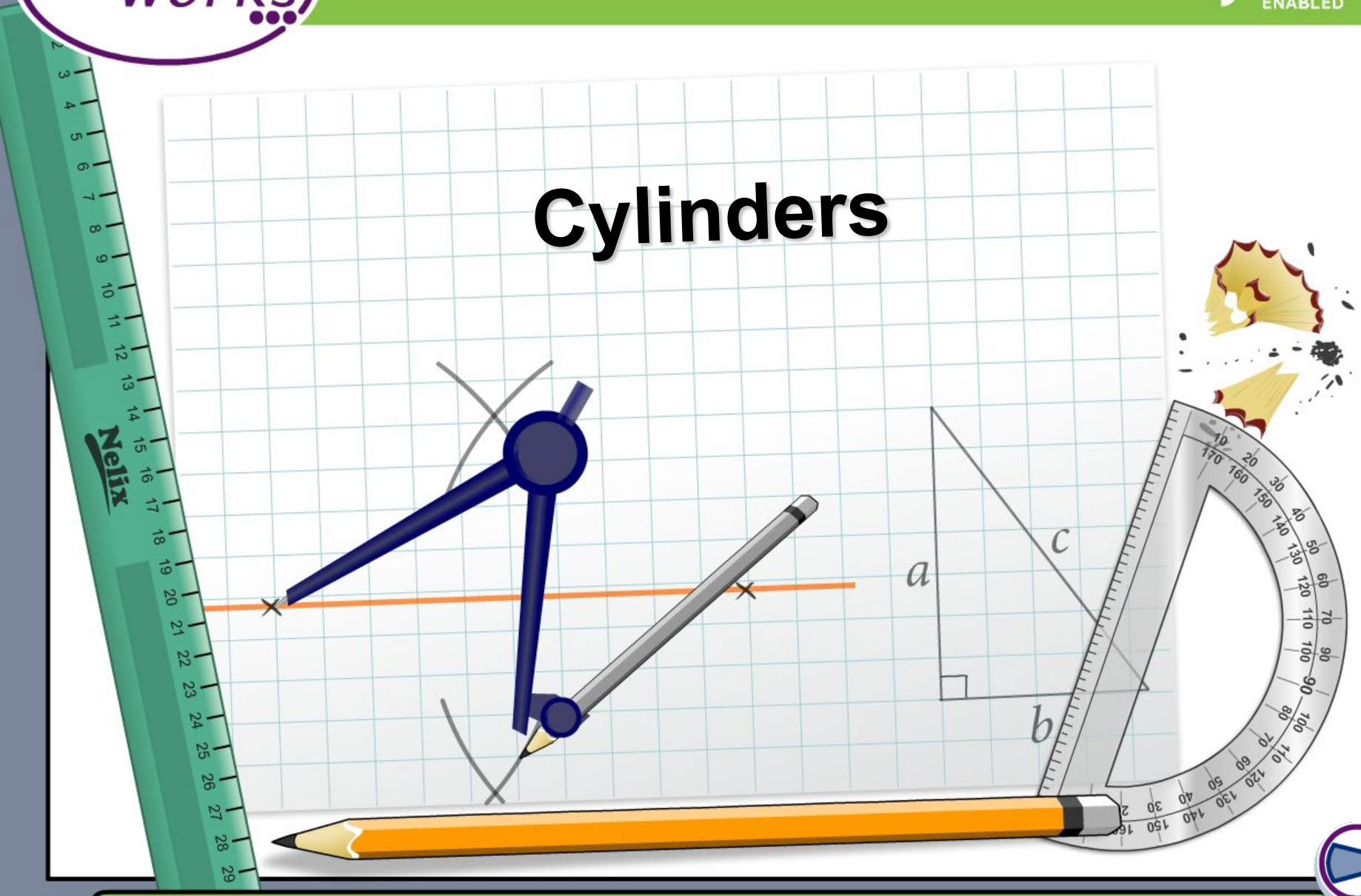
Cylinders



Information

Common core icons

This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.

Slides containing examples of mathematical modeling are marked with this stamp.

This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These are:

1) Make sense of problems and persevere in solving them.

2) Reason abstractly and quantitatively.

3) Construct viable arguments and critique the reasoning of others.

4) Model with mathematics.

5) Use appropriate tools strategically.

6) Attend to precision.

7) Look for and make use of structure.

8) Look for and express regularity in repeated reasoning.

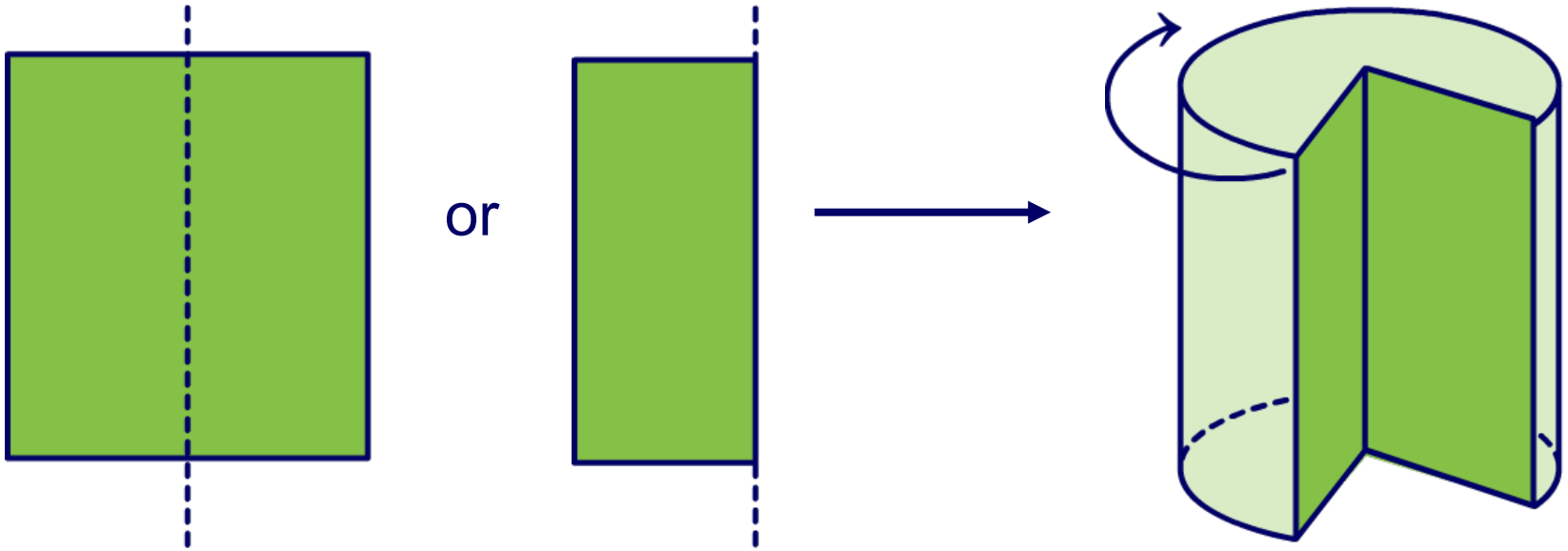
This icon indicates that the slide contains activities created in Flash. These activities are not editable.

This icon indicates teacher's notes in the Notes field.

Volume of a cylinder

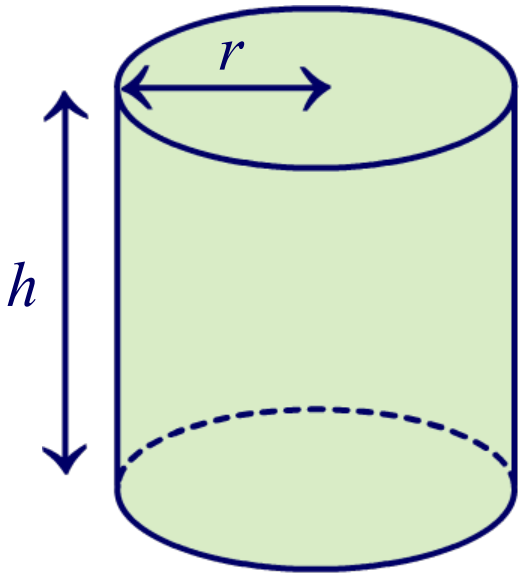
A **cylinder** is a 3-D shape with two parallel congruent bases, which are usually circular.

A cylinder can be created by rotating a rectangle around an axis.



Volume of a cylinder

The volume of a cylinder can be found by multiplying the area of the cross-section by the height of the cylinder.



The volume of a cylinder is given by:

Volume = area of circular base × height

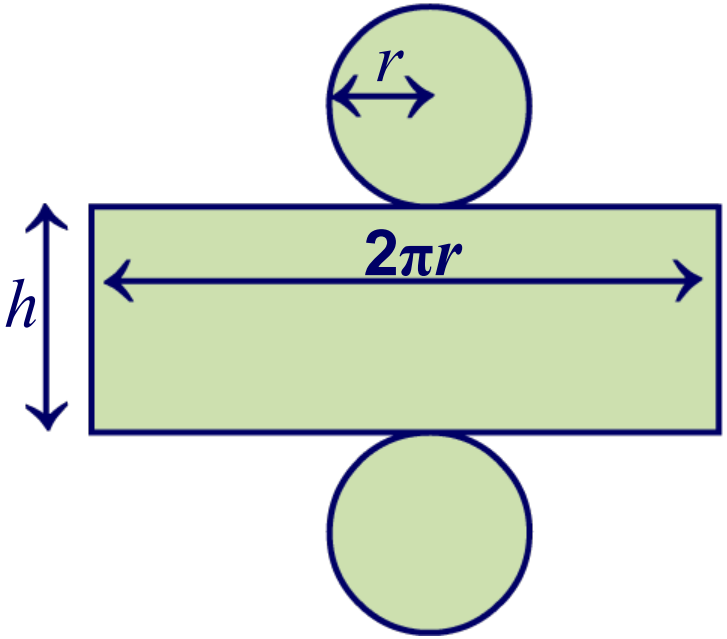
$= \pi r^2 \times h$

$$V = \pi r^2 h$$

Surface area of a cylinder

To find the formula for the surface area of a cylinder we can draw its net.

How can we find the width of the curved face?



The width of the curved face is equal to the circumference of the circular base, $2\pi r$.

area of curved face:

$$2\pi rh$$

area of 2 circular faces:

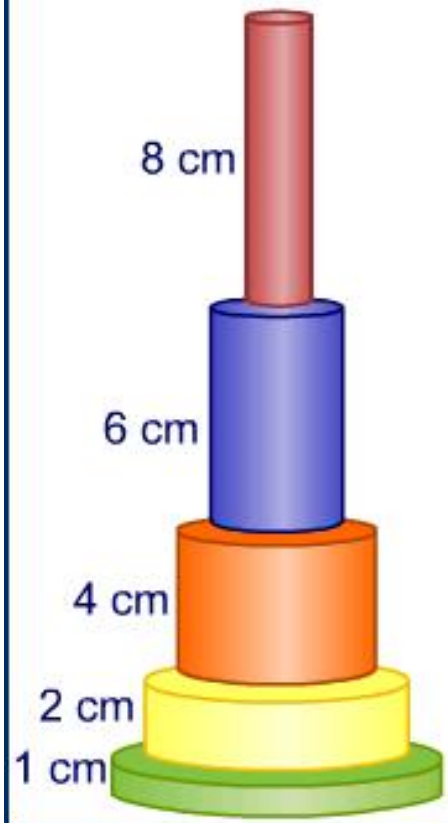
$$2 \times \pi r^2$$

surface area of a cylinder:

$$2\pi rh + 2\pi r^2$$

Surface area = $2\pi r(h + r)$

True or false?



Here are some toy cylinders. The green one has a diameter of 10 cm and a height of 1 cm.

Each successive cylinder has a decrease in diameter of 2 cm and a height as shown in the diagram.

Is it true that, as the diameters decrease and the heights increase, the volumes increase?

Press **start** to begin.

start

Soup cans

Can you work out these problems about cylindrical soup cans?

Press start to begin.

start