

Packet 13: Geometry

Dear Parents/Guardians,

In Packet 13, students explore geometry. In Lesson 1, students use visual representations to derive area formulas for polygons. In Lesson 2, students find the volume of right rectangular prisms. In Lesson 3, students use nets to calculate the surface area of polyhedra.

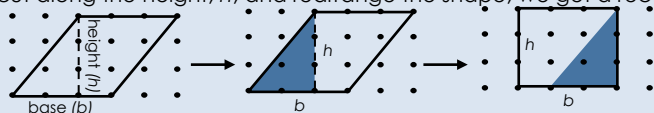
Deriving Area Formulas: Rectangles and Parallelograms

One of the formulas for finding the area of a rectangle is multiplying the base and height.

$$A = bh$$

Students will use this to help derive formulas for other polygons, such as a parallelogram.

If we cut along the height, h , and rearrange the shape, we get a rectangle.

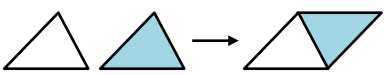
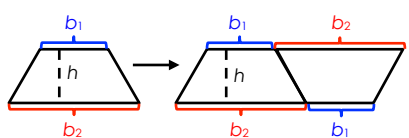


$$\text{Area of a Parallelogram} = bh$$

Notice it is the same formula for finding the area of a rectangle.

Deriving Area Formulas: Triangles and Trapezoids

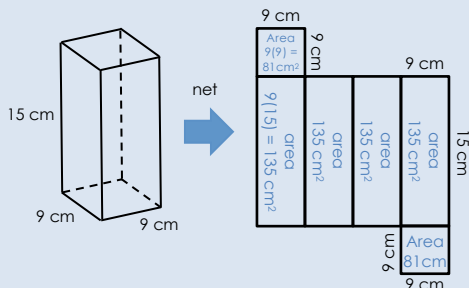
Students will explore different ways to derive the formulas for finding the areas of triangles and trapezoids. Below are examples.

Area of a Triangle	Area of a Trapezoid
 <p>Duplicate one triangle (create a congruent triangle), and reassemble them to form a parallelogram.</p> <p>Students could use one of the following formulas to find the area of a triangle.</p> $A = \frac{1}{2}bh$ $A = \frac{bh}{2}$	 <p>Duplicate the trapezoid (create a congruent trapezoid), and reassemble them to form a parallelogram.</p> <p>Students could use one of the following formulas to find the area of a trapezoid.</p> $A = \frac{1}{2}(b_1 + b_2)h$ $A = \frac{(b_1 + b_2)h}{2}$

Finding Surface Area of Polyhedra

Students will create the nets for polyhedra to calculate surface area.

Example: Calculate the surface area for the figure below.



To calculate the surface area, add the areas of the polygons that create the polyhedron.

$$SA = 81 + 81 + 135 + 135 + 135 + 135 = 702 \text{ cm}^2$$

$$SA = 2(81) + 4(135) = 702 \text{ cm}^2$$

(For calculating the volume of right rectangular prisms, please see Additional Resources.)



By the end of the packet, your student should know...

How to derive formulas for areas of parallelograms, triangles and trapezoids
Lesson 13.1

How to derive formulas for the volume of a right rectangular prism
Lesson 13.2

How to use nets to create polyhedra
Lesson 13.3

How to solve problems that involve area, volume, or surface area
Lessons 13.1, 13.2, and 13.3

Additional Resources

Resource Guide (RG)
Part 2, pages 38-40

Volume of right rectangular prisms (0 – 4:10 min):
<http://youtu.be/DS7f3K88HgI>