.** $100 \times (72.18 + 3.12) \div 6$

- Let your child follow the order of operations within parentheses.

Exercise 26

on lessons 1&2

▸ Ordering of Mathematical Operations
▸ Numerical Expressions with Parentheses

REMEMBER UNDERSTAND APPLY PROBLEM SOLVING | From the school book

1. Use the order of mathematical operations to evaluate each expression of the following.

a. 10 × 4 – 3 = _____

b. 2 + 7 × 5 – 6 = _____ [Aswan 23]

c. 15 ÷ 3 + 2 = _____

d. 55 ÷ [2 + 9] – 5 = _____ [Giza - Awseem 23]

e. 12 + 24 ÷ 4 + 8 = _____ [Port Said - Port fouad 24]

f. 5.5 ÷ 5 × 10 – 10 = _____ [El Beheira 23, Giza - Awseem 23]

g. 34 × 28 ÷ 2 + 5 = _____

h. 28.1 – 3.5 × 0.2 + 29.4 = _____ [Ismailia 23]

i. 145.42 – 7.11 × 10 + 13.2 = _____

j. 1.3 + 3.45 × 8 – 2.02 = _____ [Cairo - Heliopolis 23]

k. 102.15 + 6 ÷ 1.2 – 34 × 2.3 = _____

l. 3.52 × 10 + 283 ÷ 10 = _____ [Aswan - Kom Ombo 23]

m. 35 × 0.1 + 89.14 ÷ 0.1 = _____

n. 2.4 + 3.15 × 10 – 7.6 = _____ [Cairo 23]

o. 56.5 × 2.3 – 15 + 12.7 = _____

p. 597.8 ÷ 6.1 + 13 × 1.7 = _____

q. 1,403.5 – 12.3 ÷ 0.01 + 9.8 = _____

r. 82.43 × 3.1 + 4.05 ÷ 0.01 – 2.5 = _____

s. 90.7 + 116.6 × 0.1 × 2 – 20 = _____

2. 🕮 **Grouping symbols.** Evaluate the set of expressions.

a. $45.84 + 13.05 \div 5 + 20.32 - 1.14 \times 2.1$

b. $(45.84 + 13.05) \div 5 + 20.32 - 1.14 \times 2.1$

3. 🕮 **Grouping symbols, Advanced.** Evaluate the set of expressions.

a. $30 \times 2.5 + 47.18 - 3.12 \div 0.1$

b. $30 \times (2.5 + 47.18 - 3.12 \div 0.1)$

4. 🕮 **The Right route.** Ali drives a bus route through the city. His stops follow the order of operations for evaluating the expression.

$$300.53 - 11.04 \times 0.2 \div 0.01 + 13.07$$

Stop 1	Stop 2	Stop 3	Stop 4
A. $300.53 - 11.04$	E. $2.208 \div 0.01$	J. $57.898 \div 0.01$	N. $5{,}789.8 + 13.07$
B. 11.04×0.2	F. $0.2 \div 13.08$	K. $220.8 + 13.07$	P. $79.73 + 13.07$
C. $0.2 \div 0.01$	G. 289.49×0.2	L. 289.49×20	Q. $300.53 - 233.87$
D. $0.01 + 13.07$	H. 11.04×20	M. $300.53 - 220.8$	R. $57.898 + 13.07$

Record the letters of the correct stops along his route to show the steps for evaluating the expression.

1. Stop 1: _____
2. Stop 2: _____
3. Stop 3: _____
4. Stop 4: _____

Tour Bus

5. 🕮 **How Many Values ?** Use grouping symbols to create as many expressions with different values as you can.

a. $29.2 + 43 \times 0.01 + 15 \div 0.1$

b. $158 \div 2 + 6 \times 10.5 - 5$

c. $57 - 11 \times 1.2 + 3.4 + 1.9 \div 10$

6. **Place the Grouping Symbols.** Kamal placed grouping symbols in the expression. When he evaluated the expression, he found a value of 6.45

What grouping symbols did he use ? Where did he place them ?

$15.25 \div 2 + 3 + 6.8 \div 2$

7. **Writing About Math.** Explain why the values of $217 + 354 \times 0.1$ and $(217 + 354) \times 0.1$ are different. What is the value of each expression ?

8. **Who is correct ?** Wael and Marwan both solved the problem $47.1 \times 31 - 28.4 \div 4 + 33.2$

Wael says the answer is 63.815 and Marwan says the answer is 1,486.2 Who is correct ?

How do you know ? Explain your thinking.

Multiple Choice Questions

Choose the correct answer.

1. Which is the first step in evaluating $28.1 - 3.5 \times 0.2 + 29 - 4$?

A. $28.1 - 3.5$ B. 3.5×0.2

C. $0.2 + 29$ D. $29 - 5$

[Giza - Awseem 24, El Haram 24, Giza 23]

2. The first operation to calculate : $15 \div [3 - 2] \times 7 + 8$ is _____

A. addition. B. subtraction.

C. multiplication. D. division.

3. To find the value of expression : $43.1 \div 0.1 - 3.1 \times [2.2 + 3.8]$ perform the operations _____ first.

A. subtraction B. multiplication

C. within parentheses D. division

[Aswan - Kom Ombo 23]

4. The second step in the expression : $36.12 \times 4 + 55 - 12.5$ is _____

A. 36.12×4

B. 36.12×59

C. $144.48 + 55$

D. $144.48 - 12.5$

5. $2.3 \div 0.1 + 10 =$ _____

A. 230 B. 10.23

C. 33 D. 0.33

[Cairo - El Basaten 24, El Beheira - Housh Essa 23]

6. $12 + 24 \div 4 + 8 =$ _____

A. 28 B. 26

C. 22 D. 10

[Cairo - West 24, Port Said 23]

7. The value of this expression : $[7.5 \times 10] + 2.3$ is _____

A. 77.3 B. 9.8

C. 19.8 D. 2.78

[El Menia 23]

8. $25 \times 4 \div [6 - 5] =$ _____

A. 100 B. 101

C. 0.01 D. 165

[Cairo - El Mokattam 24, Monofia - Shiben El Kom 23]

9. $[13.5 - 5.13] \div 0.1 + 16.3 =$ _____

A. 10 B. 83.5

C. 30 D. 100

[Cairo - El Nouzha 23, Al Khalifa and Al Mokattam 23]

10. Which of the following equals to 9 ?

A. $5 + 4 \times 3 - 2$

B. $(5 + 4 \times 3) - 2$

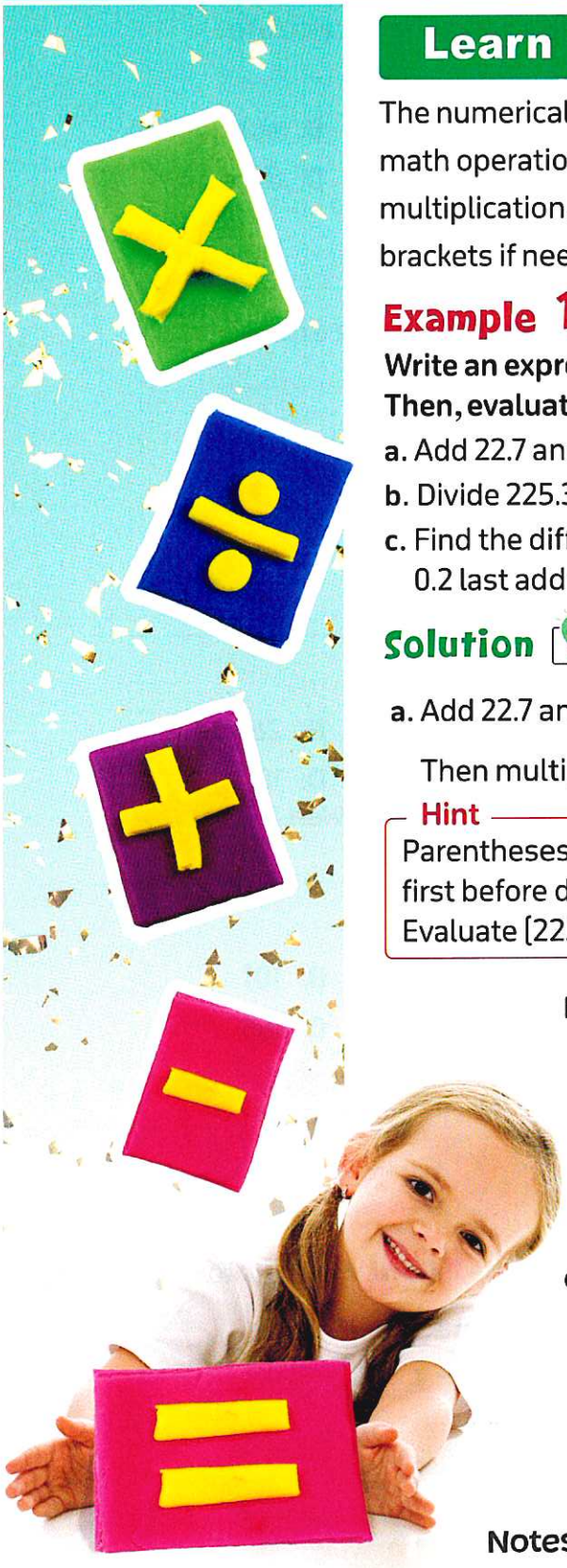
C. $5 + 4 \times (3 - 2)$

D. $(5 - 4) \times 3 + 2$

[Cairo - El Mokattam 24]

Lesson 3

Writing Expressions to Represent Scenarios



Learn Writing Expression

The numerical expression in math is a sentence with numbers and math operations. This math operations may be "addition, subtraction, multiplication, or division". Expression may contain parentheses or brackets if needed.

Example 1

Write an expression that matches the clues.
Then, evaluate the expression.

a. Add 22.7 and 35.3, then multiply the result by 3

b. Divide 225.3 by 3, then add 4.9. After, divide the result by 10

c. Find the difference between 66.25 and 7.5, then divide the result by 0.2 last add to 1.4

Solution

a. Add 22.7 and 35.3 ⟶ $22.7 + 35.3$

Then multiply the result by 3 ⟶ $[22.7 + 35.3] \times 3$

Hint

Parentheses are needed to find the result of adding the numbers first before doing the multiplication operation
Evaluate $[22.7 + 35.3] \times 3 = 58 \times 3 = 174$

b. Divide 225.3 by 3 ⟶ $225.3 \div 3$

, then add 4.9 ⟶ $225.3 \div 3 + 4.9$

After, divide the result by 10 ⟶ $[225.3 \div 3 + 4.9] \div 10$

Evaluate : $[225.3 \div 3 + 4.9] \div 10 = [75.1 + 4.9] \div 10$

$= 80 \div 10 = 8$

c. Find the difference between 66.25 and 7.5 ⟶ $66.25 - 7.5$

Divide the result by 0.2 ⟶ $[66.25 - 7.5] \div 0.2$

Add to 1.4 ⟶ $[66.25 - 7.5] \div 0.2 + 1.4$

Evaluate : $[66.25 - 7.5] \div 0.2 + 1.4 = 58.75 \div 0.2 + 1.4$

$= 293.75 + 1.4 = 295.15$

Notes for parents :

- Ask your child to read the clues well, and translate it into numbers and operations.

Expressions and story problems

Example 2

Write an expression that matches the scenario. Then, evaluate the expression.

Amgad ran 15.3 kilometers for 5 days each and 12.7 kilometers for 8 days each.
How many kilometers did he run over those 13 days ?

Solution

In 5 days ⟶ 15.3×5

, in 8 days ⟶ 12.7×8

Then in 13 days ⟶ $15.3 \times 5 + 12.7 \times 8$

Evaluate : $76.5 + 101.6 = 178.1$ kilometres

Steps to solve

- Read and understand
- Plan and solve
- Check your answer

Example 3

Write an expression that matches the scenario. Then, evaluate the expression.

Amira had 275 pounds. She bought 3 kilograms of oranges with 7.25 pounds each and 13.75 pounds for sweet corn. How much money was left with Amira ?

Solution

Total money ⟶ 275

Price of oranges ⟶ 3×7.25

Price of oranges and sweet corn ⟶ $3 \times 7.25 + 13.75$

Left money ⟶ $275 - [3 \times 7.25 + 13.75]$

Evaluate : $275 - [21.75 + 13.75]$

$= 275 - 35.5 = 239.5$ pounds.

Check your understanding

1. Write an expression that matches the clues, then evaluate " Subtract 6.2 from the product of 5.2 and 3. Then, multiply by 10".

2. Ali had 700 pounds. He bought 3 toys for 40 pounds each and 7 toys for 50 pounds each. How much money was left with Ali ?

- Remind your child to follow the order of operations when he/she evaluate the expression.

Exercise 27
on lesson 3

▸ Writing Expressions to Represent Scenarios

● REMEMBER ● UNDERSTAND ○ APPLY PROBLEM SOLVING | 📖 From the school book

1. Writing Expressions. For each problem, write an expression that matches the clues. Then, evaluate the expression.

a. Add 2.7 and 1.2, then multiply the result by 10. [Giza - 6th October 24]

b. 📖 Subtract 3.1 from 4.62. Then, multiply the result by 2. [Port Said 24]

c. Multiply 6.3 by 12.4 and then add 21.88. After, divide the result by 20.

d. 📖 Divide 93 by 0.3 and then add 114.7. After, divide the result by 5.

e. 📖 Add 30.4 , 87 and 17.5. Then, subtract the result from 224.7. Multiply by 100.

f. Divide 2,325 by 10. Next subtract 162. Then, add 24.5. Last, multiply the result by 3.

g. 📖 Multiply 7.6 by 100. Next, subtract 34.3. Then, add 12.4. Last, divide the result by 0.1.

h. Find the sum of 1.3 and 3.45. Multiply by 8. Next, subtract 2.02. Then, subtract the result from 75.

i. 📖 Find the difference between 10 and 9.27. Multiply by the sum of 54 and 46. Then, divide 1,168 by the result.

2. Expressions and story problems. For each problem, write an expression that matches the scenario. Then, evaluate the expression.

a. Ehab had 102.5 pounds. He bought 4 toys for 19.5 pounds each.
How much money was left with Ehab ?

Remember

The steps to write expressions

- Read and understand
- Plan and solve
- Check your answer

b. 🕮 Kamel is saving money to buy a car. He currently has 1,000 L.E. He begins working two jobs. At his first job, he saves 50 L.E. a week. At his second job, he saves 30 L.E. a week. He saves the money from his jobs for 4 weeks to add to his savings. How much does Kamel have saved at the end of the 4 weeks ?

c. Sandy made 11.8 liters of orange juice. She sold 4 liters and divided the rest into 6 bottles equally. How much orange juice is in each bottle ?

d. Ali traveled 3,900 kilometers by car. He drove 560 kilometers for 3 days each and 430 kilometers for 5 days each. How many kilometers were left to finish his trip ?

e. 🕮 As a part of his fitness training, Mounir cycles 38.7 kilometers in 2 hours. If he cycles at the same rate the entire time, how many meters does he cycle per minute ?

f. 🕮 Hoda is filling identical vases with water for flower arrangements at the florist. She starts with 15.75 liters and pours an equal amount into 16 vases. When she is finished, Hoda still has 3.75 L of water left. How much water is in each vase ? Give your answer in liters.

Multiple Choice Questions

Choose the correct answer.

1. Which expression matches the clue "Add 30 to 25 and divide the result by 0.5"?

A. $30 + 25 \div 0.5$

B. $0.5 \times [30 + 25]$

C. $[30 + 25] \div 0.5$

D. $30 \div 0.5 + 25$ [Giza 23]

2. Subtract 2.2 from 6.42 and multiply the result by 3, then the expression is ———

A. $2.2 \times 2 - 6.42$

B. $3 \times 6.42 - 2.2$

C. $6.42 - 2.2 \times 2$

D. $[6.42 - 2.2] \times 3$ [Giza - Abo El Nomrous 23]

3. Which expression matches the clue "Multiply 5.4 by 100, next add 18. Last divide the result by 9"?

A. $5.4 \times 100 + 18 \div 9$

B. $5.4 \times [100 + 18] \div 9$

C. $[5.4 \times 100] + 18 \div 9$

D. $[5.4 \times 100 + 18] \div 9$

4. Which expression matches the clue "Divide 66 by 0.2, then add to the result the product of multiplying 3.6 by 0.1"?

A. $66 \div 0.2 + 3.6 \times 0.1$

B. $66 \div [0.2 + 3.6] \times 0.1$

C. $66 \div [0.2 + 36 \times 0.1]$

D. $[66 \div 0.2 + 3.6] \times 0.1$

5. Which expression matches the clue "Add 7.12 to the result of multiplying 2.1 by 10, then subtract the result from 45"?

A. $2.1 \times 10 + 7{,}12 - 45$

B. $45 - [2.1 \times 10 + 7.12]$

C. $[2.1 \times 10 + 7.12] - 45$

D. $2.1 \times [10 + 7.12] - 45$

6. Which expression matches the clue "Find the difference between 42 and 37. Multiply by the sum of 2 and 8. Then divide 2,000 by the result"?

A. $2{,}000 \div [42 - 37 \times 2 + 8]$

B. $2{,}000 \div \big[[42 - 37] \times [2 + 8]\big]$

C. $[42 - 37 \times 2 + 8] \div 2{,}000$

D. $[42 - 37] \times [2 + 8] \div 2{,}000$

7. Which expression matches the clue "Giovanni bought 60 fish. He put 5 fish in 9 bowles each". How many fish are left with Giovanni? [Giza - Awseem 23]

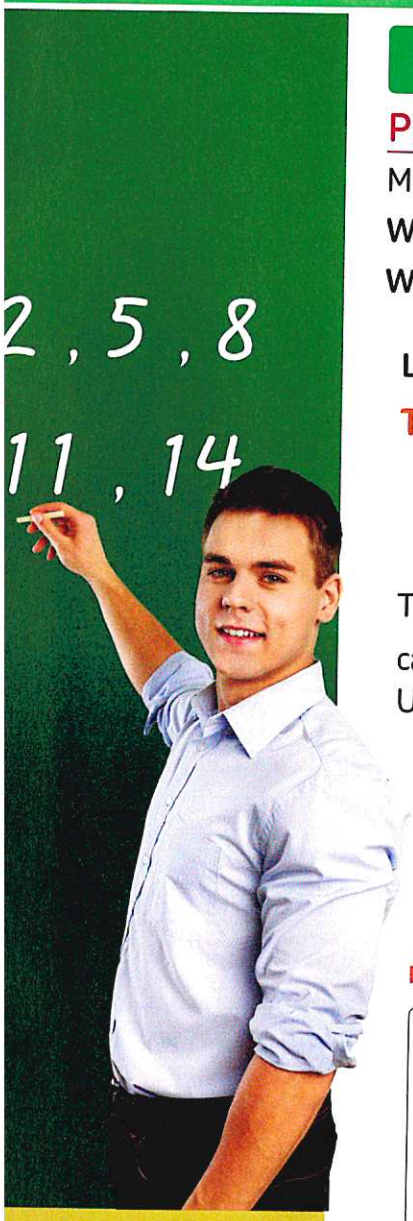
A. $[60 - 5] \times 9$ **B.** $[60 - 9] \times 5$ **C.** $60 + 5 \times 9$ **D.** $60 - 5 \times 9$

8. Which expression matches the clue "Mary run 12.5 kilometers for 3 days each and 11.3 kilometers for 7 days each". How many kilometers did she run in these 10 days?

A. $12.5 \times 3 + 11.3 \times 7$ **B.** $12.5 \times 3 - 11.3 \times 7$ **C.** $12.5 \times 7 + 11.3 \times 3$ **D.** $[12.5 + 11.3] \times [7 + 3]$

Lesson

4 Identifying Numerical Patterns



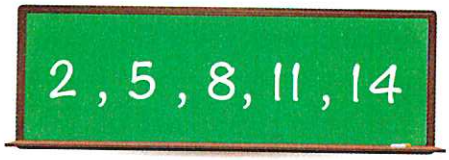
Learn A rule can be used to describe a pattern

Problem

Mr. Ahmed wrote a number pattern.

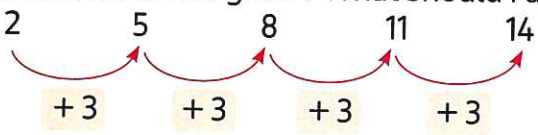
What rule describes his pattern ?

What will the next number be ?



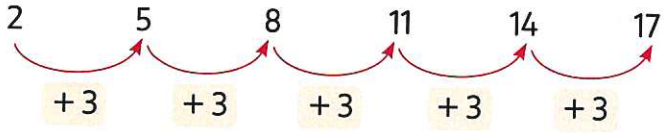
Look at the number pattern. Find the rule.

Think : What should I do to 2 to get 5 ? What should I do to 5 to get 8 ?



The numbers increase by 3. So, the rule "add 3" describes the pattern. You can write the rule as "n + 3" such that n represents the previous numbers.

Use the rule to extend the pattern.



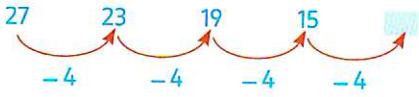
MATH IDEA

A rule must be true for all the numbers in the pattern.

So, the next number in the pattern is 17

▸ More Examples :

A 27 , 23 , 19 , 15 , ___



The rule is subtract 4 .

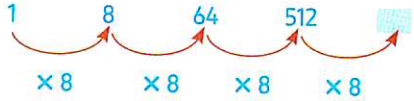
- To find the missing number, subtract 4.

$15 - 4 = 11$

So, the missing number is 11.

The rule : $x - 4$

B 1 , 8 , 64 , 512 , ___



The rule is multiply by 8 .

- To find the missing number, multiply by 8.

$8 \times 512 = 4096$

So, the missing number is 4096.

The rule : $n \times 8$

Notes for parents :

- Ask your child to describe a pattern and let him/her discover how he/she could find the next number in a pattern.

Example 1

Look at each set of numbers and identify whether the numbers form a pattern. If yes then identify the rule.

a. 7 , 14 , 28 , 56 , _____

b. 2 , 3.5 , 5 , 6.5 , _____

c. 90 , 85 , 70 , 60 , _____

d. 8 , 16 , 24 , 30 , _____

Solution

a. Yes, the rule : $2 \times n$

b. Yes, the rule : $n + 1.5$

c. No

d. No

Example 2

Look at each table and determine the rule use a variable to write the rule.

a.

Input	Output
1	7
2	8
3	9
4	10

Rule : _____

b.

Input	Output
4	1
8	2
12	3
16	4

Rule : _____

c.

Input	Output
10	8
12	10
14	12
16	14

Rule : _____

Solution

a. $n + 6$

b. $n \div 4$

c. $n - 2$

Check your understanding

1. Look at each set of numbers and identify whether the numbers form a pattern. If yes then identify the rule.

a. 4 , 5.5 , 8.5 , 14.5

_____ , _____ , _____ , _____ , _____

b. 1 , 6 , 10 , 11 , 16

_____ , _____ , _____ , _____ , _____

2. Look at each table and determine the rule use a variable to write the rule.

a.

Input	Output
10	2
20	4
30	6
40	8

Rule : _____

b.

Input	Output
1	3
3	5
5	7
7	9

Rule : _____

• Ask your child to use letters to represent unknown quantities in a rule for a numerical pattern.

Exercise 28
on lesson 4

▸ Identifying Numerical Patterns

REMEMBER · UNDERSTAND · APPLY · PROBLEM SOLVING | From the school book

1. Look at each set of numbers and identify whether the numbers form a pattern. If yes, then identify the rule.

	Set	Pattern ? [Y / N]	Rule
1.	5 , 10 , 20 , 40 , 80 ...		[El Menia 23]
2.	3 , 6 , 9 , 15 , 21 , 28 ...		
3.	1.5 , 3 , 4.5 , 6 , 7.5 ...		
4.	5 , 3 , 6 , 1 , 7 , 5 ...		
5.	1 , 3 , 9 , 18 , 54 ...		
6.	85 , 73 , 61 , 49 , 37 ...		

2. Look at each table and determine the rule. Use a variable to write the rule.

a.

Input	Output
1	6
2	7
3	8
4	9
5	10

Rule : _____

b.

Input	Output
1	8
2	16
3	24
4	32
5	40

Rule : _____

c.

Input	Output
70	10
63	9
56	8
49	7
42	6

Rule : _____

d.

Input	Output
1	8
2	9
3	10
4	11

Rule : _____

e.

Input	Output
5	1
10	2
15	3
20	4
25	5

Rule : _____

f.

Input	Output
35	25
34	24
33	23
32	22
31	21

Rule : _____

g.

Input	Output
3	18
4	24
5	30
6	36
7	42

Rule : _____

h.

Input	Output
3	12
6	24
9	36
12	48

Rule : _____

i.

Number of Bicycles (input)	Number of wheels (output)
1	2
2	4
3	6
4	8
5	10

Rule : _____

j.

Input	Output
2	20
3	30
4	40
5	50
6	60

Rule : _____

k.

Input	Output
6	1
12	2
18	3
24	4
30	5

Rule : _____

l.

Input	Output
1	1.5
2	2.5
3	3.5
4	4.5
5	5.5

Rule : _____

3. **Write the rule for each pattern with a variable, then complete the pattern by finding the missing values.**

a. 52 , 44 , 36 , 28 , 20 , _____ , _____ Rule : _____

b. 23 , 27 , _____ , 35 , 39 , _____ , _____ Rule : _____

c. 2 , 4 , 8 , 16 , _____ , 64 , _____ Rule : _____ [Giza – Abo El Nomrous 23]

d. 17 , _____ , 21 , 23 , _____ , _____ Rule : _____

e. 32 , 16 , 8 , _____ , 2 , _____ Rule : _____

[Giza – Awseem 23 , Cairo – El Nouzha 23]

f. _____ , 8 , 15 , _____ , 29 , _____ Rule : _____

4. **Complete the following.**

a. The missing number in the pattern 2 , 6 , 18 , ... , 162 is _____

b. The rule in the pattern : 5 , 7 , 9 , 11 , ... is _____

c. The rule in the pattern : 1 , 4 , 19 , 94 , ... is _____

d. The rule in the pattern : 10 , 20 , 30 , 40 , ... is _____

e. The rule in the pattern : 7 , 15 , 31 , 63 , ... is _____

f. The next number in the pattern : 0 , 1 , 1 , 2 , 3 , 5 , 8 , 13 , ... is _____

5. 📖 **Look at the pattern and the two students' work. Then, respond to the prompt.**

Write a rule using a variable and explain your thinking.

Input	Output
28	4
35	5
42	6
49	7
56	8

Yahia's Work

Rule : $n \times 7$

I think the rule is multiply by 7 because $4 \times 7 = 28$ and $5 \times 7 = 35$ and it works for each pair.

Walid's Work

Rule : $n \div 7$

I think the rule is divide by 7 because $28 \div 7 = 4$ and $35 \div 7 = 5$ and it works for each pair.

Which student is correct ? Explain how you know your answer is correct.

Challenge

6. **Look at the table and determine the rule. Use variable to write the rule.**

Input	Output
2	3
4	7
6	11
8	15
10	19

Multiple Choice Questions

Choose the correct answer.

1. 3 , 5 , 7 , 9 , 11 , _____ in the same pattern. [Alexandria - West 23]

A. 21 **B.** 15 **C.** 13 **D.** 12

2. 2 , 5 , 8 , 11 , _____ in the same pattern. [El Beheira – Housh Essa 23]

A. 12 **B.** 14 **C.** 16 **D.** 17

3. The missing value in the pattern 23 , 27 , ... , 35 , is _____ [Port Said 23]

A. 29 **B.** 31 **C.** 30 **D.** 34

4. The pattern rule of : 35 , 31 , 27 , 23 , ... is _____ [El Monofia – Shiben El Kom 23]

A. $n - 2$ **B.** $n + 4$ **C.** $n \times 4$ **D.** $n - 4$

5. The rule of the pattern : 3 , 7 , 11 , 15 , ... is _____ [Port Said - East 24 – Ismailia 23]

A. $n - 4$ **B.** $n + 4$ **C.** $n \times 4$ **D.** $n \div 4$

6. The rule of the pattern : 3 , 6 , 12 , 24 , ... is _____ [Giza - El Haram 24]

A. $n + 2$ **B.** $n - 2$ **C.** $n \times 2$ **D.** $n \div 2$

7. The rule of the pattern : 2 , 5 , 8 , 11 , ... is _____ [Giza 24 , Port Said - North 24]

A. $n + 1$ **B.** $n + 2$ **C.** $n + 3$ **D.** $n + 4$

8. If the input is 3 and the output is 15 then the rule is _____ [Kafr El Sheikh 24]

A. $n + 5$ **B.** $n - 5$ **C.** $n \times 5$ **D.** $n \div 5$

9. If the input is 45, and the rule is "$n \div 5$", then the output is _____ [Cairo – El Salam 23]

A. 6 **B.** 40 **C.** 9 **D.** 50

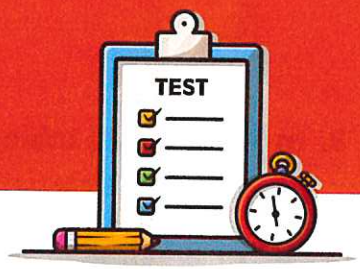
10. Observe the table : the pattern rule is _____ [Cairo - Helwan 24]

A. $n - 2$ **B.** $n + 2$

C. $n \times 2$ **D.** $n \div 2$

Input	3	6	9	12
Output	6	12	18	24

Unit Six Assessment



1. Choose the correct answer.

1. 16, 8, 4, _____ [In the same pattern] [El Monofia – Tala 23]

   A. 4 **B.** 1 **C.** 2 **D.** 8

2. 145 = _____

   A. $24.5 \times (20 - 10) \div 2$ **B.** $245 \times (1 - 0.9)$

   C. $24.5 \times 10 - 20 \times 5$ **D.** $2 \times 100 - 6.5 \times 10$

3. The rule of this pattern :

Input	1	2	3	4
Output	1	3	5	7

   is _____ [Damietta 24]

   A. $n + 1$ **B.** $2 \times n - 1$ **C.** $3 \times n - 1$ **D.** $2 \times n + 1$

4. Which expression matches the clue "Add 2.4 and 3.5, then divide the result by 3 ? [El Monofia – El Bagour 24]

   A. $2.4 + 3.5 \div 3$ **B.** $(2.4 + 3.5) \div 3$

   C. $2.4 + (3.5 \div 3)$ **D.** $6.9 \div 3$

5. The second step to evaluate the expression : $9.3 \times 0.1 + 4.7 - 1.1$ is _____

   A. 9.3×0.1 **B.** 9.3×4.8 **C.** $0.93 + 4.7$ **D.** $0.93 + 1.1$

6. The rule of the pattern : 1, 3, 5, 7, ..., is _____ [El Monofia - Shebin El Kom 24]

   A. $n + 1$ **B.** $n + 2$ **C.** $n - 1$ **D.** $n \times 2$

7. The next number in the pattern : 1.5, 3, 4.5, 6, 7.5, ... is _____ [Giza - South 24]

   A. 8 **B.** 8.5 **C.** 9 **D.** 9.5

2. Complete the following.

1. The value of the expression : $(9.4 - 3.4) \times 10 + 4$ is _____ [Aswan 24]
2. 10, 30, 50, _____, _____ [In the same pattern] [Cairo – Heliopolis 23]
3. The expression which matches the clue "Subtract 12.4 from the result of multiplying 8.5 by 3.2" is _____ and its value is _____
4. In the pattern : 4, 11, 18, 25, ..., the rule is _____
5. The first operation to evaluate the expression : $[94 - 3.4] \div 2 + 55 \times 10$ is _____
6. In the pattern : 1, 4, 16, 64, ..., the rule is _____
7. $3.2 \times 3 \div 6 + 1.4 =$ _____ [El Monofia – Shiben El Kom 23]

8. In the opposite table :

The rule of the pattern is _____

Input	7	9	11	13
Output	9	11	13	15

3. Choose the correct answer.

1. The first operation to solve $983 - 16 \div 8 + 11 \times 10$ is _____

[El Monofia - Sars El Lian 24, Cairo – Al Khalifa & Al Mokattam 23]

A. add **B.** subtraction **C.** multiply **D.** divided

2. $1.2 + 0.24 \times 10 =$ _____ [Cairo 23]

A. 2.5 **B.** 2.6 **C.** 3.6 **D.** 4

3. The missing number in the pattern : 1.5 , 3 , ... , 6 is _____

A. 4 **B.** 4.5 **C.** 5 **D.** 3.5

4. Which expression matches the clue "Add 30 to 25 and divide the result by 0.5" [Giza 23]

A. $30 + 25 \div 0.5$ **B.** $0.5 \times (30 + 25)$ **C.** $(30 + 25) \div 0.5$. **D.** $30 \div 0.5 + 25$

5. $5.4 \times 0.1 - 0.32 =$ _____ [Giza – Abo El Nomrous 23]

A. 0.68 **B.** 53.68 **C.** 0.22 **D.** 54.2

6. $15 \div 5 + 7 =$ _____ [West Alexandria 23]

A. 5 **B.** 7 **C.** 3 **D.** 10

7. The value of this expression : $(7.5 \times 10) + 2.3$ is _____ [El Menia 23]

A. 77.3 **B.** 9.8 **C.** 19.8 **D.** 2.78

4. Answer the following questions.

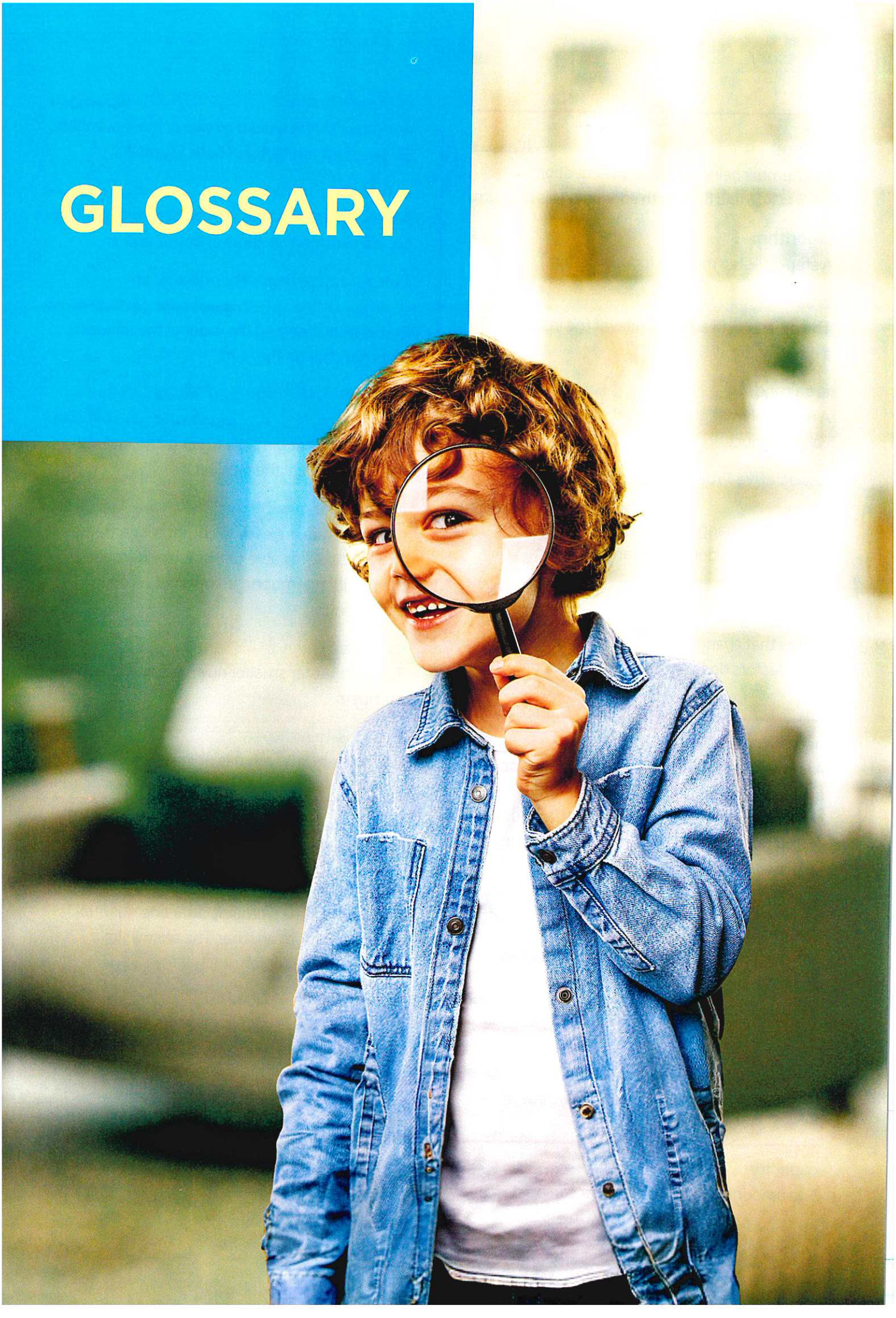
1. Use order of mathematical operations to evaluate : $4.2 + 24 \div 4 + 8$ [Alex. – First Montaza 23]

2. Hany had 1,000 pounds. He bought 5 toys for 33 pounds each and 5 books for 27 pounds each. Write the expression represents the money left with him then evaluate it.

3. Write the expression matches the clue then evaluate it : Subtract 3.1 from 4.21 then multiply the result by 0.1 [Alexandria – First Montaza 23]

4. Write the expression that matches the clue, then evaluate it "Add 2.7 to 1.2, then multiply the result by 10". [Giza - 6th October 24]

GLOSSARY



A

addend عدد مُضاف
Any number being added. In the equation 6 + 8 = 14, 6 and 8 are both addends, 14 is the sum.

algorithm خوارزمية
A step-by-step method for computing.

area مساحة
The measure, in square units, of the inside of a plane figure.

area model نموذج مساحة المستطيل
A model of multiplication that shows each place value product.

Associative Property of Addition خاصية الدمج فى عملية الجمع
States that changing the grouping of three or more addends does not change the sum.

Associative Property of Multiplication خاصية الدمج فى عملية الضرب
States that changing the grouping of three or more factors does not change the product.

B

benchmark معيار
A known size or amount that can be used as a reference to help understand a different size or amount. Benchmarks can be helpful in estimation and in checking the reasonableness of answers.

benchmark fractions كسور معيارية
Fractions that are commonly used for estimation. Benchmark fractions are useful when comparing and ordering. One-half, one-third, one-fourth, three-fourths, and two-thirds are all benchmark fractions.

brackets أقواس
Symbols used in pairs to group things together.

C

capacity سعة
The amount of liquid a container can hold.

common factor عامل مشترك
Any factor that is shared by two or more numbers. Six is a common factor of both 12 and 24.

common multiple مضاعف مشترك
Any multiple that is shared by two or more numbers. Six is a common multiple of both 2 and 3.

Commutative Property of Addition خاصية الإبدال فى عملية الجمع
States that changing the order of the addends does not change the sum.

Commutative Property of Multiplication خاصية الإبدال فى عملية الضرب
States that changing the order of the factors does not change the product.

compatible numbers أعداد لها قيمة مميزة
Numbers that are easy to compute mentally and are close in value to the actual numbers. Compatible numbers can be used when estimating.

compose يكوّن
To put together smaller numbers to make larger numbers.

Composite number عدد غير أولى
A positive number that is not prime

D

decompose يحلل
To separate a number into two or more parts.

difference فرق
The amount that remains after one quantity is subtracted from another. The answer in a subtraction problem.

digit رقم
Any of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9. [Also known as base 10 numerals.]

Distributive Property of Multiplication خاصية التوزيع فى الضرب
States that whether the numbers in parentheses are added before or after multiplication, the results are the same.

dividend مقسوم
A number that is divided by another number.
Fifty-six is the dividend in 56 ÷ 8 = 7

division عملية القسمة
Splitting into equal parts or groups also known as fair sharing.

divisor مقسوم عليه
The number by which another number is divided.
Eight is the divisor in 56 ÷ 8 = 7

E

equation معادلة
A mathematical sentence with an equal sign. The amount on one side of the equal sign has the same value as the amount on the other side.
4 + 3 = 7

equivalent مكافئ
Having the same value.

estimate يُقدِّر
To find a number close to an exact amount, an estimate tells about how much or about how many.

expanded form صيغة ممتدة
A way to write numbers that shows the place value of each digit. 263 = 200 + 60 + 3

expression تعبير رياضي
A mathematical phrase without an equal sign.
n + 4

F

factors عوامل
Numbers we can multiply together to get another number

factor pairs أزواج عوامل العدد
Sets of two numbers that multiply together to reach a certain product.

factor tree شجرة العوامل
A diagram that shows all the factors of a number, with the number appearing at the top of the "tree" and factors of that number appearing in "branches" until each branch ends in prime number.

finite نهائى
Not infinite. Has an end.

fraction كسر اعتيادى
A way to describe a part of a whole or a part of a group by using equal parts

G

greatest common factor (GCF)
العامل المشترك الأكبر
The greatest number that is a factor of two (or more) other numbers.

H

Hundredths أجزاء من المائة
In the decimal numeration system, Hundredths is the name of the next place to the right of Tenths.

I

infinite لا نهائى
Without an end. Not finite.

input مُدخَل
The known variable you feed into an expression.

inverse operation عملية عكسية
Opposite operations. They are operations that reverse the effect of another operations.

L

least common multiple (LCM)
المضاعف المشترك الأصغر
The smallest positive number that is a multiple of two or more numbers.

M

midpoint strategy استراتيجية نقطة المنتصف
A method in which students use the midpoint of two numbers on number line to help visualize rounding numbers.

multiples مضاعفات
Numbers created by multiplying two factors.

multiplication عملية الضرب
The process of finding the product of two or more numbers "repeated addition".

multiplicative comparison مقارنة باستخدام عملية الضرب
A way to compare quantities using multiplication.

N

numerical pattern نمط عددي
A list of numbers that follow a certain sequence or pattern.

O

Order of Operations ترتيب إجراء العمليات
A set of rules tells us the order in which to compute.
1. For operations within parentheses
   a. multiply or divide from left to right
   b. add or subtract from left to right
2. For operations within brackets
   a. multiply or divide from left to right
   b. add or subtract from left to right
3. For operations outside parentheses
   a. multiply or divide from left to right
   b. add or subtract from left to right

output مُخرَج
What comes out of the function; the solution.

P

parentheses أقواس
Grouping symbols for operations. When simplifying an expression, the operations within the parentheses are evaluated first.

partial products ناتج عملية الضرب بالتجزئة
Any of the multiplication results we get leading up to an overall multiplication result.

partial products model نموذج إيجاد ناتج عملية الضرب بالتجزئة
A model that breaks numbers down into their factors or palce values to make multiplication easier.

partial quotients model نموذج إيجاد خارج عملية القسمة بالتجزئة
A method of dividing in which multiples of the divisor are subtracted from the dividend, and then the partial quotients are added together.

pattern نمط
A repeating or growing sequence or design.

place value قيمة مكانية
The value of the place of a digit in a number.

powers of ten قوى العدد ١٠
A set of mathematical notations that allow you to express any number as a product of multiples of 10.

prime factorization التحليل إلى عوامل أولية
Finding which prime numbers multiply together to produce the original number.

prime number عدد أولي
A whole number greater than 1 that has exactly two different factors, 1 and itself.

product ناتج الضرب
The answer to a multiplication problem.
In $6 \times 7 = 42$, 42 is the product.

Q

quotient خارج القسمة
The answer to a division problem.

R

reasonable معقول
Makes sense according to the numbers and operation used.

regroup يعيد التسمية
To rearrange numbers into groups of 10 when performing mathematical operations.

regrouping إعادة التسمية
The process of making groups of tens when adding or subtracting two-digit numbers [or more].

remainder باقي القسمة
The amount left over when one number is divided by another.

round يُقرب
A way to change a number to a shorter or simpler number that is very close to the original number.

rule قاعدة
something that happens every time
[for example : 2, 5, 8, 11 ... the rule is + 3].

S

sequence تسلسل
A set of numbers arranged in a special order or pattern.

simplify يبسط
To express a fraction in simplest form.

standard algorithm for multiplication
خوارزمية الضرب المعيارية
Strategy for multiplying by using partial products or multiplying in parts.

standard form صيغة قياسية
A common or usual way of writing a number using digits. 12,376 is in standard form.

sum مجموع
The answer to an addition problem.

T

Tenths أجزاء من عشرة
In the decimal numeration, Tenths is the name of the place to the right of the decimal point.

Thousandths أجزاء من ألف
The value of a digit that is the fourth position from the right when describing whole number place value.

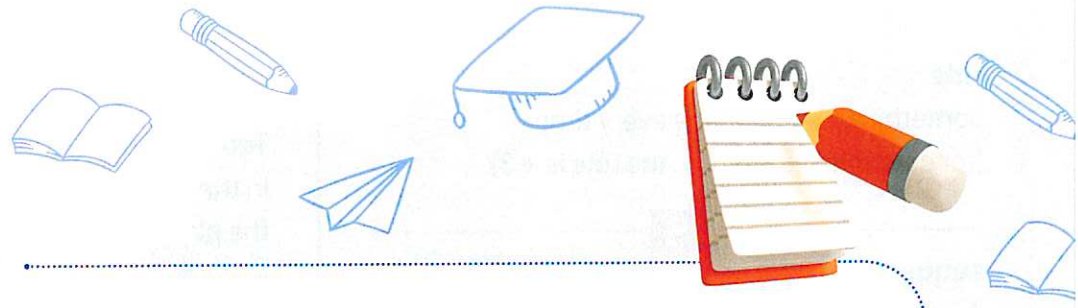
U

unknown مجهول
Part of an expression or equation that has to be found; a variable that can be represented in a problem by a letter.

V

value قيمة
How much a digit is worth depending on where it is in a number; the result of a calculation.

variable متغير
A letter or symbol that represents a number.
for example : in $5 \times b = 10$, b is the variable.



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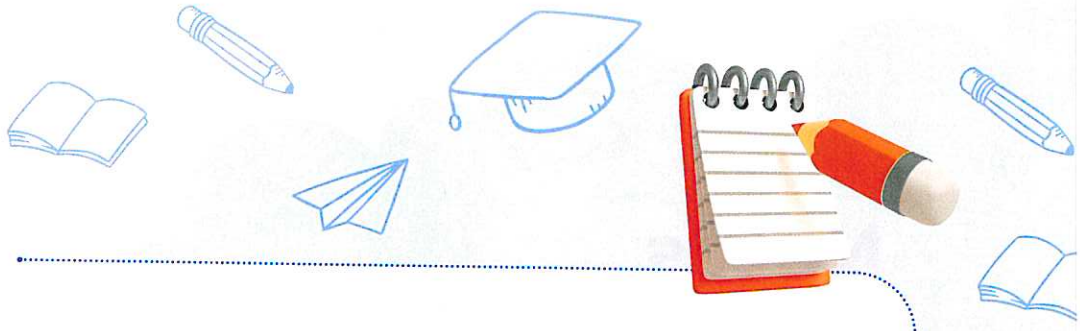

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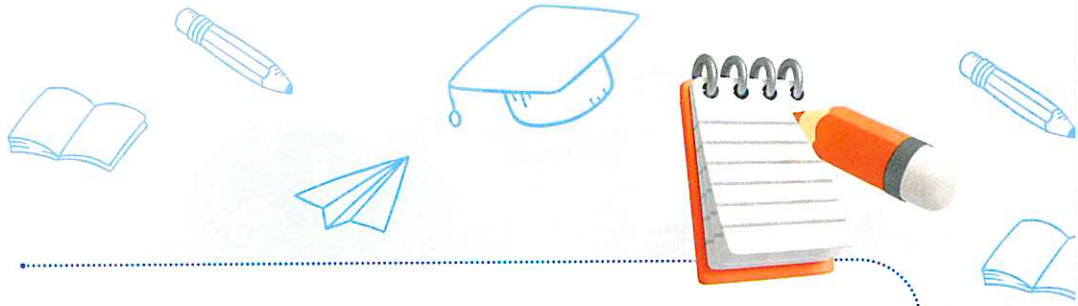

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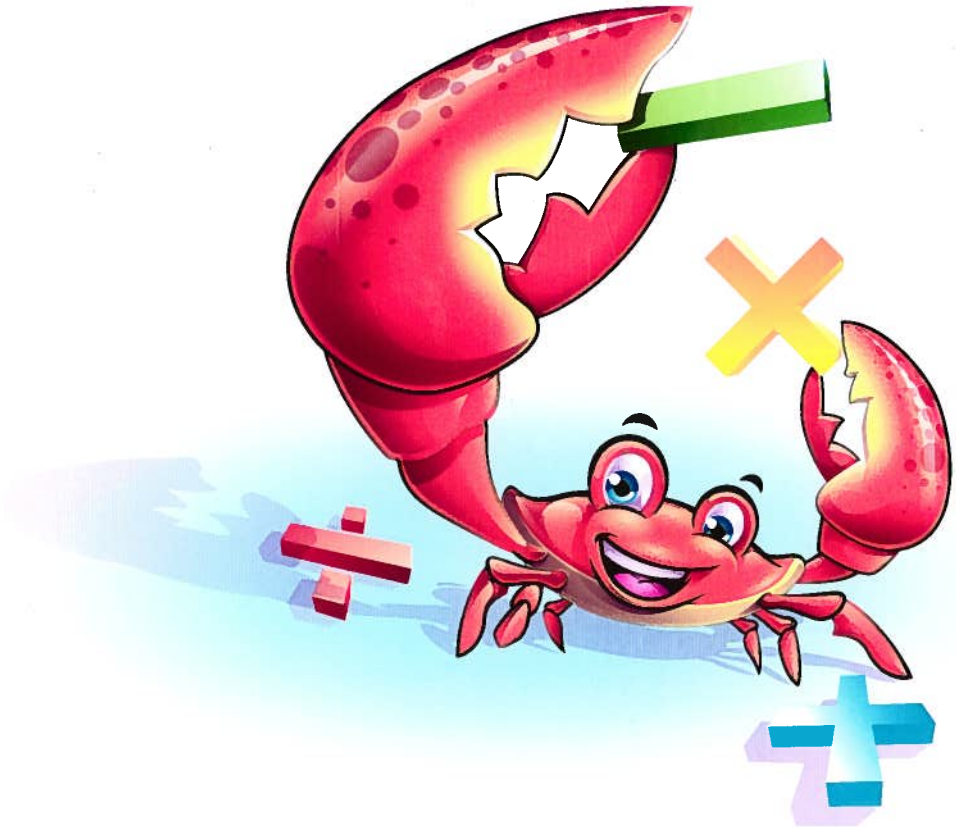

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