Station 1 - Points

Definition	**Points** are locations in space with no dimension represented by a dot.	
How to label	**Points** are labeled using a single, capital letter. It is important to use a capital letter because lowercase letters are used for labeling **lines**.	P
Diagram	P	
HW Problems & Examples	**Points** are relatively easy and used in almost everything else we do. Almost every homework problem we do will use **points** in some way.	
Extra Information	You have already plotted points on a number and on a 2-dimensions coordinate graph. Eventually, we will start plotting points in 3-dimensions!	

Station 2 - Segments

Definition	A **segment** is section of a line consisting of two **points** (called *endpoints*) and all the **points** between them on the **line**.	
How to label	**Segments** are labelled using the two endpoints and a bar drawn above them. Since neither *endpoint* is more important than the other, the order you list them does not matter. The two segments to the right are actually the same segment!	$\overline{AB}$ $\overline{BA}$
Diagram	A B	
HW Problems & Examples	1.1 #12	
Important Information	**Segments** are also called known as **Line Segments** since they are part of a line.	

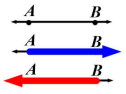
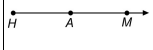
Station 3 - Lines

Definition	**Lines** are straight paths with no thickness extending forever in ***opposite*** directions.	
How to label	**Lines** are labeled by choosing any ***TWO* points** on the line with a double-sided arrow on top. You may also label a **line** using a single, lowercase letter. In the diagram below, you can label it line *m*.	All the **seven** of the following are correct ways to label the line below: $\overleftrightarrow{AB}$ $\overleftrightarrow{AG}$ $\overleftrightarrow{GB}$ $\overleftrightarrow{BA}$ $\overleftrightarrow{GA}$ $\overleftrightarrow{BG}$ Line m
Diagram	m A G B	
HW Problems & Examples	1.1 #4,7	
Extra Information	**Lines** extend forever in opposite directions, and thus have no length. Only **two points** are needed to label a **line**. You **never** use three or more **points** to label a **line**. For example, an ***incorrect*** way to label the line above would be: $\overleftrightarrow{AGB}$ 	

Station 4 - Planes

Definition	**Planes** are flat surfaces with no thickness, extending forever in all directions on that surface.	
How to label	**Planes** are labeled in one of two ways. The first is by writing the word **plane** and listing any 3 **points** in that **plane** that do NOT lie on the same **line**. The second way is by using an uppercase script letter, similar to a fancy font.	In the diagram below, you can label the plane either: Plane ABC or Plane $\mathcal{R}$
Diagram	$\mathcal{R}$ B A C	
HW Problems & Examples	1.1 #6,8,34,55(b and c)	
Extra Information	A **plane** is a 2-dimensional sheet, but can be drawn in 3-dimenstional space. This means it can be challenging to draw, as shown in the diagram above. There are multiple other ways to label the plane above. Here are a few examples: Plane ACB Plane BAC Plane CAB	

Station 5 - Rays

Definition	**Rays** are a part of a **line** that starts at one **point** (called the *endpoint*) and extends forever in one direction.	
How to label	**Rays** are labeled using two **points**, the first being the *endpoint* and the second being any **point** on the **ray** in the direction it extends. ***Important:*** The arrow on top of the two letters always points right, regardless of what direction the **ray** actually extends.	$\overrightarrow{AB}$ $\overrightarrow{BA}$
Diagram	In the diagram to the right; • The top is: $\overrightarrow{AB}$ • The middle is: $\overrightarrow{AB}$ • The bottom is: $\overrightarrow{BA}$	
HW Problems & Examples	1.1 #14	
Extra Information	If a **ray** contains more than 2 **points**, you can label it in multiple ways. The key is making sure the first letter is always the *endpoint*. For example, the **ray** to the right could be called $\overrightarrow{HA}$ or $\overrightarrow{HM}$.	

Station 6 – Opposite Rays

Definition	**Opposite Rays** are two rays that (1) start at the same endpoint and (2) extend in opposite directions.	
How to label	**Opposite rays** are simply **rays**, so the way we label them is the same.	In the diagram below, since they share a common endpoint and extend in opposite directions, the only pair of opposite rays are: $\overrightarrow{ED}$ $\overrightarrow{EF}$
Diagram	D E F	
HW Problems & Examples	1.1 #15,50	
Extra Information	The keys to being **opposite rays**: 1. They must start at the same endpoint, in this example point E 2. They must extend in opposite directions, in this example one extends left and one extends right. When **opposite rays** are put together, they form a **line**!	