

Solids

Our world is made up of lots of shapes. We will look at solids such as prisms, cubes, cones, spheres, pyramids, and cylinders. We can create 3-D shapes by folding paper. We will use some nets to help create the shapes we are studying.

When working with 3-D shapes we can find the volume of the shapes. The volume is the capacity that the shape can hold. It is measured in cubic units. We can also find the surface area of the shape. The surface area is the total area of all the faces on the shape. Surface area is measured in square units.

Isometric dot paper is used to draw three-dimensional shapes. Click [here](#) to print out a sheet and try to draw some of the shapes that we are studying in this unit. Make sure the line segments end on two dots.

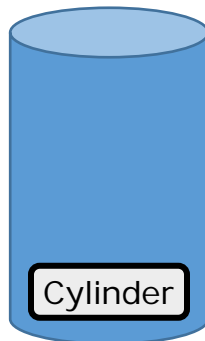
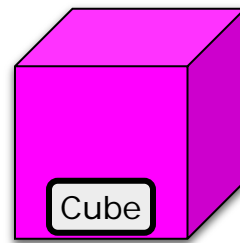
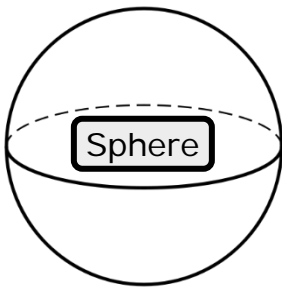
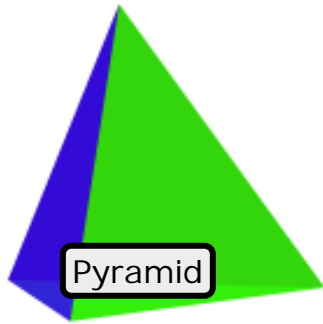
3-Dimensional Shapes

Rectangular Prism Net

Volume and Surface Area

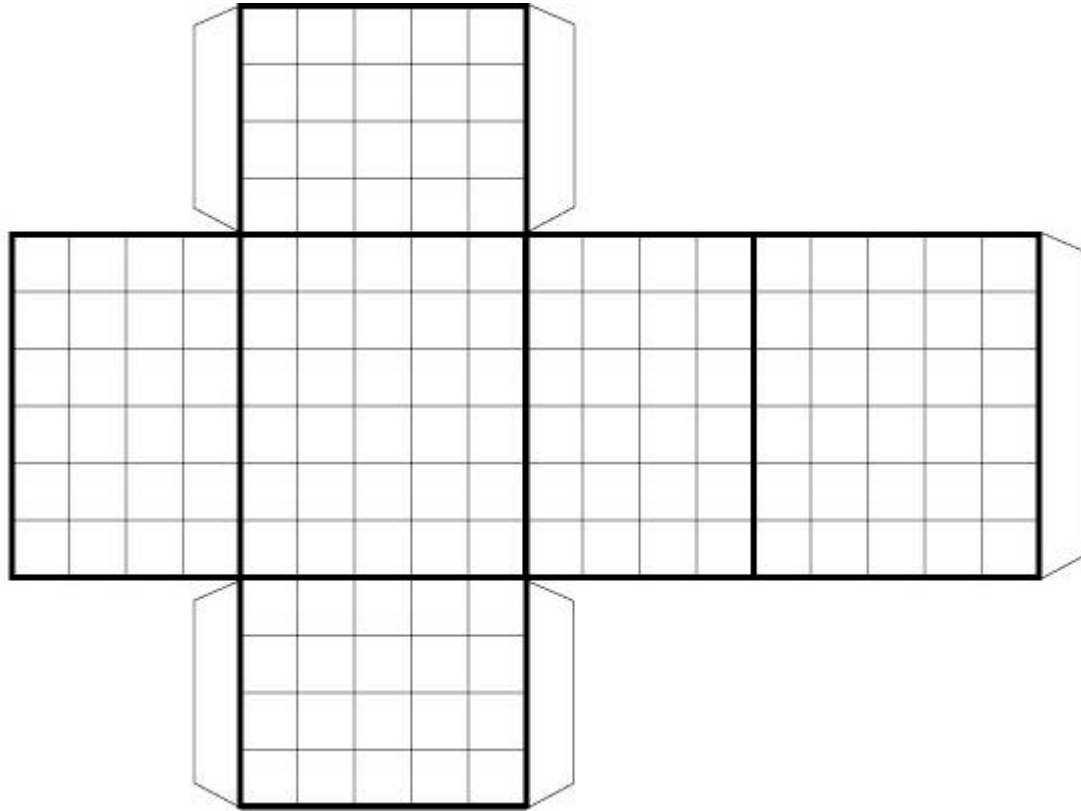
Isometric Dot Paper

3-Dimensional Shapes

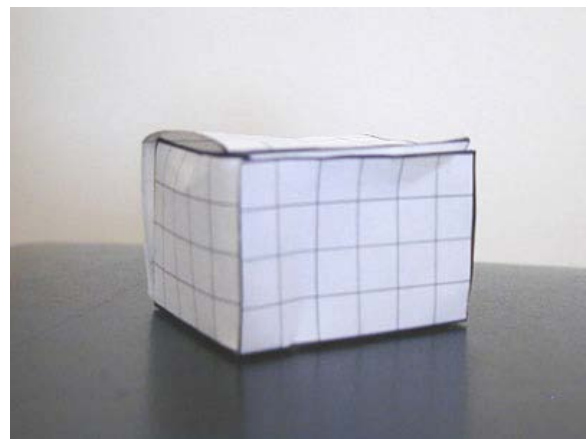
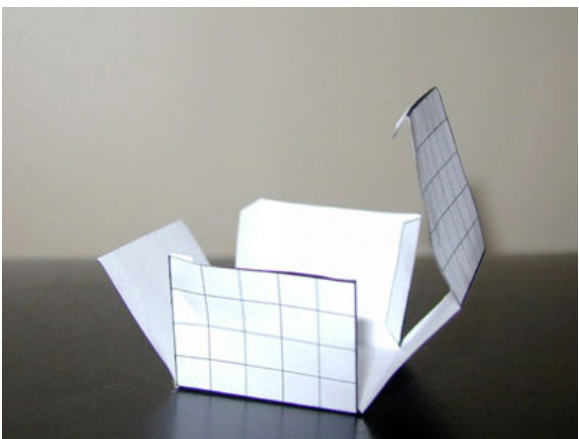


Rectangular Prism Net

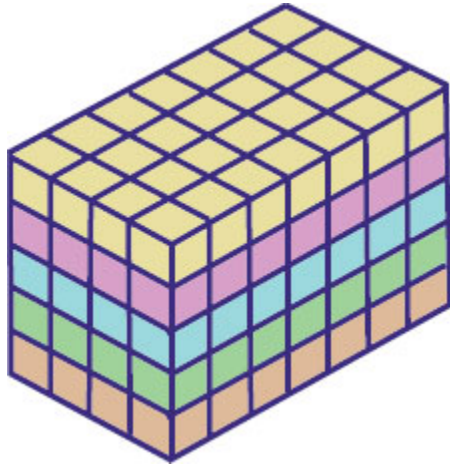
First predict what shape will result from folding the Net, then cut out this net and construct a 3-D shape. Fold it along the dark edges. Use small pieces of tape on the flaps to hold the sides together. What shape does it make?



This net creates a rectangular prism.



Volume and Surface Area



This rectangular prism is made of many cubes. When we figure the total number of cubes in the prism, we have its volume. Thus, the **volume** is measured in **cubic units**.

To figure the number of cubes in this prism, look across the top of the prism. There are 28 yellow cubes (4×7). Then looking at the different colored stacks, there are five slices of cubes, 28 yellow, 28 purple, 28 blue, 28 green, and 28 orange. Thus, there are 28×5 cubes in all which makes 140 cubes.

The **volume** of this prism is $4 \times 7 \times 5 = 140$ **cubic units**.

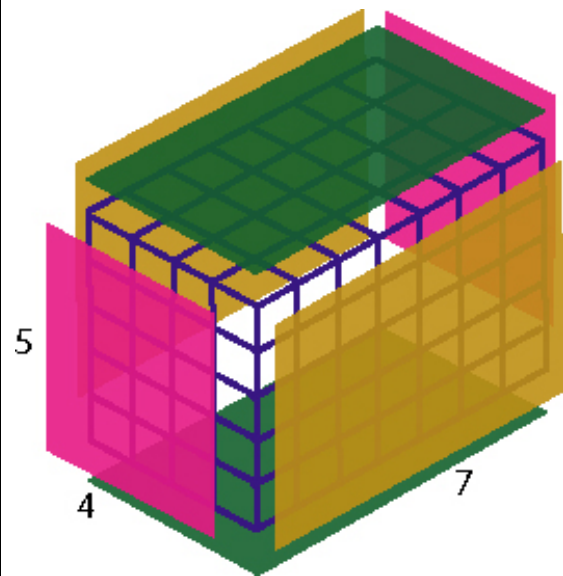
To figure the **coverage** of the **faces** of each side of the prism, we measure area which is measured in **square units**.

The pink face's area would be 4×5 or 20 square units. There is another face hidden on the opposite side of the pink face that also has an area of 20 square units.

The gold face would have an area of 7×5 (the box is 5 units tall) or 35 square units. There is another hidden face on the opposite side of the gold face that also has an area of 35 square units.

The area of the top would be 7 by 4 or 28 square units. The bottom which is hidden would also have an area of 28 square units.

If you were going to **cover the box** with paper you would need to know the **total of all the areas** which would be $(2 \times 20) + (2 \times 35) + (2 \times 28) = 166$ **square units** which is called the **surface area** of the prism.



Isometric Dot Paper

