Geometric Shapes

NFE Accreditation and Equivalency Learning Material

Philippines Nonformal Education Project (ADB-Assisted)

Bureau of Nonformal Education
DEPARTMENT OF EDUCATION,
CULTURE AND SPORTS
<table>
<thead>
<tr>
<th>Metric</th>
<th>Imperial</th>
</tr>
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<tbody>
<tr>
<td><strong>Length</strong></td>
<td></td>
</tr>
<tr>
<td>1 millimeter (mm) = 10 micrometer (µm)</td>
<td>1 foot (ft) = 12 inches (in)</td>
</tr>
<tr>
<td>1 centimeter (cm) = 10 millimeters (mm)</td>
<td>1 yard (yd) = 3 feet (ft)</td>
</tr>
<tr>
<td>1 decimeter (dm) = 10 centimeters (cm)</td>
<td>1 mile = 1760 yards (yd)</td>
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<td>1 meter (m) = 10 decimeters (dm) = 100 cm</td>
<td>1 nautical mile = 2025.4 yards (yd)</td>
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<td>1 decameter (dam) = 10 meters (m)</td>
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<td>1 hectometer (hm) = 10 decameters (dam)</td>
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<tr>
<td>1 kilometer (km) = 10 hectometers (hm) = 1000 meters (m)</td>
<td>1 mile = 5280 feet (ft)</td>
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<tr>
<td><strong>Mass</strong></td>
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<tr>
<td>1 gram (g) = 1000 milligrams (mg)</td>
<td>1 ounce (oz) = 437.5 grains</td>
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<tr>
<td>1 kilograms (kg) = 1000 grams (g)</td>
<td>1 pound (lb) = 16 ounces (oz)</td>
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<tr>
<td>1 tonne = 1000 kilograms (kg)</td>
<td>1 stone = 14 pounds (lb)</td>
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<tr>
<td></td>
<td>1 hundredweight (cwt) = 112 pounds (lb)</td>
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<td>1 ton = 20 cwt</td>
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<td><strong>Volume</strong></td>
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<td>1 liter (l) = 1000 milliliters (ml)</td>
<td>1 pint (pt) = 20 fluid ounce (fl oz)</td>
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<tr>
<td>1 kiloliter (kl) = 1000 liters (l)</td>
<td>1 quart (qt) = 2 pints (pt)</td>
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<tr>
<td>1 cubic centimeter (cm³) = 1000 cubic millimeters (mm³)</td>
<td>1 gallon (gal) = 4 quarts (qt)</td>
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<td>1 cubic meter (m³) = 1000000 cubic centimeters (cm³)</td>
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<tr>
<td><strong>Area</strong></td>
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<tr>
<td>1 square centimeter (cm²) = 10000 square millimeters (mm²)</td>
<td>1 square foot (ft²) = 144 square inches (in²)</td>
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<tr>
<td>1 square meter (m²) = 10000 square centimeters (cm²)</td>
<td>1 square yard (yd²) = 9 square feet (ft²)</td>
</tr>
<tr>
<td>1 hectare (ha) = 10000 square meters (m²)</td>
<td>1 acre = 4840 square yards (yd²)</td>
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<tr>
<td>1 square kilometer (km²) = 100 hectares (ha)</td>
<td>1 square mile = 640 acres</td>
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<tr>
<td><strong>Time</strong></td>
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<td>1 minute = 60 seconds</td>
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<td>1 hour = 60 minutes</td>
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<td>1 day = 24 hours</td>
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<td>1 week = 7 days</td>
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<tr>
<td>1 month = 4 weeks (approx.)</td>
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<tr>
<td>1 year = 12 months = 365 days</td>
<td>1 year = 366 days (in a leap year)</td>
</tr>
<tr>
<td>1 decade = 10 years</td>
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<td>1 century = 100 years = 10 decades</td>
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<tr>
<td>1 millennium = 1000 years = 10 centuries</td>
<td></td>
</tr>
</tbody>
</table>

**Math Symbols**

- + plus (addition)
- - minus (subtraction)
- × times (multiplication)
- ÷ divided by (division)
- = equal sign
- ≠ not equal to
- ≈ equivalent sign
- > greater than
- ≤ less than
- ≥ greater than or equal to
- ≤ less than or equal to
- ± plus or minus

**Multiplication Table**

<table>
<thead>
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</table>
Geometric Shapes

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DEPARTMENT OF EDUCATION,
CULTURE AND SPORTS

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My dear NFE A&E Learners,

Welcome to the Nonformal Education Accreditation and Equivalency (NFE A&E) Learning Program of the Department of Education, Culture and Sports (DECS). NFE A&E is a new nonformal approach to learning which provides out-of-school youth (OSY) and adults an alternative way to improve their basic education skills in reading, writing and computing, and acquire an elementary or secondary level certificate. The long-term vision of this NFE A&E System is to provide OSY and adults opportunities whereby they can continue to learn on their own throughout their lives so that they can improve their quality of life and the life of their families and participate in national development efforts.

The program is built around a uniquely nonformal curriculum and uses a range of innovative learning strategies designed to break down traditional barriers of time, accessibility and resources, which make it difficult for OSY and adults to pursue or continue their education. We have prepared learning modules at two learning levels (elementary and secondary) in English and Filipino. These modules aim to help you improve your skills, knowledge and competencies across five learning areas which are designed to help you function more effectively as Filipino citizens in a modern society. By studying the modules and completing the various self-assessment activities and assignments, we hope you will be able to better understand the problems of daily living and make informed decisions about possible options to improve the quality of your life. This includes having new skills and knowledge to raise your standard of living through better health practices, better food, increased
income, improved family life and more direct participation in community and civic activities.

The modules will also prepare you to take an NFE A&E Test at either the elementary or secondary level. If you successfully complete the test, you will receive either an elementary or secondary level certificate which can help you get a better job and pursue other learning opportunities.

We hope you find the modules interesting, useful and challenging. They have been specially prepared to help you progress from being dependent on a facilitator to being able to learn by yourself. This means you will need to take more responsibility for your own learning and will require a high level of commitment, motivation and self-discipline. These, however, are skills which are essential for you to progress in an ever-changing and increasingly competitive Filipino and global society.

Good luck and mabuhay!

RAUL S. ROCO
Secretary
What Is This Module About?

In our daily lives, we do not notice that we are dealing with geometric shapes. How do you describe the shape of your notebook? Is it similar to the shape of this module? What is the shape of your house? How many sides does it have? These are only some of the questions that this module will answer.

What Will You Learn From This Module?

After studying this module, you should be able to:

- identify the different kinds of lines;
- explain the concept of congruence;
- define what rays, angles, plane figures and space figures are; and
- identify the different kinds of angles, plane figures and space figures.

Let's See What You Already Know

Before you start studying this module, take this simple test first to find out how much you already know about the topics to be discussed.

A. Write T in the blank if the statement is true and F if it is false.

_____ 1. A sphere has no base.

_____ 2. Two line segments are congruent if they have the same measurement.

_____ 3. A polygon with four equal sides is called a rectangle.

_____ 4. All prisms are cubes.

_____ 5. A line has no beginning and no end.
B. Encircle the letter of the correct answer to each of the following.

1. A _____ has two circular bases.
   a. cone    c. cylinder
   b. circle  d. sphere

2. A _____ has three sides and three corners.
   a. triangle   c. rectangle
   b. square    d. trapezoid

3. A _____ has four equal sides and four corners.
   a. rectangle   c. trapezoid
   b. square     d. rhombus

4. Three-dimensional shapes are called _____.
   a. triangles    c. space figures
   b. cones        d. planes

5. Two line segments are _____ if their measurements are the same.
   a. equivalent    c. similar
   b. congruent     d. adjacent

Well, how was it? Do you think you fared well? Compare your answers with those in the Answer Key on page 28 to find out.

If all your answers are correct, very good! This shows that you already know much about the topics in this module. You may still study the module to review what you already know. Who knows, you might a learn a few more new things as well.

If you got a low score, don’t feel bad. This means that this module is for you. It will help you understand some important concepts that you can apply in your daily life. If you study this module carefully, you will learn the answers to all the items in the test and a lot more! Are you ready?

You may go now to the next page to begin Lesson 1.
Lesson 1

Lines and Angles

After studying this lesson, you should be able to:

♦ define what a line is;
♦ explain the concept of congruence;
♦ define what rays and angles are; and
♦ identify the different kinds of angles.

Let's Try This

Look at the drawings below. Then identify them according to the kinds of lines they are. Refer to the list following the drawings.

A.

\[ \text{Diagram A} \]

B.

\[ \text{Diagram B} \]

C.

\[ \text{Diagram C} \]
D.

E.

1. straight lines
   a. parallel lines
   b. intersecting lines
   c. perpendicular lines

2. curved lines

Compare your answers with mine below.

1. The lines in letters A to D are all straight lines. The lines in B are parallel, those in C are intersecting and those in D are perpendicular.

2. The lines in letter E are curved lines.

How well did you do? Were your answers similar to mine? If they were, that’s very good. You already know how to identify the different kinds of lines. If they were not, just pay attention to this lesson and you will know a whole lot about lines.

Let’s Learn

Are you familiar with the lines and their kinds now? Were you able to identify the lines in the drawing as to their kinds?
A line has no definite beginning and end. It can only be measured when two points called **endpoints** are set on either side of it. These points represent the beginning and the end of the given line, which is then more properly called a **line segment**.

From the previous activity, you can see that there are basically two kinds of lines—straight and curved lines.

Straight lines are further subdivided into the following kinds:

1. **Parallel lines** are lines on the same plane which run beside each other without meeting at any point no matter how far they are extended.

2. **Intersecting lines**, on the other hand, are lines on the same plane that intersect with each other at least at one point.

3. **Perpendicular lines** are lines on the same plane that intersect each other at one point and form 90°-angles.
Let's Review

Determine whether each of the sets of lines are parallel, intersecting or perpendicular. Write Pa for parallel, I for intersecting and Pe for perpendicular in the spaces provided before the numbers.

_____ 1.

_____ 2.

_____ 3.

_____ 4.

_____ 5.

Compare your answers with those in the Answer Key on page 28. Did you get all the answers right?
Let’s Think About This

Do you know what the word congruence means? It refers to the state of agreeing or coinciding. What does this mean? Read on to find out.

Let’s Study and Analyze

Look at the line segments in the drawing below. Try measuring them with a ruler. Are they equal in length?

A __________________________ B

C __________________________ D

Yes, they are! We can therefore say that Line Segment AB or \( \overline{AB} \) (read as “Line Segment AB”) is congruent to \( \overline{CD} \).

Let’s Think About This

Look at a clock. Do you know where its hands are? What do they remind you of?

The hands of a clock are examples of rays, lines that have a beginning but no definite end. They can go on and on in one direction. They form an angle when they meet at a certain point as in the hands on the face of a clock.

Do you know what kind of angle the hands of the clock above show?
If you answered that they form an obtuse angle, then you are right. If you were not able to answer correctly, read on to find out more about angles and their different kinds.

Let’s Learn

What is an angle anyway? An **angle** is the figure formed when two rays or lines intersect at one point. Its kinds include:

1. **Acute angle**—This is an angle that measures less than 90°.

   ![Acute Angle Diagram](image)

2. **Right angle**—This is an angle that measures exactly 90°.

   ![Right Angle Diagram](image)

3. **Obtuse angle**—This is an angle that measures more than 90° but less than 180°.

   ![Obtuse Angle Diagram](image)

4. **Straight angle**—This is an angle that measures exactly 180°.

   ![Straight Angle Diagram](image)
Let's Try This

Look at the drawing below. Identify what kinds of angles those mentioned are.

1. \(\angle CAB\)
2. \(\angle GIH\)
3. \(\angle NPO\)
4. \(\angle BCE\)
5. \(\angle RTS\)

Compare your answers with those in the Answer Key on page 28. Did you get all the answers right?
**Let's See What You Have Learned**

Match the items in Column A with those in Column B.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>______ 1. A figure that has no definite beginning and end</td>
<td>a. Perpendicular</td>
</tr>
<tr>
<td>______ 2. Two lines that do not and will not intersect no matter how far they are extended</td>
<td>b. Ray</td>
</tr>
<tr>
<td>______ 3. Two lines that form a 90°-angle</td>
<td>c. Obtuse</td>
</tr>
<tr>
<td>______ 4. Two lines that cross each other at any one point</td>
<td>d. Parallel</td>
</tr>
<tr>
<td>______ 5. Refers to the state of agreeing or coinciding</td>
<td>e. Congruence</td>
</tr>
<tr>
<td>______ 6. A figure that has a beginning but no definite end</td>
<td>f. Right</td>
</tr>
<tr>
<td>______ 7. An angle which measures less than 90°</td>
<td>g. Intersecting</td>
</tr>
<tr>
<td>______ 8. An angle which measures exactly 90°</td>
<td>h. Acute</td>
</tr>
<tr>
<td>______ 9. An angle which measures more than 90° but less than 180°</td>
<td>i. Straight</td>
</tr>
<tr>
<td>______ 10. An angle which measures exactly 180°</td>
<td>j. Line</td>
</tr>
</tbody>
</table>

Compare your answers with those in the *Answer Key* on page 29. Did you get all the answers right? If you did, that’s very good. You may then proceed to the next lesson. If you did not, that’s okay. Just review the parts of the lesson you didn’t understand very well before going to Lesson 2.
Let's Remember

♦ A line has no definite beginning and end.

♦ The two basic types of lines are straight and curved lines.

♦ There are three kinds of straight lines—parallel, intersecting and perpendicular lines.

♦ The term congruence refers to the state of agreeing or coinciding.

♦ The four basic kinds of angles are acute, right, obtuse and straight angles.
Lesson 2

Plane Figures

After studying this lesson, you should be able to:

- identify the different kinds of plane figures;
- differentiate one kind of plane figure from another; and
- determine whether two given plane figures are congruent or not.

Let's Think About This

Look at the drawing below. Are you familiar with the different kinds of plane figures? What plane figures do you see in the given drawing? List their names down in the spaces provided.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

Compare your answers with those in the Answer Key on page 29. Did you get all the answers right?

Let's Learn

There are many kinds of plane figures but we will only focus on the following in our discussion.

1. **Trapezoid**—A quadrilateral having only two parallel sides.

   ![Trapezoid Diagram]

2. **Parallelogram**—A quadrilateral with opposite sides parallel and equal.

   ![Parallelogram Diagram]

3. **Rhombus**—A parallelogram with four equal sides and no right angles.

   ![Rhombus Diagram]
4. **Rectangle**—A parallelogram all of whose angles are right angles.

![Rectangle Diagram]

5. **Square**—A rectangle with all four sides equal.

![Square Diagram]

6. **Polygons**—Closed plane figures bounded by straight lines.
   a. **Triangle**—A polygon having three sides.

![Triangle Diagram]

   b. **Pentagon**—A polygon having five sides.

![Pentagon Diagram]
c. **Hexagon**—A polygon having six sides.

\[ \text{Hexagon} \]

\[ \text{Hexagon} \]

d. **Octagon**—A polygon having eight sides.

\[ \text{Octagon} \]

\[ \text{Octagon} \]

7. **Circle**—A closed plane curve every point of which is of the same distance from a fixed point within the curve.

\[ \text{Circle} \]

\[ \text{Circle} \]

8. **Oblong**—A plane deviating from a square, circular or spherical form by elongation in one dimension.

\[ \text{Oblong} \]

\[ \text{Oblong} \]
Let's Try This

Make your own drawing similar to the one on page 12 using all the shapes you just learned about. Use the space provided below for your drawing.

Have your Instructional Manager check your drawing. Ask him/her for some feedback before going to the next part of the lesson.
Let's See What You Have Learned

Match the names of shapes in Column A with the corresponding figures in Column B. Write the letters of the correct answers in the spaces provided before the numbers.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>______</td>
<td>a.</td>
</tr>
<tr>
<td>1. Trapezoid</td>
<td></td>
</tr>
<tr>
<td>______</td>
<td>b.</td>
</tr>
<tr>
<td>2. Parallelogram</td>
<td></td>
</tr>
<tr>
<td>______</td>
<td>c.</td>
</tr>
<tr>
<td>3. Rhombus</td>
<td></td>
</tr>
<tr>
<td>______</td>
<td>d.</td>
</tr>
<tr>
<td>4. Rectangle</td>
<td></td>
</tr>
<tr>
<td>______</td>
<td>e.</td>
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<tr>
<td>5. Square</td>
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<tr>
<td>______</td>
<td>f.</td>
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<tr>
<td>6. Triangle</td>
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<tr>
<td>______</td>
<td>g.</td>
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<tr>
<td>7. Pentagon</td>
<td></td>
</tr>
<tr>
<td>______</td>
<td>h.</td>
</tr>
<tr>
<td>8. Hexagon</td>
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</tr>
<tr>
<td>______</td>
<td>i.</td>
</tr>
<tr>
<td>9. Circle</td>
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</tr>
<tr>
<td>______</td>
<td>j.</td>
</tr>
<tr>
<td>10. Oblong</td>
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</tbody>
</table>
Compare your answers with those in the *Answer Key* on page 30. Did you get all the answers right? If you did, that’s very good. You may then go to the next lesson. If you didn’t, just review the parts of the lesson you didn’t understand very well before going to Lesson 3.

**Let’s Remember**

- The most common plane figures include the following:
  1. trapezoid;
  2. parallelogram;
  3. rhombus;
  4. rectangle;
  5. square;
  6. triangle;
  7. pentagon;
  8. hexagon;
  9. octagon;
  10. circle; and
  11. oblong.
Space Figures

After studying this lesson, you should be able to:

- define what space figures are; and
- identify the different kinds of space figures.

Let's Think About This

Look at the following common household items. What space figures do they remind you of?

![Images of a basketball, ice cream cone, pitcher, and box]

First, let us identify what the items in the picture above are. In the picture can be seen a pitcher, a box, an ice cream cone and a basketball. The pitcher is an example of a cylinder. The box is an example of a cube. The ice cream cone is an example of a cone. Finally, the basketball is an example of a sphere.

Did you get all the answers right? Why don't you read on to find out more about space figures?
Let's Learn

**Space** or three-dimensional figures are ones that have depth in addition to width and height. Some common simple space figures include cubes, spheres, cylinders, prisms, cones and pyramids. Let us discuss each of them in more detail below.

1. **Cube**—This is a three-dimensional figure having six matching square sides. An example of this is a box.

   ![Cube Diagram]

2. **Cylinder**—This is a space figure having two congruent circular bases that are parallel. An example of this is a pitcher or a drinking glass.

   ![Cylinder Diagram]

3. **Sphere**—This is a space figure having all of its points the same distance from its center. An example of this is a basketball.

   ![Sphere Diagram]
4. **Cone**—This is a space figure having a circular base and a single vertex. An example of this is an ice cream cone.

![Cone Diagram]

5. **Pyramid**—This is a space figure with a square base and four triangular-shaped sides. Examples of this are the pyramids you can see in Egypt.

![Pyramid Diagram]

6. **Tetrahedron**—This is a four-sided space figure. Each of its faces is a triangle. An example of this is the Tetra Pak some commercial fruit juices like Zip use.

![Tetrahedron Diagram]
7. **Prism**—This is a space figure with two congruent parallel bases that are polygons. The most common kind of this figure is the triangular prism. An example of this is the box that Toblerone is kept in.

![Diagram of a triangular prism]

Let’s Try This

Think of other common things that are shaped like the space figures you just learned about. List five of them down in the spaces provided below indicating their corresponding shapes.

1. 
2. 
3. 
4. 
5. 

Have your Instructional Manager check your answers. Ask him/her to give you some feedback before going to the next part of the lesson.
Let's See What You Have Learned

Match the pictures in Column A with their names in Column B by drawing connecting lines.

Column A

Column B

Sphere

Tetrahedron

Cylinder

Triangular prism

Pyramid

Cube

Cone
Compare your answers with those in the Answer Key on pages 30 and 31. Did you get all the answers right? If you did, that's very good. You may then proceed to the next part of the module. If you didn't, don't worry. Just review the parts of the lesson you made mistakes in before going to the next part of the module.

Let's Remember

♦ The most common space figures include the following:

   1. cube;
   2. cylinder;
   3. sphere;
   4. cone;
   5. pyramid;
   6. tetrahedron; and
   7. prism.

Well, this is the end of the module! Congratulations for finishing it. Did you like it? Did you learn anything useful from it? A summary of its main points is given below to help you remember them better.

Let's Sum Up

This module tells us that:

♦ A line has no definite beginning and end.

♦ The two basic types of lines are straight and curved lines.

♦ There are three kinds of straight lines—parallel, intersecting and perpendicular lines.

♦ The term congruence refers to the state of agreeing or coinciding.
The four basic kinds of angles are acute, right, obtuse and straight angles.

The most common plane figures include the following:

1. trapezoid;
2. parallelogram;
3. rhombus;
4. rectangle;
5. square;
6. triangle;
7. pentagon;
8. hexagon;
9. octagon;
10. circle; and
11. oblong.

The most common space figures include the following:

1. cube;
2. cylinder;
3. sphere;
4. cone;
5. pyramid;
6. tetrahedron; and
7. prism.
What Have You Learned?

Complete the following crossword puzzle using the given clues.

Across

1. Lines that do not and will not ever intersect
3. A space figure having all of its points the same distance from its center
7. A quadrilateral having only two sides parallel
9. A three-dimensional figure having six matching square sides
10. A space figure with two congruent, parallel bases that are polygons

Down

2. An angle which measures less than 90°
4. Lines that form a 90°-angle when they intersect
5. A parallelogram with four equal sides and no right angles
6. A quadrilateral with opposite sides parallel and equal
8. Lines that cross each other at a certain point
11. A polygon having six sides
12. A rectangle with all four sides equal

13. A space figure having all of its points the same distance from its center

14. A space figure having two congruent circular bases that are parallel

15. An angle which measures exactly 90°

Compare your answers with those in the Answer Key on page 31. How well did you do?
Answer Key

A. Let’s See What You Already Know (pages 1–2)

A. 1. T  
   2. T  
   3. F  
   4. F  
   5. T  

B. 1. c  
   2. a  
   3. b  
   4. c  
   5. b  

B. Lesson 1

Let’s Review (page 6)

1. Pe  
2. Pa  
3. I  
4. Pe  
5. Pa  

Let’s Try This (page 9)

1. obtuse  
2. acute  
3. right  
4. straight  
5. right
Let's See What You Have Learned (page 10)

1. j
2. d
3. a
4. g
5. e
6. b
7. h
8. f
9. c
10. i

C. Lesson 2

Let's Think About This (pages 12–13)

1. trapezoid
2. pentagon
3. square
4. triangle
5. rectangle
6. circle
7. oblong
8. hexagon
9. rhombus
10. octagon
Let's See What You Have Learned (pages 17–18)

1. g
2. d
3. a
4. h
5. e
6. b
7. i
8. f
9. c
10. j

D. Lesson 3

Let's See What You Have Learned (pages 23–24)

Cube

Cylinder

Sphere

Cone
E. What Have You Learned? (pages 26–27)
References


### Conversion Tables

#### English to Metric

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### Lupang Hinirang

Bayang nagwil
Perlas ng Silanganan,
Alab ng puso,
Sa dibdib mo’y buhay.

Lupang Hinirang,
Duyan ka ng magiting,
Sa manlulupig,
Di ka pasisiil.

Sa dagat at bundok,
Sa simoy at sa langit mong bughaw,
May dilag ang tula
At awit sa paglayang minamahal.
Ang kislap ng watawat mo’y
Tagumpay na magniningning,
Ang bituin at araw niya
Kailan pa ma’y di magdidilim.
Lupa ng araw, ng luwalhat’i pagsinta,
Buhay ay langit sa piling mo;
Aming ligaya, na pag may mang-aapi
Ang mamatay nang dahil sa iyo.

### The Philippine National Flag

#### Symbolism

- **White**: purity
- **Blue**: peace, truth and justice
- **Red**: patriotism and courage
- **Equilateral triangle**: equality
- **Eight rays of the sun**: first eight provinces to revolt against Spain (Manila, Laguna, Pampanga, Cavite, Bulacan, Nueva Ecija, Batangas & Tarlac)
- **Three stars**: three major island groups (Luzon, Visayas and Mindanao)
The Bureau of Nonformal Education, Philippines was awarded
the Year 2000 UNESCO International NOMA Literacy Prize for its
Nonformal Education Accreditation and Equivalency
(NFE A&E) System.

"The international recognition of the significance and efforts of the
Bureau in making education accessible to sectors of society is indeed an
honor not only to the Department of Education, Culture and Sports
but also to the entire Filipino nation."

Secretary-General
UNESCO National Commission of the Philippines