

**?**

**W**

**2K**

**Lesson Question**

**Words to Know**

*Fill in this table as you work through the lesson. You may also use the glossary to help you.*

**Use** a given height with either the

or diameter measure.

of a cone.

**Apply** the formula to find the volume

of a cone.

**Determine** the

formula for the

**Investigate** a relationship between cylinder

and cone volumes.

**Lesson Goals**

|  |  |
| --- | --- |
|  | a segment that extends from the center of a circle to any point on the circle |
|  | to explain or show the similarities or differences between items or ideas |
|  | the measure of the amount of space occupied by a three- dimensional solid object |
|  | a solid object with a circular base and one vertex |
|  | a chord that passes through the center of a circle |



## Circular Base Area

This construction **cone** has a **radius** of 7 inches. What is the area of the base?

*A* =

*A* = π(7)2

*A* = π(7)(7)

7

*A* = in.2

**Slide**



**Identifying Parts of a Cone**

Parts of a cone

* Base
* Center of base
* Vertex

of base

**2**



radius

base

vertex

Height

**Diameter**

Radius

•

•

•

Measurements of a cone

**Slide**

)2

*A* = π(

= 4π units sq.

*2*

*5*

*5*

units sq.

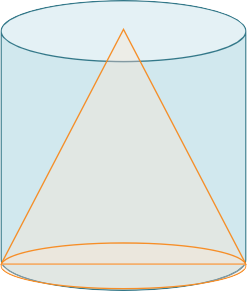
*A* =

*2*

**Relating a Cone to a Cylinder**

Consider a cone and a cylinder with the same height and radius.

**4**



.

same base area and

greater volume even though they have the

would actually have the

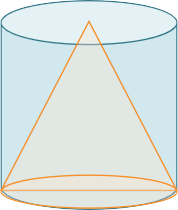
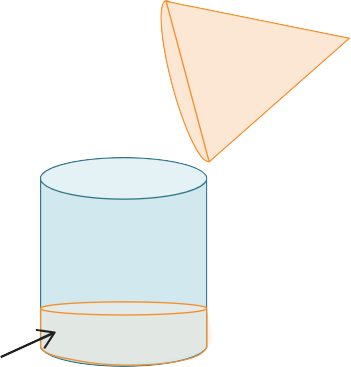
The

**Comparing Cylinder and Cone Volumes**

**EXAMPLE**

**Compare** the **volume** of each when a cone and a cylinder have the same base area and height.

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1

3





Volume =   (Volume of cylinder)

**Comparing Cylinder and Cone Volumes**

**EXAMPLE**

**4**

**6**

*V* 

1

1

Volume of a Cone:

(Volume of the cylinder)

3

*V*  3 *Bh*

of the

* *B* is the circular base
* *h* is the height

•

* Volume of a cylinder: *V* = *Bh*

**Determining a Formula for the Volume of a Cone**

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## Calculating the Volume of a Cone

What is the volume of a cone with a radius of 2 meters and a height of 5 meters?

1

Formula: *V* = 3 *Bh*

*V*  1 *r*2*h*

3

*V*  1(22)( ) 3

5 m

*V*  1( )(5)

# 3

2 m

*V*  1 (20) 3

**8**

*V*  m3

Using the symbol for π

gives an exact value.

**Slide**

## Determining the Volume of a Cone for a Given Diameter

A cone has a diameter of 12 inches and a height of 15 inches. What is its volume?

1

**10**

* *V*  3 *Bh*

*V*  1 *r*2*h*

3

*V*  1 (62 )(15) 3

*V*  1( )(15)

# 3

*V*  15 (36) 3

*V* = 5π(36)

*V* = in.3

 *r*

12 in.

15 in.



# **Summary** Introduction to the Volume of a Cone

**?**

How do you find the volume of a cone?

**Lesson Question**

**Answer**

*Use this space to write any questions or thoughts about this lesson.*