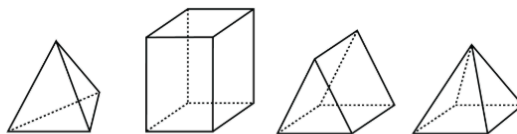


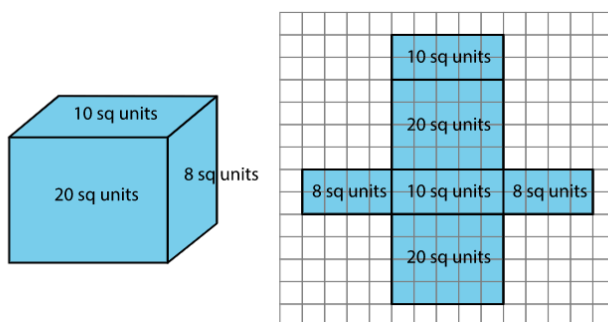
Surface Area

Lessons 12-16

Imagine painting all of the sides of a box. The amount of surface to be covered with paint is the **surface area** of the box. Your student will focus on finding the surface areas of different three-dimensional objects such as the **prisms** and **pyramids** shown here.

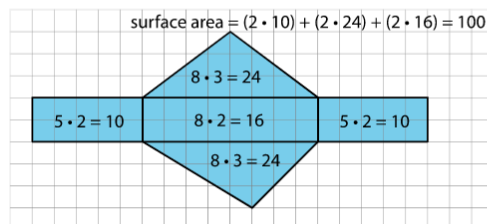


One way to find the surface area of a three-dimensional object is to draw its **net**, which shows all the **faces** of the object as a two-dimensional drawing. A net can be cut out and folded to make the object. To find the surface area of the object, we can find the area of each face (as shown on the net) and add them. The areas of the six rectangular faces shown add up to 76 square units because $10 + 20 + 10 + 20 + 8 + 8 = 76$, so the surface area of this box is 76 square units.



Here is a task to try with your student:

Andre drew a net of a triangular prism and calculated its surface area. He made an error in both the net drawing and in the calculation.



1. Identify Andre's errors.
2. Find the correct surface area for the prism. Show your reasoning.

Solution:

1. Net: The triangles in a triangular prism should be identical, but the net shows two different triangles. Calculation: There are a few errors. The area of each triangle should be $\frac{1}{2} \cdot 8 \cdot 3$ or 12 square units. Andre did not multiply the base and height by half. The wrong calculation is repeated for both triangles. In the calculation for the surface area, Andre doubled the area of the largest rectangle (which is 16 square units) while there is only one rectangle with that area.
2. The surface area should be 60 square units. The combined area of the two triangles should be $2(\frac{1}{2} \cdot 8 \cdot 3)$ or 24 square units. $10 + 10 + 16 + 24 = 60$. Sample corrected net:

