



WINTER | Water Ice Cubes: Three Dimensional Shapes

Summary:

Our world is full of two and three-dimensional shapes. In winter, water that is two-dimensional is in its liquid state turns into a three-dimensional shape—ice! Our garden is also full of two and three-dimensional shapes—let's see what we can find.

Before Visiting the Garden:

Gather: Warm clothing, an ice cube, notebook, pencil, and a ruler.

Explore: *Isometric Projection #13*, ink and pencil drawing on paper 1981 by Sol LeWitt. This drawing is a bit of an optical illusion—is it 2D or 3D?

Read: *Mouse Shapes* by Ellen Stoll Walsh

In the Garden:

Two-dimensional shapes have two measurements, length and width. One example of a two-dimensional object is a piece of paper. Cold temperatures give us a prime example of a three-dimensional shape—an ice cube. With three-dimensional shapes we can measure length, width, and height. Water is pretty shifty, as in shape shifty! It can be a 2D puddle in spring and a 3D ice cube in winter.

Questions to Explore:

- What shapes do you see in the garden?
- Do any of the shapes you see look different in the winter than they did in the summer?
- Can you describe something that is two-dimensional?
- Can you describe something that is three-dimensional?

Activity:

1. We're going to do a shape hunt so grab your notebook, pencil and ruler.
2. In your notebook, begin to sketch the shapes you see. Help your gardener identify the shapes, as some may be more complex. For instance, is a formerly rectangular garden bed now a half sphere of snow?
3. Next grab your ruler and begin to measure the shapes.
4. In your notebook record which shapes have a height and length measurement versus which shapes have a length, width, and height.
5. Count up the number of 2D and 3D shapes you found. Which type of shape did you find more of in the garden?

Beyond the Garden | Testing the strength of 2D and 3D shapes

Experiment with some engineering principles using objects you find around the house. Begin by assembling your materials: paper, tape, a quarter and scissors. Use these materials to begin constructing a structure that will support the weight of a quarter. Using paper in its 2D form, try taping together individual sheets into a square. Will that hold the quarter's weight? Next, try changing the paper into 3D shapes by rolling or folding it. What can you create? Which shape was the strongest? Up the ante and add more weight with additional quarters or a by balancing a fork!

Continue Exploring | Supporting Materials

Shape Games: <http://pbskids.org/games/shapes/>