



Name: _____ Date: _____

Student Exploration: Parallel, Intersecting, and Skew Lines

Vocabulary: intersecting lines, line, parallel lines, plane, point, skew lines

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

1. A **point** is a specific location in space. A **line** is a straight path that extends forever in both directions. Line AB (\overleftrightarrow{AB}) shown to the right contains points A and B.



How many other points do you think \overleftrightarrow{AB} contains? _____ Why? _____

2. A **plane** is a flat surface that extends forever in all directions. How many lines do you think a plane contains? _____ Why? _____

Gizmo Warm-up

In the *Parallel, Intersecting, and Skew Lines* Gizmo, you will explore relationships between lines in the same plane and between lines in different planes.

With **One line** selected from the dropdown menu, click on the plane to stop its rotation.



1. Click **New line** several times. How many different lines can be generated that all lie in this plane? _____
2. Click **New plane** a few times. How many different planes can be generated that contain this line? _____
3. A plane is “defined” if only one plane can be generated. Does one line define a plane? _____
Why? _____



Activity: Relationships between two lines	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> • Select Intersecting lines. 	
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- Click on **New lines** several times. Drag the plane around as needed to view the lines.
 - The lines **intersect**. How many points do the lines have in common? _____
 - Click **New plane** a few times. Does the plane change? _____
 - In your own words, describe intersecting lines. _____

- Click **New example** several times. For each new example, click **New plane**.
 - Is it possible for more than one plane to contain a pair of intersecting lines? _____
Explain. _____
 - Does a pair of intersecting lines define a plane? _____ Explain. _____

- Select **Parallel lines**. Drag the plane until it appears to be nearly flat. Then click **New lines** several times, dragging the plane each time.
 - The lines are **parallel**. How many points do parallel lines have in common? _____
 - Click **New plane** a few times. Does the plane change? _____
 - In your own words, describe parallel lines. _____

- Click **New example** several times. For each new example, click **New plane**.
 - Is it possible for more than one plane to contain a pair of parallel lines? _____
Explain. _____
 - Does a pair of parallel lines define a plane? _____ Explain. _____

Activity (continued from previous page)



Activity (continued from previous page)

5. Select **Skew lines**. Drag the plane around to see different views. Then click **New line** several times, dragging the plane each time.

A. The two lines shown each time are **skew**. Do skew lines ever intersect? _____

B. Click **New plane** a few times. How many of the lines lie in the new plane? _____

C. In your own words, describe skew lines. _____

6. Click **New example** several times. For each new example, click **New plane**.

A. Are skew lines ever in the same plane? _____

B. Does a pair of skew lines define a plane? _____ Explain. _____

7. Neither parallel lines nor skew lines ever intersect. What are the differences between parallel lines and skew lines? _____

8. Can two lines that lie in the same plane be anything but intersecting or parallel? _____

Explain. _____

9. The figure below contains several different pairs of intersecting, parallel, and skew lines.

A. Name three different pairs of intersecting lines.

B. Name three different pairs of parallel lines.

C. Name three different pairs of skew lines.

