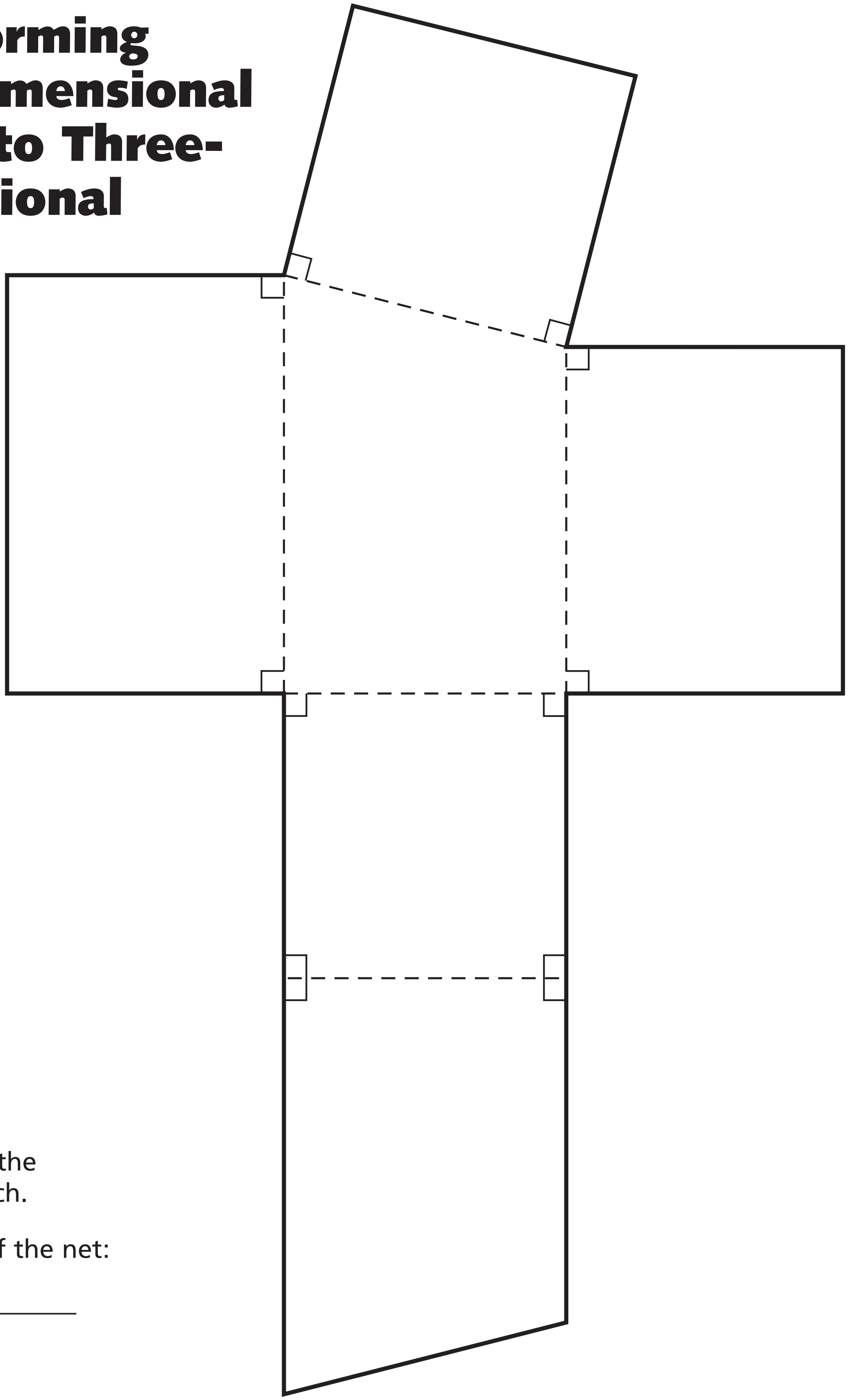
Name ______________________ Date ____________

Transforming Two-Dimensional Nets into Three-Dimensional Figures

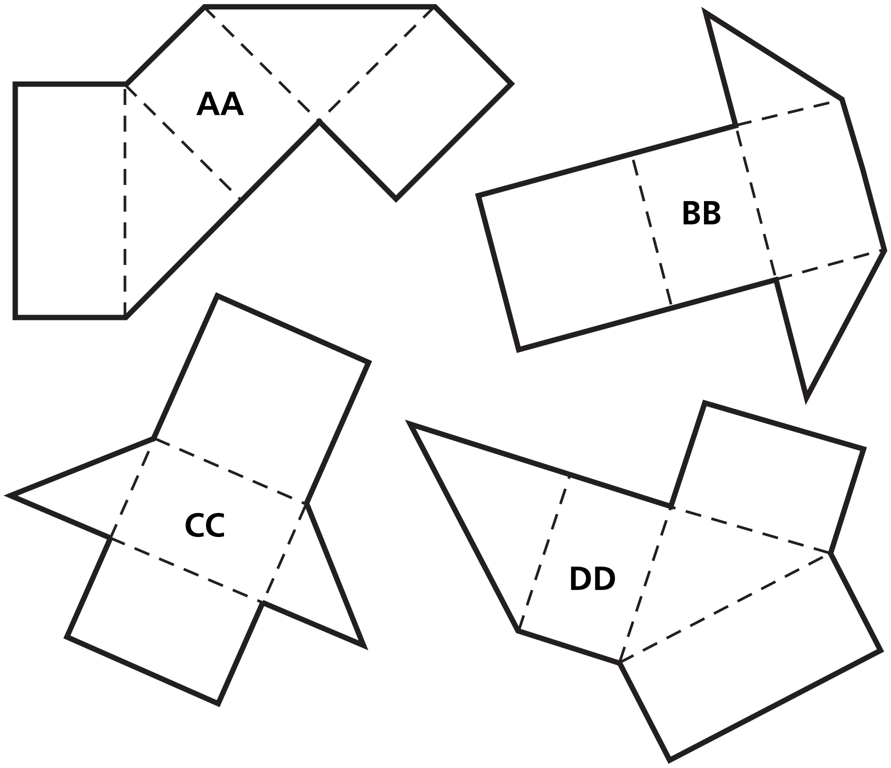


1. Measure to the nearest $\frac{1}{2}$ inch.

2. Total area of the net:

____

Describing Three-Dimensional Figures



1. Find one pair of nets that can be folded into the same three-dimensional figure.

   __________________ __________________

2. Describe the three-dimensional figure that either of those nets will make by saying how many faces, vertices, and edges it has.

   ____

   ____

3. Look at the line segments (both dotted and solid) in a net, and think about what happens when you fold that net and tape the edges. How can you predict the number of edges a three-dimensional figure will have by looking at a net?

   ____

   ____

   ____

Name ______________________________ Date ______________

Sorting Three-Dimensional Figures

Find the 6 polyhedra in your class collection that are neither *prisms* nor *pyramids.* Use them to help you complete the page.

1. Find the **2** three-dimensional figures that have all the following attributes and write their letters on the lines below.

   - ☑ two parallel, polygonal faces that are *not* congruent
   - ☑ other faces are not parallelograms or triangles
   - ☑ more vertices than faces

   ______ ______

---

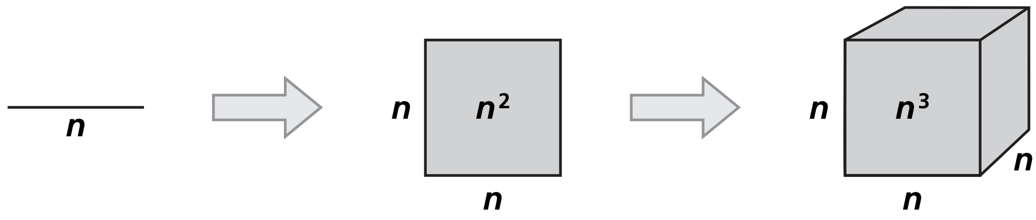
2. Three-dimensional Figures J and M may be called *antiprisms.* Write some attributes that describe both of these shapes.

   - ☑ ____
     ____
     ____
   - ☑ ____
     ____
     ____
   - ☑ ____
     ____
     ____

Name ______________________________ Date ______________

Volume of Rectangular Prisms

You already know that a certain length, *n*, may represent the length of a line segment, the side of a square, and the edge of a cube.



Length: n **Area: n^2** **Volume: n^3**

1. Complete the table using positive numbers only.

n	1									
n^2		36	25	81		16	64		49	
n^3					8			27		1000

2. The symbol $\sqrt{}$ means "square root."

If n is not a negative number, then $\sqrt{n^2} = n.$
Write the square roots.

$\sqrt{25}$ = ________ $\sqrt{64}$ = ________ $\sqrt{100}$ = ________

$\sqrt{144}$ = ________ $\sqrt{225}$ = ________ $\sqrt{625}$ = ________

3. The symbol $\sqrt[3]{}$ means "cube root." $\sqrt[3]{n^3} = n.$
Write the cube roots.

$\sqrt[3]{64}$ = ________ $\sqrt[3]{216}$ = ________ $\sqrt[3]{27}$ = ________

$\sqrt[3]{512}$ = ________ $\sqrt[3]{1000}$ = ________ $\sqrt[3]{729}$ = ________

Name ______________________ Date ____________

Volume of Prisms

Imagine you have this wooden block (Three-Dimensional Figure A). Each side is a parallelogram. You need to find its volume. It is painted in two colors, is quite solid, and cannot be taken apart.

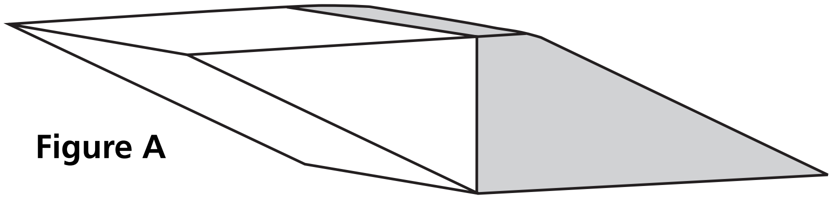
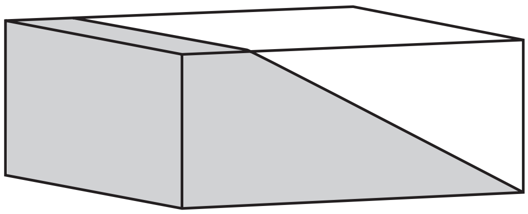


Figure A

But you can imagine taking it apart and rearranging the parts to make this other three-dimensional figure.

Figure B



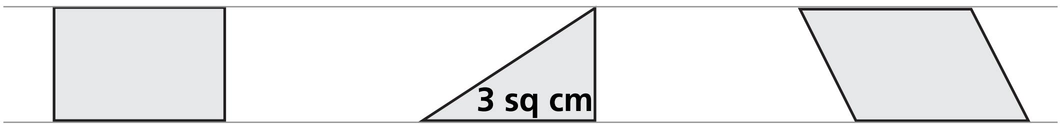
Although you have imagined Figure B, you only have Figure A to measure.

Tell what measurements you would make on Figure A, and what you would do with those measurements. Explain why your method will give the correct volume of Figure A.

Name ____________________ Date ____________

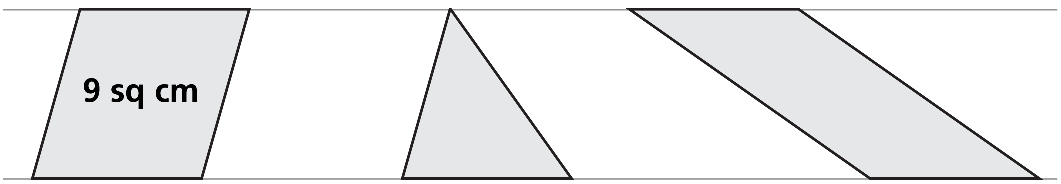
Area of Nets

1. These three figures all have the same height and the same base length. The area of one of them is shown. Write the areas of the other two.



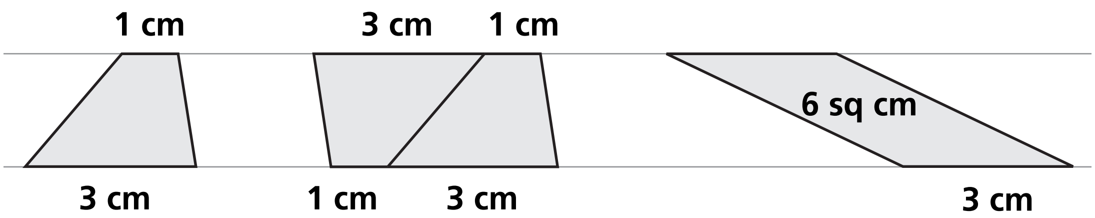
______ sq cm ______ sq cm

2. Again, all three figures have the same height and base length. The area of one is shown. Write the areas of the other two.



______ sq cm ______ sq cm

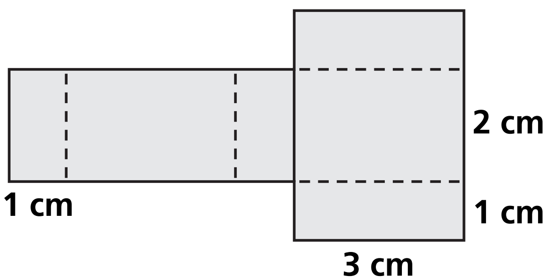
3. All three figures have the same height. The area of one is shown. Write the areas of the other two.



______ sq cm ______ sq cm

4. What is the total area of all the faces shown on this net of a rectangular prism?

______ sq cm



Name ______________________ Date ____________

Surface Area of Polyhedra

How does *volume* change if we double the dimensions?

1. On the LAB page, you investigated how *area* changes as the dimensions are doubled. The data you generated on that page will also allow you to make a conjecture about how area changes when the dimensions are quadrupled.

   Look back at those numbers and write what you think might be the rule.

   When the dimensions are multiplied by ______________________________

   ____

Now perform some experiments to see how *volume* changes when the dimensions are doubled.

2. From the class collection, choose a polyhedron for which you can calculate the volume easily. Record its letter and its volume (showing how you calculated that volume)

   Three-Dimensional Figure: ______ Volume: ______

3. Double each dimension and calculate the new volume, again showing how you did it.

   VOLUME of a similar polyhedron
   with all dimensions doubled:

4. Repeat this experiment with a new polyhedron.

   Three-Dimensional Figure: ______ Volume: ______

   VOLUME of a similar polyhedron
   with all dimensions doubled:

5. State a conjecture. How do the volumes compare when the dimensions are doubled?

   When the dimensions are doubled, ______________________________

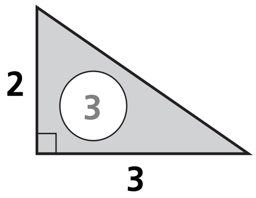
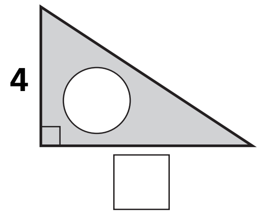
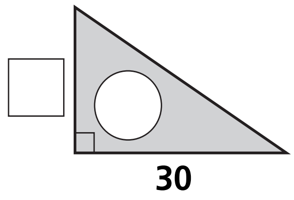
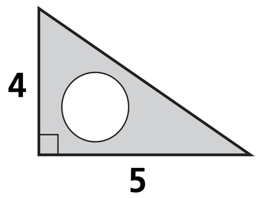
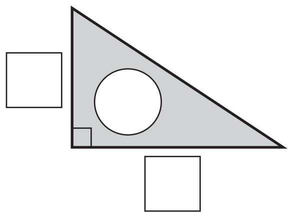
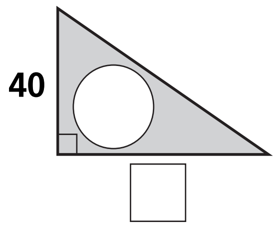
   ____

Name ______________________ Date ______________

Extension
Lesson 8

Comparing Volume and Surface Area

Fill in the missing numbers and look for the patterns.

Column A	Column B	Column C
	All dimensions in Column A are doubled.	All dimensions in Column A are multiplied by 10
1 Prism base:  Prism height = 3 Volume: ________	Prism base:  Prism height = ______ Volume: ________	Prism base:  Prism height = ______ Volume: ________
2 Prism base:  Prism height = 4 Volume: ________	Prism base:  Prism height = ______ Volume: ________	Prism base:  Prism height = ______ Volume: ________
3 Look at the **area** of the base of each prism.	The area of the bases of the prisms in Column B is ______ times the area of those in Column A.	The area of the bases of the prisms in Column C is ______ times the area of those in Column A.
4 Look at the **volume** of each prism.	The volume of the bases of the prisms in Column B is ________ times the volume of the prisms in Column A.	The volume of the bases of the prisms in Column C is ________ times the volume of the prisms in Column A.