DO NOW:

Please complete the following slope problems quickly and quietly.

Are these lines parallel?

Are these lines perpendicular?

Points, Lines, & Planes
Our 1st Foldable!!!

1. Get a half piece of construction paper.
2. Make a hot dog fold, then a burrito fold.
3. Cut along the middle folds (dotted lines).
4. On the top inside of each flap, write a description of each, or how you might identify it.

Undefined Terms

**Point** A point has no dimension. It is represented by a dot.

**Line** A line has one dimension. It is represented by a line with two arrowheads, but it extends without end.

Through any two points, there is exactly one line. You can use any two points on a line to name it.

**Plane** A plane has two dimensions. It is represented by a shape that looks like a floor or a wall, but it extends without end.

Through any three points not on the same line, there is exactly one plane. You can use three points that are not all on the same line to name a plane.
Collinear & Coplanar

Collinear Points - Points that lie on the same line.

Coplanar Points - Points that lie in the same plane.

Let's Try an Example

a. Give two other names for $\overrightarrow{PQ}$ and for plane $R$.

b. Name three points that are collinear. Name four points that are coplanar.
Segments & Rays

Line $AB$ (written as $\overrightarrow{AB}$) and points $A$ and $B$ are used here to define the terms below.

**Segment** The **line segment** $AB$, or **segment** $\overrightarrow{AB}$, (written as $\overrightarrow{AB}$) consists of the **endpoints** $A$ and $B$ and all points on $\overrightarrow{AB}$ that are between $A$ and $B$. Note that $\overrightarrow{AB}$ can also be named $\overrightarrow{BA}$.

**Ray** The **ray** $\overrightarrow{AB}$ (written as $\overrightarrow{AB}$) consists of the endpoint $A$ and all points on $\overrightarrow{AB}$ that lie on the same side of $A$ as $B$.

Note that $\overrightarrow{AB}$ and $\overrightarrow{BA}$ are different rays.

If point $C$ lies on $\overrightarrow{AB}$ between $A$ and $B$, then $\overrightarrow{CA}$ and $\overrightarrow{CB}$ are **opposite rays**.
Try this Example!!

a. Give another name for $GH$.

b. Name all rays with endpoint $J$. Which of these rays are opposite rays?

Intersections

The intersection of two different lines is a point.

The intersection of two different planes is a line.
Use a Piece of Paper & a Pen to Illustrate the Following!!

a. Sketch a plane and a line that is in the plane.
b. Sketch a plane and a line that does not intersect the plane.
c. Sketch a plane and a line that intersects the plane at a point.

Class/Homework

Use the diagram to decide whether the given statement is true or false.

1. Points H, I, and G are collinear.
2. Points H, I, and J are coplanar.
3. \( \overline{EG} \) and \( \overline{FG} \) are opposite rays.
4. All points on \( \overline{CH} \) and \( \overline{GF} \) are coplanar.
5. The intersection of \( \overline{EF} \) and plane \( JK \) is \( \overline{HI} \).
6. The intersection of \( \overline{EF}, \overline{HI}, \) and \( \overline{GH} \) is point G.
7. The intersection of plane \( EGH \) and plane \( JGI \) is point G.
8. The intersection of plane \( EFJ \) and plane \( JKG \) is \( \overline{HI} \).

Sketch the figure described.

9. Two rays that do not intersect
10. Three planes that intersect in one line

11. Three lines that intersect in three points
12. A ray that intersects a plane in one point

In Exercises 13–15, use the diagram.

13. Name 12 different rays.
14. Name 2 pairs of opposite rays.
15. Name 3 lines that intersect at point C.

16. Draw four noncollinear points \( A, B, C, \) and \( D \). Then sketch \( \overline{AB}, \overline{BC}, \) and \( \overline{AD} \).
17. Sketch plane \( M \) intersecting plane \( N \). Then sketch plane \( O \) so that it intersects plane \( N \), but not plane \( M \).