

# NUMBER SMART

Teacher's Resource Material

**Alicia Ancheta-Camitan**  
**Rosario B. Butaran**  
**Ma. Lourdes P. dela Cruz**  
**Maria Teresita A. Guadarrama**  
**Teodora A. Riel**  
**Perla A. Zotomayor, Ed.D.**  
Authors

**Herminia D. Torres, Ph.D.**  
Coordinator



Published & Distributed by

**REX Book Store**

856 Nicanor Reyes, Sr. St.

Tel. Nos. 736-05-67 • 735-13-64

1977 C.M. Recto Avenue

Tel. Nos. 735-55-27 • 735-55-34

Manila, Philippines

[www.rexpublishing.com.ph](http://www.rexpublishing.com.ph)

# 5

Revised Edition

# UNIT III – RATIO AND PROPORTION, PERCENT, GEOMETRY, AND SIMPLE EQUATIONS

## CHAPTER 6 – RATIO AND PROPORTION

### Chapter Summary

This chapter contains topics and skills on ratio and proportion. Varied activities have been designed for pupils to explore concept of ratio and proportion and expressing fractions as ratios and vice versa.

To evaluate pupils' prior understanding of ratio and proportion, a pre-assessment will be given to them.

Performance-based activities will also be given at the end of the chapter so pupils can apply concepts and skills they have learned.

### Content Standards

*The learner should be able to demonstrate an understanding of...*

- four fundamental operations involving decimals and ratio and proportion.

### Performance Standards

*The learner should be able to...*

- apply four fundamental operations involving decimals and ratio and proportion in mathematical problems and real-life situations.

### Pre-assessment

Conduct a pre-test to the class.

I. Express each ratio in simplest form.

- |              |                                    |
|--------------|------------------------------------|
| 1. 80 to 16  | 6. $1\frac{1}{2}$ to $\frac{1}{2}$ |
| 2. 54 to 90  | 7. 60 to 15                        |
| 3. 75 to 100 | 8. 6 to $\frac{1}{2}$              |
| 4. 36 to 72  |                                    |
| 5. 75 to 350 |                                    |

II. Solve for the missing term.

- |                      |                      |
|----------------------|----------------------|
| 1. $8 : 4 = 16 : n$  | 5. $N : 20 = 10 : 5$ |
| 2. $3 : n = 27 : 45$ | 6. $3 : n = 8 : 24$  |
| 3. $n : 3 = 12 : 4$  | 7. $5 : 6 = n : 60$  |
| 4. $9 : 10 = n : 20$ | 8. $16 : n = 12 : 3$ |

III. Solve.

1. If the ratio of 2 numbers is 20:1, the larger number is how many times the smaller number?
2. If the ratio of 2 numbers is 4:1, the smaller number is what fractional part of the larger number?

### Key Stage Standards:

The learner demonstrates understanding and appreciation of key concepts and skills involving numbers and number sense, measurement, geometry, patterns and algebra, statistics and probability as applied, using appropriate technology, in critical thinking, problem solving, reasoning, communicating, making connections, representations, and decisions in real life.

### Grade Level Standards:

At the end of Grade 5, the learner demonstrates understanding and appreciation of key concepts and skills involving whole numbers up to 10 000 000, order of operations, factors and multiples, fractions and decimals including money, ratio and proportion, percent, time, circumference, area, volume, temperature, polygons, circles, solid figures, sequence and number sentences, tables, line graphs, and experimental probability as applied, using appropriate technology, in critical thinking, problem

3. A cake recipe calls for  $2\frac{1}{2}$  cups of milk to  $3\frac{1}{2}$  cups of flour. Write in simplest form the ratio of the number of cups of milk to the number of cups of flour in this recipe.
4. The perimeter of a rectangular garden is 60 feet and the width is 15 feet. Find the ratio of the length of the rectangle to its width in simplest form.

solving, reasoning, communicating, making connections, representations, and decisions in life.

The teacher will administer pre-test days before the chapter starts. This pre-assessment measures the pupils' readiness to continue learning about number theory and order of operations. The teacher can already group the pupils based on the results.

**Resource:**

Pre-assessment worksheets

## Lesson 1: Visualizing Ratio (2 days)

### Introduction/Preparatory Activities

1. Pose the problem below:  
An oil tank with a capacity of 100 gallons contains 25 gallons of oil.
  - a. Find the ratio of the number of gallons of oil in the tank to the capacity of the tank.
  - b. What part of the tank is full?
2. Illustrate the problem using a diagram.

### Body/Developmental

#### Jumpstart

1. Let the pupils follow the directions in **Jumpstart**. Check if each pupil is doing it correctly.
2. Lead the class in doing **Study the Model**.

#### Focus

1. Let the pupils practice by answering **Focus**.
2. Concept Attainment Technique:
  - a. Choose the concept: Ratios. Show fraction flash cards with ratio forms.
  - b. Ask the pupils to place the correct ratio at the right side and all the wrong sums at the left side.
  - c. Ask the pupils to evaluate: Why is your ratio correct? Not correct?
  - d. Lead them to find similarities in the correct answer. Then discuss and define the concept.

#### Take a Leap

1. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:  
Group Archimedes – Pupils who got 17–20 points correct  
Group Einstein – Pupils who got 13–16 points correct  
Group Gauss – Pupils who got 12 points and below correct
2. Add more groups to make sure that there are only about 4–5 members in a group. (Use Descartes, Polya, Euclid etc.)
3. Have Group Archimedes do exercise A in **Take a Leap** and Groups Einstein and Gauss do exercise B.

#### Quick Check

Ask the pupils to do **Quick Check**. Tell them to draw examples of equivalent ratios.

#### Make Meaning

1. Lead them to the exercises in **Make Meaning**.

#### Knowledge:

Visualizing ratio

#### Pre-assessment:

Diagnostic Test



More resources on Learning Objectives are available in the Technology Enhancement CD

#### Skills:

- Visualize the ratio of two given sets of objects.
- Express the ratio of two numbers using either the colon (:) or a fraction.
- Identify and write equivalent ratios.



More resources on Acquisition Strategies are available in the Technology Enhancement CD

#### Concept Attainment Technique

#### KU:

- Ratio is comparing two quantities.
- Ratio is used in various real-life situations.
- Knowledge of ratio helps us in interpreting numerical data reported about people and services, among others.
- Two ratios are equivalent if they have the same value when changed into fractions.



More resources on Practice Strategies are available in the Technology Enhancement CD

More Resources can be found in the TEC.

2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:

<http://learnzillion.com/lessons/580-visualize-parttopart-ratios-using-pictures>

Exercise 047.pdf

<http://www.math.com/school/subject1/lessons/S1U2L1DP.html>

[http://www.mathslice.com/ratios\\_ws.php](http://www.mathslice.com/ratios_ws.php)

### Smart Ideas

Discuss the important points in **Smart Ideas**. Ask the class to read **Smart Ideas** and explain these in their own words. They may use the language they are comfortable with.

### Level Up

Have Groups Einstein and Gauss do numbers 1 to 4 and Group Archimedes do numbers 5 to 8.

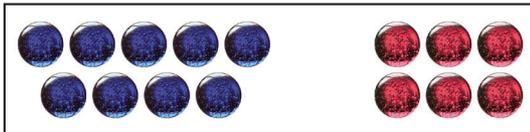
### Conclusion/Evaluation

Lead the class in doing **Let's Reflect**.

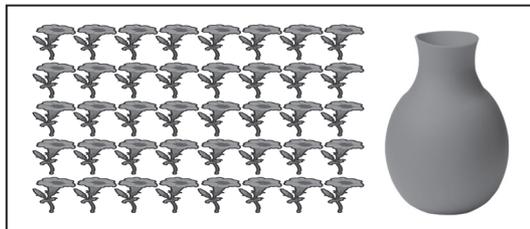
### Answer Key

#### Focus

1. a. 15 : 3
- b. 5 : 1
2. 6 : 1
3. 9 : 3 or 3 : 1
- 4.



- 5.



### Take a Leap

- |       |                   |     |         |
|-------|-------------------|-----|---------|
| A. 1. | 15 : 20 or 3 : 4  | 6.  | 15 : 14 |
| 2.    | 6 : 8 or 3 : 4    | 7.  | 19 : 18 |
| 3.    | 14 : 5            | 8.  | 14 : 9  |
| 4.    | 18 : 20 or 9 : 10 | 9.  | 1 : 7   |
| 5.    | 20 : 1            | 10. | 1 : 1   |

#### KQ:

- What is ratio?
- How do you use ratio in real-life situations?
- When are two ratios equivalent?

#### Mid-assessment Activity



More resources on Learning Evidences are available in the Technology Enhancement CD

**Summarizes the lesson learned.**

#### 21st Century Skills

- Use communication, critical and creative thinking

#### Point of Integration

- Home Economics (adjusting the amount of ingredients)

- B. 1. 10 : 2 or 5 : 1                      6. 3 : 9 or 1 : 3  
 2. 3 : 15 or 1 : 5                        7. 3 : 6 or 1 : 2  
 3. 5 : 20 or 1 : 4                        8. 2 : 4 or 1 : 2  
 4. 2 : 12 or 1 : 6                        9. 300 : 12 or 25 : 1  
 5. 4 : 24 or 1 : 6                        10. 4 : 48 or 1 : 12

### Make Meaning

#### Spicy Sausage Egg Casserole

$3\frac{1}{2}$  cups butter

$3\frac{1}{2}$  lbs sausage

3 cups of milk

6 tsp salt

6 cups flour

#### Coffee Cake Supreme

27 cups of flour

7 cups sugar

### Level Up

1. 6 : 1                                      5. 20 : 4  
 2. 5 : 1                                      6. 26.25 kilometers  
 3. 5 : 1                                      7. 3 500 liters  
 4. 3 : 1                                      8. No, you need to fill it out again before you reach the destination.

## Lesson 2: Expressing Fractions as Ratios and Vice Versa (1 day)

### Introduction/Preparatory Activities

1. Have the pupils play with a partner. They are going to play Waste-basket Basketball and record their successful shoots and failures. Set up the wastebasket at a reasonable distance from the throw line. Each of them will attempt to throw the ball into the basket 10 times.
2. After each throw, have them record their own results. You can have them make a chart to show successful and failed attempts.
3. Find the fraction that reflects each of their results. Start by showing their successful attempts in fraction form. For example, if they were successful 5 times, then the fraction of their successful attempts is  $\frac{5}{10}$ .
4. Then show the pupil how to express fraction in ratio form (5:10).

### Knowledge:

Expressing fractions as ratios and vice versa



More resources on Learning Objectives are available in the Technology Enhancement CD

### Skills:

- Express one value as a fraction of another given their ratio and vice versa
- Find how many times one value is as large as another given their ratio and vice versa
- Simplify ratios

## Body/Developmental

### Jumpstart

1. Guide the class in doing **Jumpstart** in the worktext.
2. Draw out from the pupils the importance of expressing a fraction in the form of a ratio.
3. Discuss **Study the Model**. Ask the class to practice by giving more guided exercises.

### Focus

1. Let the pupils practice by answering **Focus** individually.
2. Cooperative Learning Technique:
  - a. Allow the pupils to form groups. Give each group a flash card with fractions.
  - b. Let the leader guide them in changing them to ratio. They can use different methods.
  - c. After brainstorming and getting the correct method, the leader will present the answer to the whole class for evaluation.
  - d. Assess how the pupils work as a group.
  - e. Allow the pupils to practice some more on changing ratio into a fraction.
3. Let the pupils answer **Focus** with a partner.

### Take a Leap

1. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct

Group Einstein – Pupils who got 13–16 points correct

Group Gauss – Pupils who got 12 points and below correct

2. Ask the pupils to do the exercises in **Take a Leap** by teams.

### Quick Check

Ask the pupils to do “Share with a Friend.” Let them discuss on how to change fractions to ratio and vice versa.

### Make Meaning

1. The pupils answer the exercise with a partner.
2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:

[http://www.khanacademy.org/math/arithmetic/rates-and-ratios/ratios\\_and\\_proportions/v/ratios-as-fractions-in-simplest-form](http://www.khanacademy.org/math/arithmetic/rates-and-ratios/ratios_and_proportions/v/ratios-as-fractions-in-simplest-form)

[http://www.ehow.com/info\\_12050173\\_fraction-ratio.html](http://www.ehow.com/info_12050173_fraction-ratio.html)

<http://www.wisc-online.com/objects/ViewObject.aspx?ID=ABM27>

<http://calculator.tutorvista.com/math/356/ratio-to-fraction-calculator.html>

### KU:

- Ratio can be expressed as a fraction and a fraction can be expressed as a ratio.
- A ratio can be simplified like you simplify fractions to lowest term.



More resources on Acquisition Strategies are available in the Technology Enhancement CD

### Cooperative Learning Technique

- The symbol “ : ” which stands for is to is replaced by a horizontal bar to indicate division. Thus, 1:2 is the same as  $\frac{1}{2}$ .

### KQ:

- How are ratio and fraction related?
- How do you change a ratio into a fraction?
- How do you simplify ratios?

### 21<sup>st</sup> Century Skills

- Use communication, collaboration, and critical thinking skills with confidence

### Point of Integration

Science

### Differentiation by readiness

### Mid-assessment Activity



More resources on Practice Strategies are available in the Technology Enhancement CD

More Resources can be found in the TEC.

## Level Up

1. Allow the fast learner to do **Level Up**.
2. Have the class check the answers. Facilitate clarification and further discussion of the topics.

## Smart Ideas

Ask the class to read **Smart Ideas** and explain these in their own words. They may use the language they are comfortable with. This is the time to clarify some confusion on concepts and difficulties encountered by the pupils. Encourage them to ask questions.

## Conclusion/Evaluation

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

### Answer Key

#### Focus

- A. 1.  $\frac{10}{18}$  or  $\frac{5}{9}$ ; 10 : 18 or 5 : 9  
2.  $\frac{15}{25}$  or  $\frac{3}{5}$ ; 15 : 25 or 3 : 5  
3.  $\frac{15}{50}$  or  $\frac{3}{10}$ ; 15 : 50 or 3 : 10
- B. 1. 4 : 3 or  $\frac{4}{3}$       5. 1 : 4 or  $\frac{1}{4}$   
2. 3 : 5 or  $\frac{3}{5}$       6. 2 : 5 or  $\frac{2}{5}$   
3. 1 : 5 or  $\frac{1}{5}$       7. 105 : 34 or  $\frac{105}{34}$   
4. 3 : 8 or  $\frac{3}{8}$       8. 5 : 2 or  $\frac{5}{2}$

#### Take a Leap

- A. 1. 4 : 6 = 2 : 3      6. 4 : 20 = 1 : 5  
2. 2 : 6 = 1 : 3      7. 2 : 24 = 1 : 12  
3. 2 : 6 = 1 : 3      8. 5 : 20 = 1 : 4  
4. 3 : 18 = 1 : 6      9. 8 : 2 = 4 : 1  
5. 4 : 24 = 1 : 6      10. 3 : 9 = 1 : 3
- B. 1.  $\frac{4}{6}$  or  $\frac{2}{3}$       6.  $\frac{4}{20}$  or  $\frac{1}{5}$   
2.  $\frac{2}{6}$  or  $\frac{1}{3}$       7.  $\frac{2}{24}$  or  $\frac{1}{12}$   
3.  $\frac{2}{8}$  or  $\frac{1}{4}$       8.  $\frac{5}{20}$  or  $\frac{1}{4}$   
4.  $\frac{3}{18}$  or  $\frac{1}{6}$       9.  $\frac{8}{2}$  or  $\frac{4}{1}$   
5.  $\frac{4}{24}$  or  $\frac{1}{6}$       10.  $\frac{3}{9}$  or  $\frac{1}{3}$



More resources on Learning  
Evidences are available in  
the Technology  
Enhancement CD

**Summarizes the lesson  
learned.**

**Assessment:**

Journal

**Let's Reflect!**

**Differentiation by  
interest**

- C. 1.  $\frac{3}{10}; 3:10$       4.  $\frac{4}{12}; 4:12$   
 2.  $\frac{5}{9}; 5:9$       5.  $\frac{3}{9}; 3:9$   
 3.  $\frac{4}{8}; 4:8$

**Make Meaning**

- A. Answers may vary.  
 B. 1.  $\frac{4}{20}$  meter  
 2. 160 centimeters

**Level Up**

- A. a. 1) 1:3      b. 1) 4:6      c. Answers may vary.  
 2)  $\frac{1}{3}$       2)  $\frac{4}{6}$

1. a.



b.



c.



2. 7:15  
 3. 12 boys;  $\frac{3}{10}$  of the class are boys; 7:3  
 4. Answers may vary.  
 5. 3:5 is the inverse of 5:3. They are not the same. For example, the ratio of 3 girls to 5 boys is different from 5 boys to 3 girls.

**Lesson 3: Visualizing Proportion (2 days)**

**Introduction/Preparatory Activities**

It is the far future and the pupils are now doctors, lawyers, engineers, scientists, and president of the Philippines. They are so famous that their hometown wants to honor them with a big statue in the middle of the town. In order to make their statue lifelike, they need to use proportions.

Have pupils make three measurements (in centimeters): height, shoulder width, and shoe length. They can work with a partner. They will have to build a 10-foot tall statue. How wide and long would it be in centimeters?

**Body/Developmental**

**Motivation/Presentation**

- Let the pupils follow the directions in **Jumpstart**. Check if each pupil is doing it correctly.
- Lead the class in doing **Study the Model**.

**Knowledge:**

Visualizing proportion



More resources on Learning Objectives are available in the Technology Enhancement CD

**Skills:**

- Define and describe a proportion.
- Find the missing term in a pair of equivalent ratios.

**KU:**

- Proportion is an equality of two ratios.

## Focus

1. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct

Group Einstein – Pupils who got 13–16 points correct

Group Gauss – Pupils who got 12 points and below correct

2. Concept Attainment Technique:
  - a. Choose the concept: Visualizing proportion. Show equal ratios flash cards.
  - b. Ask the pupils choose flash cards with correct proportion. Let them place flash cards with correct answer at the right side and all the wrong proportion at the left side.
  - c. Ask the pupils to evaluate: Why is your proportion correct? Not correct?
  - d. Lead them to find similarities in the correct answer. Discuss and define the concept.
3. Ask the teams to answer **Focus** together:

Team Archimedes – the group works on their own

Team Einstein – the group works with little supervision of the teacher

Team Gauss – the group works with close supervision of the teacher

## Take a Leap

Ask the pupils to study and answer **Take a Leap**, exercise A. Exercise B may be given as homework.

## Quick Check

Ask the pupils to do **Quick Check**. Tell them to answer the items together.

## Make Meaning

1. Lead them to the exercises in **Make Meaning**. Let them do it by teams. Supervise closely the teams.
2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:

[http://www.mathplayground.com/mv\\_proportions.html](http://www.mathplayground.com/mv_proportions.html)

<http://flowingdata.com/2009/11/25/9-ways-to-visualize-proportions-a-guide>

<http://www.mathplanet.com/education/algebra-1/how-to-solve-linear-equations/ratios-and-proportions-and-how-to-solve-them>

## Smart Ideas

1. Discuss **Smart Ideas**.
2. Call on an auditory learner to summarize the **Smart Ideas** in Lesson 3.



More resources on Acquisition Strategies are available in the Technology Enhancement CD

- Proportion can be used in many real-life situations. It can tell us how one quantity varies or changes with respect to another.

## Concept Attainment Technique

### KQ:

- What is a proportion?
- How do you use proportion in real-life situations?

## 21<sup>st</sup> Century Skills

- Use communication, collaboration, and critical-thinking skills with confidence

## Points of Integration

Home Economics

## Mid-assessment Activity



More resources on Practice Strategies are available in the Technology Enhancement CD

More Resources can be found in the TEC.



More resources on Learning Evidences are available in the Technology Enhancement CD

**Summarizes the lesson learned.**

## Level Up

Allow pupils to do **Level Up** problem numbers 1 to 5. Problem numbers 4 to 9 may be given as homework.

## Conclusion/Evaluation

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

## Answer Key

### Focus

1. 10
2. 40
3. 1
4. 25 000

### Take a Leap

A. Answers may vary.

- B.
- |       |         |
|-------|---------|
| 1. 5  | 6. 5    |
| 2. 6  | 7. 40   |
| 3. 6  | 8. 50   |
| 4. 16 | 9. 27   |
| 5. 12 | 10. 2.5 |

## Make Meaning

### Chili Vanilly

- 2.5 kg hamburger
- 1 onion
- $\frac{1}{2}$  kg tomatoes
- 3 tbsp chili powder
- 2 green bell peppers
- $2\frac{1}{2}$  cans of tomato sauce
- 2 cans of beans

### Mango Bango Crisp

- 2 kg mangoes
- $\frac{5}{6}$  kg tomatoes
- 2.75 cups oatmeal
- $\frac{5}{6}$  cup butter
- $\frac{1}{2}$  tbsp cinnamon
- 0.5 tsp nutmeg

## Level Up

1. 39 : 21
2. 6
3. 252 square meters
4. Heidi has ₱100 while Sally has ₱140.
5. 15
6. 9
7. 6
8. ₱960
9. 126

## Lesson 4: Forming Proportions (2 days)

### Introduction/Preparatory Activities

1. Review ratios with the class. Stress that their main purpose is to compare 2 or more amounts.
2. Break the class up into two or three. Distribute the bags of counters (30 white and 20 black) to each group. They will explore equal ratios by making as many piles as they can that contain an equal number of both colors. Each pile must be identical in color and number.
3. After completing the activity, groups will report their findings. Discuss with the pupils what they discovered. (Pupils will separate 30 white counters and 20 black counters into 10 piles each with 3 white and 2 black. Each pile represent the simplest ratio (3:2) derived from the whole (30:20). By combining piles, pupils will discover that ratios are equal if they are built with the same simplest ratio. Their parts have a relationship to the whole. (Equal ratios are in proportion.)

### Body/Developmental Jumpstart

1. Let the pupils follow the directions in **Jumpstart**. Check if each pupil is doing it correctly.
2. Lead the class in doing **Study the Model**.

### Focus

1. Cooperative Learning Technique:
  - a. Allow the pupils to form groups. Give each group a flash card with equal ratios.
  - b. Let the leader guide them in answering it. They can use different methods in checking proportion.
  - c. After brainstorming and getting the correct method, the leader will present the answer to the whole class for evaluation.
  - d. Assess how the pupils work as a group.
2. Allow the pupils to practice some more on forming proportion.
3. Let the pupils practice by answering **Focus**.

### Knowledge:

Forming proportions



More resources on Learning Objectives are available in the Technology Enhancement CD

### Skills:

- Form proportion as equality of two ratios
- Apply knowledge of proportion in problem solving

### KU:

- A proportion is formed by equating two ratios or two fractions.
- A proportion is a statement of equality of two ratios.
- To find the missing term in a proportion, means finding the number (numerator or denominator) that will make the proportion true.



More resources on Acquisition Strategies are available in the Technology Enhancement CD

### Cooperative Learning Technique

### KQ:

- How do you form a proportion?

## Take a Leap

Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct

Group Einstein – Pupils who got 13–16 points correct

Group Gauss – Pupils who got 12 points and below correct

## Quick Check

Ask the pupils to do “Share with a Friend.” Let them discuss on how form proportions.

## Make Meaning

1. Ask the pupils to work alone on **Make Meaning**.
2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:  
<http://www.mathworksheets4kids.com/ratio/create-proportion.pdf>  
[http://www.helpingwithmath.com/printables/worksheets/ratio\\_proportion/wor0601ratio05.htm](http://www.helpingwithmath.com/printables/worksheets/ratio_proportion/wor0601ratio05.htm)  
[http://www.mathslice.com/ratios\\_ws.php](http://www.mathslice.com/ratios_ws.php)  
Part 048.pdf

## Smart Ideas

Discuss **Smart Ideas**. Call on an auditory learner to summarize the **Smart Ideas** in Lesson 4.

## Level Up

Allow pupils to do **Level Up** activity A. Activity B may be given as homework.

## Conclusion/Evaluation

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

		Answer Key
A.	1.	30
	2.	494
	3.	90
B.	1.	24
	2.	144
	3.	6
	4.	1 000
	4.	69
	5.	16
	5.	12.75
	6.	(defective item)
	7.	15
	8.	13

- How do you find the missing term in a proportion?

## 21<sup>st</sup> Century Skills:

- Critical thinking and problem solving, communication, and collaboration

## Point of Integration

Scale Drawing

## Mid-assessment Activity



More resources on **Practice Strategies** are available in the **Technology Enhancement CD**

More Resources can be found in the TEC.



More resources on **Learning Evidences** are available in the **Technology Enhancement CD**

**Summarizes the lesson learned.**

## Assessment:

Journal

## Let's Reflect

## Make Meaning

- A. 1. 75 minutes  
2. 30 minutes  
3. 40 minutes  
4. 50 minutes
- B. 1. 11.25 km  
2. 4.5 km  
3. 6 km  
4. 7.5 km

## Level Up

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. means: 8 and 6<br>product: 48  | extremes: 4 and 12<br>product: 48 |
| 2. means: 7 and 10<br>product: 70 | extremes: 5 and 14<br>product: 70 |
| 3. means: 4 and 24<br>product: 96 | extremes: 32 and 3<br>product: 96 |

The product of the means and the product of the extremes are the same.

In a proportion, the product of the means is equal to the product of the extremes.

## Lesson 5: Direct Proportion (3 days)

### Introduction/Preparatory Activities

If 1 cup of flour needs 2 eggs, then 2 cups of flour needs 4 eggs. When the amount of flour increased, what happened to the number of eggs needed?

Elicit from the class other direct relationships they may know.

### Body/Developmental

#### Motivation/Presentation

1. Start the lesson by exploring **Jumpstart** and **Study the Model**.
2. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:  
Group Archimedes – Pupils who got 17–20 points correct  
Group Einstein – Pupils who got 13–16 points correct  
Group Gauss – Pupils who got 12 points and below correct
3. Ask questions to check on pupils' current understanding related to direct proportion.

### Knowledge:

Direct proportion



More resources on Learning Objectives are available in the Technology Enhancement CD

### Skills:

- Recognize when two quantities are in direct proportion
- Solve problems involving ratio and direct proportion

### KU:

- To compare decimals, compare the digits from left to right by place values.
- If the number of decimals is not the same, zeros may be annexed to the right of the decimal.

## Focus

1. Let the pupils practice by answering **Focus**.
2. Concept Formation Technique:
  - a. Provide by the concepts: Direct Proportion.
  - b. They will give the description of direct proportion, then they will explain the difference between a direct proportion from the indirect proportion.
  - c. Using the activities, ask the question: How do you solve direct proportion?

## Take a Leap

Do the activity in **Take a Leap** with a partner.

## Quick Check

Ask the pupils to do "Share with a Friend." Let them discuss direct proportion.

## Make Meaning

1. Have Teams Einstein and Gauss do numbers 6 to 10 and Team Archimedes do numbers 1 to 5.
2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:

<http://www.onlinemathlearning.com/proportions.html>

<http://zonalandeducation.com/mstm/physics/mechanics/forces/directProportion/directProportion.html>

<http://math.about.com/od/proportions/a/Proportions-2.htm>

<http://www.bbc.co.uk/schools/gcsebitesize/maths/algebra/proportionhirev1.shtml>

<http://www.emathzone.com/tutorials/everyday-math/direct-proportion.html>

<http://www.emathzone.com/tutorials/everyday-math/direct-proportion.html>

## Smart Ideas

Discuss **Smart Ideas**. Call on a visual learner to summarize the **Smart Ideas** in Lesson 5.

## Level Up

Allow the fast learners to do **Level Up**.

## Conclusion/Evaluation

### Let's Reflect!

To assess the pupils' understanding related to Lesson 5, let them do **Let's Reflect**.



More resources on **Acquisition Strategies** are available in the **Technology Enhancement CD**

- Arrange decimals in order by comparing decimals two at a time first.

## Concept Formation Technique

### KQ:

- When are two quantities in direct proportion?
- How do you use direct proportion in real-life situations?

## 21<sup>st</sup> Century Skills

- Critical thinking, communication, flexibility, creativity, and collaboration



More resources on **Practice Strategies** are available in the **Technology Enhancement CD**

More Resources can be found in the TEC.

## Mid-Assessment Activity

### Point of Integration

Fractions



More resources on **Learning Evidences** are available in the **Technology Enhancement CD**

**Summarizes the lesson learned.**

### Assessment:

Journal

**Let's Reflect**

## Answer Key

### Focus

- 27
- 56
- 250 km
- 18
- 20 cups of flour and 28 tablespoons of sugar
- ₱136
- 135 minutes
- 7

### Take a Leap

- The package three 3-ounce cans is the better buy.
- 26
- 23 : 157
- 6
- ₱6 500
- 45 cm
- ₱88
- 1 400 mL
- ₱114.80
- 14 400 grams

### Make Meaning

- E
- T
- L
- R
- M
- T
- E
- H
- T
- E

### THE LETTER M

### Level Up

- Answers may vary.
- Answers may vary.
- Dyesebel is trying to trick her little brother. The chocolate bar that she offered to her brother is smaller than her chocolate bar. Thus, half of her chocolate bar is bigger than his brother's.
- Twelve meters of rope cost ₱86.40. The cost of the rope per meter is ₱7.20.
- 

t	1	2	3	4	5	6	7	...
v	4	8	12	16	20	24	28	...

## CHAPTER TEST

### I. Knowledge (15%)

Find the value of  $n$  in each proportion.

1.  $\frac{n}{14} = \frac{20}{35}$

6.  $\frac{25}{n} = \frac{10}{8}$

2.  $\frac{9}{6} = \frac{21}{n}$

7.  $20 : 30 = 6 : n$

3.  $\frac{24}{n} = \frac{16}{10}$

8.  $n : 7 = 28 : 14$

4.  $\frac{3}{4} = \frac{n}{10}$

9.  $\frac{4}{3} = \frac{n}{48}$

5.  $\frac{n}{6} = \frac{17}{3}$

10.  $\frac{21}{28} = \frac{6}{n}$

### II. Process (25%)

Express the following ratios in simplest form.

1.  $8 : 36$

2.  $40 : 150$

3.  $141 : 57$

4.  $64 : 32$

5.  $8 : 120$

### III. Understanding (30%)

Determine the answer for each problem.

1. A contractor estimates that it will cost ₱120 000 to build a deck to a customer's specifications. How much would it cost to build 5 similar decks?



2. A recipe requires 3 cups of flour to make 27 dinner rolls. Find the amount of flour needed to make 9 rolls.



3. Mandy runs 2 km in 9 min. She plans to run in an 8-km race. How long will it take her to complete the race?



4. Laurence's new car can go 26 mi/gal of gas. The car's gasoline tank holds 14 gal. How far will he be able to go on a full tank?



5. Frances can complete 2 skirts in 15 days. How long will it take her to complete 8 skirts?



6. Three eggs are required to make 2 dozen muffins. How many eggs are needed to make 12 dozen muffins?



7. A liter of alcohol solution is a mixture of 700 mL of water and 300 mL of pure alcohol. How much water and pure alcohol must be needed to get 2 liters of alcohol solution?



8. If a car is traveling at a rate of 40 km per hour, how many kilometers can it travel in 5 hours if the speed is constant?



9. My father can finish cultivating 4 plots in a half day. How many days will it take him to cultivate 30 plots?



10. If 2 items cost ₱350, how much will 10 items cost?



## Answer Key

### I. Knowledge (15%)

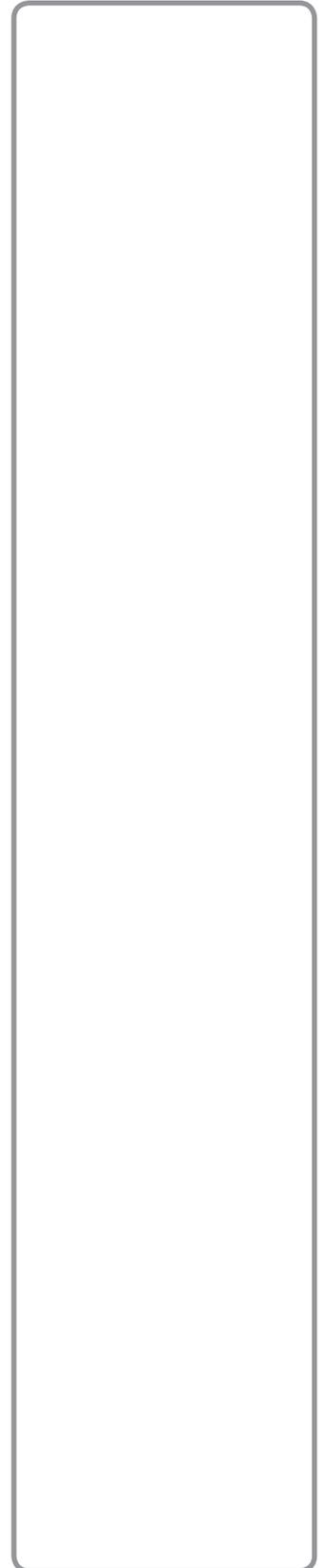
- |        |       |
|--------|-------|
| 1. 8   | 6. 20 |
| 2. 14  | 7. 9  |
| 3. 1.5 | 8. 14 |
| 4. 7.5 | 9. 64 |
| 5. 34  | 10. 8 |

### II. Process (25%)

- |            |           |
|------------|-----------|
| 1. 4 : 9   | 4. 2 : 1  |
| 2. 4 : 15  | 5. 1 : 15 |
| 3. 47 : 19 |           |

### III. Understanding (30%)

1. ₱600 000
2. 1 cup
3. 36 minutes
4. 364 miles
5. 60 days
6. 18 eggs
7. 1 400 mL water and 600 mL pure alcohol
8. 200 km
9.  $3\frac{3}{4}$  days
10. ₱1 750



## PRODUCT/PERFORMANCE TASK

<b>Goal</b>	<p>Your goals are:</p> <ul style="list-style-type: none"> <li>• To be able to solve problems involving physical anthropology correctly; and</li> <li>• To be able to determine the proportion from bone length to height.</li> </ul>
<b>Role</b>	<p>Your role can be a/an:</p> <ul style="list-style-type: none"> <li>• Measurer, who will measure the bone length and height of each member; or</li> <li>• Anthropologist, who will determine the proportion between bone length and height</li> </ul>
<b>Audience</b>	The audience will be a teacher who will check the answers.
<b>Situation</b>	The pupils will work in groups of threes or fours. By measuring their bone length and height, and with the use of proportion, they will find out if bone size is a good predictor of height.
<b>Performance</b>	Measure the forearms (from the elbow to the end of the wrist) of each group member and record the information on a chart. Measure the actual height of one group member and record the information. Use the forearm measurement and the actual height of one member to predict the heights of the other members. They may use a calculator. Measure the actual heights of the other group members. Compare the predicted heights and the actual heights. Ask the pupils to give their conclusions.
<b>Standards</b>	They should be able to use proportion in predicting heights given bone lengths accurately. They should be able to measure lengths correctly. The pupils should demonstrate collaboration, adaptability, creativity, and critical-thinking skills among group members.

### Rubric for the Performance Task

**Advanced** – Can easily and accurately apply the concept of proportion in the given task

**Proficient** – Apply the concept of proportion in the given task

**Still Learning** – Able to apply the concept of proportion in the given task in a slower pace

**Need Help** – Has difficulty in all the skills

# UNIT III – RATIO AND PROPORTION, PERCENT, GEOMETRY, AND SIMPLE EQUATIONS

## CHAPTER 7 – PERCENT

### Chapter Summary

This chapter contains topics and skills on percent. Varied activities have been designed for pupils to explore how to rename percent to fractions, decimals, and ratios, and vice versa. They will have challenging experiences in solving problems involving percentage, rate, and base.

To evaluate pupils' understanding of percent, a pre-assessment will be given to them.

Performance-based activities are also integrated into some of the elements of the work text so pupils can apply concepts and skills they have learned in the chapter.

### Content Standards

*The learner should be able to demonstrate an understanding of...*

- percent.

### Performance Standards

*The learner should be able to...*

- apply percent in mathematical problems and real-life situations.

### Pre-assessment:

Conduct a pre-test to the class.

I. Choose the letter of the best answer.

1. All of the following are equal to 12.5%, except \_\_\_\_.

- |                    |                       |
|--------------------|-----------------------|
| a. 0.125           | c. $\frac{1}{8}$      |
| b. $12\frac{1}{2}$ | d. $\frac{125}{1000}$ |

2. 0.47 is equal to \_\_\_\_.

- |                  |                      |
|------------------|----------------------|
| a. 47%           | c. 470%              |
| b. $\frac{4}{7}$ | d. $\frac{47}{1000}$ |

II. Answer the following:

1. 75 is what percent of 50?
2. What is 10% of 200?
3. What is 10% of 50?
4. 8 is 25% of what number?
5. 12 is 75% of what number?
6. 15 is 60% of what number?
7. 16 is  $66\frac{2}{3}$ % of what number?

### Key Stage Standards:

The learner demonstrates understanding and appreciation of key concepts and skills involving numbers and number sense, measurement, geometry, patterns and algebra, statistics and probability as applied, using appropriate technology, in critical thinking, problem solving, reasoning, communicating, making connections, representations, and decisions in real life.

### Grade Level Standards:

At the end of Grade 5, the learner demonstrates understanding and appreciation of key concepts and skills involving whole numbers up to 10 000 000, order of operations, factors and multiples, fractions and decimals including money, ratio and proportion, percent, time, circumference, area, volume, temperature, polygons, circles, solid figures, sequence and number sentences, tables, line graphs, and experimental probability as applied, using appropriate technology, in critical thinking, problem solving, reasoning, communicating,

III. Complete the table.

Original Price	Sales Price	Discount	Discount Rate	Rate of Sale Price
1. ₱1 250			5%	
2. ₱50 000			15%	
3. ₱42 000	₱10 080			
4.		₱ 400	8%	

IV. Analyze and solve each problem carefully. Show solutions.

1. Last year, monthly ballet fee was ₱3 600. This year, the fee increased by 10%. How much is the present monthly fee?
2. A 4 500 liters of mixture is composed of 65% orange concentrate, 15% glucose, and the rest is artificial flavoring and vitamin C. How many liters of artificial flavoring and vitamin C are contained?

making connections, representations, and decisions in life.

The teacher will administer pre-test days before the chapter starts. This pre-assessment measures the pupils' readiness to continue learning about number theory and order of operations. The teacher can already group the pupils based on the results.

**Resource:**

Pre-assessment worksheets

## Lesson 1: Meaning of Percent (3 days)

### Introduction/Preparatory Activities

1. Show a hundreds grid on the board (with 35 shaded squares). Tell the pupils that the shaded squares show the ratio 35:100 or 35 percent (35%).
2. Tell them that percent is another way of expressing ratio or fraction whose denominator is 100. Emphasize that the word percent means "per hundred" or "for every one hundred." Give an example like: For every ₱100 you spend when you buy at McDomeng's Burger, ₱3 goes to its Social Action Program. This means that 3% of ₱100 goes to the Social Action Program.

### Body/Developmental

#### Jumpstart

1. Let the pupils follow the directions in **Jumpstart**. Check if each pupil is doing it correctly.
2. Lead the class in doing **Study the Model**.

#### Focus

1. Let the pupils practice by answering **Focus**.
2. Concept Attainment Technique:
  - a. Choose the concept: percent. Show diagrams to illustrate percent.
  - b. Ask the pupils to choose the diagrams with correct percent. Let them place the correct diagrams at the right side of the board and all the wrong diagrams at the left side.
  - c. Ask the pupils to evaluate: Why is your diagram correct? Not correct?

**Knowledge:**

Meaning of percent



More resources on Learning Objectives are available in the Technology Enhancement CD

**Skills:**

- Use models to illustrate the concept of percent and its relationship to fractions, ratios, and decimal numbers
- Know and understand the concept of percent

**KU:**

- Percent means "for every 100" and it can be expressed as a fraction which denominator is 100.  $25\% = 25/100$ .



More resources on Acquisition Strategies are available in the Technology Enhancement CD

**Concept Formation Technique**

- Percent is also a ratio of a given number to 100.  $25\% = 25: 100$ .

- d. Lead them to find similarities in the correct diagrams. Then discuss and define the concept.
3. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:
- <http://www.nwlincs.org/mtlincs/pilotproject/math/percon.htm>  
<http://www.nwlincs.org/mtlincs/pilotproject/math/percon.htm>  
[https://www.khanacademy.org/math/arithmetric/decimals/percent\\_tutorial/v/describing-the-meaning-of-percent#!](https://www.khanacademy.org/math/arithmetric/decimals/percent_tutorial/v/describing-the-meaning-of-percent#!)  
[http://www.eduplace.com/math/mw/background/5/11/te\\_5\\_11\\_fractions\\_develop.html](http://www.eduplace.com/math/mw/background/5/11/te_5_11_fractions_develop.html)  
<http://www.aaamath.com/pct61ax2.htm>

### Take a Leap

- Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:  
 Group Archimedes – Pupils who got 17–20 points correct  
 Group Einstein – Pupils who got 13–16 points correct  
 Group Gauss – Pupils who got 12 points and below correct
- Add more groups to make sure that there are only about 4 to 5 members in a group. (Use Descartes, Polya, Euclid, etc.)
- Have Groups Einstein and Gauss do exercise A in **Take a Leap** and Group Archimedes do exercise B.

### Make Meaning

Ask the pupils to work alone on **Make Meaning**, exercise A. Exercise B may be given as homework.

### Smart Ideas

Discuss the important points in **Smart Ideas**. Ask the class to read **Smart Ideas** and explain these in their own words. They may use the language they are comfortable with.

### Level Up

Allow the Fast learner to do **Level Up**.

### Conclusion/Evaluation

Lead the class in doing **Let's Reflect**.

		Answer Key
<b>Focus</b> 1. a. 8 b. 24 c. 4 d. 5 220 e. 12	2. a. 25 b. 12.5 c. 62.5 d. 100 e. 7.5	

- 100% means 1 whole while 50% means 1/2.
- You can get a given percent of any value or number by visualizing the given number as a rectangle divided into either 100 parts or 10 equal parts.
- For percent, which is multiple of 5 or 10, divide the number into 10 parts. Each part is 10% of the given number. Knowing this, it is easy now for you to get 20% (10% + 10%) or 5% (half of 10%) or 25% (10% + 10% + 5%) and so on.
- Percent is important because it is used in many real-life situations like discounts, interests, and fields like business, medicine, and many industries.



More Resources can be found in the TEC

### KQ:

- What does percent mean?
- How do you use it in real-life situations?
- Why is it important to study percent?

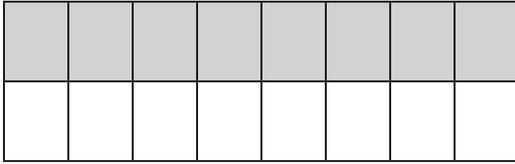
### 21<sup>st</sup> Century Skills:

- Use communication, critical and creative thinking

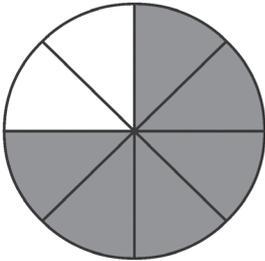
**Take a Leap**

- A. 1. 33                    4. 1  
2. 49                    5. 42  
3. 77                    6. 7.5

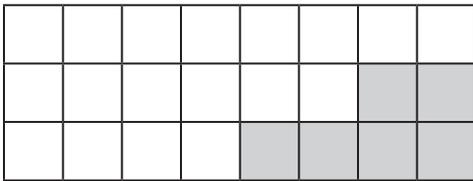
B. 1.



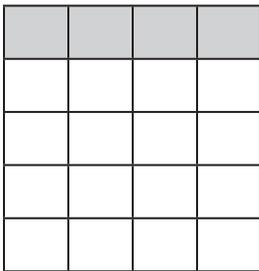
2.



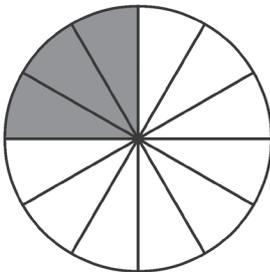
3.



4.



5.



**Point of Integration**  
Geometry  
**Differentiation by**  
**readiness**

## Make Meaning

Situation 1:

Answers may vary.

Situation 2:

- |           |            |            |
|-----------|------------|------------|
| 1. a) P84 | 2. a) P120 | 3. a) P240 |
| b) P70    | b) P100    | b) P200    |

Situation 3:

- a. P6 000      b. P12 000      c. P15 000

## Level Up

- |          |            |
|----------|------------|
| 1. 11.25 |            |
| 2. 205.2 |            |
| 3. 24    |            |
| <hr/>    |            |
| 1. 23%   | 5. P560    |
| 2. 69%   | 6. 14      |
| 3. P300  | 7. 20      |
| 4. 4     | 8. P48 600 |

## Lesson 2: Renaming Percent as Fractions, Decimals, and Ratios (3 days)

### Introduction/Preparatory Activities

1. Have pupils use base ten models to find out how many units it takes to cover the whole mat. Ask if the mat represents one whole, and each unit is one-hundredth of the whole mat, what can they say about how many hundredths are equivalent to one whole.
2. Make sure they have grasped this concept before moving on to the next step. Then write 1% on the board. Explain to the pupils that percent can be represented as fraction, decimal, and ratio.
3. Tell pupils that they are going to display percent in fraction, decimal, and ratio form. Go around the room to check on pupil models. Assist anyone who is having difficulty.

### Body/Developmental

#### Jumpstart

1. Guide the class in doing **Jumpstart** in the work text. Draw out from the pupils the importance of expressing percent as a fraction, decimal, and ratio.
2. Discuss **Study the Model**. Ask the class to practice by giving more guided exercises.

#### Focus

Let the pupils practice by answering **Focus** individually.

### Knowledge:

Renaming percent as fractions, decimals, and ratios



### Skills:

- Show the relationship between percent and a decimal number
- Give the relationship among fractions, ratios, and percent

### KU:

- Percent is a fraction with a denominator of 100 or is a ratio of a given number to 100.
- Percent can be given as decimals by moving



## Take a Leap

1. Ask the pupils to do the exercises in **Take a Leap**.
2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:

<http://www.shodor.org/interactivate/lessons/FractionConversion-WithPercents/>

<http://www.mathworksheets4kids.com/percent/ratio-method.pdf>  
Activity\_Part050.pdf

[http://www.math-drills.com/fractions/convert\\_fractions\\_decimals\\_percents\\_ratios\\_a.html](http://www.math-drills.com/fractions/convert_fractions_decimals_percents_ratios_a.html)

<http://www.amblesideprimary.com/ambleweb/mentalmaths/fracto.html>

## Make Meaning

The pupils answer the exercise with a partner.

## Level Up

1. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct

Group Einstein – Pupils who got 13–16 points correct

Group Gauss – Pupils who got 12 points and below correct

2. Ask the teams to play the game in **Level Up** together:

Team Archimedes – the group works on their own

Team Einstein – the group works with little supervision of the teacher

Team Gauss – the group works with close supervision of the teacher

3. Have Teams Einstein and Team Gauss do numbers 1 to 5 and Team Archimedes do numbers 6 to 9.

4. Have the class check the answers. Facilitate clarification and further discussion of the topics.

## Smart Ideas

Ask the class to read **Smart Ideas** and explain these in their own words. They may use the language they are comfortable with. This is the time to clarify some confusion on concepts and difficulties encountered by the pupils. Encourage them to ask questions.

## Conclusion

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

the decimal point of the number two places to the left.

- Percent as a ratio is a fraction in simplest form.
- Percent, fraction, and decimal are related to one another and are just different forms of the same number or value.



More resources on **Practice Strategies** are available in the **Technology Enhancement CD**

More Resources can be found in the TEC

- Every fraction or decimal has an equivalent value in percent.
- Percent can have a value greater than 100% or less than 1%. These are fraction or decimal percent.

### KQ:

- How do you rename a percent to fraction, decimal, or ratio?
- How are percent, decimal, and fraction related?
- Can percent be greater than 100% or less than 1%?



More resources on **Learning Evidences** are available in the **Technology Enhancement CD**

**Summarizes the lesson learned.**

### 21st Century Skills:

- Use communication, collaboration, and critical-thinking skills with confidence

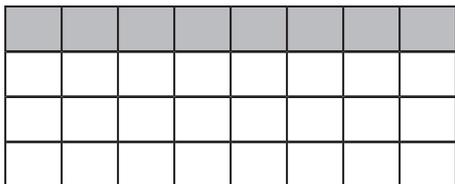
**Answer Key**

**Focus**

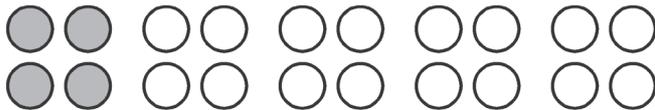
1.	$\frac{1}{5}$	20%	0.2
2.	$\frac{3}{20}$	15%	0.15
3.	$\frac{3}{5}$	60%	0.6
4.	$\frac{9}{20}$	45%	0.45
5.	1	100%	1

**Take a Leap**

1. 0.25



2. 0.2



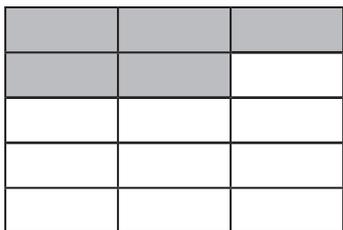
3. 0.6



4. 0.8



5. 0.3



6. 0.5



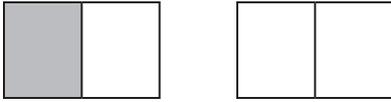
**Point of Integration**

- Social Studies (facts and figures, per capita Income, etc.)

**Differentiation by readiness**

**Differentiation by interest**

7. 0.25



8. 1



B. Answers may vary.

**Make Meaning**

$200\% = 2$  ;  $300\% = 3$

A mixed number results in a percent value greater than 100%.

1. 6                      6

2.  $8\frac{3}{10}$                 8.3

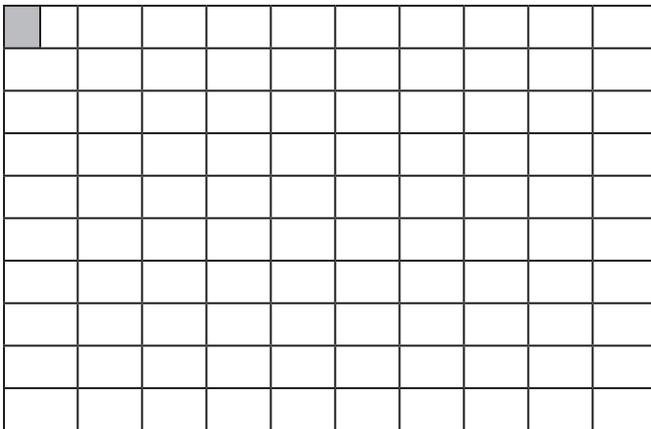
3.  $2\frac{9}{10}$                 2.9

**Level Up**

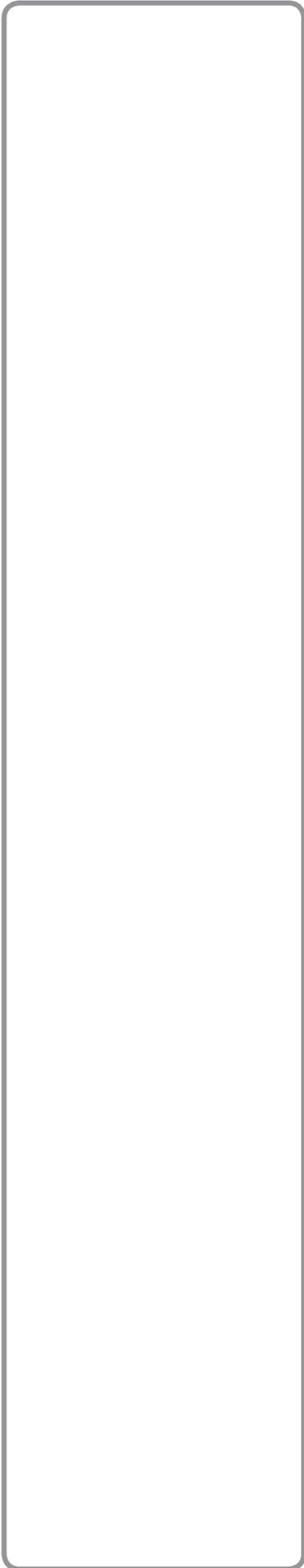
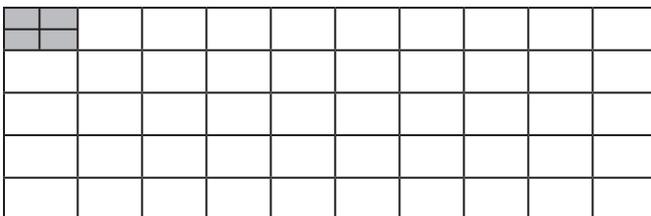
A. 1–5. Answers may vary.

Yes, there is such a case as percent less than 1%.

6.



7.




8.  $\frac{1}{2}$  is different from  $\frac{1}{2}$ ,  $\frac{1}{2}$  is the same as 50%
9. Increasing the price of an item by 100% means doubling the price of the item.

### Lesson 3: Changing Fractions to Decimals to Percent and Vice Versa (2 days)

#### Introduction/Preparatory Activities

Have the pupils do the activity:

Match each percent with its equivalent fraction or decimal number.

- |        |                     |
|--------|---------------------|
| 1. 2%  | a. $8\frac{3}{10}$  |
| 2. 25% | b. $\frac{105}{34}$ |
| 3. 65% | c. $\frac{1}{2}$    |
| 4. 37% | d. 0.02             |
| 5. 49% | e. 0.371            |

#### Body/Developmental

#### Motivation/Presentation

#### Jumpstart

1. Let the pupils follow the directions in **Jumpstart**. Check if each pupil is doing it correctly.
2. Lead the class in doing **Study the Model**.

#### Focus

1. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:  
 Group Archimedes – Pupils who got 17–20 points correct  
 Group Einstein – Pupils who got 13–16 points correct  
 Group Gauss – Pupils who got 12 points and below correct
2. Ask the teams to answer **Focus** together.

#### Take a Leap

Ask the pupils to study and answer **Take a Leap**.

#### Knowledge:

Changing fractions to decimals to percent and vice versa



More resources on Learning Objectives are available in the Technology Enhancement CD

#### Skills

- Change percent to fraction or decimal and vice versa

#### KU:

- To change fraction to decimal, divide the numerator by the denominator.
- To change a decimal to percent, move the decimal point two places to the right and affix the percent sign.



More resources on Acquisition Strategies are available in the Technology Enhancement CD

- Simplifying the fraction equivalent of a percent does not change the value of the percent and it still represents the same number.
- To find the value of a number expressed in percent, we need to

## Quick Check

Ask the pupils to do **Quick Check**. Tell them to answer the items together.

## Make Meaning

1. Lead the creative learners to do the exercises in **Make Meaning**.
2. Assign exercises for practical and analytic learners as homework.

## Smart Ideas

1. Discuss **Smart Ideas**.
2. Call on an auditory learner to summarize the **Smart Ideas** in Lesson 3.

## Level Up

1. Allow pupils to do **Level Up** activities by group.
2. Have Teams Einstein and Gauss do exercise A and Team Archimedes do exercise B.

## Conclusion

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

### Answer Key

#### Focus

- |         |        |
|---------|--------|
| 1. 4.25 | 425%   |
| 2. 8.25 | 825%   |
| 3. 12.8 | 1 280% |
| 4. 75.2 | 7 520% |
| 5. 54.4 | 5 440% |

#### Take A Leap

1.  $2\frac{9}{10}$
2. 20%
3. ₱150
4.  $\frac{79}{100}$
5. ₱1 260

## Make Meaning

Answers may vary.

## Level Up

- |              |           |
|--------------|-----------|
| A. 1. 0.0025 | 4. 0.0075 |
| 2. 0.004     | 5. 0.008  |
| 3. 0.007     |           |

change the percent to either decimal or fraction first before multiplication or division could be performed.



More resources on **Practice Strategies** are available in the **Technology Enhancement CD**

More Resources can be found in the TEC



More resources on **Learning Evidences** are available in the **Technology Enhancement CD**

## Summarizes the lesson learned.

- To easily get a picture or a visual representation of a part of a whole or any number, the part or number is expressed in percent. This is because percent is a ratio of a number to 100, which is easier to represent and understand.

### KQ:

- How do you find the percentage of a number?
- What is a percentage of a number less, equal, or greater than the number

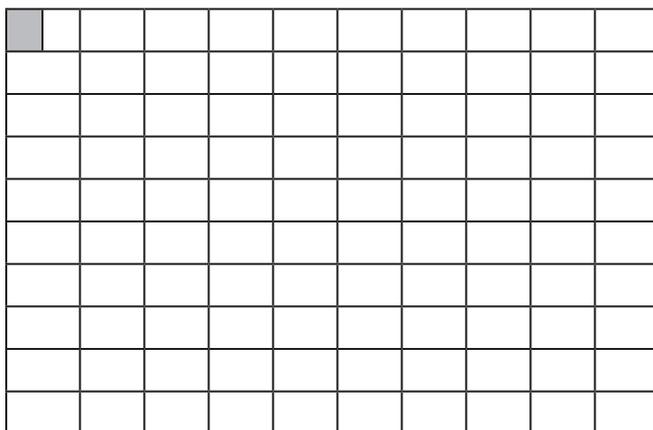
### 21<sup>st</sup> Century Skills:

- Use communication, collaboration, and critical thinking skills with confidence

### Points of Integration

- Social Studies (annual percent increase of Philippine population)

B. 1.



2.  $\frac{1}{2}$  and  $\frac{1}{2}\%$  do not have the same value.  $\frac{1}{2}\%$  in fraction form is  $\frac{1}{200}$ .
3.  $\frac{1}{2}\%$  is not equivalent to 0.50. 0.50 in percent form is 50%.

## Lesson 4: Solving Problems Involving Percentage, Rate, and Base (5 days)

### Introduction/Preparatory Activities

1. Let the hundreds grid represent given amounts, and then determine the value of one of the small squares (1%). Pupils can determine the value of 1% of the hundreds grid by thinking of sharing a given amount equally among the 100 parts. As examples, if the hundreds grid represents 500 people (i.e. if 500 people represents 100% in some situation), then each small square represents 5 people. Similarly, if the hundreds grid represents 76 kilograms, then each small square has a value of 0.76 kilogram; and if the hundreds grid represents 253 days, then the value of each small square is 2.53 days.
2. To prepare pupils for this lesson, it may be helpful to pose questions that involve convenient fractional parts of the grid. For example, if the hundreds grid represents 500 people:
  - a. How many people would be represented by half of the hundreds grid?
    - ... by one-fifth of the hundreds grid?
    - ... by 20 small squares?
  - b. What part of the hundreds grid would represent 250 people?
    - ... 50 people?
    - ... 5 people?

### Knowledge:

Solving problems involving percentage, rate, and base



### Skills:

- Define the following: percentage, rate or percent, base
- Identify the base percentage and rate in a problem
- Solve problems involving percent
- Create problems involving percentage with reasonable answers

### KU:

- Percentage is a value representing a part of a base number

## Body/Developmental Activities

### Jumpstart

1. Let the pupils follow the directions in **Jumpstart**. The teacher checks if each pupil is doing it correctly.
2. Lead the class in doing **Study the Model**.

### Focus

Let the pupils practice by answering **Focus**.

### Take a Leap

1. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct

Group Einstein – Pupils who got 13–16 points correct

Group Gauss – Pupils who got 12 points and below correct

2. Have Teams Einstein and Gauss do numbers 5 to 8 and Team Archimedes do numbers 1 to 4.

### Make Meaning

Ask the pupils to work alone on **Make Meaning**.

### Smart Ideas

Discuss **Smart Ideas**. Call on an auditory learner to summarize the **Smart Ideas** in Lesson 4.

### Level Up

1. Allow pupils to do **Level Up** by group.
2. Have Team Gauss do exercise A, Team Einstein do exercise B, and Team Archimedes do exercise C.

### Conclusion

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

	Answer Key	
<b>Focus</b>		
A. 96		36
160		48
12		
B. 1. a) 9	2. a) 2.5	
b) 126	b) 0.5	
c) 57.6	c) 8.75	
d) 300	d) 37.5	
e) 3.6	e) 75	

which could either be less, equal, or greater than the base number itself.



More resources on **Acquisition Strategies** are available in the **Technology Enhancement CD**

- We can use models or use multiplication of the base number by the rate to find the percentage of a number.
- Percentage (P), base number (B), and the rate (R) are related in a formula or equation. ( $P = B \times R$ ).



More resources on **Practice Strategies** are available in the **Technology Enhancement CD**

- We can either compute for the base, the percentage, or the rate.
- Percentage may be less, greater, or equal to the base number if the rate used is less than, equal to, or greater than 100%.



More resources on **Learning Evidences** are available in the **Technology Enhancement CD**

**Summarizes the lesson learned.**

**KQ:**

- How do you find the percentage of a number?
- When is a percentage of a number less, equal, or greater than the number?

### Take a Leap

1. Answers may vary.
2. Answers may vary.
3. ₱573.75
4. ₱104
5. Answers may vary.
6. ₱675
7. ₱28 750
8. 140

### Make Meaning

Situation 1:

A single discount of 40% is better than two successive discounts of 20%. A ₱100 will be bought for ₱60 at a single discount of 40%. It will be bought for ₱64 at 2 successive discounts of 20%.

Situation 2:

Answers may vary.

### Level Up

- A.
1. 37.5%
  2. 200%
  3. 20%
  4. 100%
  5. 125%
  6. 5%
  7. 150%
  8. 300%
- B.
1. 400
  2. 50
  3. 1 000
  4. 888.89
  5. 300
  6. 90
  7. 150
  8. 4 800
- C.
1. 40 (base)
  2. 0.5% (rate)
  3. 5 000 (base)
  4. 40% (rate)
  5. ₱1 200 (base)

### 21<sup>st</sup> Century Skills:

- Critical thinking and problem solving, communication, and collaboration

### Points of Integration

Current Events

Money

## CHAPTER TEST

### I. Knowledge (15%)

Write **T** if the statement is correct and **F** if it is incorrect.

1.  $\frac{1}{4} = 50\%$

2.  $\frac{1}{5} = 0.005$

3.  $\frac{8}{10} = 8\%$

4.  $72\frac{1}{2} = 72.5$

5.  $8\% = 0.8$

6.  $25\% = 0.4$

7.  $7\% = 0.07$

8.  $0.09 = 9\%$

9.  $0.34 = \frac{17}{50}$

10.  $0.02 = 20\%$

### II. Process (25%)

Answer the following:

1. What number is 40% of 40?
2. What number is  $33\frac{1}{2}\%$  of 15?
3. 50% of what number is 8?
4. 0.25 is 2% of what number?
5. What percent of 20 is 12?

### III. Understanding (30%)

Solve the following problems.

1. Roller blades regularly sell for ₱1 850 in Francine's store. Find the sale price if Francine offers a discount of 20%.



2. The original price of a camera was ₱7 200. I was given a discount of 36%. How much did I pay for the camera?



3. The regular price of a DVD recorder is ₱3 800. The price has decreased by 15%. Find its new price.



4. The marked price of a clock was ₱400. Ali bought it at a discount of 20%. How much did he pay for it?



5. How much would it cost to buy a ₱350.00 shirt offered at 35% discount?



6. The marked price of a camera is ₱8 000. Thomas bought the camera at a 12% discount. How much did he pay for the camera?



7. Solve for the discount of a brush originally priced at ₱130 and is on sale at 40% off.



8. Solve for the sale price of a tennis racket whose regular price is ₱540 and is on sale at 60% off.



9. The original cost of the kitchenware was ₱500.00. Now, it is being sold for ₱300.00. What percent was the discount?



10. After giving 50% discount, the customer saved ₱500 on the item. What was the original price of the item?



### Answer Key

#### I. Knowledge (15%)

- |      |       |
|------|-------|
| 1. F | 6. F  |
| 2. F | 7. T  |
| 3. F | 8. T  |
| 4. T | 9. T  |
| 5. F | 10. F |

#### II. Process (25%)

- |       |         |
|-------|---------|
| 1. 16 | 4. 12.5 |
| 2. 5  | 5. 60%  |
| 3. 16 |         |

#### III. Understanding (30%)

- |            |            |
|------------|------------|
| 1. ₱1 480  | 6. ₱740    |
| 2. ₱4 608  | 7. ₱52     |
| 3. ₱3 230  | 8. ₱216    |
| 4. ₱320    | 9. 40%     |
| 5. ₱227.50 | 10. ₱1 000 |

## PRODUCT/PERFORMANCE TASK

<b>Goal</b>	<p>Your goals are:</p> <ul style="list-style-type: none"> <li>To be able to interpret data from a survey critically; and</li> <li>To be able to express fraction in percent form correctly.</li> </ul>																
<b>Role</b>	<p>Your role can be a/an:</p> <ul style="list-style-type: none"> <li>Converter, who will express fraction in percent form; and</li> <li>Decision maker, who will decide on the best answer to each question.</li> </ul>																
<b>Audience</b>	The audience will be a teacher who will check the answers.																
<b>Situation</b>	The pupils will work in groups of fours.																
<b>Performance</b>	<p>Suppose you survey all the students at your school to find out whether they like salad or cake better as a dessert, and you record your results in the table below.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>salad</th> <th>cakes</th> <th>total</th> </tr> </thead> <tbody> <tr> <td>boys</td> <td>82</td> <td>63</td> <td>145</td> </tr> <tr> <td>girls</td> <td>85</td> <td>73</td> <td>158</td> </tr> <tr> <td><b>total</b></td> <td>167</td> <td>136</td> <td>303</td> </tr> </tbody> </table>		salad	cakes	total	boys	82	63	145	girls	85	73	158	<b>total</b>	167	136	303
	salad	cakes	total														
boys	82	63	145														
girls	85	73	158														
<b>total</b>	167	136	303														
	<p>Answer the following questions:</p> <ul style="list-style-type: none"> <li>What percentage of pupils at your school prefers salad over cake?</li> <li>Are those who prefer salad more likely to be boys or girls?</li> <li>Are girls more likely to choose salad over cake than boys?</li> </ul>																
<b>Standards</b>	They should be able to use data accurately and be able to express them as percentages. The pupils should demonstrate collaboration, adaptability, creativity, and critical-thinking skills among group members.																

### Rubric for the Performance Task

**Advanced** – Can easily and accurately apply the concept of percentage in the given task

**Proficient** – Apply the concept of percentage in the given task

**Still Learning** – Able to apply the concept of percentage in the given task in a slower pace

**Need Help** – Has difficulty in all the skills

# UNIT III – RATIO AND PROPORTION, PERCENT, GEOMETRY, AND SIMPLE EQUATIONS

## CHAPTER 8 – GEOMETRY

### Chapter Summary

This chapter contains topics and skills on geometry. Varied activities have been designed for pupils to explore polygons up to 10 sides, compare their properties, and to differentiate congruent from similar polygons. Circles will also be discussed here.

To evaluate pupils' prior understanding of geometry, a pre-assessment will be given to them.

Performance-based activities will also be given at the end of the chapter so pupils can apply concepts and skills they have learned.

### Content Standards

*The learner should be able to demonstrate an understanding of...*

- polygons and circles.

### Performance Standards

*The learner should be able to...*

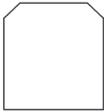
- describe and construct polygons and circles.

### Pre-assessment:

Conduct a pre-test to the class.

- I. Classify each polygon by the number of sides.

1.



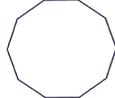
4.



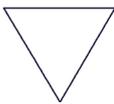
2.



5.



3.



- II. Draw a figure to fit each description.

1. an obtuse triangle	4. a trapezoid
2. a nonagon	5. a right triangle

### Key Stage Standards:

The learner demonstrates understanding and appreciation of key concepts and skills involving numbers and number sense, measurement, geometry, patterns and algebra, statistics and probability as applied, using appropriate technology, in critical thinking, problem solving, reasoning, communicating, making connections, representations, and decisions in real life.

### Grade Level Standards:

At the end of Grade 5, the learner demonstrates understanding and appreciation of key concepts and skills involving whole numbers up to 10 000 000, order of operations, factors and multiples, fractions and decimals including money, ratio and proportion, percent, time, circumference, area, volume, temperature, polygons, circles, solid figures, sequence and number sentences, tables, line graphs, and experimental probability as applied, using appropriate technology, in critical thinking, problem

3. a regular hexagon	
----------------------	--

III. Tell whether each statement is **True** or **False**.

1. Every quadrilateral is a parallelogram.
2. A square is always a rectangle.
3. A triangle with 2 equal sides is a scalene triangle.
4. Every trapezoid is a quadrilateral.
5. An obtuse triangle can have 2 obtuse angles.
6. Congruent polygons are similar polygons.
7. A circle is a polygon.
8. A decagon has 12 sides.
9. The radius of a circle is longer than the diameter.
10. The diameter is the longest chord of a circle.

solving, reasoning, communicating, making connections, representations, and decisions in life.

The teacher will administer pre-test days before the chapter starts. This pre-assessment measures the pupils' readiness to continue learning about number theory and order of operations. The teacher can already group the pupils based on the results.

**Resource:**

Pre-assessment worksheets

## Lesson 1: Exploring Polygons Up to 10 Sides (3 days)

### Introduction/Preparatory Activities

Ask the pupils to give examples of the basic geometric ideas/figures learned in the previous grades.

### Body/Developmental

#### Jumpstart

1. Let the pupils follow the directions in **Jumpstart**. Check if each pupil is doing it correctly.
2. Lead the class in doing **Study the Model**.

#### Focus

1. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct

Group Einstein – Pupils who got 13–16 points correct

Group Gauss – Pupils who got 12 points and below correct

2. Let the pupils practice by answering **Focus** by group.

#### Take a Leap

1. Cooperative Learning Technique:
  - a. Allow the pupils to form groups. Give each group an illustration of different polygons.
  - b. Let the leader guide them in identifying them.
  - c. After brainstorming and getting the correct answer, the leader will present the answer to the whole class for evaluation.
  - d. Assess how the pupils work as a group.
2. Allow the pupils to practice some more on describing the polygons.
3. The pupils will do **Take a Leap** individually.

#### Quick Check

Ask the pupils to do **Quick Check**. Tell them to use trial and error in finding the answer.

#### Make Meaning

1. Lead them to the exercises in **Make Meaning**.
2. Ask the pupils to visit the *Student's Space* and additional Resource: downloadable activity at:

<http://www.newbedford.k12.ma.us/elementary/gomes/stjohn/Subjects/Math/Geo/Geometry%20Worksheets.html>

<http://www.onlinemathlearning.com/types-polygons.html>

[http://www.math-aids.com/cgi/pdf\\_viewer\\_4.cgi?script\\_](http://www.math-aids.com/cgi/pdf_viewer_4.cgi?script_)

#### Knowledge:

Exploring polygons up to ten-sided polygons



More resources on **Learning Objectives** are available in the **Technology Enhancement CD**

#### Skills:

- Describe, model, and draw polygons
- Name polygons with five or more sides

#### KU:

- A polygon is a closed figure formed by line segments that meet only at their endpoints.
- Polygons are classified according to the number of their sides.
- A regular polygon is a polygon with equal sides and equal interior angles.



More resources on **Acquisition Strategies** are available in the **Technology Enhancement CD**

#### KQ:

- What is a polygon?
- How do you classify polygons?
- What is a regular polygon?

#### 21<sup>st</sup> Century Skills

- Use communication and critical and creative thinking.

#### Mid-assessment Activity

##### Point of Integration

- Art (making tessellations and tangrams)



More resources on **Practice Strategies** are available in the **Technology Enhancement CD**

More Resources can be found in the TEC

name=identify\_regular\_polygons.pl&pentagon=1&hexagon=1&heptagon=1&octagon=1&nonagon=1&decagon=1&hendecagon=1&dodecagon=1&language=0&memo=&answer=1&x=157&y=19

<http://www.math-play.com/Polygon-Game.html>

[http://www.superteacherworksheets.com/geometry/polygons\\_TZFMZ.pdf](http://www.superteacherworksheets.com/geometry/polygons_TZFMZ.pdf)

<http://worksheets.tutorvista.com/polygon-worksheets.html>

### Smart Ideas

Discuss the important points in **Smart Ideas**. Ask the class to read **Smart Ideas** and explain these in their own words. They may use the language they are comfortable with.

### Level Up

The pupils will do **Level Up** by group.

### Conclusion/Evaluation

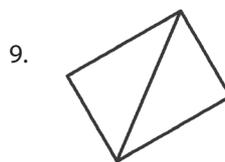
Lead the class in doing **Let's Reflect**.

### Focus

1–4. Answers may vary.



### Answer Key



10. Answers vary.

### Take a Leap

- |                  |                  |
|------------------|------------------|
| 1. quadrilateral | 6. heptagon      |
| 2. octagon       | 7. quadrilateral |
| 3. pentagon      | 8. pentagon      |
| 4. pentagon      | 9. octagon       |
| 5. triangle      | 10. pentagon     |

### Make Meaning

There is no polygon with the same name.

### Level Up

Answers vary.



More resources on Learning Evidences are available in the Technology Enhancement CD

**Summarizes the lesson learned.**

## Lesson 2: Comparing Properties of Polygons (2 days)

### Introduction/Preparatory Activities

Tell the pupils to look around and name the shape of the things they see. Write the names of the shapes on the board (square, triangle, trapezoid, etc.). Call on the visual learners and have them draw the figures on the board. They may also be asked to figure out how the world will look like if there is only one existing shape.

### Body/Developmental

#### Jumpstart

1. Guide the class in doing **Jumpstart** in the worktext.
2. Draw out from the pupils the importance of precision in illustrating polygons.
3. Discuss **Study the Model**. Ask the class to practice by giving more guided exercises.

#### Focus

Let the pupils practice by answering **Focus** individually.

#### Take a Leap

1. Cooperative Learning Technique:
  - a. Allow the pupils to form groups. Give each group a different cutouts of polygons
  - b. Let the leader guide them in answering the identification game. They can use the properties of the polygons.
  - c. After brainstorming and getting the correct answers, the leader will present the answers to the whole class for evaluation.
  - d. Assess how the pupils work as a group.
  - e. Allow the pupils to practice some more on describing other polygons using the properties.
2. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct  
Group Einstein – Pupils who got 13–16 points correct  
Group Gauss – Pupils who got 12 points and below correct
3. Ask the pupils to do the exercises in **Take a Leap** by teams.

#### Quick Check

Ask the pupils to do “Share with a Friend.” Let them discuss on how identifying polygons.

#### Make Meaning

1. The pupils answer the exercise with a partner.
2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:

#### Knowledge:

Comparing properties of polygons



More resources on Learning Objectives are available in the Technology Enhancement CD

#### Skills:

- Compare properties of polygons

#### KU:

- Polygons are classified according to the number of sides. Triangles can be classified according to angles:
  - An acute triangle is a triangle with three acute angles.
  - A right triangle is a triangle with one right angle.

#### Cooperative Learning Technique

- An obtuse triangle is a triangle with one obtuse angle.



More resources on Acquisition Strategies are available in the Technology Enhancement CD

#### KU:

- A triangle can be classified according to sides:
  - An equilateral triangle is a triangle with three equal sides.
  - An isosceles triangle is a triangle with two equal sides.
  - A scalene triangle is a triangle with no sides equal.



More resources on Practice Strategies are available in the Technology Enhancement CD

More Resources can be found in the TEC.

<http://www.onlinemathlearning.com/properties-of-polygon.html>  
<http://www.math.com/tables/geometry/polygons.htm>  
<http://www.mathsisfun.com/geometry/regular-polygons.html>  
<http://www.math.tamu.edu/~zaretsky/Math366/Activity1%20Chap%209%20Properties%20of%20Polygons%20Key.pdf>  
[http://www.mathplayground.com/matching\\_shapes.html](http://www.mathplayground.com/matching_shapes.html)  
 Activity Part 057.pdf

### Level Up

1. Allow the fast learner to do **Level Up**.
2. Have the class check the answers. Facilitate clarification and further discussion of the topics.

### Smart Ideas

Ask the class to read **Smart Ideas** and explain these in their own words. They may use the language they are comfortable with. This is the time to clarify some confusion on concepts and difficulties encountered by the pupils. Encourage them to ask questions.

### Conclusion/Evaluation

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

### Answer Key

#### Focus

Answers may vary.

#### Take a Leap

- |    |              |                |            |
|----|--------------|----------------|------------|
| A. | 1. isosceles | 5. isosceles   | 9. scalene |
|    | 2. obtuse    | 6. obtuse      | 10. obtuse |
|    | 3. scalene   | 7. equilateral |            |
|    | 4. isosceles | 8. acute       |            |
| B. | 1. True      | 5. True        | 9. False   |
|    | 2. False     | 6. True        | 10. True   |
|    | 3. True      | 7. False       |            |
|    | 4. True      | 8. False       |            |

#### Make Meaning

Illustrations may vary.

Polygons	Number of Sides	Number of Triangles	Sum of the Angles
quadrilateral	4	2	360°
pentagon	5	3	540°
hexagon	6	4	720°
heptagon	7	5	900°
octagon	8	6	1 080°

### Level Up

25

### Mid-assessment Activity

#### KU:

- Some quadrilaterals have special properties:
  - A trapezium is a quadrilateral with no parallel sides.



More resources on Learning Evidences are available in the Technology Enhancement CD

#### Summarizes the lesson learned.

- A trapezoid is a quadrilateral with a pair of opposite sides parallel.
- A parallelogram is a quadrilateral with two pairs of opposite sides parallel.
- A rectangle is a parallelogram with four right angles.
- A rhombus is a parallelogram with four equal sides.
- A square is a rectangle with four equal sides. It is also a rhombus with four right angles.

#### KQ:

- How do you classify polygons?
- What are the properties of the various kinds of polygons?

#### 21<sup>st</sup> Century Skills:

- Use communication, collaboration, and critical-thinking skills with confidence

#### Point of Integration

Art (making tangrams)

#### Differentiation by readiness

## Lesson 3: Congruent and Similar Polygons (3 days)

### Introduction/Preparatory Activities

Have 6 pairs of similar/congruent triangles shuffled onto card stock. Make enough sets of 12 pieces to give a complete set for every group of 4 pupils in your class. Ask the members to pair up the triangles that are related in some way, explaining that for each triangle, there is another that is like it in one way or another. Pupils write down an explanation of why they paired the triangles the way they did.

### Body/Developmental

#### Motivation/Presentation

#### Jumpstart

1. Let the pupils follow the directions in **Jumpstart**. Check if each pupil is doing it correctly.
2. Lead the class in doing **Study the Model**.

#### Focus

1. Concept Formation Technique:
  - a. The pupils will be provided by the concepts: Congruent and similar figures.
  - b. They will give the illustrations and descriptions of congruent and similar figures then they will explain why they were able to form the concept: Congruent figures and similar figures.
  - c. Using the activities, ask the questions:
    - How do you describe congruent figures?
    - How do you describe similar figures?
2. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct

Group Einstein – Pupils who got 13–16 points correct

Group Gauss – Pupils who got 12 points and below correct
3. Ask the teams to answer **Focus** together:

Team Archimedes – the group works on their own

Team Einstein – the group works with little supervision of the teacher

Team Gauss – the group works with close supervision of the teacher

#### Take a Leap

Ask the pupils to study and answer **Take a Leap**.

#### Quick Check

Ask the pupils to do **Quick Check**. Tell them to answer the items together.

#### Knowledge:

Congruent and Similar Polygons



More resources on Learning Objectives are available in the Technology Enhancement CD

#### Skills:

- Identify and describe similar polygons
- Visualize congruent polygons

#### KU:

- Polygons are similar if they have exactly the same shape. Similar polygons can have different sizes.



More resources on Acquisition Strategies are available in the Technology Enhancement CD

#### Concept Formation Technique

- Two polygons are similar if:
  - The corresponding sides of each are in the same proportion.
  - The corresponding interior angles are the same (congruent).
- Polygons are congruent if they have the same size and shape.
- Two polygons are congruent if you can exactly fit one of them to the other.

#### Mid-assessment Activity

#### KQ:

- How do you classify polygons?

## Make Meaning

1. Lead them do the exercises in **Make Meaning**.
2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:

[https://ph.search.yahoo.com/search;\\_ylt=A2oKmJQU3YZT2k4A8jCzRwx.;\\_ylc=X1MDMjExNDczNDAwMwRfcgMyBGJjawNmMnZ-rYWw5OWVocmFqJTl2YiUzRDQlMjZkJTNEckJfcTJLaHBZRUw4b2tJUIRzdXBfQs0tJTl2cyUzRGJuJTl2aSuzRE5vOXM0dE5SWFFS-cEEzVVB4NVBYBGZyA3lmcC10LTQwMQRncHJpZAMEbXRlc3RpZANudWxsBG5fcnNsdAMxMARuX3N1Z2cDMARvcmlnaW4DcG-guc2VhcmNoLnIhaG9vLmNvbQRwb3MDMARwcXN0cgMEcH-FzdHJsAwRxc3RybAMzNgRxdWVyeQNjb25ncnVlbnQgYW5k-IHNpbWlsYXlGcG9seWdvnbnMgdmlkZW8EdF9zdG1wAzE0M-DEzNDc4OTY0NjMEdnRlc3RpZANQ SEMwMDE-?pvid=vr19.TEwNi7xfoqqUujtUxC\\_MTE0LlOG3RT 20wl&p=congruent+and+similar+polygons+video&fr2=sb-top&fr=yfp-t-401&rd=r1#](https://ph.search.yahoo.com/search;_ylt=A2oKmJQU3YZT2k4A8jCzRwx.;_ylc=X1MDMjExNDczNDAwMwRfcgMyBGJjawNmMnZ-rYWw5OWVocmFqJTl2YiUzRDQlMjZkJTNEckJfcTJLaHBZRUw4b2tJUIRzdXBfQs0tJTl2cyUzRGJuJTl2aSuzRE5vOXM0dE5SWFFS-cEEzVVB4NVBYBGZyA3lmcC10LTQwMQRncHJpZAMEbXRlc3RpZANudWxsBG5fcnNsdAMxMARuX3N1Z2cDMARvcmlnaW4DcG-guc2VhcmNoLnIhaG9vLmNvbQRwb3MDMARwcXN0cgMEcH-FzdHJsAwRxc3RybAMzNgRxdWVyeQNjb25ncnVlbnQgYW5k-IHNpbWlsYXlGcG9seWdvnbnMgdmlkZW8EdF9zdG1wAzE0M-DEzNDc4OTY0NjMEdnRlc3RpZANQ SEMwMDE-?pvid=vr19.TEwNi7xfoqqUujtUxC_MTE0LlOG3RT 20wl&p=congruent+and+similar+polygons+video&fr2=sb-top&fr=yfp-t-401&rd=r1#)

<http://www.math.com/school/subject3/lessons/S3U3L2DP.html>

Activity Part 059.pdf

Activity Part 060.pdf

[http://www.helpingwithmath.com/printables/worksheets/geometry/8g2\\_congruence01.htm](http://www.helpingwithmath.com/printables/worksheets/geometry/8g2_congruence01.htm)

## Smart Ideas

1. Discuss **Smart Ideas**.
2. Call on an auditory learner to summarize the **Smart Ideas** in Lesson 3.

## Level Up

Allow pupils to do **Level Up**.

## Conclusion

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

### Answer Key

#### Focus

- A. 1. 16                      3. 5                      5. 7.5  
2. 20                      4. 10                      6. 30
- B. a and b appear to be congruent.

## Take a Leap

1. similar                      4. similar                      7. not similar
2. not similar                      5. not similar                      8. not similar
3. not similar                      6. similar

## Make Meaning

Answers may vary.

## Level Up

Answers may vary.

- What are the properties of the various kinds of polygons?
- When are two polygons similar?
- How can you use proportions to identify similar polygons?



More resources on **Practice Strategies** are available in the **Technology Enhancement CD**

More Resources can be found in the **TEC**.



More resources on **Learning Evidences** are available in the **Technology Enhancement CD**

**Summarizes the lesson learned.**

### 21<sup>st</sup> Century Skills

- Use communication, collaboration, and critical-thinking skills with confidence

### Points of Integration

Scale Drawing  
Proportion

## Lesson 4: Circles (2 days)

### Introduction/Preparatory Activities

Have pupils brainstorm a list of actual objects that are shaped like circles. If pupils mention objects that are spheres, remind them that circles are two-dimensional and spheres are three-dimensional.

### Body/Development

#### Jumpstart

1. Let the pupils follow the directions in **Jumpstart**. Check if each pupil is doing it correctly.
2. Lead the class in doing **Study the Model**.

#### Focus

1. Let the pupils practice by answering **Focus**.
2. Concept Attainment Technique:
  - a. Teacher chose the concept: Circle. Show parts of the circle.
  - b. Let the pupils identify the parts of the circle and ask them to describe the circle using the parts given.
  - c. Ask the pupils to evaluate: Why circle is different from other polygons?
  - d. Lead them to find similarities and differences between a circle and other polygons. Then discuss and define the concept of circle.

#### Take a Leap

Ask the pupils to study and answer **Take a Leap**.

#### Quick Check

Ask the pupils to do "Share with a Friend." Let them discuss the description of the circle.

#### Make Meaning

1. Ask the pupils to work alone on **Make Meaning**.
2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:  
<http://www.coolmath.com/reference/circles-geometry.html>  
<http://www.mathsisfun.com/geometry/circle.html>  
<http://www.math.com/tables/geometry/circles.htm>  
<http://www.mathworksheets4kids.com/circles/parts-easy-large.png>  
<http://www.kidsmathgamesonline.com/facts/geometry/circles.html>

#### Smart Ideas

1. Discuss **Smart Ideas**.
2. Call on an auditory learner to summarize the **Smart Ideas** in Lesson 4.

#### Knowledge:

##### Circles



More resources on Learning Objectives are available in the Technology Enhancement CD

#### Skills:

- Visualize and describe a circle
- Identify terms related to a circle
- Draw circles with different radii using a compass



More resources on Acquisition Strategies are available in the Technology Enhancement CD

#### Concept Attainment Technique

#### KU:

- A circle is a closed plane figure made up of points that have the same distance from a point called its center.
- A circle is named using the letter placed at its center.
- A radius of a circle is a segment drawn from the center to any point on the circle.



More resources on Practice Strategies are available in the Technology Enhancement CD

More Resources can be found in the TEC.

- A diameter of the circle is a segment drawn from any point on the circle to any other point on the circle passing through the center. Its length is two times the length of the radius.

### Level Up

Allow pupils to do **Level Up** activities.

### Conclusion

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

### Answer Key

#### Focus

(geometric construction)

#### Take a Leap

(geometric construction)

#### Make Meaning

- A.
1. 6 cm
  2. 5.75 m
  3. 10 cm
  4. 9.4 m
  5. 24 cm
  6. 8 m
  7. 13.75 cm
  8. 18 m
  9. 13.35 cm
  10. 16 cm

#### Level Up

1. center
2. tangent line
3. Radius
4. chord
5. diameter

- A chord is a segment whose endpoints lie on the circle.
- A secant is the line that intersects the circle at two points.
- A tangent is the line that intersects the circle at exactly one point.

#### Mid-assessment Activity

##### KQ:

- What is a circle?
- How do you name a circle?
- Given the radius, how do you draw a circle using a compass?
- What terms related to a circle can you identify?



More resources on Learning Evidences are available in the Technology Enhancement CD

#### Summarizes the lesson learned.

#### 21<sup>st</sup> Century Skills

- Use critical thinking, problem solving, communication, and collaboration

#### Point of Integration

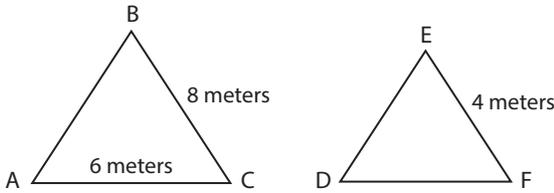
Scale Drawing

## CHAPTER TEST

### I. Knowledge (15%)

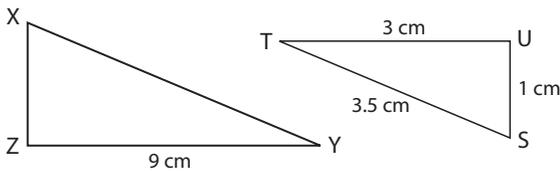
A. Write the letter of the best answer.

\_\_\_\_\_ 1.  $\triangle ABC$  is similar to  $\triangle DEF$ . What is the length of  $\overline{DF}$ ?



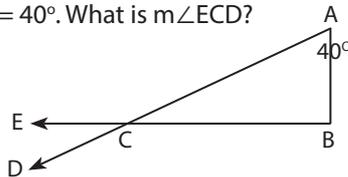
- a. 2 meters                      c. 5 meters  
b. 3 meter                        d. 10 meters

\_\_\_\_\_ 2. If  $\triangle XYZ$  is similar to  $\triangle STU$ , what is the length of  $XY$ ?



- a. 9                                      c. 12  
b. 10.5                                d. 12.5

\_\_\_\_\_ 3. In the figure below,  $\triangle ABC$  is a right triangle and  $m\angle A = 40^\circ$ . What is  $m\angle ECD$ ?



- \_\_\_\_\_ 4. Which polygon has seven sides?  
a. hexagon                            c. nonagon  
b. heptagon                           d. pentagon
- \_\_\_\_\_ 5. Which of the following is a quadrilateral?  
a. triangle                              c. rhombus  
b. pentagon                              d. decagon

### II. Process (25%)

Draw the correct number of sides by using line segments in order to finish each figure and illustrate the word.

1. quadrilateral

\_\_\_\_\_

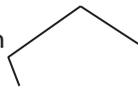
2. octagon



3. triangle



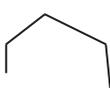
4. pentagon



5. hexagon



6. decagon



### III. Understanding (30%)

A. Fill in the blanks.

- \_\_\_\_\_ 1. It is a triangle with 2 equal sides.
- \_\_\_\_\_ 2. It is the longest chord in any circle.
- \_\_\_\_\_ 3. It is a polygon of 9 sides.
- \_\_\_\_\_ 4. It is a parallelogram with all sides equal.
- \_\_\_\_\_ 5. It is the third angle of a triangle if two angles are  $74^\circ$  and  $90^\circ$ .

B. Draw and label a figure to fit each description.

1. an isosceles trapezoid
  
  
  
  
  
  
  
  
  
  
2. a scalene obtuse triangle
  
  
  
  
  
  
  
  
  
  
3. an equilateral triangle
  
  
  
  
  
  
  
  
  
  
4. an isosceles right triangle
  
  
  
  
  
  
  
  
  
  
5. a trapezoid with a right angle
  
  
  
  
  
  
  
  
  
  
6. a rhombus that is not a square

C. Complete each statement with ALL, SOME, or NO.

1. \_\_\_\_\_ trapezoids are parallelograms.
2. \_\_\_\_\_ parallelograms are quadrilaterals.
3. \_\_\_\_\_ rectangles are trapezoids.



## Answer Key

### I. Knowledge (15%)

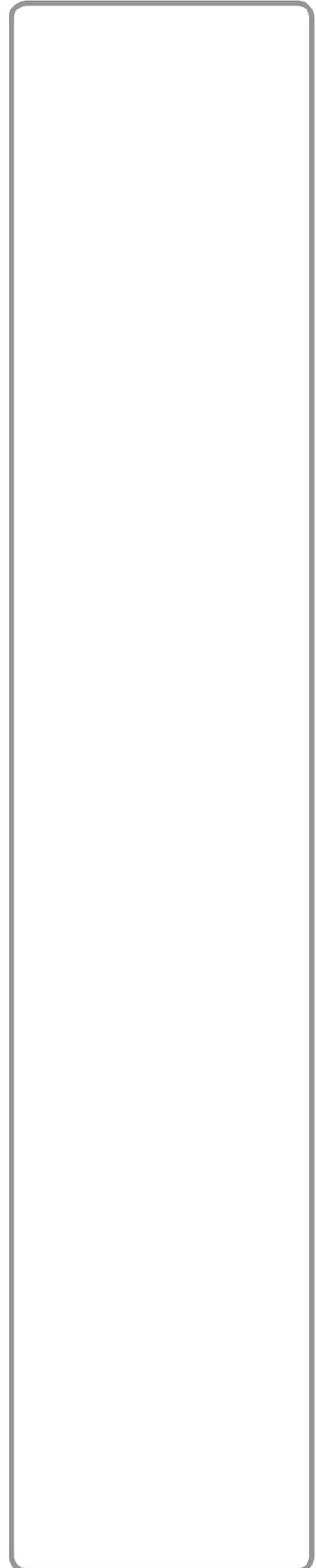
- A. 1. B                      4. B  
     2. B                      5. C  
     3. B

### II. Process (25%)

Answers vary.

### III. Understanding (30%)

- A. 1. isosceles  
     2. diameter  
     3. nonagon  
     4. rhombus/square  
     5.  $16^\circ$
- B. Answers vary.
- C. 1. No  
     2. All  
     3. No



### PRODUCT/PERFORMANCE TASK

<b>Goal</b>	To be able to define the relationship among circumference, diameter, and $\pi$ through a measuring activity
<b>Role</b>	Your role can be a/an: <ul style="list-style-type: none"> <li>• Coach, who will share the group's work with the class and will make sure that everybody in the group participates;</li> <li>• Recorder, who will measure the circumference and diameter of each circle; or</li> <li>• Checker, who will divide the circumference by the diameter of each circle.</li> </ul>
<b>Audience</b>	The audience will be a teacher who will check the answers.
<b>Situation</b>	The pupils will work in groups of threes or fours. Each group is given three circular objects of varying sizes. They need to come up with the formula for finding the circumference of a circle using the diameter and $\pi$ (the ratio of the circumference to the diameter).
<b>Performance</b>	Measure the circumference and the diameter of each circle using a yarn or a measuring tape. Divide the circumference by the diameter of the circle. They make a hypothesis about the results that they got (value of $\pi$ ). Ask pupils to come up with a formula for finding the circumference of a circle given the diameter of the circle and the value of $\pi$ . The coach will prove/justify to the class that their formula works.
<b>Standards</b>	They should be able to calculate the value of $\pi$ and the circumference using the formula accurately. They should be able to measure the diameter and the circumference correctly. The pupils should demonstrate collaboration, adaptability, creativity, and critical-thinking skills among group members.

#### Rubric for the Performance Task

**Advanced** – Can easily and accurately apply the concept of proportion in the given task

**Proficient** – Apply the concept of proportion in the given task

**Need Help** – Has difficulty in all the skills

# UNIT III – RATIO AND PROPORTION, PERCENT, GEOMETRY, AND SIMPLE EQUATIONS

## CHAPTER 9 – EQUATIONS

### Chapter Summary

This chapter contains topics and skills on simple equations. Varied activities have been designed for pupils to explore how to form patterns in mathematical sentences. They will have challenging experiences in solving for the unknown in simple equations.

To evaluate pupils' understanding of simple equations, a pre-assessment will be given to them.

Performance-based activities are also integrated into some of the elements of the work text so pupils can apply concepts and skills they have learned in the chapter.

### Content Standards

*The learner should be able to demonstrate an understanding of...*

- the concept of sequence and solving simple equations.

### Performance Standards

*The learner should be able to...*

- apply the knowledge of sequence in various situations.
- use different problem-solving strategies.

### Pre-assessment:

To facilitate the pre-assessment of pupils' level of understanding on the chapter coverage, ask the pupils to answer a diagnostic test.

### Diagnostic Test

Conduct a pre-test to the class.

- I. Find the next term in each sequence.
  1. 4, 8, 16, 32, ...
  2. 48, 24, 12, 6, ...
  3. 110, 99, 88, 77, ...
  4. 1, 10, 19, 28, ...
- II. Find the missing values in the table below:

Number of People	Number of Sandwiches
3	6
6	
	18
12	24
15	
	36

### Key Stage Standards:

The learner demonstrates understanding and appreciation of key concepts and skills involving numbers and number sense, measurement, geometry, patterns and algebra, statistics and probability as applied, using appropriate technology, in critical thinking, problem solving, reasoning, communicating, making connections, representations, and decisions in real life.

### Grade Level Standards:

At the end of Grade 5, the learner demonstrates understanding and appreciation of key concepts and skills involving whole numbers up to 10 000 000, order of operations, factors and multiples, fractions and decimals including money, ratio and proportion, percent, time, circumference, area, volume, temperature, polygons, circles, solid figures, sequence and number sentences, tables, line graphs, and experimental probability as applied, using appropriate technology, in critical thinking, problem

Following this pattern, predict how many sandwiches would be needed if 120 people attended the picnic. How many could attend if 180 sandwiches were provided?

III. Solve the following equations:

1.  $84 = 49 + n$

2.  $9 = \frac{n}{6}$

3.  $115 = n = 96$

4.  $8n = 96$

5.  $\frac{n}{11} = 7$

6.  $151 = 1 + 3n$

7.  $15n = 165$

8.  $201 = n - 48$

IV. Solve.

There are 15 houses on one side of the street that are numbered 2, 4, 6, etc. Mrs. Noble lives in one of these houses. The numbers of all the houses numbered below hers have the same sum as those numbered above hers.

- a. How many houses are there on her side of the street?
- b. What is her house number?

solving, reasoning, communicating, making connections, representations, and decisions in life.

The teacher will administer pre-test days before the chapter starts. This pre-assessment measures the pupils' readiness to continue learning about number theory and order of operations. The teacher can already group the pupils based on the results.

**Resource:**

Pre-assessment worksheets

## Lesson 1: Patterns in Mathematical Sentences (3 days)

### Introduction/Preparatory Activities

1. Have the pupils look around classroom and observe the different types of patterns.
2. Discuss different types of patterns, for example: shapes, size, and color.
3. Have the pupils create their own pattern and identify their rule.

### Body/Developmental

#### Motivation/Presentation

#### Jumpstart

1. Let the pupils follow the directions in **Jumpstart**. Check if each pupil is doing the activity correctly.
2. Lead the class in doing **Study the Model**.

#### Focus

1. Let the pupils practice by answering **Focus**, exercise A. Exercise B may be given as homework.
2. Concept Formation Technique:
  - a. The pupils will be provided by the concepts: Patterns in mathematical sentences.
  - b. They will give the descriptions of patterns using mathematical sentences then they will explain why they were able to form the concept: Patterns in mathematical sentences.
  - c. Using the activities, ask: How do you make patterns using mathematical sentences?

#### Take a Leap

1. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct

Group Einstein – Pupils who got 13–16 points correct

Group Gauss – Pupils who got 12 points and below correct

2. Have Groups Einstein and Gauss do exercise B in **Take a Leap** and Group Archimedes do exercise A.

#### Quick Check

Ask the pupils to do “Share with a Friend.” Let them discuss on how write mathematical sentence using patterns.

#### Make Meaning

1. Ask the pupils to work alone on **Make Meaning** exercise A. Exercise B may be given as homework.

#### Knowledge:

Patterns in mathematical sentences

#### Pre-assessment:

Interview

#### Point of Integration:

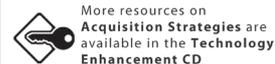
Measurement (Finding the Area and Surface Area)



More resources on Learning Objectives are available in the Technology Enhancement CD

#### Skill:

- Determine the patterns in completing mathematical sentences
- Formulate the rule in finding the next term in a sequence



More resources on Acquisition Strategies are available in the Technology Enhancement CD

#### Concept Formation Technique

#### 21<sup>st</sup> Century Skills

- Use communication and critical and creative thinking.

#### KU:

- A pattern or a sequence is a list of numbers or objects in which all terms are related by a rule. Each number in the list is called a term.
- Finding a pattern can help in forming number sentences.
- Patterns can help us form the correct number sentences by looking at the relationship of the

2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:

[http://www.math-drills.com/patterning/patterning\\_making\\_number\\_patterns\\_all.html](http://www.math-drills.com/patterning/patterning_making_number_patterns_all.html)

### Smart Ideas

Discuss the important points in **Smart Ideas**. Ask the class to read **Smart Ideas** and explain these in their own words. They may use the language they are comfortable with.

### Level Up

Allow the fast learner to do **Level Up**.

### Conclusion/Evaluation

#### Let's Reflect!

Lead the class in doing **Let's Reflect**.

#### Answer Key

#### Focus

- A. 1. 16  
2.  $\frac{10}{25}$   
3. 96  
4. 4  
5.  $\frac{128}{81}$
- B. 1.  $17\frac{1}{2}$   
2. 62  
3. 30  
4. 10  
5. 85

#### Take a Leap

- A. 1. 22  
2. 121  
3. 13  
4.  $\frac{1}{32}$   
5. 303  
6. 6
- B. 1. decrease previous term by 7  
2. -1, -2, -3, ...  
3. increase previous term by 6  
4. increase previous term by 11

numbers to each other and representing them in an equation or formula.

- Some problems are best solved by finding patterns.



More resources on Practice Strategies are available in the Technology Enhancement CD

More Resources can be found in the TEC

#### KQ:

- How does pattern help in solving for the unknown?

#### Mid-evaluation Activity

#### Assessment:

Answer **Let's Reflect** – My Journal

## Make Meaning

- A. Area of a square = side x side  
Surface area of a cube = 6 x side x side  
Surface area of the prism = Area of the base x height  
Area of a triangle =  $\frac{1}{2}$  Area of the base x height
- B. 1. multiply by 3  
2. subtract 12  
3. divide by 2  
4. square of the number  
5. Add the first 2 terms to get the next term.

## Level Up

2. Dodie is 42 years old and his son is 15 years old.
3. 13.5 kg of mangoes and 10.5 kg of bananas
4. 35, 36, 37
5. Des is 42 years old. Krista is 21 years old.

## Lesson 2: Solving for the Unknown in Simple Equations (2 days)

### Introduction/Preparatory Activities:

1. Ask the pupils to follow the following directions:
  - a. Choose three different digits from: 1, 2, 3, 4, 5, 6, 7, 8, and 9.
  - b. Write down all the possible two-digit numbers you can form from these numbers.
  - c. Add all these two-digit numbers together.
  - d. Work out the sum of the three chosen digits.
  - e. Divide the total of the numbers by the total of the digits.
2. Amaze your pupils by telling them that you know the resulting number (22). Ask them how the trick works.

### Body/Developmental

#### Motivation/Presentation

#### Jumpstart

1. Guide the class in doing **Jumpstart** in the work text.
2. Draw out from the pupils the importance of solving for the unknown in simple equations.
3. Discuss **Study the Model**. Ask the class to practice by giving more guided exercises.

#### Focus

1. Let the pupils practice by answering **Focus** individually.

### Knowledge:

Solving for the unknown in simple equations



More resources on Learning Objectives are available in the Technology Enhancement CD

### Skill:

- Use different strategies (looking for a pattern, working backwards, etc.) to solve for the unknown in simple equations involving one or more operation on whole numbers and fractions

### 21<sup>st</sup> Century Skills

- Use communication, collaboration, and critical-thinking skills with confidence

### Point of Integration:

Social Studies (facts and figures, per capita income, etc.)

2. Cooperative Learning Technique:
  - a. Allow the pupils to form groups. Give each group a flash card with simple equations.
  - b. Let the leader guide them in answering the equations.
  - c. After brainstorming and getting the correct answer, the leader will present the answer to the whole class for evaluation.
  - d. Assess how the pupils work as a group.

### Take a Leap

1. Group the class according to readiness based on the results of the pre-assessment. The pupils should not know the results of the pre-test so they will not be labeled. Just name the pupils who should be in one of these groups:

Group Archimedes – Pupils who got 17–20 points correct

Group Einstein – Pupils who got 13–16 points correct

Group Gauss – Pupils who got 12 points and below correct

2. Ask the teams to play the game in **Take a Leap** together. Have Teams Einstein and Archimedes do exercise A and Team Gauss do exercise B.
3. The class checks the answers in class. Facilitate clarification and further discussion of the topics.

### Quick Check

Ask the pupils to do “Share with a Friend.” Let them discuss on how solve the unknown of the simple equations.

### Make Meaning

The pupils answer the exercises in **Make Meaning** with a partner. Number 3 activity may be given as homework.

### Smart Ideas

1. Ask the class to read **Smart Ideas** and explain these in their own words. They may use the language they are comfortable with. This is the time to clarify some confusion on concepts and difficulties encountered by the pupils. Encourage them to ask questions.
2. Ask the pupils to visit the *Student's Space* and additional downloadable activity at:
 

[http://www.superteacherworksheets.com/algebra/basic-algebra1\\_TTZWB.pdf](http://www.superteacherworksheets.com/algebra/basic-algebra1_TTZWB.pdf)

<http://www.gcsemathstutor.com/simpequations.php>

### Level Up

Allow the fast learner to do **Level Up**.

- a. Problem solving involving solving for the unknown in simple equations
- b. Finding the missing term in a sequence

### Cooperative Learning Technique

#### Mid-assessment Activity

#### KU:

- We use inverse operations in working backward to find the unknown.
- Block models will help us visualize the problem and form the correct equations.



More resources on Acquisition Strategies are available in the Technology Enhancement CD

#### KQ:

- How do inverse operations help in solving for the unknown?



More resources on Practice Strategies are available in the Technology Enhancement CD

More Resources can be found in the TEC.

#### Assessment:

Answer **Let's Reflect** – My Journal

## Conclusion/Evaluation

### Let's Reflect!

Ask the class to answer **Let's Reflect**. Ask for volunteers to share their answers in class.

### Answer Key

#### Focus

- |               |               |
|---------------|---------------|
| 1. N = 755    | 6. N = 10 000 |
| 2. N = 215    | 7. N = 20     |
| 3. N = 50 150 | 8. N = 500    |
| 4. N = 7 675  | 9. N = 280    |
| 5. N = 12 150 | 10. N = 6 800 |

#### Take a Leap

- |               |                        |
|---------------|------------------------|
| A. 1. N = 500 | 6. $N = 17\frac{1}{3}$ |
| 2. N = 720    | 7. $N = 4\frac{1}{10}$ |
| 3. N = 14     | 8. N = 16              |
| 4. N = 135    |                        |
| 5. N = 1 800  |                        |
- B. 1. 4  
2. 7:24 pm

#### Make Meaning

- May 27
- 3 326
- Carlos has 50 cards while Paolo has 30 cards.
  - Krista is 17 years old while her younger brother is 8 years old.
  - Elena will give ₱550 while Cecile will give ₱275.
  - ₱20 000
  - 204
  - 2 625 mL

#### Level Up

- |   |          |
|---|----------|
| A. 1. 10  | B. 1. 80 |
| 2. 30   | 2. 9     |
| 3. ₱1 905                                       |          |
| 4. ₱540   |          |
| 5. Dodie has 640 coins while Des has 365 coins. |          |
| 6. $9\frac{11}{20}$                             |          |
| 7. 67   |          |
| 8. 75   |          |

## UNIT TEST

### I. Knowledge

Fraction	Decimal	Ratio	Percent
$\frac{3}{5}$	<b>0.6</b>	<b>3 : 5</b>	<b>60%</b>
$\frac{19}{50}$	0.38	<b>19 : 50</b>	<b>38%</b>
$\frac{1}{10}$	<b>0.1</b>	1.10	<b>10%</b>
$\frac{14}{25}$	<b>0.56</b>	<b>14 : 25</b>	56%

### II. Process

1.  $n = 108$
2.  $n = 10.5$
3.  $n = 24$
4.  $n = 27$
5.  $n = 4$

### III. Understanding

- A.
1. 12
  2. Kelly has ₱280, Tim has ₱70, and Bettina has ₱40.
- B.
1. D and G
  2. I, J, K, L, M, and N
  3. A, C, H, and L
  4. C
  5. D, E, and G
  6. D and G

## CHAPTER TEST

### I. Knowledge (15%)

Find the next term in each sequence:

1. 512, 256, 128, 64, 32, 16, 8, ...
2. 1, 4, 9, 16, 25, 36, 49, ...
3. 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ...
4. 4, 12, 20, 28, 36, ...
5. 293, 278, 263, 248, 233, ...
6. 1, 2, 5, 10, 17, ...
7. 500, 475, 450, 425, 400, ...
8. 2, 14, 98, 686, 4 802, ...
9. 7, 48, 89, 130, 171, ...
10.  $\frac{1}{3}, \frac{2}{3}, 1, \frac{4}{3}, \frac{5}{3}, \dots$

### II. Process (25%)

Solve the following problems using block models. Then write the number sentence.

1. Grade 5, section A donated 256 books in a book drive project. Section B donated thrice as much. How many books did section B donate more than section A?
2. Loida has 264 stamps. She has three times as many stamps as Cosy. If Cosy shares her stamps equally with Viola, how many stamps will Viola get?
3. On a hiking trip, Cammy and her two friends hiked 15 kilometers on the first day, 10 kilometers on the second, and 7 kilometers on the third. If they walked a total of 60 kilometers over the 5-day trip and did not walk more than 18 miles on any day, how many kilometers could they have walked on each of the last two days?
4. A parking lot permits either cars or motorcycles. Overall, the vehicles parked on a certain day have 60 wheels. Use your reasoning and problem-solving skills to determine how many cars and how many motorcycles there could be in the parking lot that day.

### III. Understanding (30%)

Consider the scenarios and solve the problems.

1. Cristina ran for 11 minutes on Monday, 27 minutes on Tuesday, 43 minutes on Wednesday, 59 minutes on Thursday, and 75 minutes on Friday. If Cristina continues this pattern, how many minutes will Cristina run on Saturday?
2. The terms in the sequence {2, 7, 12, 17, 22, ...} increases by fives. The terms in the sequence {3, 10, 17, 24, 31, ...} increases

by sevens. The number 17 occurs in both sequences. What is the next number that occurs in both sequences?

3. The first four triangular numbers are 1, 3, 6, and 10. What is the seventh triangular number?
4. Each number in a sequence is obtained by adding the two previous numbers. The 6th, 7th, and 8th numbers in the sequence are 29, 47, and 76. What is the 3rd number in the sequence?
5. Lauren decides she is going to hop from her house to her friend's house down the street. However, she hops in a pattern taking two hops forward and one hop backwards. If her friend's house is 15 hops away from her, what is the least number of hops she must take to reach her friend's house?
6. Kyla is 35 years younger than Lauren. Grace is half of Kyla's age. Kenneth is 17 years older than Grace. If Kenneth is 35 years old, how old is Lauren?
7. Karl is 4 years younger than Donna, but Kristine is 24 years older than Donna. If Kristine is 35, how old is Karl?
8. Four pupils in the class weighed themselves. Drew was 15 kilograms lighter than Betty. Howard was twice as heavy as Drew and Kat was 3 kilograms heavier than Howard. If Kat weighed 71 kilograms, how heavy was Betty?
9. When three girls jumped on a weighing scale together, they weighed 163 kilograms. One girl stepped off and the scale moved down to 103 kilograms. One more girl jumped off and the scale showed 54 kilograms. What was the weight of each girl?
10. Bea baked cupcakes over the weekend. Each day during the week, she took 3 cupcakes to school to share with her friends. On Saturday, when she counted, there were 18 cupcakes left. How many had she baked?

### Answer Key

#### I. Knowledge (15%)

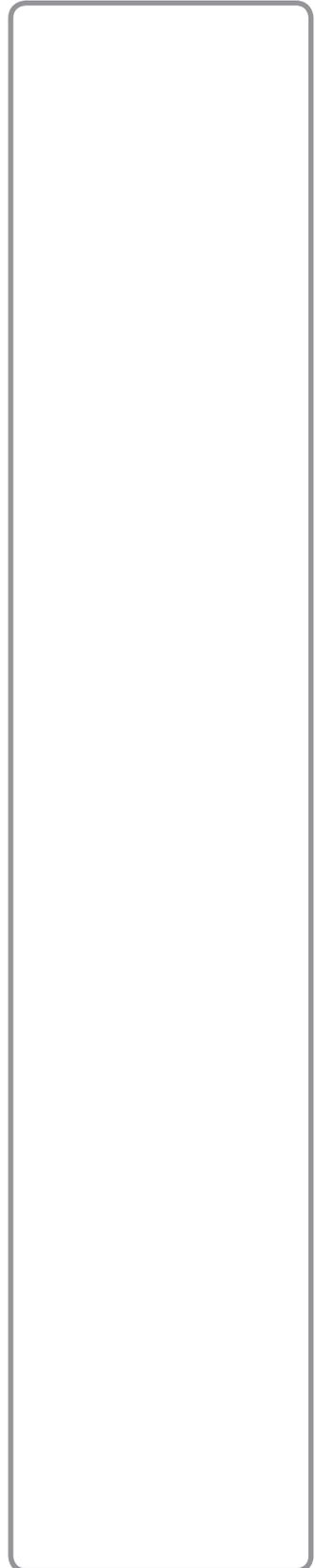
- |         |           |
|---------|-----------|
| A. 1. 4 | 6. 26     |
| 2. 64   | 7. 375    |
| 3. 89   | 8. 33 614 |
| 4. 44   | 9. 212    |
| 5. 218  | 10. 2     |

#### II. Process (25%)

- B. 1. 512
2. 44
3. 14 km
4. Answers may vary; but there could be as many as 14 cars or as many as 28 motorcycles.

**III. Understanding (30%)**

- C. 1. 91
- 2. 52
- 3. 28
- 4. 7
- 5. 38
- 6. 61 years old
- 7. 7 years old
- 8. 49 years old
- 9. 60 kg, 49 kg, and 54 kg
- 10. 33



### PRODUCT/PERFORMANCE TASK

<b>Goal</b>	Your role can be a/an: <ul style="list-style-type: none"> <li>• To be able to interpret/explain solutions using simple equations/patterns; and</li> <li>• To be able to create patterns/equations to represent relationships between quantities.</li> </ul>
<b>Role</b>	Your role can be a/an: <ul style="list-style-type: none"> <li>• Pattern/equation maker – who will look for strategies on how the problems will be solved; or</li> <li>• Decision maker – who will decide on the best answer to each question.</li> </ul>
<b>Audience</b>	The audience will be a teacher who will check the answers.
<b>Situation</b>	The pupils will work in groups of fours
<b>Performance</b>	<p>You work for a small business that sells bicycles, cars, and six-wheeled container vans.</p> <p>a. On Tuesday, you counted 48 car wheels. How many cars were in the shop?</p> <p>b. On Thursday, there were no bicycles in the shop. There were only cars and six-wheeled container vans. There were a total of 14 vehicles and 62 wheels. How many cars and how many six-wheeled container vans were in the shop?</p>
<b>Standards</b>	They should be able to make sense of problems and construct viable arguments in critiquing the response of others. The pupils should demonstrate perseverance, collaboration, adaptability, creativity, and critical-thinking skills among group members.

#### Rubric for Performance Task

**Advanced** – Can easily and accurately apply patterns and simple equations in the given task

**Proficient** – Apply patterns and simple equations in the given task

**Still Learning** – Able to apply patterns and simple equations in the given task in a slower pace

**Need Help** – Has difficulty in all the skills

Or you can use this rubric:

The group will be assessed according to accuracy, correctness and completeness of solution; clarity and creativity of presentation; 5 being the highest and 1 being NI or Needs Improvement.