Geometry*

Siyavula Uploaders

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1 MATHEMATICS

2 Grade 5

3 GEOMETRY, DATA HANDLING AND PROBABILITY

4 Module 55

5 GEOMETRY

Geometry

5.1 Activity 1:

- To describe, sort and compare 2-D shapes [LO 3.2.2]
- To examine and compare 2-D shapes LO 3.3.3]

1. Let us revise the work that you did in Grade 4. At the same time you can see how good your memory is! For the following activity you will have to use your father's hammer and nails. Just keep your thumb out of the way!

5.1.1 You require:

- Wooden planks - 30 cm × 30 cm
- Nails
- Elastic bands

Place the nails about 1,5 cm apart.
DO YOU STILL REMEMBER?
A **quadrilateral** is any figure with 4 sides and 4 angles.
A **square** has four sides of equal length and four 90° angles.
The opposite sides of a **rectangle** are of equal length and all four angles are 90°.
A **triangle** is any figure with 3 angles and 3 sides.
1.1 Form the following figures with rubber bands on the nail board.
1.2 Draw two of each figure on the dotted sheet (p. 5).
Quadrilateral

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Square
Rectangle
Triangle
1.3 Have a class discussion: Make a list of all the similarities between your figures on the peg-board.
1.4 Now draw and examine the figures on your dotted page (page 4) and, as a class, see how much dissimilarity you can find among them.

5.2 Activity 2:

- To describe, sort and compare 2-D shapes from drawings and pictures [LO 3.2.2]
- To recognise and describe natural and cultural 2-D shapes [LO 3.6]

1. Page through old newspapers and magazines and cut out examples of quadrangles, squares, rectangles and triangles. Paste them into the appropriate boxes below. Get a friend to check whether you have done it correctly. (Hint: See whether the qualities of the figure match those of the example that your friend pasted in.)

5.3 Activity 3:

5.4 To visualise and name 2-D shapes [LO 3.1.2]

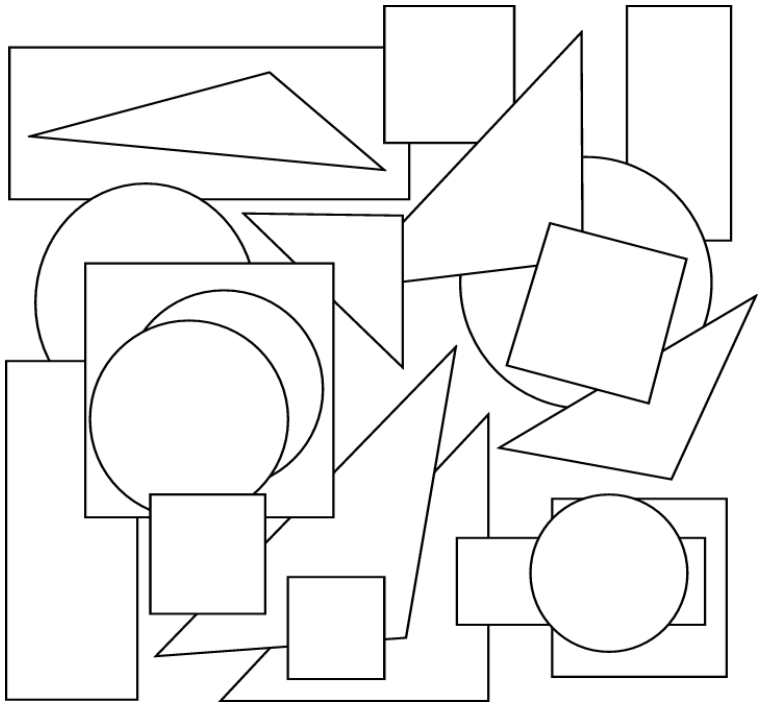

Figure 1

Now let us see how good you are at observing shapes. Below you will see squares, triangles and circles that have been laid out to overlap here and there. Examine them carefully and then complete the instructions that follow.

1. Colour the parts of all the triangles you can see in purpleHow many triangles are there?
2. Colour all the circles in pink. How many circles are there?
3. Colour all the squares in red. How many squares are there?
4. Colour all the rectangles in green. How many rectangles are there?

5.5 Activity 4:

5.6 To compare 2-D shapes with reference to certain qualities [LO 3.2.2]

Although it sounds very simple, it is still extremely important for you to know how many sides and angles a figure has, because it can help us to classify polygons without much trouble. Use the drawings below and then complete the table that follows.

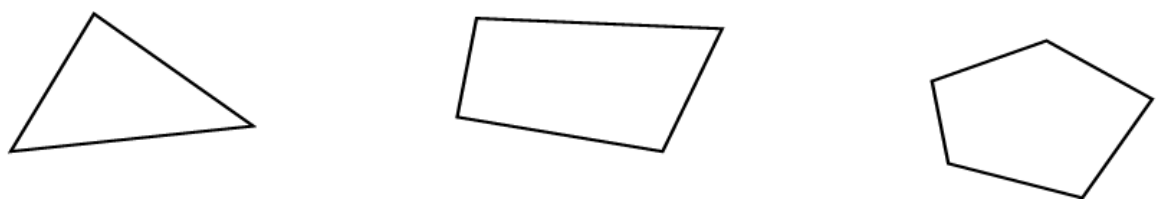

Figure 2

A triangle, quadrilateral and a pentagon

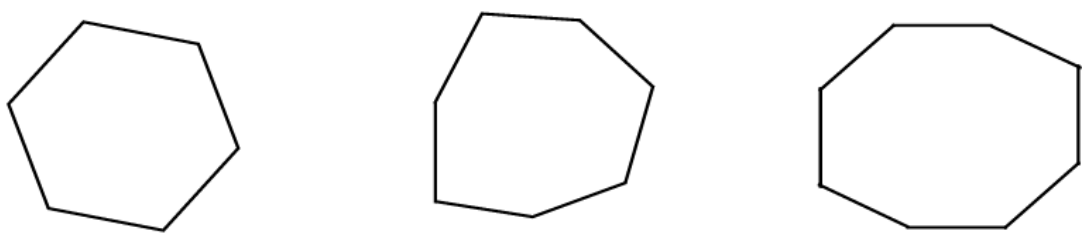

Figure 3

A hexagon, heptagon and an octagon

Number of sides in the polygon	3	4	5	.....	.....	8	12	100	220
Number of triangles in the polygon	1	.....	.....	4	5	.....	.....	.....	.....

Table 1

5.7 Activity 5:

5.8 To draw and describe 2-D shapes in terms of symmetry [LO 3.3.1]

This activity is an assignment for your portfolio. Read the instructions as well as the assessment criteria carefully before you start. Ask your teacher to explain where necessary.

First of all, test your memory. Explain the meaning of "symmetrical" to your friend.

1. Use magazines to find pictures of shapes / figures that are symmetrical.

- Paste them on to the sheet of paper given to you by your teacher.
- Indicate the axis of symmetry with a coloured chalk. (Use your ruler!)

2. Do the following:

- Neatly copy the shapes that you used for the table in Activity 1.7 onto a sheet of paper. (Ask your teacher for some paper.) You can draw them as large as you like.
- Indicate the axes of symmetry neatly.

5.9 Activity 6:

5.10 To examine and compare 3D objects [LO 3.3.1]

5.11 To recognise 3D objects [LO 3.1.1]

So far we have worked with 2-dimensional shapes. Let's now take a good look at 3-dimensional figures.

1. Have a class discussion. What is the difference between 2-dimensional and 3-dimensional figures?

2. How would you like to be an architect and a builder? Now you and your friend have the opportunity to build the school of your dreams! You need the following:

- a large sheet of cardboard
- glue and a pair of scissors
- matchboxes, etc. (Use your own, clever ideas!)

This school must have classrooms and there must be a round swimming pool. Naturally you will also want a computer centre and a school hall. The changing rooms and the rugby field must be close together.

First study the following useful information before you start:

The following information might be useful:

A structure like a matchbox is called a **RECTANGULAR PRISM**, because the faces are all rectangles.

A **CUBE** is a special type of rectangular prism, because the FACES of a cube are all squares.

3. After your model has been completed, you must complete the table below. Look at the figures you have made. If, for instance, the hall is a rectangular prism, it must be written in the applicable column.

Rectangular prisms	Cubes	Other 3D shapes	2D shapes
e.g. *Hall*	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Table 2

5.11.1

5.12 Activity 7:

5.13 To make patterns from geometric shapes and to describe them in terms of tessellations [LO 3.5.1]

5.13.1 TESSELLATIONS

Think about how tiles are laid on a wall or the floor of a bathroom. The tiles fit exactly against one another. The spaces you can see are only there for the cement or glue so that the tiles can stick properly and will not fall off.

The tiles usually look like this when they are laid:

We say the tiles TESSELLATE because they fit into one another EXACTLY without spaces between them.

1. This afternoon when you are at home, look at the tiles in your bathroom, kitchen or any other room. You could also look at the floor or wall tiles in any shop in your area. Make a drawing of what they look like in the box below:

2. Now look at the drawing of the tiles above. Can you see that the inside tiles are **rectangles** and the outside tiles are **triangles**?

Now make your own patterns by combining

- triangles
- quadrilaterals
- pentagons
- any creative shape

6 Assessment

LU 3
Space and Shape (Geometry)The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.
We know this when the learner:
3.1 recognises, visualises and names two-dimensional shapes and three-dimensional objects in natural and cultural forms and geometric settings including those previously dealt with and focusing on:3.1.1 similarities and differences between cubes and rectangular prisms; • similarities and differences between squares and rectangles;
3.2 describes, sorts and compares two-dimensional shapes and three-dimensional objects from the environment and from drawings or pictures according to properties including: • number and/or shape of faces • number and/or length of sides;
3.3 investigates and compares (alone and/or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by: • making models of geometric objects using polygons they have cut out; • drawing shapes on grid paper;
3.5 makes two-dimensional shapes, three-dimensional objects and patterns from geometric shapes and describes these in terms of: • tessellations;
3.6 recognises and describes natural and cultural two-dimensional shapes, three-dimensional objects and patterns in terms of geometric properties.

Table 3

7

8 Memorandum

ACTIVITY 3

1. 6
2. 5
3. 6
4. 4

ACTIVITY 4

6 ; 7

3 ; 6 ; 10 ; 98 ; 218