Unit 5
3D Geometry


2D vs. 3D

2D: A two-dimensional (2D) object is an object that only has two **dimensions**, such as a length and a width, but no thickness.

3D: A **three-dimensional (3D) object** is an object with three dimensions: a length, a width, and a height. You can hold 3D objects in your hand and you can turn them around. This is what makes a piece of paper a three-dimensional object. It has a thickness, even if that thickness is very small.
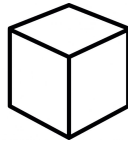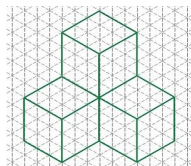

Isometric Drawings

An isometric drawing is a pictorial representation of an object in which all three dimensions are drawn at full scale rather than foreshortening them to the true projection.

Isometric lines are angled by 30° and for ease are often completed on isometric paper.

Fun Fact

Isometric projection and drawings are used to create many video game maps.

Using an isometric projection allows the player to see the entire world.

Isometric Drawings

Isometric drawings are often used by engineers and developers.

Since isometric drawings are drawn to scale it is important to know exactly what is contained in each drawing. Therefore, counting or measuring the contents of the drawing is often necessary.
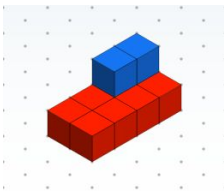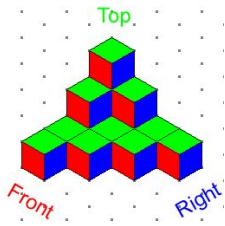

How many cubes are contained in the drawing?

How many cubes are contained in the drawing?

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How many cubes are contained in the drawing?

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Try replicating

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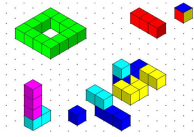## Try replicating

Top.

Front   Right.
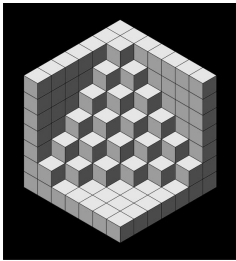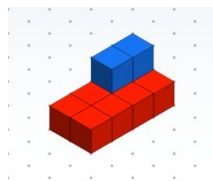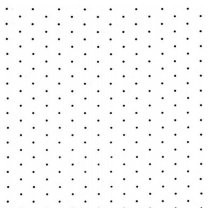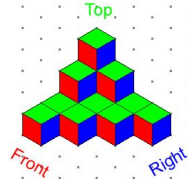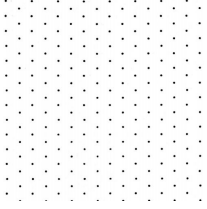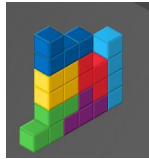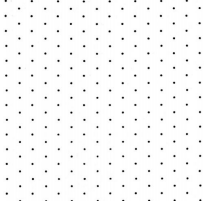
Try replicating

Try replicating
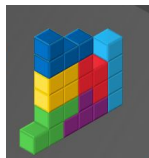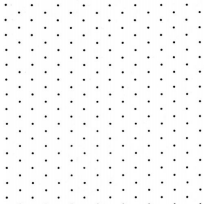
Practice building your own

Design your own isometric pictures!

You can use:

- Isometric dot paper
- Lined Paper

   or

- iPad/Cell Phone

For online isometric drawing go to:
https://bit.ly/1Bxji1O

*If you finish early, come talk to me.

Review - Replicate the isometric drawing
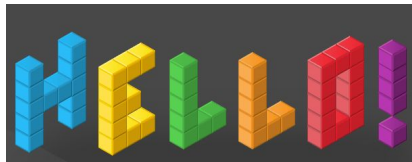
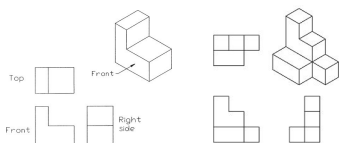## Views of 3D objects

3 ways to look at a 3D object:

1. Top

2. Front

3. Side

Views of 3D objects

Build it:

On a whiteboard:

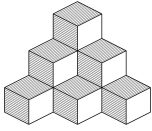Draw the top, front and side view.

Don't show anyone until I ask for it.

Views of 3D objects

Build it:

On a whiteboard:

Draw the top, front and side view.

Don't show anyone until I ask for it.
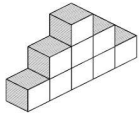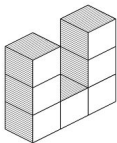

Views of 3D objects

Build it:

On a whiteboard:

Draw the top, front and side view.

Don't show anyone until I ask for it.

Orthographic Drawings

An orthographic drawing represents a three-dimensional object using several two-dimensional views of the object. It is also known as an orthographic projection.

Orthographic drawings are 2D images and include a; top view, front view and side view.
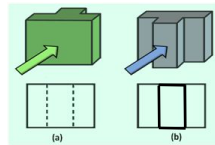

3D Representation   2D Orthographic Projection
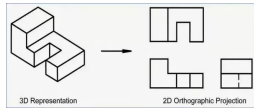
Orthographic Drawings

In orthographic drawing, different types of lines are used to represent hidden objects and objects that are close.

A bold line is used to represent objects that are closer.

A dashed line is used to represent hidden lines.

(a)   (b)
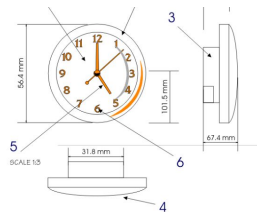
Fun fact!

Orthographic drawings are often drawn with measurements. This allows engineers to show exactly what is needed.

This is called a working drawing.

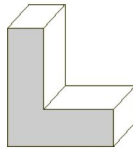Draw the front view of this structure

Draw the side view of this structure
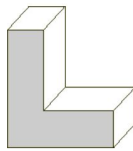
Draw the top view of this structure

Draw the front view of this structure

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Draw the side view of this structure

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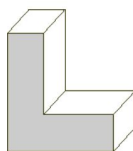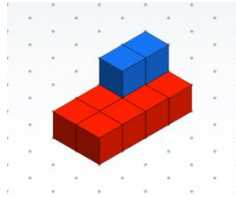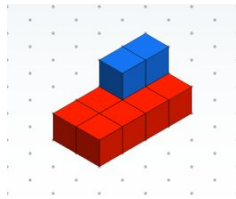
Draw the top view of this structure

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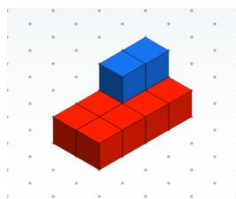
Draw the front, top, and side view of this structure

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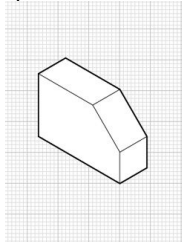
Practice!

Pages 450 - 451 Questions # 1, 6, 8

Page 457 Questions 5, 6

Page 459 Questions 1, 3, 4

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Games

http://www.teacherled.com/iresources/shapesapp/isometricdots/isometricdots.html

https://www.coolmathgames.com/0-b-cubed

https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Isometric-Drawing-Tool/

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