

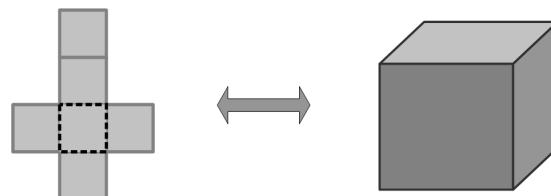
Handout #1

SS-IV3DS: Identifying and Visualizing 3D Shapes



Into

Talk About . . .



LESSON OBJECTIVE

When you complete this lesson, you will be able:

- To identify common 3D shapes from drawings.
- To visualize 3D shapes from flat 2D shapes through folding.
- To determine number of faces and edges on prisms.

• **1D, 2D, 3D.** For example: *1D is when you walk in a straight line, back and forth. 2D is like paper, a drawing -- you can move up and down and left and right. 3D is like the real*

world. You can go up and down, left or right, and forward or back.

• **We Already Know 2D Shapes.** For example: *We already know the names of 2D shapes, right? Like squares, rectangles, circles, and triangles. Today, we're going to learn the names and properties of a 3D shapes.*

• **Today We'll Look at 3D Shapes That Have A Volume.** For example: *3D shapes have a volume. Remember, 2D shapes -- like squares or triangles -- have an **area** and 1D shapes -- like a line -- have a length. Volume is a **measure of how much space something takes up.***

3D shapes have a volume:

true | false

We live in a 2D world:

true | false

REVIEW

Below, draw a square:

Below, draw a triangle:

Below, draw a line:



On the above shapes, label them as either '1D' or '2D'.



In your own words, define **area**:

Handout #1

SS-IV3DS: Identifying and Visualizing 3D Shapes

“” Definitions: Common 3D Shapes

Here are some very common 3D shapes along with their names and proprieties:

NOW YOU KNOW!

Unlike **two dimensional shapes** like squares and triangles, **three dimensional shapes** have a **volume**.

That is, they **take up three dimensional space**.

1D, 2D, 3D:

'1D' stands for one dimensional.

'2D' stands for two dimensional.

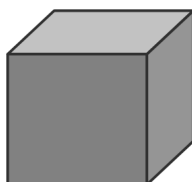
'3D' stands for three dimensional.

People use the shortcut '3D' all the time -- like when they say, "Hey, did you see that 3D movie yet?"



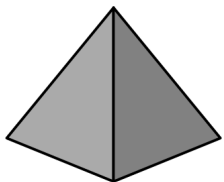
Box (Rectangular Solid). Must have **six sides**. Opposite sides are equal in area and perimeter.

Every angle is a right (90°) angle.



Cube. Must have **six sides**. All sides are equal in area and perimeter.

Every angle is a right (90°) angle.

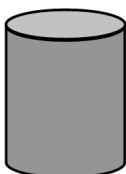


Pyramid. Pyramids can be **triangular** or **square** pyramids. On **triangular pyramids** there are four sides and all sides are triangles. On **square pyramids** there are five sides and the **bottom or base** is a square and all other sides are triangles.



Cone. Must have two continuous surfaces.

The bottom is a flat circle.



Cylinder. Must have three continuous surfaces.

The bottom and the top are flat circles. The middle is a tube.



Sphere. Has only one continuous surface and forms a perfectly symmetric ball.

Every point is **equal distance** from the center.

Handout #1

SS-IV3DS: Identifying and Visualizing 3D Shapes

Investigate: Folding 2D into 3D Shapes

DIRECTIONS

Attached to this handout are some **three dimensional shape cutouts**. Take them and cut them out along the dotted lines.

With your tutor, fold the flat shapes into **three dimensional shapes**. Use them to answer the questions to the right.

Shape Letter	Three Dimensional Name of Shape
A	
B	
C	
D	
E	
F	

- Q1** What separates a **triangular pyramid** from a **square pyramid**?
- Q2** What separates a **cone** from a **square pyramid**?
- Q3** Is a **cube** also a **box (rectangular solid)**?
- Q4** There was no **sphere** shape. Why do you think that was?
- Q5** Put your shapes away. Now draw a cube **spread out flat on a piece of paper** (like the one you folded):
- Q6** Now draw a square pyramid **spread out flat on a piece of paper** (like the one you folded):

Handout #1

SS-IV3DS: Identifying and Visualizing 3D Shapes

Definitions: Faces and Edges

DIRECTIONS

3D shapes have **faces** and **edges**. Use drawings or grab the cutouts from the last section and fill out the table to the right.

Shape Type	Faces	Edges
Cube		
Square Pyramid		
Rectangular Box		
Triangular Pyramid		

Say It

In your own words, talk about the difference between 2D and 3D?



Do 3D shapes have an **area** or a **volume**? Explain the difference between area and volume in your own words:



Closure

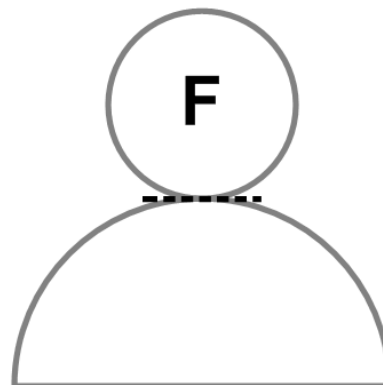
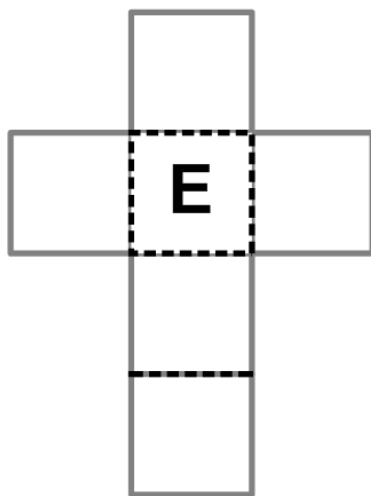
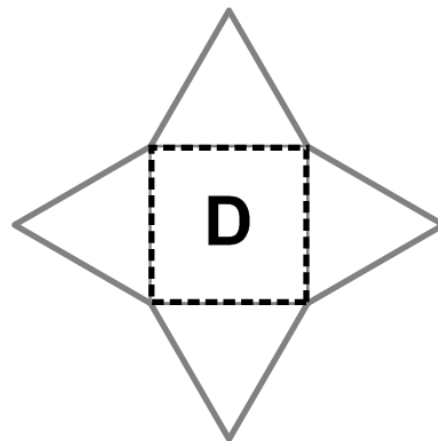
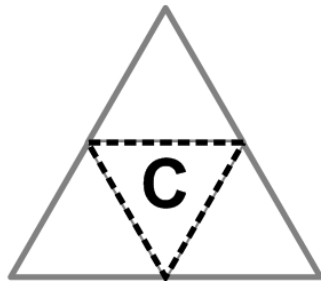
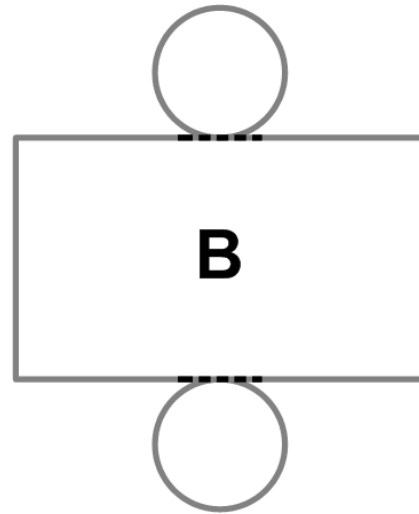
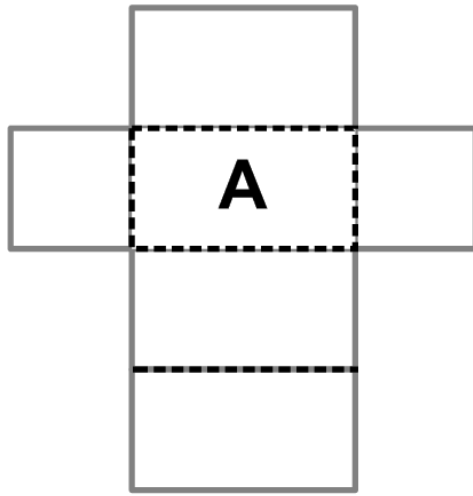
Today, we learned about some 3D shapes and worked on visualizing them from a folded piece of paper.



Which shape do you find the hardest to remember?

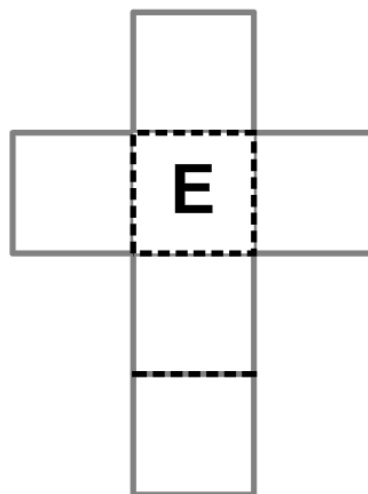
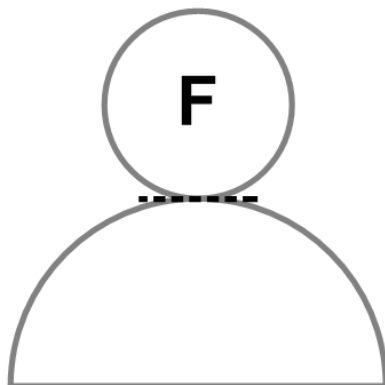
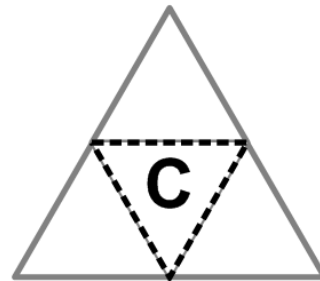
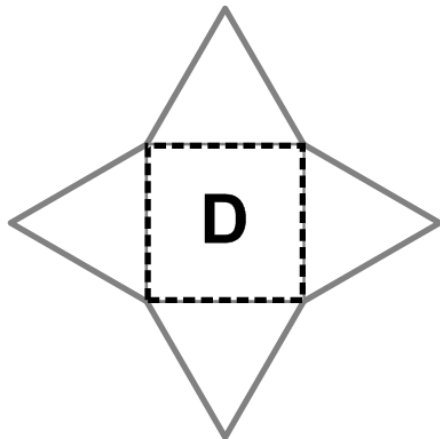
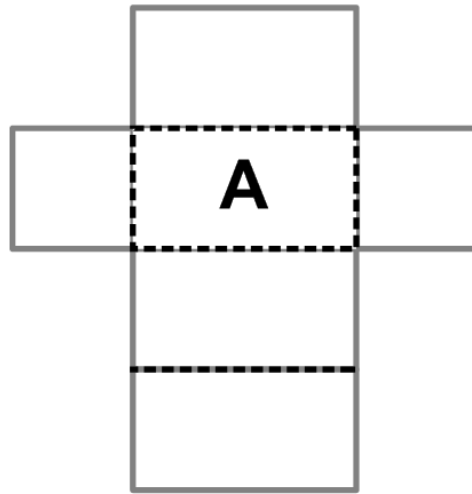
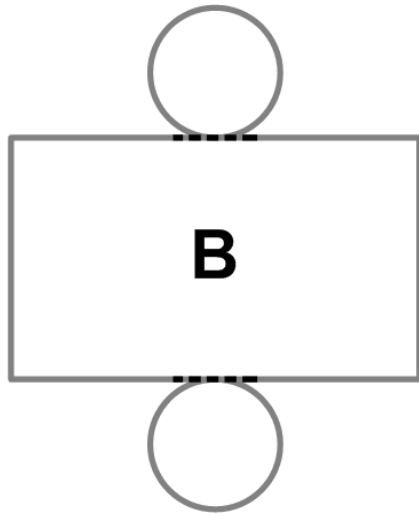
Cutout #1

SS-IV3DS: Identifying and Visualizing 3D Shapes



Cutout #1

SS-IV3DS: Identifying and Visualizing 3D Shapes



Worksheet #1

SS-IV3DS: Identifying and Visualizing 3D Shapes

? Questions

You run into shapes all the time.

Like a basketball. What's a basketball?



Basketball

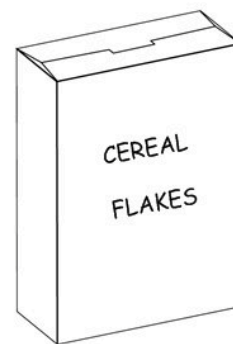
Well, it's a **sphere**.

Let's see if you can put a **shape name** on these **three dimensional figures** you run into in real life:



Ice Cream

Shape:



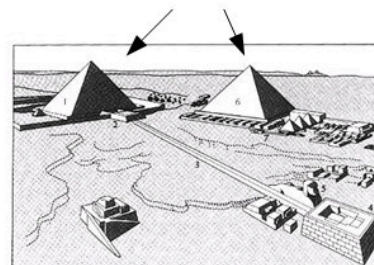
Cereal

Shape:



Pop Can

Shape:



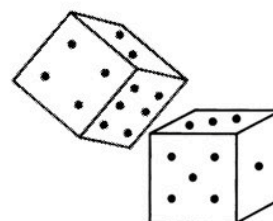
Egypt

Shape:



Earth

Shape:



Dice

Shape:

Worksheet #1

SS-IV3DS: Identifying and Visualizing 3D Shapes

? Questions

You run into shapes all the time.

Like a basketball. What's a basketball?



Basketball

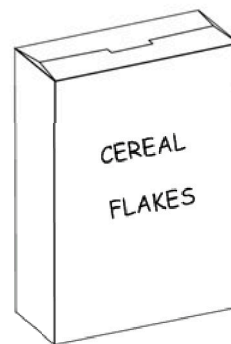
Well, it's a **sphere**.

Let's see if you can put a **shape name** on these **three dimensional figures** you run into in real life:



Ice Cream

Shape: **Cone**



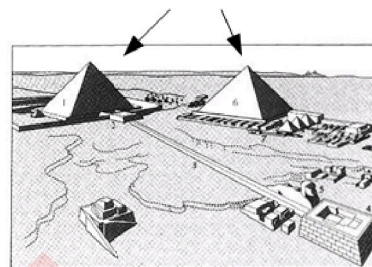
Cereal

Shape: **Box**



Pop Can

Shape: **Cylinder**



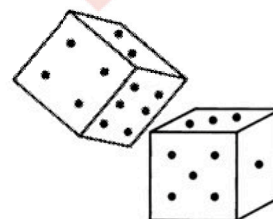
Egypt

Shape: **Pyramid**



Earth

Shape: **Sphere**



Dice

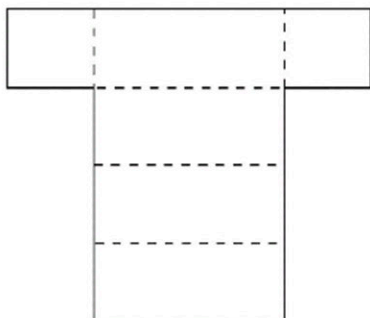
Shape: **Cube**

Worksheet #2

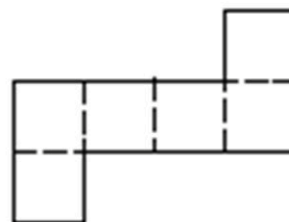
SS-IV3DS: Identifying and Visualizing 3D Shapes

? Questions

- Q1** In your head, fold the figures along the dotted lines. Then fill in the shape names for each figure:



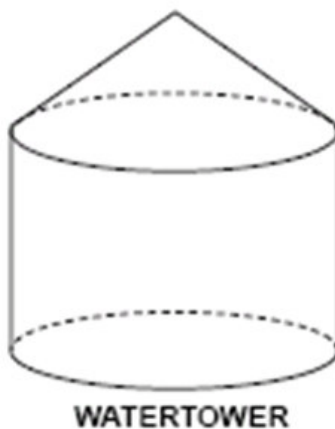
Shape:



Shape:

□

- Q2** What shapes are represented in this drawing of a water tower?



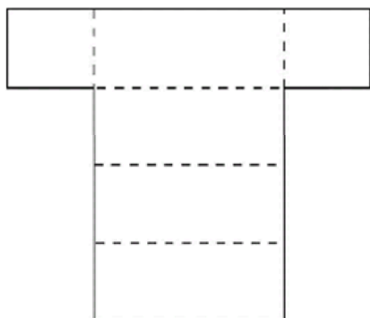
- A. pyramid and cone
- B. rectangular solid and triangle
- C. parallelogram and pyramid
- D. cylinder and cone

Worksheet #2

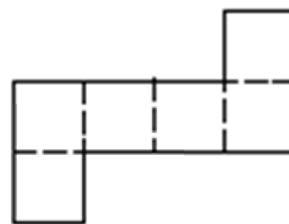
SS-IV3DS: Identifying and Visualizing 3D Shapes

? Questions

- Q1** In your head, fold the figures along the dotted lines. Then fill in the shape names for each figure:

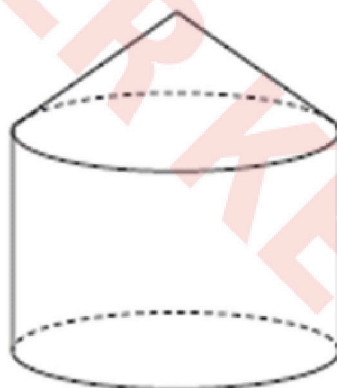


Shape: *Box*



Shape: *Cube*

- Q2** What shapes are represented in this drawing of a water tower?



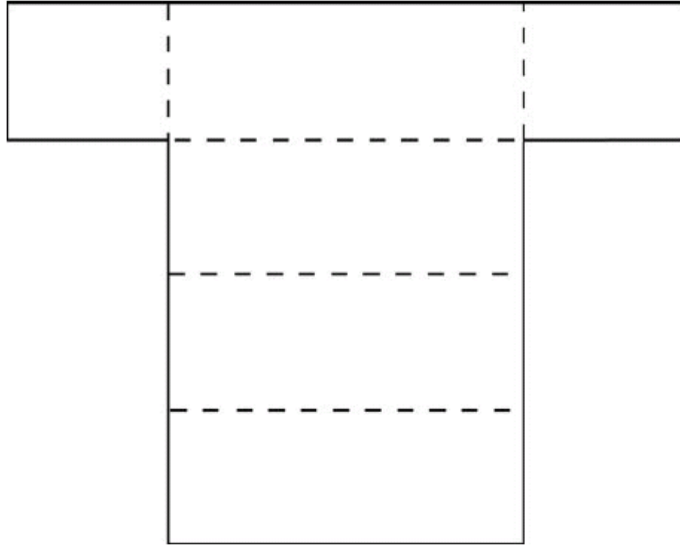
WATERTOWER

- A. pyramid and cone
- B. rectangular solid and triangle
- C. parallelogram and pyramid
- D. *cylinder and cone ✓*

Quiz #1

SS-IV3DS: Identifying and Visualizing 3D Shapes

Q1



Let's say you folded up the piece of cutout paper shown above. Which 3D shape would it make?

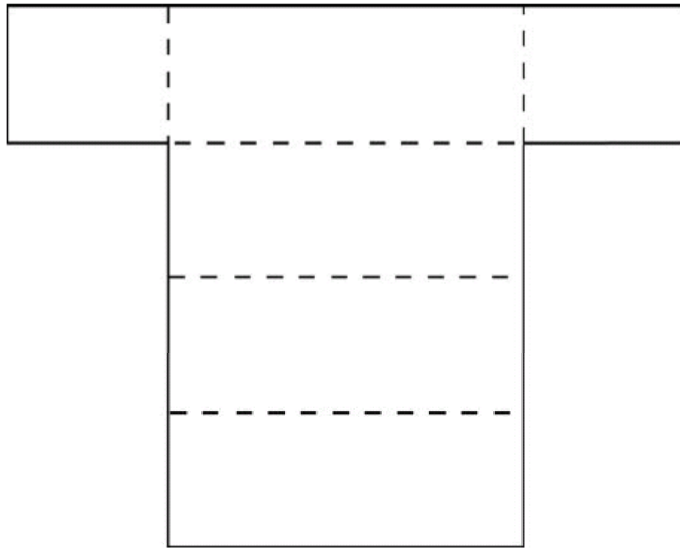
- A. Cylinder
- B. Cube
- C. Square Pyramid
- D. Rectangular Box

Q2 Draw a cube below:

Quiz #1

SS-IV3DS: Identifying and Visualizing 3D Shapes

Q1



Let's say you folded up the piece of cutout paper shown above. Which 3D shape would it make?

- A. Cylinder
- B. Cube
- C. Square Pyramid
- D. **Rectangular Box** ✓

Q2 Draw a cube below:

