1.1.1: Investigation - Comparing Volumes of Cones and cylinders

Purpose
Compare volumes of shapes that have the same base and height.

Hypothesis
I think that...

1.		× _____ =		

Investigate

How many times will the volume of the shape on the left fill the shape on the right?

Conclusion

1. $V_{cone} \times \underline{\quad} = V_{cylinder}$

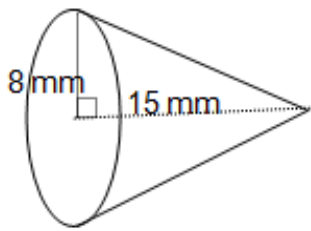   Formula: $\frac{1}{3}\pi r^2 h \; or \; \frac{\pi r^2 h}{3}$

A cone and a cylinder with the same base and height are related.

The relationship between the volumes of a cone and its related cylinder is the same as that for a pyramid and its related prism.
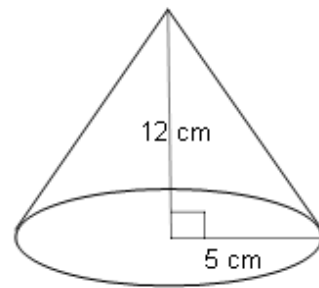
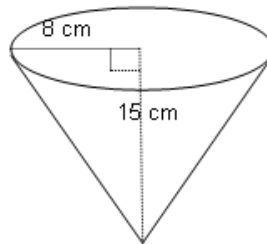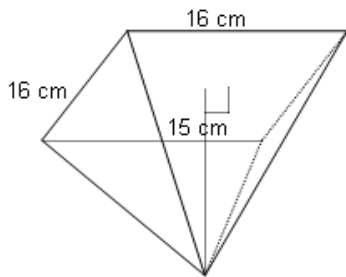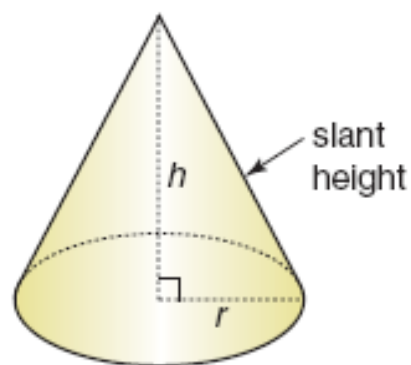These 3 volumes together …   … are equal to this volume.

Example 1)

8 mm
15 mm

Example 2)

12 cm
5 cm
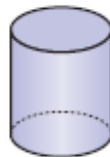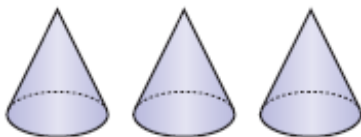
Example 3) Which popcorn container will hold more?

16 cm
16 cm
15 cm

8 cm
15 cm

Sometimes the height of a cone is not given. We can measure the
_____**slant height**_____ and radius, then use
____Pythagorean Theorem____ to calculate the ____height____

Example 4)

A paper drinking cup is a cone.
The base has diameter 6.4 cm.
The slant height is 9.5 cm.
a) Determine the height of the cone.
b) Determine the volume of water
   that will fill the cup.

6.4 cm

9.5 cm