LEARNING GUIDE 6: **VOLUME**

Ref: Math Links 8 (Chapter 7, pp. 246 - 279)

NAME: _____ TA: _____

TEACHER: _____

LEARNING GUIDE EXPECTATIONS:

(1) understand the concept of volume

(2) calculate the volume of a prism

(3) calculate the volume of a right cylinder

(4) solve problems involving prisms and cylinders

ASSIGNMENTS:

Expectation 1: understand the concept of volume

- ☐ Watch this video
- ☐ Assignment 1: p. 250 — #3, 4
- ☐ Assignment 2: p. 251 — #5, 6

Expectation 2: calculate the volume of a prism

- ☐ Watch this video
- ☐ Assignment 3: p. 258 - 259 — #4, 5, 6
- ☐ Assignment 4: p. 259 — #7, 8
- ☐ Assignment 5: p. 259 — #9, 10
- ☐ Assignment 6: p. 260 - 261 — #11, 12, 14, 16, 19, 22

Expectation 3: calculate the volume of a right cylinder

- ☐ Watch this video
- ☐ Assignment 7: p. 265 — #4, 5
- ☐ Assignment 8: p. 265 - 266 — #6, 7
- ☐ Assignment 9: p. 266 - 267 — #9, 12, 14, 16, 18

Continued on the back page…….

Expectation 4: solve problems involving prisms and cylinders

- [ ] Watch this video
- [ ] Assignment 10: p. 273 — #4, 5, 6
- [ ] Assignment 11: p. 273 - 275 — #8, 11, 13, 15, 18, 20, 21

- [ ] **Review and Challenge**: p. 276 - 277 #1-4, 5, 9, 10, 11, 13, 14, 17, 19, 20

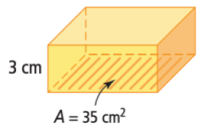
VOLUME IS:

FORMULA

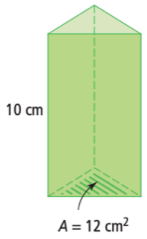
volume = area of the base x height of prism

EXAMPLE 1. Determine the volume of each prism or cylinder — p. 247

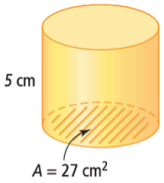
a)



b)

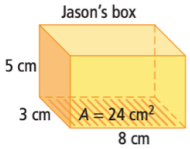


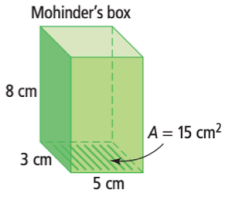
c)



EXAMPLE 2. Determine the Volume Using Different Orientations — p. 248

Jason and Mohinder each have a box with the same dimensions. But Jason's box is shorter and Mohinders box is taller. Calculate the volume of each - which box is bigger?



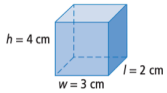


SHAPES

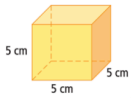
VOLUME OF A PRISM = BASE AREA X H_{OP}

EXAMPLE 1. Use a Formula to Determine the Volume of a Right Rectangular Prism — p. 255

(a) Determine the volume of the right rectangular prism.

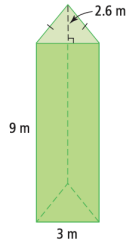


(b) Determine the volume of the cube.



EXAMPLE 2: Use a Formula to Determine the Volume of a Right Triangular Prism — p. 256

(a) Determine the volume of the right triangular prism.



HOW TO FIND THE FRACTION OF A NUMBER.

1. CHANGE FRACTION TO DECIMAL
2. OF MEANS MULTIPLY
3. SOLVE

1/2 of 10 is?

7/9 of 134 is?

EXAMPLE 3: Use Volume to Solve a Problem.

When Katie opened a new box of Oat Crunches, she noticed the box has only 5/6 full.

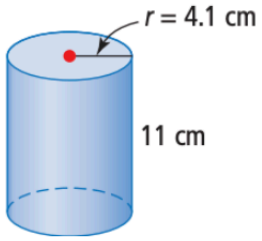
How much space was empty?
Hint: first calculate the volume of the cereal box



VOLUME OF A PRISM = BASE AREA X H_{OP}

EXAMPLE 1: Determine the Volume of a Cylinder Give the Radius (r) — p. 263

Calculate the volume of the cylinder.



EXAMPLE 2: Determine the Volume of a Cylinder Given the Diameter (d) — p. 264

A hockey puck is made of vulcanized rubber. What is the volume of rubber required to manufacture one puck?

Express your answer to the nearest cubic centimetre.



EXAMPLE 1: Solve a Problem Involving Right Triangular Prisms — p. 269

Marcus is making a display of packages of Prism Chocolates in his candy shop. He will stack 64 packages to form a shape that is a triangular prism, using eight packages in the bottom layer.

What is the volume of the display?



EXAMPLE 2: Solve a Problem Involving Cylinders — p. 270

A cylinder with a radius of 0.6 m and a height of 15 m, needs to be replaced with a cylinder of equal volume. However, the new cylinder has a radius of 0.5 m.

How high must the new cylinder be?

EXAMPLE 3. Solve a Problem involving Right Prisms and Cylinders — p. 271

Engineers Rob and Kyla have designed rectangular culverts to carry water under a new highway. They estimate that the distance under the highway is 45 m.

Determine the volume of concrete they need to make the required number of culvert pieces. Give your answer to the next highest tenth of cubic metre.

