ED 285 Fall 2017
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Lesson Plan Presentation #3
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CCSS.Math.Content.8.G.C.9

Common Core State Standards Math

Grade 8,Geometry

I. **Cluster:** Solve real-world and mathematical problems involving volume of cylinders, cones and spheres

Standard: Know the formulas for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Shapes Lesson Plan

II. Framework:

The ability to describe items is crucial and this lesson will explore some basic shapes that you will encounter on a daily basis. This lesson is targeted for eighth grade students to help them visualize and identify the use of shapes in everyday life.This can be an exploration of an art activity but is essential to math skills and learning geometry.

We will read about shapes and discuss the shapes and how they are essential in building and decorative applications.

The students will complete a practical experiment to calculate volume of water needed in aquaponics container.

This of interest with our own aquaponics garden here at Wahiawa Middle School where we can sample the results.

Sphere

Cube

Cone

Cylinder

Shapes Lesson Plan

III. Context and Motivation:
The teacher will bring the class to attention and display flash cards and discuss the various shapes to help the students to identify the main items of the shape patterns to be explored.
More in depth description and emphasis of the importance of shape recognition in our everyday life.
Explain and describe the shape project and identify importance of understanding shapes.
Identification of spatial skills helps with simple tasks as merging into traffic to complex image analysis of X-rays.

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IV. Teacher Modeling:
Visualization; help class to identify circle in sphere, triangle in cone, square in cube
The class including the teacher will explore with a circle, triangle, rectangle and square to use different shapes to draw our body. We will then color in our\shapes we made to draw a picture of
Following teacher and imitation of the procedure by the students offers encouragement and involv

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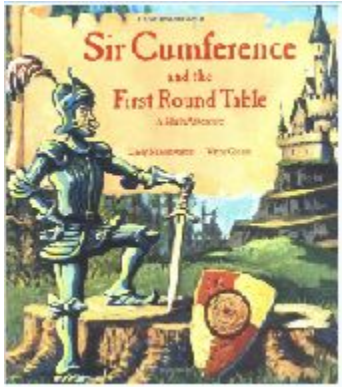
V. Guided Practice:
The teacher can read a story regarding shapes.
Stories of interest are of nonfiction to pursue teaching concepts.
This will encourage the students to think of the shapes in a different manner and how they in general discussions to better describe objects.



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VI. Independent Practice and Assessment:

The students will be presented with a worksheet that depicts each shape of a circle, rectangle triangle and square to help them to understand the shapes recently introduced.

Multiple ways of learning to teach subject areas to enhance the learning experience.

Challenges to be encountered is the limitation of some individuals not being able to discern shapes within the specified drawings and require more teacher intervention in explaining spatial geometric shapes.

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Closure:

A worksheet will be given to the students to take home and locate the various shapes they find at home.

They should describe the object and explain the use of the item in the home.

Exploration to find the various shapes at home of common items will strengthen the learning of a new subject.

Follow the link to view this Shapes Lesson Plan on You Tube:

Sphere

Cube

Cone

Cylinder

Shapes Lesson Plan

Materials:
Chart paper and plain lined sheets of paper, along with crayons and pencils to make the drawings of the shapes being explored.
Learning is expanded by reading about the shapes and learning what an object shape picture looks like but drawing the shapes enhances the learning experience.

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Time needed:15 minutes before the lesson, a 90-minute lesson (or split into two shorter lessons), and 15 minutes in a follow-up lesson review. Timings given are only approximate. Exact timings will depend on the needs of the class.

Similar timing to be used for more in depth examination of volume equations and practice.

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Cube

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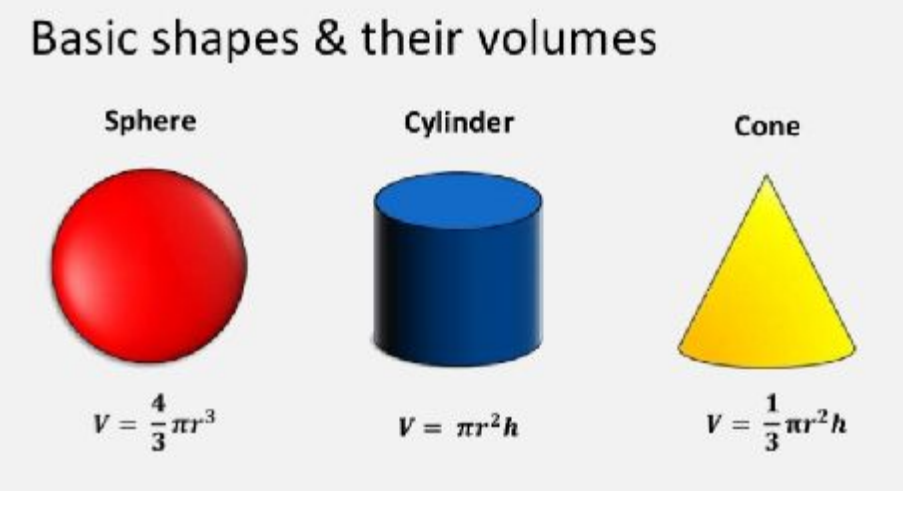
Shapes Lesson Plan

Future Study:
Real world applications of determination of volume of a sphere, cylinder and cone.
Example: surface

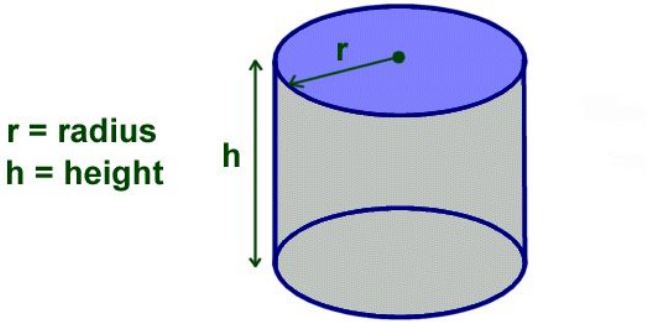


Shapes Lesson Plan - Volume of a Cylinder

Determine quantity of water needed for aquaponic container

What is a cylinder?

There are different kinds of cylinders. On this page we will be discussing the most simple form where the cylinder looks like a tube or a soup can with two circles at each end that are the same size and parallel.



Terms of a Cylinder

In order to calculate the surface area and volume of a cylinder we first need to understand a few terms:

Radius - The radius is the distance from the center to the edge of the circles at each end.

Pi - Pi is a special number used with circles. We will use an abbreviated version where Pi = 3.14. We also use the symbol π to refer to the number pi in formulas.

Height - The height or length of the cylinder.

Shapes Lesson Plan - Volume of a Cylinder

Determine quantity of water needed for aquaponic container

Surface Area of a Cylinder

The surface area of a cylinder is the surface area of both circles at each end plus the surface area o
the outside of the tube. There is a special formula used to figure this out.

$$\textbf{Surface area} = 2\pi r^2 + 2\pi rh$$

r = radius
h = height
π = 3.14

This is the same as saying (2 x 3.14 x radius x radius) + (2 x 3.14 x radius x height)

Example:

What is the surface area of a cylinder with radius 3 cm and height 5 cm?

Surface area = $2\pi r^2 + 2\pi rh$
= (2x3.14x3x3) + (2x3.14x3x5)
= 56.52 + 94.2
= 150.72 cm^2

Shapes Lesson Plan - Volume of a Cylinder

Determine quantity of water needed for aquaponic container

Volume of a Cylinder

There is special formula for finding the volume of a cylinder. The volume is how much space takes up the inside of a cylinder. The answer to a volume question is always in cubic units.

$$\textbf{Volume} = \pi r^2 h$$

This is the same as 3.14 x radius x radius x height

Example:

Find the volume of a cylinder with radius 3 cm and height 5 cm?

Volume = $\pi r^2 h$
= 3.14 x 3 x 3 x 5
= 141.3 cm^3

Shapes Lesson Plan - Volume of a Cylinder

Determine quantity of water needed for aquaponic container

Things to Remember

- Surface area of a cylinder = $2\pi r^2 + 2\pi rh$
- Volume of a cylinder = $\pi r^2 h$
- You need to know the radius and height to figure both the volume and surface area of a cylinder.
- Answers for volume problems should always be in cubic units.
- Answers for surface area problems should always be in square units.

Shapes Lesson Plan - Vegetable Garden

Growing cucumber in aquaponic container

Connecting results of water volume to use of calculations

Knowing shapes and practical use of knowledge

Start of growth

Root system in water

Shapes Lesson Plan

Domain	Cluster	Code	Common Core State Standard
Solve real world and mathematical problems for volume of cylinders, cones and spheres.		8.G.9	Know the formulas for volume of cones, cylinders and spheres and use to solve real world mathematical problems

Success!