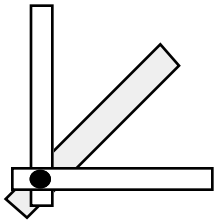
1. Geometry/Measurement Grade 8

Angles, Lines & Line Segments
G/M-1d, G/M-1e G/M-9

Materials: ruler
protractor
cardboard strips (two colors)
brass tack fastener
geometry set



1. You need three cardboard strips.
Place them so that they overlap at one end.
Attach with the fastener.

2. Use your construction of cardboard strips and your geometry set to draw adjacent angles in which:

a) both angles are equal
b) both angles are obtuse
c) both angles are acute
d) one angle is acute and the other is obtuse
e) the angles are complementary
f) the angles are supplementary
.

3. Is it possible to draw the following angles? If yes, draw them. If no, explain why it is not possible.

a) Two adjacent obtuse angles that are complementary.

b) Two adjacent angles, one acute and one obtuse that are supplementary.

c) Two reflex angles that are adjacent.

d) Two adjacent acute angles that are supplementary.

e) Two adjacent congruent angles that are supplementary.

f) Two adjacent congruent angles that are complementary.

g) Three adjacent angles, one reflex angle, one acute angle and one obtuse angle.

When you have completed this station, place answer sheet in your portfolio and put you construction in a safe place to be used later .
Label your portfolio entry.

Please tidy up the station.

2. Geometry/Measurement Grade 8

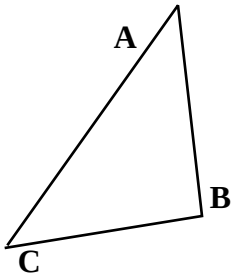
Angles, Lines & Line Segments
G/M-1, G/M 7, B/M-8

Materials: ruler
circular protractor

1. Pretend that your friend is telling you how to use a protractor to draw an angle of 150˚.

Write down what he or she is telling you to do and draw the angle beside your writing.

2. Use your ruler and protractor to draw an angle congruent to angle B in this triangle.



3. a) Write what you know about vertically opposite angles.

b) Draw a set of vertically opposite angles and give the measure of each angle.

4. Can you draw vertically opposite angles in which all four angles are congruent? Use drawings to help you explain your thinking.

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

Please tidy up the station.

3. Geometry/Measurement — Polygons Gr. 8

G/M-9

Materials: geometry set
colored paper (20 cm x 20 cm)
white paper (looseleaf or 8 1/2 x 11 unlined)
glue stick

READ THE INSTRUCTIONS 1 TO 3 BEFORE STARTING.

1. Use the tools in the geometry set to construct to make a scalene triangle, an isosceles triangle and an equilateral triangle.

2. Try to make the triangles as large as possible on the paper provided.

3. Each triangle should be a different color.

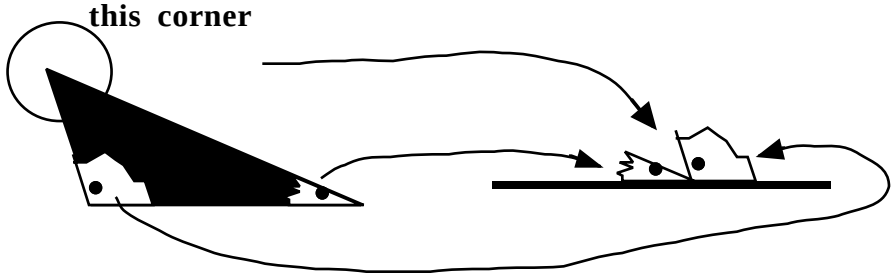
YOU WILL NEED LOOSELEAF OR UNLINED PAPER TO DO THE NEXT STAGE.

4. Take your scalene triangle and make a dot in each corner.

5. Now rip off the three corners.

6. Glue the remaining part of your triangle at the top of the white paper.

7. Draw a line on your white paper. Glue the three corners so that the dots are all at the centre:

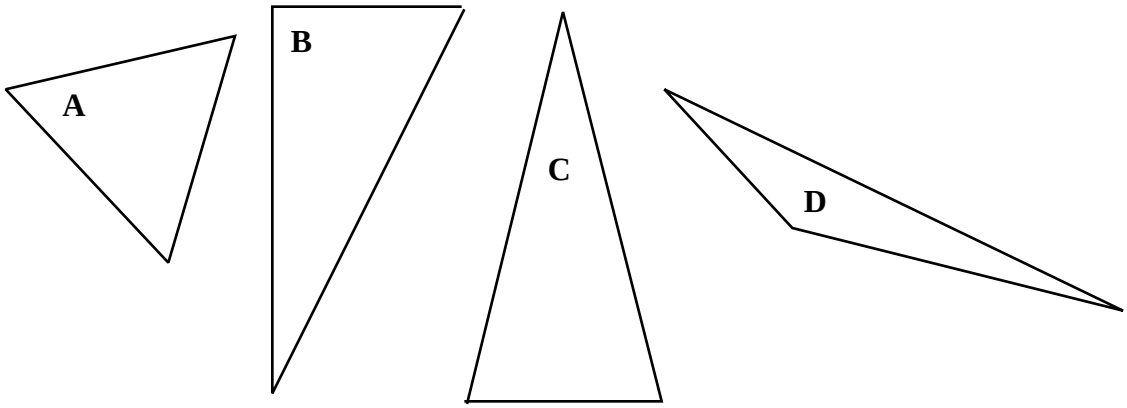


Please turn this card over.

8. Repeat the same procedure for the other two triangles.

9. What conclusion can you make based on what you have just done?

10. Use a protractor to measure the degrees in each triangle below and record on your paper.



11. Find the sum of the three angles for each triangle. Explain why your calculations may not be exactly 180˚.

12. How do you know that the angles of all equiangular (equilateral) triangle are each 60˚?

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

Label your portfolio entry.

Please tidy up the station.

4. Geometry/Measurement

Polygons Gr. 8

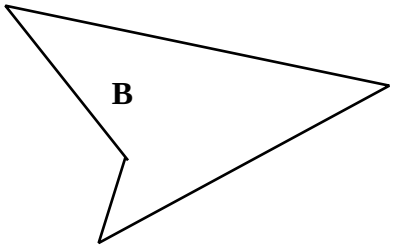
G/M-3, G/M-9,

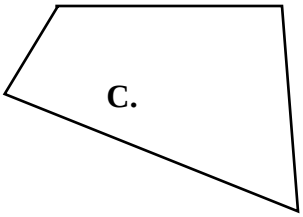
G/M-13, G/M-10
G/M-15

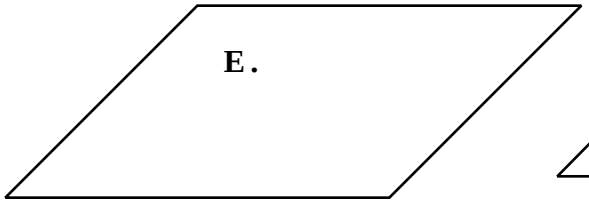
Materials: geometry set

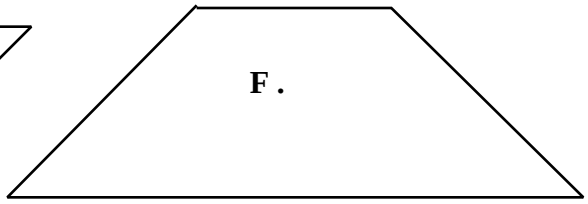
1. Name the quadrilaterals below:

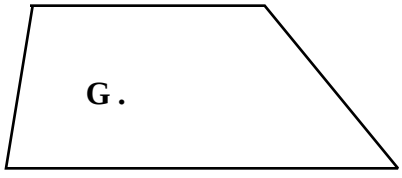
A.

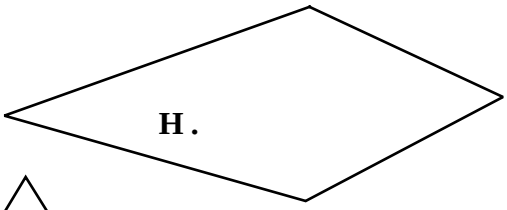


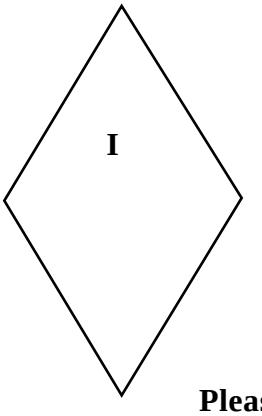












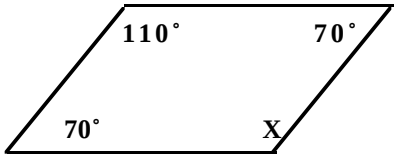
Please turn the card over . . .

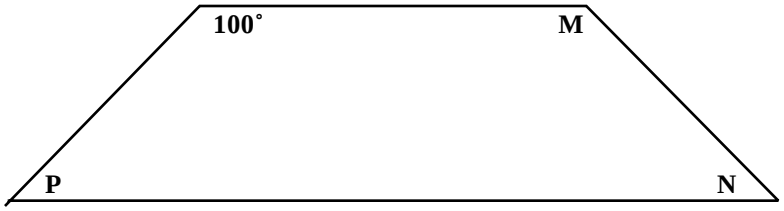
2 . **Use the geometric tools to draw your own quadrilaterals that you named in number 1.**

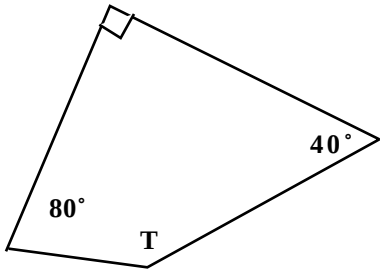
3 . **Draw one diagonal in each quadrilateral. A diagonal divides all quadrilaterals in exactly two triangles.**

4. **What conclusion can you make about the sum of the internal angles of any quadrilateral?**

5 . **Calculate the measure of the missing angle(s) in each case:**







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

Please tidy up the station.

5. Geometry/Measurement — Polygons Gr. 8

G/M-13c & d

Materials: two envelops with triangles
"congruent sides"
"largest angle"

1. a) Classify the triangles in the envelope "congruent sides" according to the number of congruent sides.

b) Record by listing the letters on the triangles.

c) Give your reason for each classification.

d) Tell how the terms equilateral, isosceles and scalene apply to your classification.

2. a) Classify the triangles in the envelope "largest angle" according to the size of the largest angle.

b) Record by listing the letters on the triangles.

c) Give your reason for each classification.

d) Tell how the terms equiangular, acute, obtuse and right apply to your classification.

3. Copy the chart below and draw triangles where possible to satisfy both conditions:

	right	acute	obtuse	equiangular
equilateral				
isosceles				
scalene				

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

Please tidy up the station.

6. Geometry/Measurement

Polygons Gr. 8

G/M-14, G/M-16b

G/M-20, G/M-22
G/M-22, G/M-44
G/M- 65

Materials: pentominoes
grid paper

1. a) Choose one of the pentomino shapes.

b) Using four pieces make a similar shape whose dimensions are twice as big as the original piece.

c) Draw to record.

d) When the shape is doubled, what happens to the area?

e) When the shape is doubled, what happens to the perimeter?

2. a) Pick another pentomino piece.

b) Using nine pieces make a similar shape whose dimensions are twice as big as the original piece. DO NOT USE THE PIECE YOU CHOSE IN YOUR CONSTRUCTION

c) Draw to record.

d) When the shape is tripled, what happens to the area?

e) When the shape is tripled, what happens to the perimeter?

3. a) Predict what happens when a shape is quadrupled?

b) To check your prediction, use the grid paper to draw a shape and to make a similar shape that is four times larger. Calculate the area and the perimeter.

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

Please tidy up the station.

7. Geometry/Measurement

Polygons Gr. 8
G/M-13, G/M-17
G/M-23, G/M-28

Materials: paper
photocopier

1. On a piece of paper, draw a(n)
- **a) scalene triangle**
- **b) trapezoid**
- **c) parallelogram**
- **d) irregular quadrilateral**

2. Make a photocopy, enlarging and shrinking the original drawings.

3. Measure the corresponding angles of the original drawings and of their images. Record.

4. Explain your findings.

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

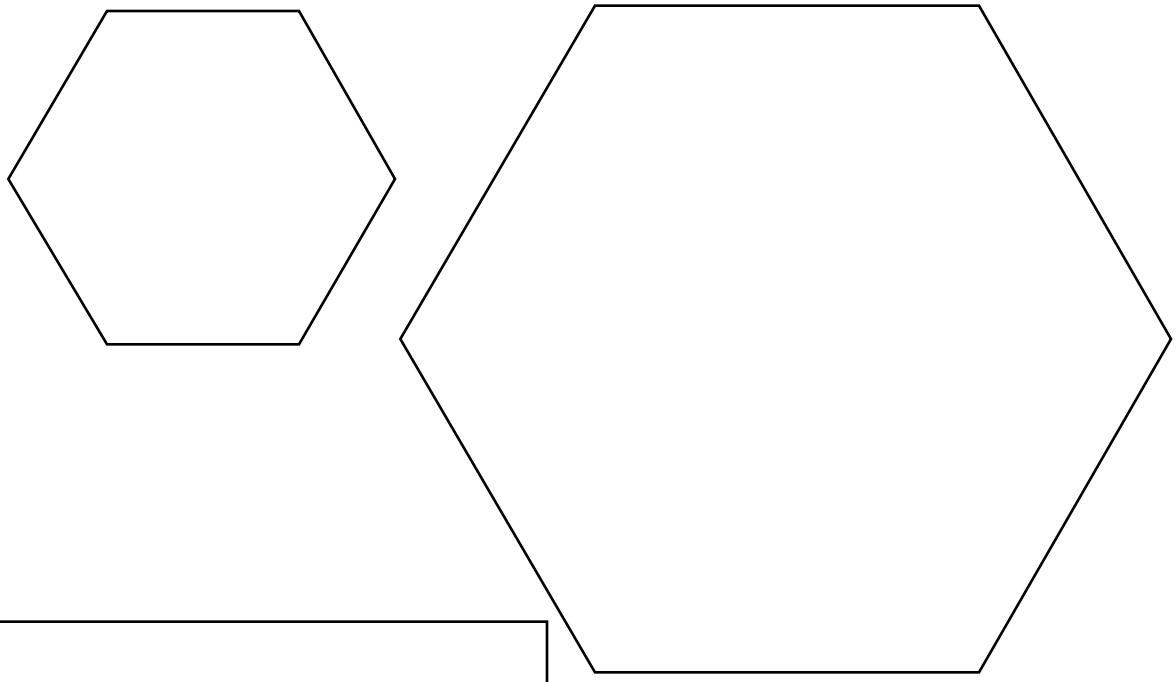
Please tidy up the station.

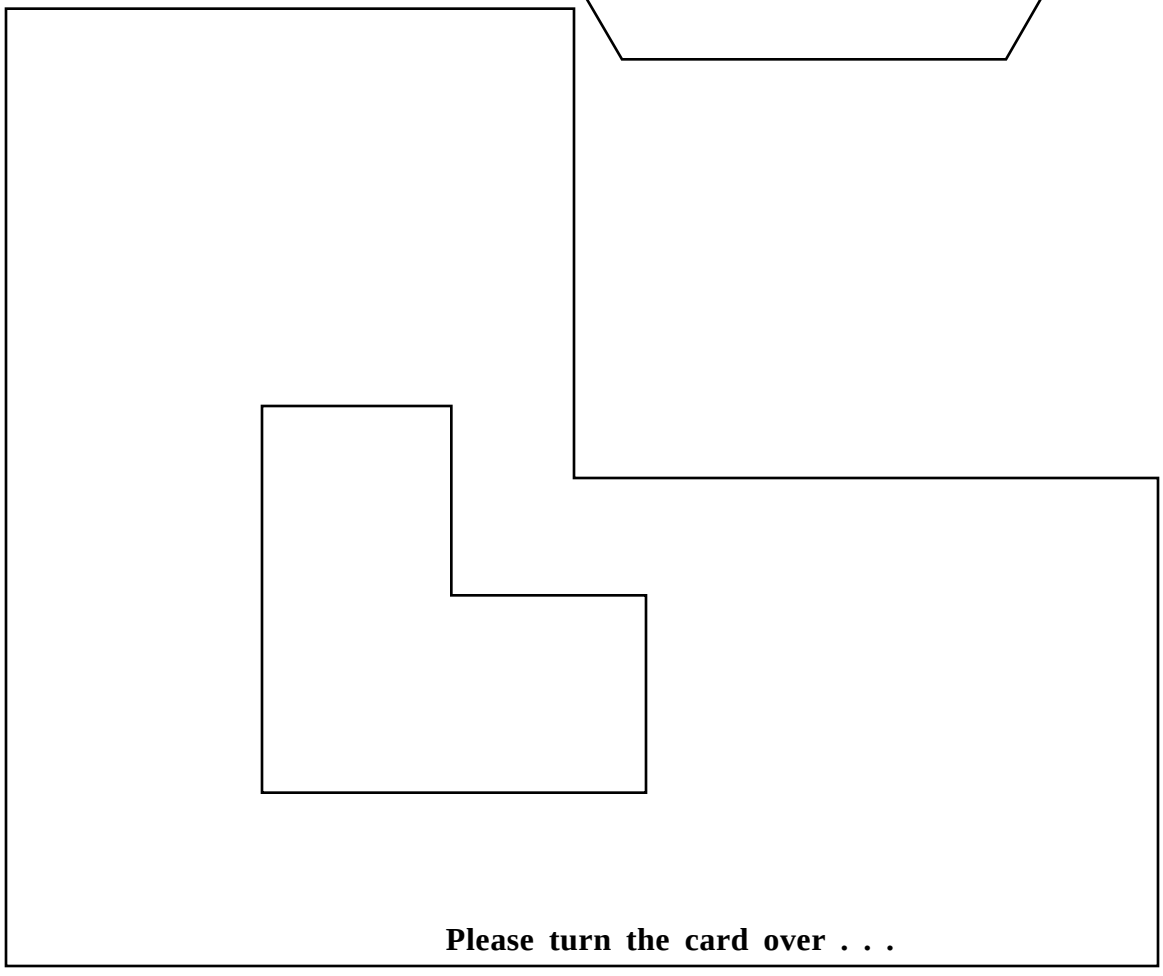
8. Geometry/Measurement

Polygons Gr. 8
G/M-19, G/M-20

Materials: plain paper and grid paper
photocopier

1. What is the scale factor of these similar polygons?





Please turn the card over . . .

2 Choose one of the following activities:

a) Find out the dimensions of a football field, a basketball court, or a baseball field. Draw a scale drawing of one of the above.

b) Find the dimensions of any of the planets and its moons and make a scale drawing of it.

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.8
G/M-20, G/M-23

Materials:
board
rubber bands
thumb tacks
grid paper
draw program on the computer

1. Draw a polygon.

2. Make polygons similar to the one you drew using a

a) grid

b) pantograph

c) computer drawing program if available

3. Record the scale factor for each drawing.

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 Gr. 8

G/M-28, G/M 30, G/M-36, A-10

Materials: grid paper
protractor

1. Plot the following points on the Cartesian plane.

(-2, +2), (-8, +2), (-2, 6)

2. Draw a reflection of the above figure about the y-axis.

3. Draw the image of the figure that you drew in #1 four units down and one unit to the right.

4. Use the origin (0.0) as centre of rotation and draw, in quadrant IV, a turn image of the first figure you drew.

5. Measure the corresponding angles and sides of all four triangles.

6. Do slides(translations), flips (reflections) and turns (rotations) maintain size and shape of the original figure? Explain your answer.

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

Please tidy up the station.

11. Geometry/Measurement — Polygons Gr. 8

G/M-34

Materials: playing cards
graph paper

You have been hired by a paving stone company to design different patterns for patios.

Using the playing cards to represent the bricks, develop three interesting patterns that tessellate. Record by drawing the patterns by hand using a ruler or by shading in the squares on the grid paper using two squares to represent one brick.

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

Please tidy up the station.

12. Geometry/Measurement

Polygons Gr. 8

G/M-33, G/M-36
A-10

Materials: grid paper

1. Draw a coordinate plane on the grid paper. Label the x-axis and the y-axis.

2. Plot the triangle whose vertices are: (3,2), (6,2) and (6,4).

a) It is flipped into the 2nd quadrant with the y-axis as mirror line.

b) This image is flipped into the 3rd quadrant with the x-axis as mirror line.

c) This image is flipped into the 4th quadrant with the y-axis as mirror line.

3. Draw the three images and give the coordinates of each vertex.

4. Which of the following have been preserved?

a) congruency
b) area
c) orientation

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

Please tidy up the station.

13. Geometry/Measurement

Polygons Gr. 8
G/M-28, G/M-33
G/M-36, A-10

Materials: grid paper 16 squares x 16 squares)

1. Draw a coordinate plane on the grid paper. Label the x-axis and the y-axis.

2. Plot the trapezoid whose vertices are:

(-2,4), (-2,-5), (-5,2), (-5,-3)

3. Draw a slide image by sliding it 7 units to the right and 3 units up.

4. Which of the following have been preserved?

a) congruency
b) area
c) orientation

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

Please tidy up the station.

14. Geometry/Measurement

Polygons Gr. 8
G/M-32, G/M-33
G/M-36, A-10

Materials: grid paper

1. Draw a coordinate plane on the grid paper. Label the x-axis and the y-axis.

2. Plot the trapezoid whose vertices are:

(-2,1), (-4,1), (-2,2), (-3,2), (-3,4), (-4,4)

It is rotated into each quadrant using the origin as a centre of rotation.

3. Plot the first rotation: (2,1), (3,1), (3,2), (5,2), (5,3), (2,3)

4. Draw and give the coordinates of the next two rotations.

5. Which of the following have been preserved?

a) congruency
b) area
c) orientation

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

Label your portfolio entry.

Please tidy up the station.

15. Geometry/Measurement

Polygons Gr. 8
G/M-38

Materials: 3-dimensional shapes
activity sheet
calculator
file cards

1. Look at the 3-dimensional shapes and list them in the chart on the activity sheet. Count the number of faces, vertices and edges for each.

2. 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.

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

4. Make up riddles about three different polyhedrons. Write each riddle on a separate file card. Your classmates should be able to use your clues to identify the polyhedrons.

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

Please tidy up the station.

16. Geometry/Measurement

Polygons Gr. 8
G/M-48a,b

Materials: drinking straws

1. Melissa said that to find the perimeter of a triangle, you only have to measure one side and multiply by 3. Do you agree?

a) Cut straws in different lengths and make as many different triangles as you can.

b) Use these straw triangles to help you explain your answer.

c) Make a rule to find the perimeter of a triangle.

2. a) Cut three pieces of straw: 10 cm, 3 cm, and 4 cm long.

b) Make a triangle using all three pieces.

c) Explain what happens.

d) Make a rule about the sides of triangles.

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

Please tidy up the station.

17. Geometry/Measurement

Polygons Gr. 8
G/M-64

Materials: paper
ruler
scissors
glue

Tara is investigating the relationship among the three sides of a right triangle. She drew a right triangle in the middle of a sheet of white paper.

She then constructed a square on each side of the triangle. Then she cut the two smaller squares and tried to fit them on the largest square.

1. Try Tara's investigation at least three times using right triangles of different shapes.

2. Explain what you found.

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

Please tidy up the station.

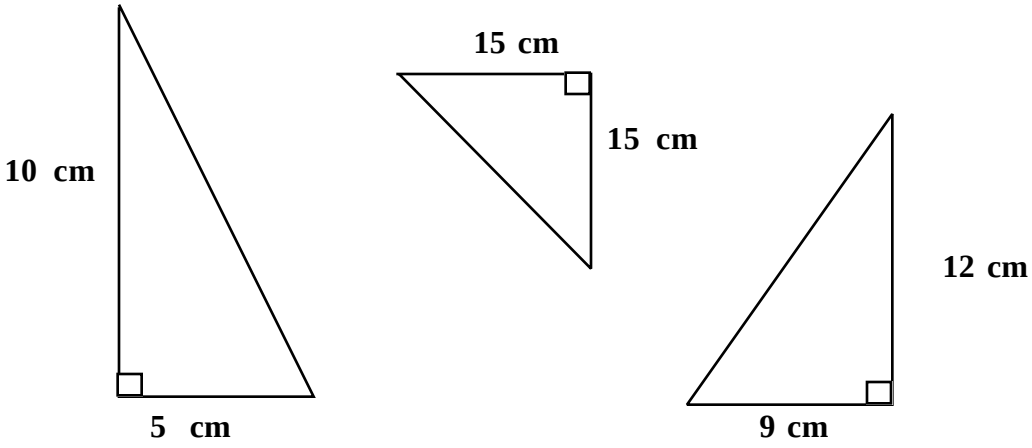
18. Geometry/Measurement

Polygons Gr. 8
G/M 50, G/M-51, G/M-53

Materials: calculator
drinking straws

1. Could sticks of 6 cm, 8 cm, and 10 cm form a right triangle? Use the straws to solve the problem. Explain why or why not.

2. Find the length of the missing sides of these right triangles.



3. Jamie wants to walk from one corner of a rectangular playground to the opposite corner. The playground is 30 m x 50 m. What is the shortest route? Explain.

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

Length Gr. 8

G/M-54, G/M 55
G/M-56, A-30

Materials:
plain paper and grid paper
compass
ruler
measuring tape
string
scissors
glue
calculator

1. a) Cut out a circle that has a diameter of 10 cm.

b) Explain how you can estimate its circumference.

c) Measure to check your estimate.

2. Elena is making a tablecloth for a round table with a diameter of 90 cm. She wants an overhang of 10 cm. List and explain three ways she could use to calculate the length of fringe she must buy to decorate the edge of the tablecloth.

3. Compare your answers in these two problems. Is there a relationship between the two?

4. Complete the table :

Diameter	Circumference
10	
20	
30	
40	
50	
100	

5. Graph the points from your table of values.

6. Explain how you could use your graph to find the amount of tape needed to make a circle, with a diameter of 150 cm, on the floor.

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

Please tidy up the station.

20. Geometry/Measurement

Length Gr. 8
G/M-54, G/M-55
G/M-56

Materials:
manila tag
compass
ruler
measuring tape
scissors
glue
brass tacks fasteners
calculator

1. On manila tag, draw a circle that has a circumference of 62.8 cm.

2. Make the face of a clock by writing the numbers evenly along the edge of your circle. Explain your strategy.

3. Make an hour hand so that it travels 52.56 cm in one hour and a minute hand that travels 47.1 cm in one hour. Remember to add a little in length to have enough length to attach them to your clock with the brass fastener. The hands also need to be wide enough to use the fastener.

4. On the back of your clock record the diameter of your clock and the length of the two hands. Briefly describe how you calculated these.

When you have completed this station,
file your clock your portfolio.
Label your portfolio entry.

Please tidy up the station.

21. Geometry/Measurement

Length Gr. 8
G/M-54, G/M-56
G/M-57

Materials: circle
calculator
metre stick

1. Roll the circle along the metre stick to calculate how far it goes in one revolution.

2. From this number calculate the diameter of the circle. Show your work.

3. How can you easily check your answer?

4. If Jenny's bike wheel is 70 cm in diameter, how far does she travel in one revolution? . . . in 10 revolutions?

5. The radius of Jenny's little brother's wheel is 20 cm. How far does he go in one revolution?

6. How many revolutions do the wheels of each bike need to make to cover 1 km?

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

Please tidy up the station.

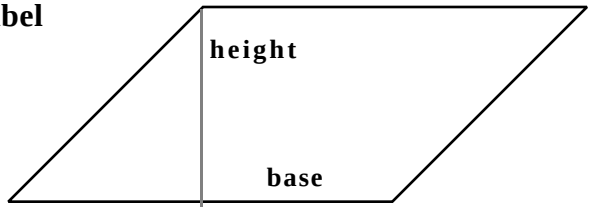
22. Geometry/Measurement

Area Grade 8
G/M-58, G/M-64b

Materials: grid paper
scissors
tape

1. Draw a parallelogram on the grid paper.

2. On your parallelogram label "base" and "height".



3. Cut the triangle that sticks out at one end and tape it to the other end. Name the polygon that you now have.

4. Using what you know about the area of a rectangle, make a rule to find the area of a parallelogram.

5. Aaron did exactly what you just did and made this chart.

base of parallelogram	height of parallelogram	area of parallelogram	base of rectangle	height of rectangle	area of rectangle
3	4	12	3	4	12
2.5	3.5	8.75			
1.5	4.2				
			3	6.5	
14		168			
			5.5		34.65

a) Fill in the missing numbers.

b) What other information should Aaron include on his chart to identify a pattern for finding the perimeter of a parallelogram?

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

Please tidy up the station.

23. Geometry/Measurement

Area Gr. 8
G/M-49, G/M-64

Materials: colored paper
scissors

1. Fold the paper in two and draw three triangles on the one side.

2. Cut the paper so that you have two of each triangle.

3. Fit each pair congruent triangles together so that they form parallelograms.

4. Justify that each shape you made is a parallelogram. Label all measurements.

5. How can you use this investigation to make a rule for finding the area of a triangle?

6. Sketch three triangles. Give the measure of the base and the height and calculate the area of each one using the rule you developed.

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

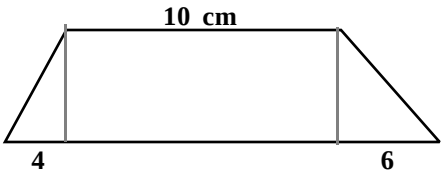
Please tidy up the station.

24. Geometry/Measurement

Area Gr. 8
G/M-64c

Materials: grid paper
scissors

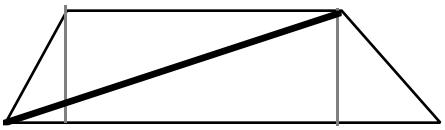
1. Make a trapezoid on the grid paper as shown below:



2. Count the squares to estimate the area of your trapezoid.

3. Use the rules for calculating the area of triangles and rectangles to find a more accurate area of your trapezoid.

4. Draw a diagonal on your trapezoid.



5. What two polygons are formed by the diagonal?

6. Shaun says that to calculate the area of a trapezoid you could calculate the area of the two triangles and add them together. Elaborate Shaun's idea to develop a rule for calculating the area of trapezoids.

7. a) Draw three trapezoids using the grid paper:

- **i. an isosceles trapezoid**
- **ii. a trapezoid with a right angle**
- **iii. an irregular trapezoid**

b) Use your rule to calculate the area of each.

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

Please tidy up the station.

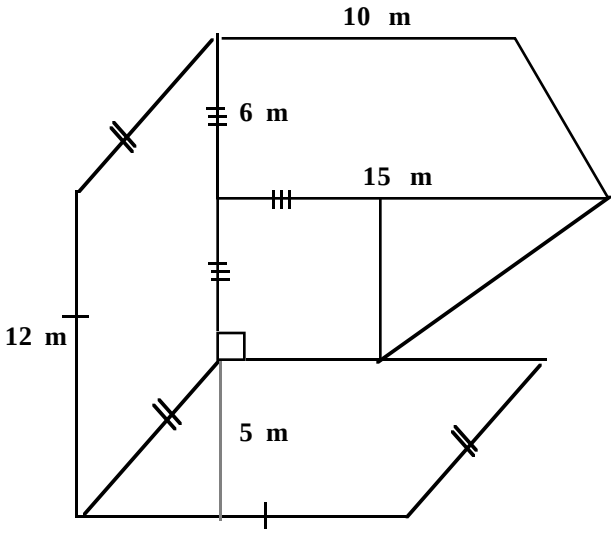
25. Geometry/Measurement

Area Gr. 8

G/M-64c

Materials: calculator

Give a step by step explanation of how to calculate the area of the following figure :



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

Please tidy up the station.

26. Geometry/Measurement

Area **Gr. 8**

G/M-64c

Materials: colored paper
compass
scissors
glue
three round objects

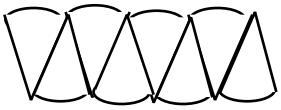
1. Construct a circle with a diameter of 15 cm.

2. Cut it out.

3. Fold it in half four times to make 16 sectors.

4. Cut out the sectors.

5. Place and glue the sectors in a line.

 **etc.**

6. Show that the height is the radius of the circle and the base is half the circumference. Use this to find a rule for the area of a circle.

7. Calculate the area of the three round objects at this station. Show your work.

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

Please tidy up the station.

27. Geometry/Measurement

Area Gr. 8
G/M-48, G/M-57
G/M-64

Materials: colored and white paper
compass
scissors

1. Use colored paper to make and cut out a square whose perimeter is 60 cm.

2. Using white paper make a circle that touches the four sides of your square.

3. Carefully glue your circle onto the square.

4. Find the following: (Show your work!)

a) What is the diameter of the circle?

b) What is the circumference of the circle?

c) What is the area of the circle?

d) What is the area of the colored paper hat is not covered with white?

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

Please tidy up the station.

28. Geometry/Measurement

Area Gr. 8
G/M-66b

Materials: cylinders
paper
ruler

1. You want to cover one of the cylinders with paper.

2. Cut two circles and a rectangle that together cover that cylinder.

3. Use these papers to calculate the surface area of the cylinder. Record.

4. Write a rule for calculating the surface area of a cylinder.

5. Calculate the surface area of the other cylinders at the station.

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

Please tidy up the station.

29. Geometry/Measurement

Area Gr. 8
G/M-66

Materials: Toblerone box or other triangular prism
ruler
scissors
a variety of triangular prisms

1. You want to cover one of the triangular prisms with paper.

2. Cut paper to fit exactly on each face.

3. Use these papers to calculate the surface area of the prism. Record.

4. Write a rule for calculating the surface area of a triangular prism.

5. Calculate the surface area of the other prisms at the station.

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

Please tidy up the station.

30. Geometry/Measurement

Area Gr. 8

G/M-69

Materials: cm cubes

Using the cubes design a hands-on investigation to determine the effect on the surface area of a polygon when its sides are doubled, tripled, etc.

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

Please tidy up the station.

31. Geometry/Measurement

Volume Gr. 8
G/M-73

Materials: jelly powder box
centicubes

Val had a jelly powder box and some centicubes. She first estimated how many cubes would fit in the box.

Next, she filled the box, dumped out the cubes and counted them.

Ron thinks that there should be a more accurate way to measure the volume, so he took the centicubes and . . .

1. Conduct the investigation and complete the story.

2. Write the rule for finding the volume of a right prism.

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

Please tidy up the station.

32. Geometry/Measurement

Volume Gr. 8

G/M-73, G/M-74

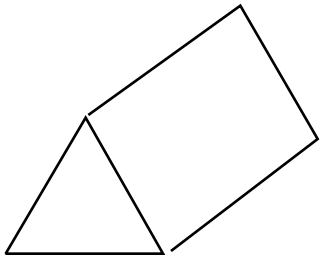
Materials: centicubes
cylinder
triangular prism
calculator

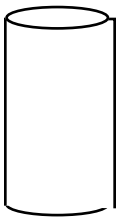
1. Hal says that to find the volume of a rectangular prism you need to multiply the length times the width times the height.

George disagrees. He says that all you have to do is multiply the area of the base times the height.

2. Who is right? Explain your response.

3. Use George's definition to develop a rule for finding the volume of a triangular prism.





4. Make a rule to find the volume of a cylinder.

5. Calculate the volume of the triangular prism and the cylinder at this station.

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

Please tidy up the station.

33. Geometry/Measurement

Volume Gr. 8
G/M-77

Materials: cm cubes

Use the scientific method to find out the effect on the volume of a solid if the height is tripled but all the other dimensions stay the same.

Use these headings to report your answer.

Problem
Materials
Procedure
Observation
Conclusion

(Remember that scientists use a few examples before drawing a conclusion)

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

Please tidy up the station.

34. Geometry/Measurement

Volume **Gr. 8**
G/M-77

Materials: cm cubes

1. **Use the centicubes to explain what happens to the volume of a cube if each dimension is doubled?**

2. **Use the centicubes to explain what happens to the volume of a cube if each dimension is tripled?**

3. **Are these result true for rectangular prisms as well? Explain your answer. (You may want to use the blocks to investigate your hypotheses)**

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

Please tidy up the station.

35. Geometry/Measurement

Grade 8

Capacity, Mass, Time

G/M-79, G/M-81

Materials: base ten blocks

When we speak of water at 4˚ C we know that

1 L = 1000 cm^3 = 1 kg

1. Use the base ten blocks to model this. Use drawings in your explanation.

2. How can you use this information to calculate the capacity of a swimming pool or hot tub?

3. How can you use this information to calculate the mass of an aquarium and its contents to make sure that it is well supported?

4. How would you convert the units given above if you were working with small bottles?

5. Write five problems dealing with this information and answer them

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

Please tidy up the station.