

1. Geometry/Measurement

Grade 7

Angles, Lines & Line Segments

G/M-1 a,b,c, G/M-6, G/M-7, G/M-13

Materials: ruler
protractor
sharp pencil
sheet of paper

1. Use the tools to draw a trapezoid that has one right angle.

- Label the trapezoid PQRS
- Label the lines that are parallel using “>”
- Identify the right angles using \square .
- Draw the diagonals.

2. Write a paragraph about your drawing using the following ideas:

- Identify the parallel lines and explain why they are parallel.
- Identify the perpendicular lines and explain why they are perpendicular.
- Identify the diagonals and define the word diagonal.
- In this case the diagonals cut the figure into two shapes.
What are the shapes?
Do diagonals from any one vertex always cut polygons into these two shapes?
Use diagrams to explain your answer.
What determines the maximum number of diagonals from any one vertex in a polygon?

3. Use the tools to draw two different polygons, each with at least one acute angle, one right angle and one obtuse angle.

- On your diagrams, label the degrees of each angle.
- Write a few sentences to explain each of the following terms:
acute angle obtuse angle right angle

4. Draw an angle of 180° .

- Describe your angle.
- Are all straight lines angles? Explain.
- Are all angles straight lines? Explain.

When you have completed this station,
place your answer sheet in your portfolio.

Label your portfolio entry.

Please tidy up the station.

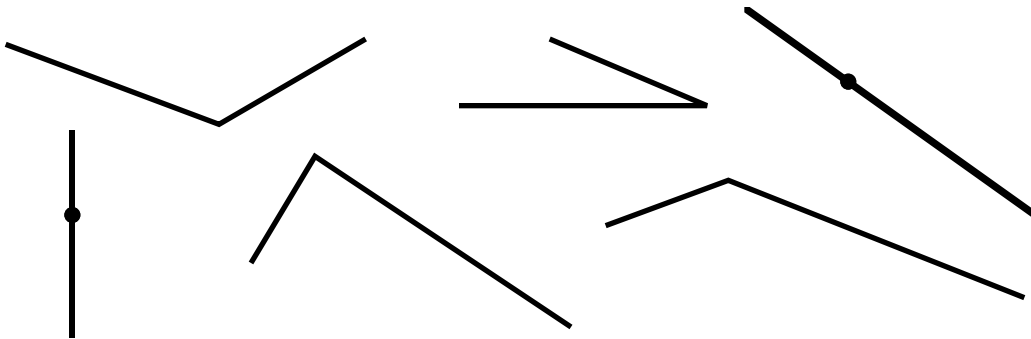
2. Geometry/Measurement

Grade 7

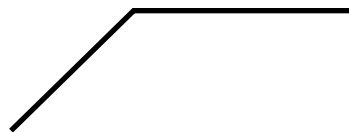
Angles, Lines & Line Segments
G/M-1d, G/M-6

Materials: ruler
protractor
sharp pencil
sheet of paper with 3 by 3 square dot paper
activity sheet "classification of angles"

- Use the 3 by 3 square dot paper to draw as many angles as you can. Each vertex must be on a dot and the end of each ray is also on a dot.
 - Cut each angle and paste each one in the correct column on the activity sheet labelled "classification of angles". At the bottom of each column, list the common attributes for that particular group of angles.
- Measure the following angles using your protractor.



- Explain how you know that this angle is 135° and not 45° when you use your protractor with a dual scale.



When you have completed this station,
place your answer sheet and your activity sheet in your portfolio.
Label your portfolio entry.

Please tidy up the station.

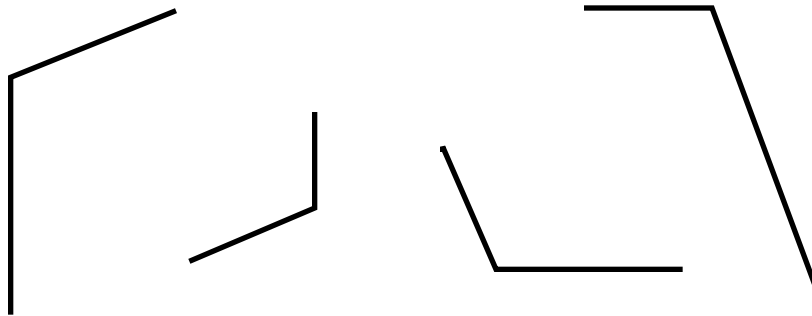
3. Geometry/Measurement

Grade 7

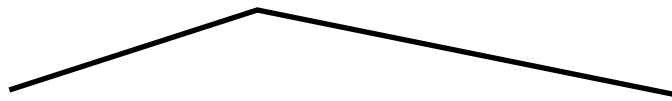
Angles, Lines & Line Segments
G/M-1d, G/M-2, G/M-6, G/M-7

Materials: ruler
protractor
sharp pencil
paper

1. a) Draw the following angles on a sheet of paper.



- b) Do the lengths of the rays (the arms) affect the size on the angle?
- c) Does the position of an angle affect its measure?
2. a. Draw the following angle.
b. What is its measure?
b. What do we call these angles?



3. Tell how you would use a protractor to draw an angle of 200° and an angle of 330° ?

When you have completed this station,
place your answer sheet and your activity sheet in your portfolio.
Label your portfolio entry.

Please tidy up the station.

4. Geometry/Measurement

Polygons Grade 7
G/M - 1a

Materials: activity sheet
 tangrams

1. a) **Use the tangram pieces to form parallelograms and trapezoids. Look at the chart on the activity sheet and record (draw) how you can use that number of pieces to create those two shapes. Are they all possible with the number of shapes that is suggested?**

- b) **Write a paragraph to compare parallelograms and trapezoids. How are they alike? How do they differ?**

When you have completed this station,
place your activity sheet in your portfolio.
Label your portfolio entry.

Put the tangrams back in their container.

Please tidy up the station.

5. Geometry/Measurement

Polygons Grade 7
G/M - 13c

Materials: toothpicks
 paper

- 1. a) Use the toothpicks to construct two different triangles of each of the following:**

equilateral triangle

isosceles triangle

scalene triangle

- b) Carefully sketch your constructions to record your work. Write about the characteristics of each kind of triangle.**
- c) Explain why you can't make a triangle using 4 toothpicks.**

When you have completed this station,
file your activity sheet in your portfolio.
Label your portfolio entry.

Put the toothpicks back in their container.

Please tidy up the station.

6. Geometry/Measurement

Polygons Grade 7 G/M-16, G/M-17

Materials: pattern blocks
paper
protractor

1. Look carefully at the beige rhombus. Can you use 4 other rhombuses to create a rhombus similar to the single rhombus?
2. Now construct another rhombus that is similar to the two you have, using three pieces to a side.
3. How do the sides compare in each case?
What is the effect on the perimeter in each case?
4. How do the number of pieces compare in each case?
What is the effect on the area in each case?
5. How do the sizes of the corresponding angles compare in each case? What is the effect on the angle measure in each case?
6. Write a few sentences to tell what these three shapes have in common. How do they differ?
7. Are they congruent? Explain why or why not.
8. Repeat steps 1 to 7 above using the triangles.
9. Repeat steps 1 to 7 above using the squares. .
10. Are all congruent shapes similar? Explain.
Are all similar shapes congruent? Explain.
11. Can you make similar polygons using trapezoids or hexagons?
Record your results.

When you have completed this station,
file your activity sheet in your portfolio.
Label your portfolio entry.

Put the pattern blocks back in their container.

Please tidy up the station.

7. Geometry/Measurement

Polygons Grade 7
G/M-16b, G/M-17,G/M-18
G/M-20, G/M-69

Materials: activity sheet
paper
grid paper
pattern blocks

1. a) **Look at the polygon on the activity sheet. Draw a similar polygon that has a scale factor of 1:2.**
 - b) **Compare the shapes:**
 - i) **lengths of sides**
 - ii) **perimeter**
 - iii) **area**
 - iv) **measures of corresponding angles**

2. a) **Now draw the polygon so that it is 3 times larger than the polygon given at the beginning of the activity.**
 - b) **What is the scale factor?**
 - c) **Compare this larger polygon to the first polygon**
 - i) **lengths of sides**
 - ii) **perimeter**
 - iii) **area**
 - iv) **measures of corresponding angles**

3. **Have you discovered a pattern? How would enlarging a polygon with a scale factor of 1:4 affect the following:**
 - a) **lengths of sides**
 - b) **perimeter**
 - c) **area**
 - d) **measures of corresponding angles**

(You may use grid paper or pattern blocks if you wish)

When you have completed this station,
your activity sheet in your portfolio.
Label your portfolio entry.

Please tidy up the station.

8. Geometry/Measurement

Polygons Gr. 7
G/M-16, G/M-22

Materials: pattern blocks: squares and triangles

1. Use the blocks to construct squares of different sizes.
 - a) What is the smallest square that you can construct?
 - b) What is the next smallest square that you can construct?
 - c) Compare the lengths of the sides.
 - d) Is it possible to construct (using the pattern blocks) a square that is not similar to the single square ?
 - e) Are the following statements true or false? Give reasons for your answers.

<p>All squares are similar. All squares are congruent.</p>
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2. Use the blocks to construct triangles of different sizes.
 - a) What is the smallest triangle that you can construct?
 - b) What is the next smallest triangle that you can construct?
 - c) Compare the lengths of the sides.
 - d) Is it possible to construct a triangle that is not similar to the single triangle from the pattern blocks?
 - e) Are the following statements true or false? Give reasons for your answers.

<p>All triangles are similar. All triangles are congruent.</p>
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When you have completed this station,
place answer sheet in your portfolio
Label your portfolio entry.

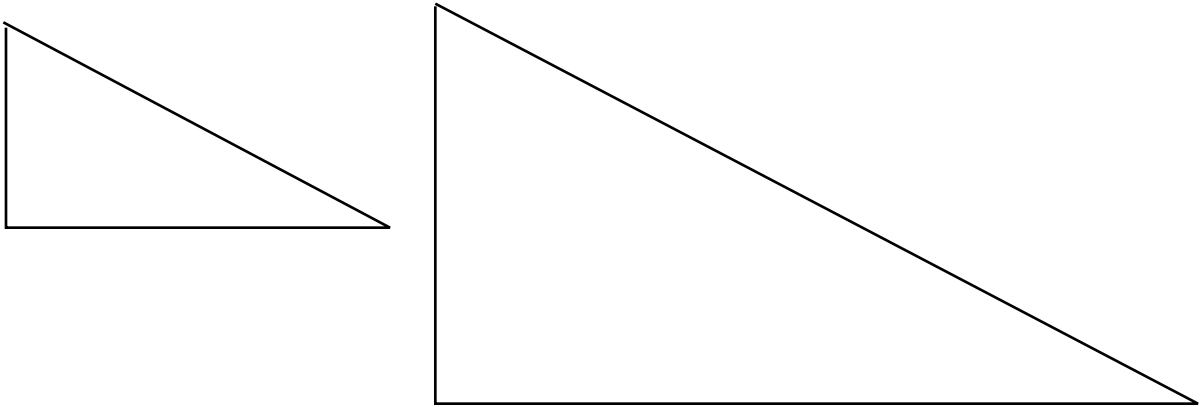
Please tidy up the station.

9. Geometry/Measurement

Polygons Gr. 7
G/M-16, G/M-17

Materials: grid paper
geoboard

1. How could you determine if these two triangles are similar?



2. How do you know that they are not congruent?
3. What can you say about the measure of the corresponding angles in two similar triangles?
4. Use the grid paper and draw a pair of parallelograms and a pair of similar trapezoid.
 - a) Determine the relationship between their sides.
 - b) Determine the measure of their corresponding angles.
5. What is true about all similar polygons whatever the number of sides?

When you have completed this station,
place answer sheet in your portfolio

Label your portfolio entry.

Please tidy up the station.

10. Geometry/Measurement

Polygons Grade 7
G/M-16b, G/M-17, G/M-20

Materials: polygon and picture cards
ruler
transparent grid paper
grid paper
Lake and Island Board
Atlas
Saskatchewan Map

- 1. Look at the similar polygons on each card and using the ruler or the transparent grid paper, calculate the scale factor in each case.**
- 2. Look in the atlas and find three different scales and explain each one.**
- 3. Look at the road map of Saskatchewan and find the scale factor. Use a ruler to measure the distance between the following towns and cities and calculate “the distance as the crow flies”.**
 - a. Prince Albert and Regina**
 - b. Saskatoon and Swift Current**
 - c. North Battleford and Lloydminster**
 - d. Choose two locations and give the distance that you measured and the actual distance using the scale factor.**
- 4. Look at the Lake and Island Board and determine an appropriate scale factor so that the Islands could be represented on the small sheet of grid paper available at this station.**
- 5. Name five real life situations when scale factors are used.**

When you have completed this station,
file your activity sheet and grid paper in your portfolio.
Label your portfolio entry.

Please tidy up the station.

11. Geometry/Measurement

Polygons Grade 7 G/M-6, G/M-35

Materials: paper
shapes
protractors
cardboard polygons

1. a) Look at the polygons provided with this station.
Use your protractor to measure the angles in each polygon and record these on a sheet of paper.

triangle = ____ °

square = ____ °

rectangle = ____ °

pentagon = ____ °

hexagon = ____ °

octagon = ____ °

decagon = ____ °

2. a. Trace and tessellate each shape around a point.
b. Identify the shapes that tessellate and those that don't.
c. Explain why some shapes tessellate around a point and some do not.
3. Write using the scientific method an experiment to solve the following problem.

Problem: Do all irregular shapes tessellate?

Materials:

Hypothesis:

Observation:

Conclusion:

When you have completed this station,
place your activity sheet and grid paper in your portfolio.
Label your portfolio entry.

Please tidy up the station.

12. Geometry/Measurement

Polygons Grade 7
G/M-28, G/M-33, G/M-35

Materials: transformation cards
activity sheets
pattern blocks
pencil and crayons

- 1. a) Look carefully at the transformation cards. Classify the transformation cards into three piles:**

reflection (flip) rotation (turn) translation (slide)

- b) List the numbers on the cards for each pile and write why you chose these cards to represent the transformation.**

- 2. a) Find the three activity sheets. Each sheet has been labelled with one of the following terms:**

reflection (flip) rotation (turn) translation (slide)

- b) Use the pattern blocks to create the transformation labelled at the top of the card.**

- c) Record by tracing the blocks you used to accomplish the transformation.**

- 3. List three examples of translation, reflection or rotation in the real world.**

When you have completed this station,
your activity sheet and grid paper in your portfolio.
Label your portfolio entry.

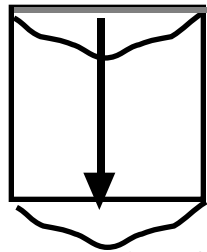
Please tidy up the station.

13. Geometry/Measurement

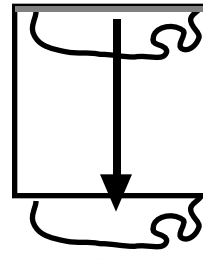
Polygons Grade 7 G/M-35

Materials: square piece of cardboard or manila tag
scissors
paper
clear tape
crayons

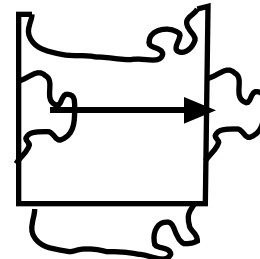
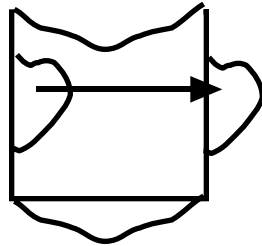
1. a) Take the 8 cm by 8 cm square of cardboard and draw a shape on one side. Cut the shape and slide it across and tape in position without overlapping.
eg.



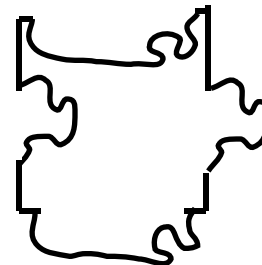
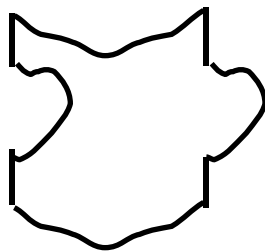
or



- b) Cut another piece from one side and translate it to the other side.



- c) You are left with some weird looking shapes that you can use to cover a surface like a sheet of paper to create a tessellation.



- d) Be creative! Try to recognize a familiar shape, add details and color several different colors to create effect.

When you have completed this station,
place your activity, cut shape and tessellation in your portfolio.
Label your portfolio entry.

Please tidy up the station.

14. Geometry/Measurement

Polygons **Grade 7**
G/M-29, G/M 31

Materials: Master: Shapes
 scissors
 Mira

1. Cut out the shapes found on the master page.
2. Use the Mira or the folding method to determine the number of lines of symmetry each shape has.
3. Make a chart as follows and record your findings.

SHAPE	NUMBER OF LINES OF SYMMETRY
right triangle	
right isosceles triangle	
equiangular triangle	
equilateral triangle	
isosceles triangle	
scalene triangle	
square	
rectangle	
pentagon	
hexagon	
octagon	
decagon	
circle	

4. Using the Mira create a symmetrical pattern that is relative to a straight line. Label your drawing.
5. Use pattern blocks to create a pattern that is symmetrical to a point. Trace your pattern and color the shapes.

When you have completed this station,
file your chart and your pterns in your portfolio.
Label your portfolio entry.

Please tidy up the station.

15. Geometry/Measurement

Space Grade 7
G/M-37, G/M-38

Materials: 3-dimensional objects
activity sheet
calculator

1. a) **Look at the 3-dimensional objects and list them in the chart on the activity sheet. Count the number of faces, vertices and edges.**

- b) **A great mathematician named Euler stated that for any polyhedron, the number of faces + the number of vertices - the number of edges is always equal to 2. ($V - E + F = 2$)**

Use the last column on the activity sheet to check to see if this is true for the polyhedrons you have listed in the chart.

Define polyhedron and write what you have discovered about the relationship between their vertices, their edges, and their faces.

When you have completed this station,
file your chart and your writing in your portfolio.
Label your portfolio entry.

Please tidy up the station.

16. Geometry/Measurement

Length **Grade 7**
G/M-44a,b,c, G/M-50

Materials: ruler
 Lake and Island Board
 calculator
 transparent grid
 cubes

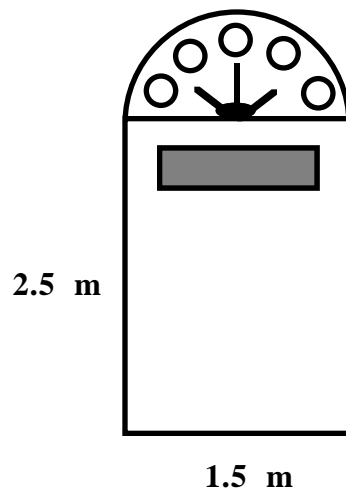
1. a) Use a ruler, the transparent grid or cubes to measure the dimensions of the islands in the lake.

b) Give the perimeter of each island.

c) Give the area of each island.

d) What scale could we use to have these boards represent real islands?

2. Write a letter to a friend to explain what perimeter means and how to calculate the perimeter of this elevator door and its semicircular window:



When you have completed this station,
file your chart and your writing in your portfolio.
Label your portfolio entry.

Please tidy up the station.

17. Geometry/Measurement

Length **Grade 7**
G/M-48a,b, G/M-56a,b G/M-64b

Materials: blue cardboard
 paper
 looseleaf
 scissors
 ruler
 glue

1. Create a lake and island board by using the following directions:

- a) Use the blue cardboard to make the lake a square of 30 cm per side.
- b) Cut and glue
 - i) a rectangular island (A) with a perimeter of 30 cm.
 - ii) a triangular island (B) with an area of 36 cm².
 - iii) an irregular shape (C) with an area of 34 cm².
 - iv) a circular shape (D) (with a circumference of about 40 cm.

2. Label each island using letters.

3. On a piece of looseleaf describe how you decided on the dimensions of each island.

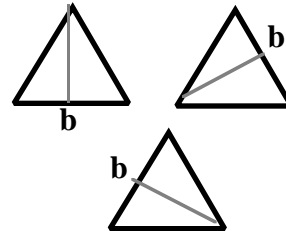
When you have completed this station,
file your Lake and Island Board in your portfolio.
Label your portfolio entry.

Please tidy up the station.

18. Geometry/Measurement

Length Grade 7
G/M-49

Materials: triangular shapes
ruler
calculator
protractor



- Use the ruler to measure each height and its corresponding base for each triangle.
- Make a chart as follows on a piece of paper to record your findings.

		base	height	perimeter	area
Triangle 1	1st				
	2nd				
	3rd				
Triangle 2	1st				
	2nd				
etc.					

- Discuss what you have discovered about each triangle.
 - For which kind of triangle are all three heights and all the three bases the same? Explain.
 - For which kind of triangle are two of the bases the same and two of heights the same? Explain.
 - For which kind of triangle are none of the bases the same nor none of heights the same? Explain.
 - Discuss what happens to the area and perimeter in each case. Why?
- Predict what would happen with an obtuse triangle. Check this out by constructing an obtuse triangle and measuring the different heights and bases.

When you have completed this station,
file your answer sheet in your portfolio.
Label your portfolio entry.
Please tidy up the station.

19. Geometry/Measurement

Area Grade 7
G/M-64a,b

Materials: grid paper
ruler
geoboard
dot paper
pattern blocks
paper
glue

1. Use the geoboard or pattern blocks to explain the following formulas. Then use the dot or grid paper to record your work. You can also draw the polygons and cut them out to explain the formulas.

Write the meaning of each formula in your own words. Refer to your work with the geoboard or with the pattern blocks.

- a) The area of a square as s^2 .
- b) The area of a rectangle as $l \times w$.
 - Can we use this formula to calculate the area of a square?
 - What do the formulas (s^2) and ($l \times w$) have in common?
 - How do they differ?
- c) How can we use the area of a rectangle to explain the area of a triangle as $\frac{1}{2}(bxh)$.
- d) Explain using the manipulatives and the paper how we can use the area of a triangle to calculate:
 - the area of a rhombus
 - the area of a parallelogram.

When you have completed this station,
file your answer sheet and your paper cut outs in your portfolio.
Label your portfolio entry.

Please tidy up the station.

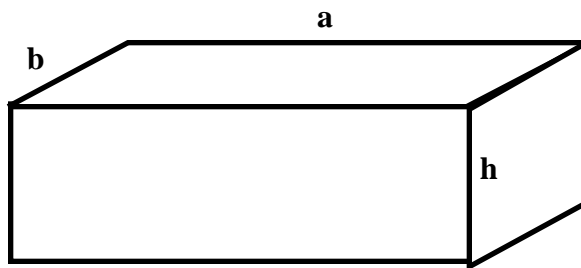
20. Geometry/Measurement

Area Grade 7
G/M-66

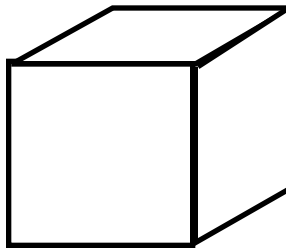
Materials: several boxes of different sizes
ruler
calculator

- Measure the necessary dimensions and calculate the surface area of each of the boxes provided.
 - Record your answers on a sheet of paper.
- Suppose you have been hired by a textbook company to write the instructions for finding surface area of a rectangular prism.

Copy or trace the following prism on a piece of paper and list the steps for finding its surface area.



- How would the directions for a cube differ from the instructions you wrote for number “2”?



When you have completed this station,
file your answer sheet in your portfolio.
Label your portfolio entry.

Please tidy up the station.

21. Geometry/Measurement

Volume Grade 7

**G/M-73a, G/M-74a,
PS-1, PS-2, PS-6**

Materials: cm cubes
ruler
paper 20 cm x 25 cm
calculator
scissors
tape

- 1. Follow the directions below to make a box that will hold the maximum number of cubes.**
 - a) Write the problem in your own words.**
 - b) List your strategies and make a plan.**
 - c) Carry out your plan.**
 - d) Reflect. Did it work? Do you need to go back to b)?**
 - e) Write the maximum number of the cubes that can possibly be held by a box formed using a 20 cm x 25 cm piece of paper and explain your reasoning. Use drawings to show what you did.**

When you have completed this station,
file your writing and your drawings in your portfolio.
Label your portfolio entry.

Please tidy up the station.

22. Geometry/Measurement

Volume Grade 7

G/M-73, G/M-74a,
G/M-75, N-30

Materials: cm cubes or 2 cm cubes
paper
ruler

1. How many different rectangular prisms can you build using 24 cubes?
 - a) Build the cubes and draw them on a piece of paper,
 - b) Write the dimensions of each prism and calculate the volume?
 - c) Now calculate the surface area for each one.
 - d) Write about the relationship between length, width, height, surface area and volume of rectangular prisms.
 - e) Why is the volume always the same? Relate this to factors in your answer.

2. Find the volume of the prisms provided at this station. In each case write how you determined the dimensions.

3. Suppose that you know that a rectangular prism has a base with an area of 40 cm^2 . The prism has a volume of 240 cm^3 . What is its height? Explain how you calculated the answer.

4. A cube has a volume of 64 cm^3 . What are its dimensions? Explain your answer.

When you have completed this station,
file your writing and your drawings in your portfolio.
Label your portfolio entry.

Please tidy up the station.