Lesson 6: Volume of Cylinders and Prisms

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| Learning Goals:  |

* To find the volume of rectangular prisms
* To find the volume of cylinders when given a radius or diameter
* To solve word problems involving volume

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| Topic: Volume of Cylinders and Prisms |

**Volume** is the amount of space a figure occupies. It is a **3-Dimensional** measurement, so its units will be ‘**cubed**.’ (m3, cm3, in3….) In general, the volume of a prism can be calculated by multiplying the area of the base by the height.



A **rectangular prism** has six rectangular faces. It has a rectangle as a base. Its volume can be calculated by:

 V = l x w x h

 Or

 Volume = length x width x height

A **cylinder** is a prism that has a circle as a base. Its volume can be calculated by:

 V = $π$r2h

 Or

Volume = pi x (radius x radius) x height

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| Example(s):  |

1. Calculate the volume of the prism to one decimal place:

a)

**Step 1** Select the correct formula.

 V = l x w x h

**Step 2** Substitute the values of the dimensions and solve.

 V = l x w x h

 = 3 x 6 x 2

 = 36 ft3

b)

**Step 1** Select the correct formula.

V = $π$r2h

**Step 2** Substitute the values of the dimensions and solve. Remember to simply r2 first.

 V = $π$r2h

 = 3.14 x ( 5 x 5) x 10

 = 3.14 x 25 x 10

 = 785cm3

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| Practice Questions:  |

1) Calculate the volume of each figure below to one decimal place.

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2. A rain barrel is 2m tall and has a radius of 0.6m. How much water can it hold?



3. The local park has decided to build a pond with the dimensions below. How much soil will be removed from the ground?

d=2m

h=0.5m

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| Strand 3 Lesson 6 Assessment |

1. What is the volume of the prism below:



1. Monster Energy drinks are redesigning their cans. The new can needs to hold approximately twice as much liquid. The original can is shown below:

h=10cm

d=6cm

Monster

The designers are choosing between two options outlined below:

|  |  |
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| **Option A** | **Option B** |
| Double the diameter, but keep the height the same. | Keep the diameter the same, but double the height. |

* Determine which of the two options listed above does not meet the requirement of doubling the volume.
* Clearly state your reasoning and the necessary calculations to support your findings.
* Show all steps needed to support your answer.