Helping With Math

Understanding Points and Lines

GRADE 4

Points and lines play an important role in our daily lives because they are present in everything that surrounds us. Starting from the things that made up the outside world, up to the things that we use everyday at home.

Come and let's explore the beauty of the places in the world!

Help Mr. Jones count how many location points are needed to be visited in the world. Given that, he is also interested in finding how many routes can he make to be in all locations. Can you do that for him?

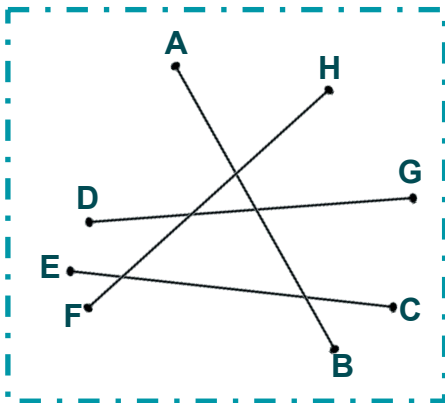# POINTS AND LINES

A *(Point A)*   **B** *(Point B)*

A point is an exact location. It has no size, only position. They are illustrated as dots so you can see them, but a point really has no size at all!

Points usually have a name, often a letter like "A", or even "B"

A ————————— *(Line AB or $\overline{AB}$)* ————————— **B**

In geometry, a line is defined as a group of two or more points. It is a straight line with no bends. Line has no thickness and it extends infinitely in both directions.

We can name lines using two uppercase letters like line AB, line CE, etc.

Ray   line   Line segment

We all love our family, right?
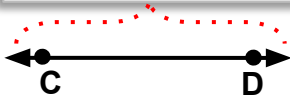Like us, a line has its own family and they are called as **subsets of line**.

Now, I will introduce them to you!

SUBSETS OF A LINE

LINE

- It extends infinitely to opposite directions.
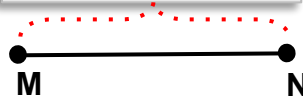
- It has two arrowheads on opposite ends.

two arrowheads

C   **D**

LINE SEGMENT

- It has no endpoints.

- It has definite length

- It is usually used to indicate measurement such as length, width, height and distance.

two endpoints

M   **N**

RAY

- It has one endpoint and an arrowhead on the other end.

- It is usually used to represent an action from a starting position towards another.

one arrowhead

X   **Y**

one endpoint

We use different symbols to name a line, line segment and ray. These symbols are drawn above the two letters that represents points on each subset of line.

$$\overleftrightarrow{CD}$$
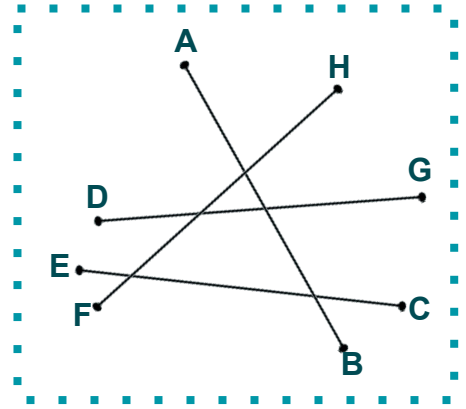
$$\overline{MN}$$

$$\overrightarrow{XY}$$

How many points are in there?	
How many lines are in there?	

A
H
G
D
E
F
C
B

Can you name all the points?	
Can you name all the lines?	

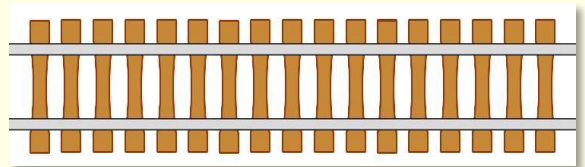Can you tell me whether the given object represents a point or a line? Encircle your answer.

Ray of Light *(example)*

POINT

(LINE)

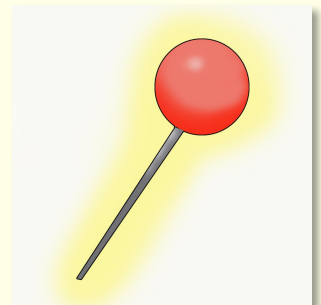**Rail Road**

POINT   LINE

Moon in the Sky

POINT

LINE

Head of the Pin

POINT

LINE

TABLE OF ACTIVITIES

THE NAVIGATOR'S VOICE

Have you heard what does the navigator say? Which of them are TRUE? Which are FALSE?

A point has no dimension but it can determine a location.

1.

A point can be named. We can use a number to name a point.

2.

Lines are straight images. However, it cannot extend to both directions.
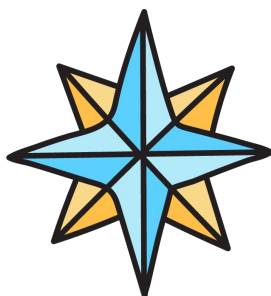
3.

A line has two arrowheads on two opposite ends.

4.

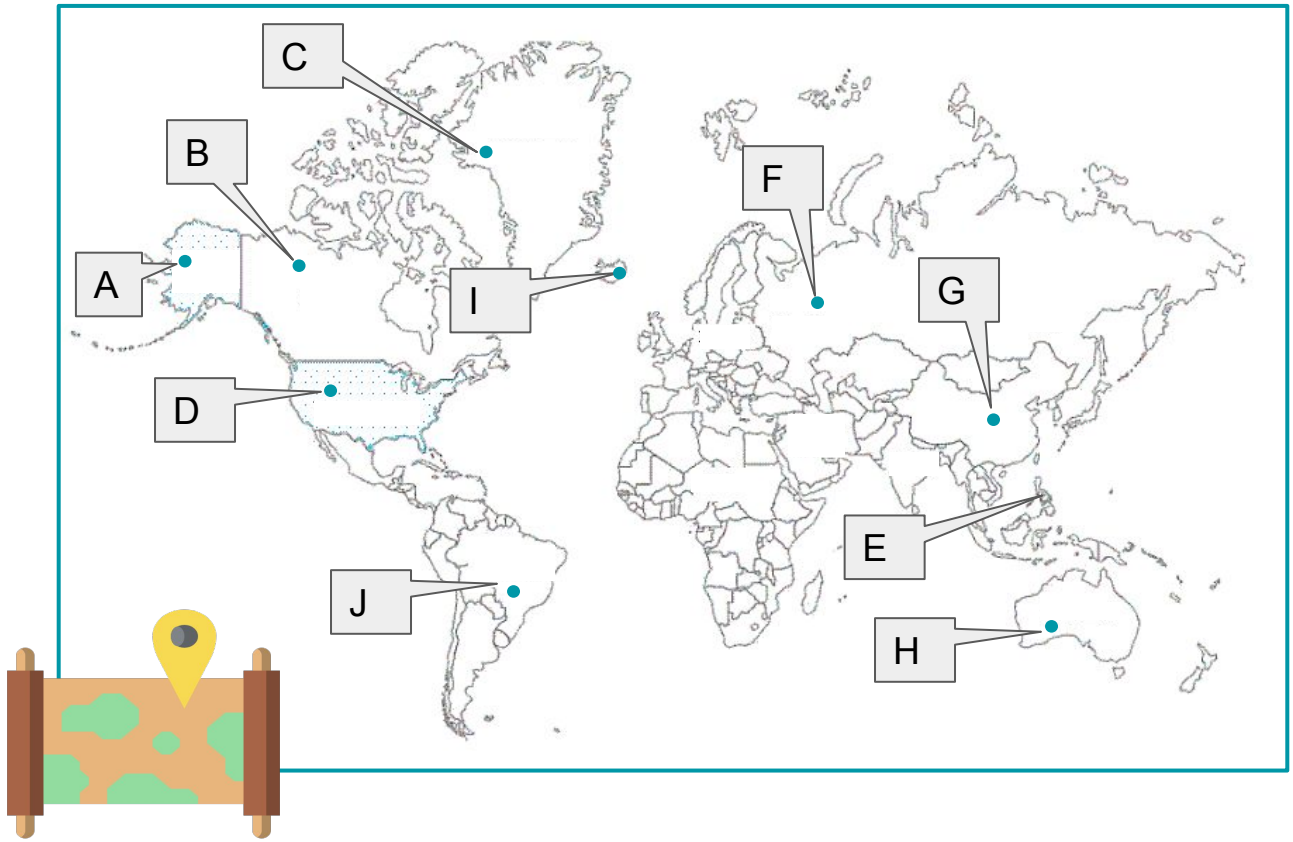A ray has one endpoint and an arrowhead on the other end.

5.

A segment is usually used to indicate measurement.

6.

LOCATING POINTS

Help navigators locate places they need to explore! Name which country is being represented by each point.
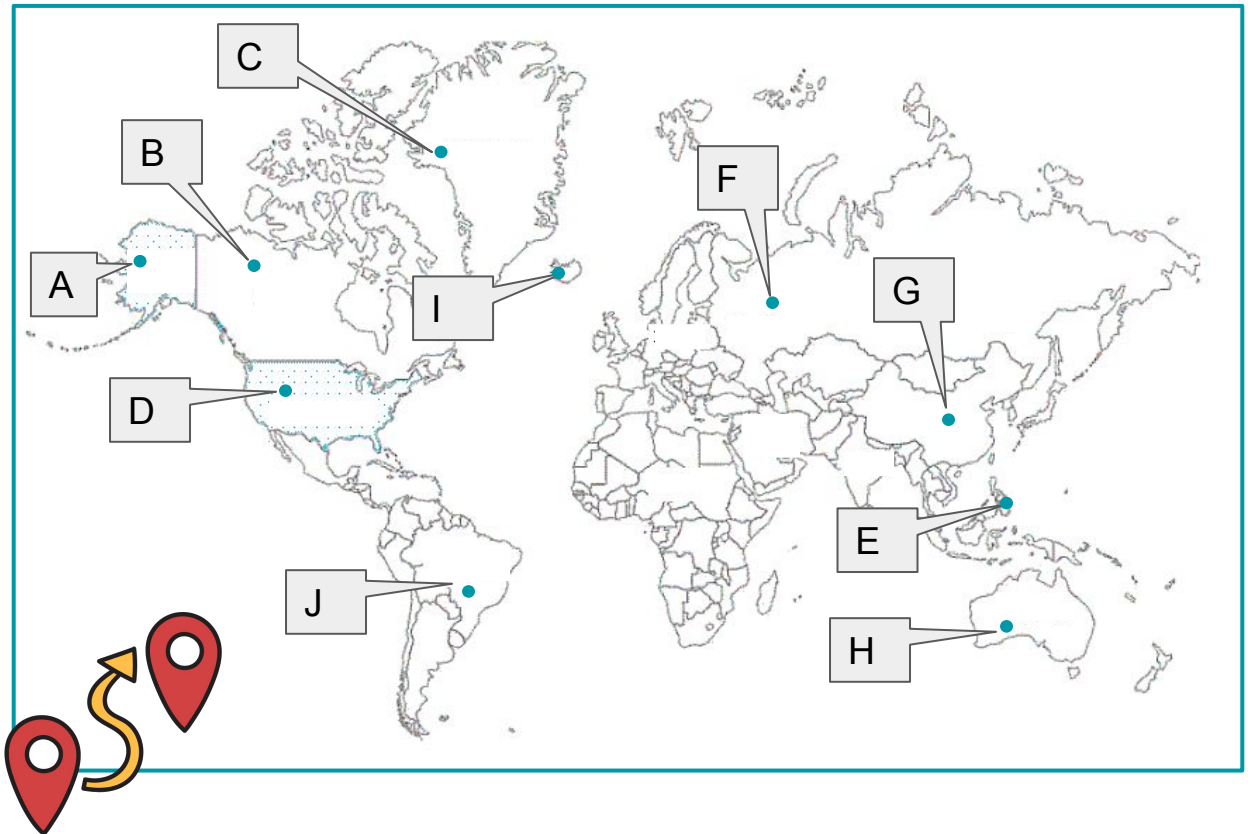

POINT		COUNTRY OR REGION
1.	A	
2.	B	
3.	C	
4.	D	
5.	E	

POINT		COUNTRY OR REGION
6.	F	
7.	G	
8.	H	
9.	I	
10.	J	

THE NAVIGATION ROUTE

Draw a line segment to connect two points then write the navigation route of Team Jones!

	Line segment	Route			Line segment	Route
1.	AD			6.	CD	
2.	IH			7.	FH	
3.	CE			8.	FG	
4.	BF			9.	DJ	
5.	EG			10.	AG	

NAVIGATION TOOLS

Identify if the following navigation tools can be classified as point or line.

CALCULATOR

(POINT)

(LINE)

TIP OF A PENCIL

(POINT)

(LINE)

TIP OF A PIN

(POINT)

(LINE)

RULER

(POINT)

(LINE)

MONOCULAR

(POINT)

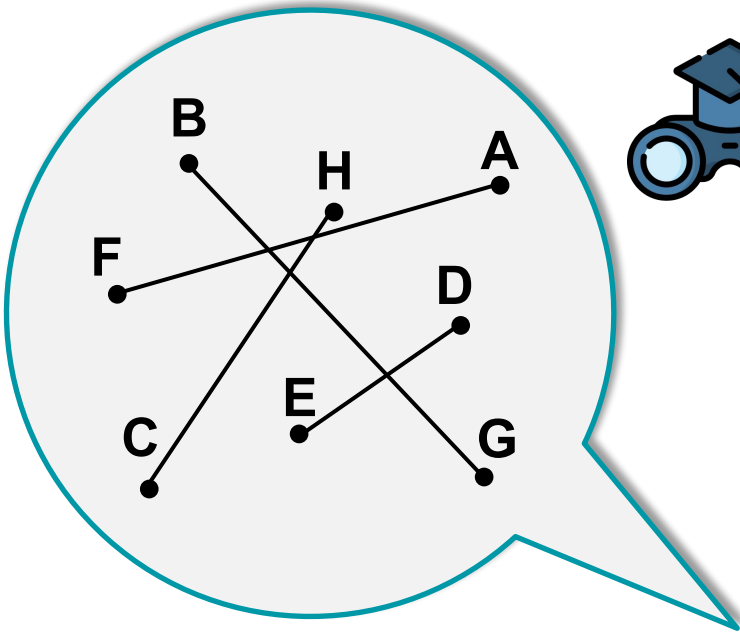(LINE)

COMPASS

(POINT)

(LINE)

WHAT DID SHE DISCOVER?

Wow! Look at what Mrs. Jones have discovered! Then, answer the questions below.

B   H   A
F   D
C   E   G
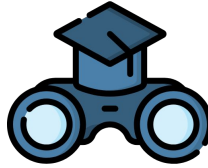
How many points are there?	
Name all the points:	

_____ _____

_____ _____

_____ _____

_____ _____

How many lines are there?	
Name all the lines:	

_____

_____

_____

_____

MAKING THE NAVIGATION MAP

Mr. Jones needs to make a navigation map with the following objects. Answer the questions that follow.

Which of the following objects represent a point?

_____

_____

_____

_____

Which of the following objects represent a line?

_____

_____

_____

THE GOLDEN FISH MEETS MR. JONES

"What a lovely fish!" says Mr. Jones. He just met the golden fish in one of his voyages. Given that, name all the lines that make up the fish. Make sure to follow the correct way of naming a line.
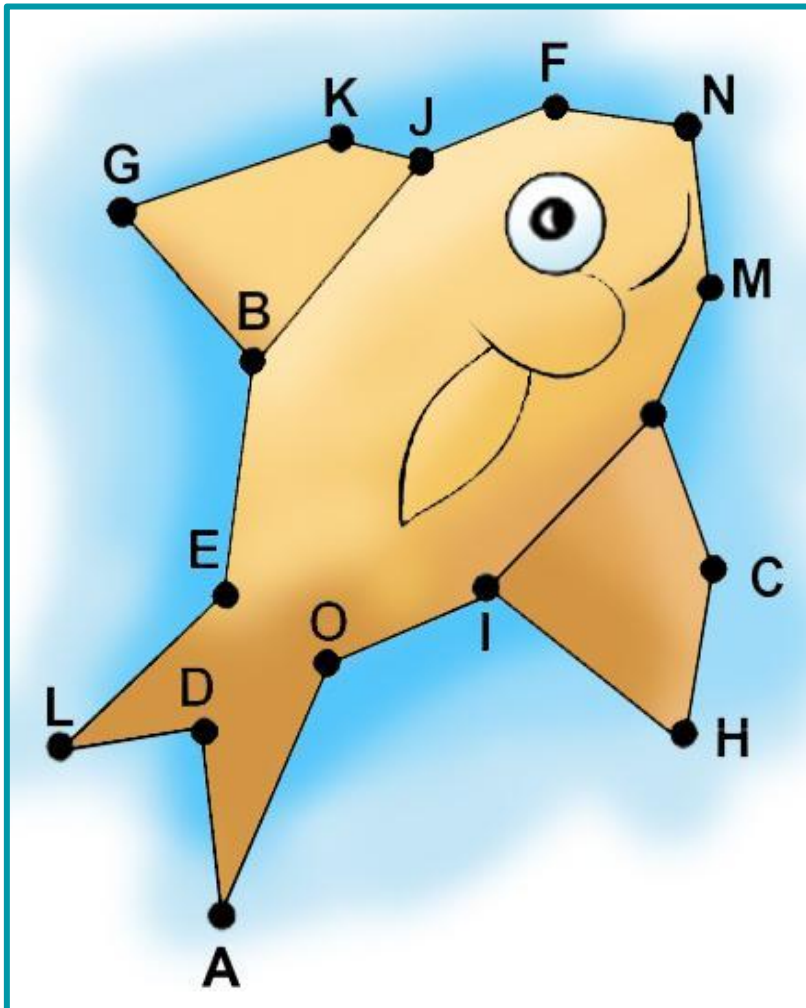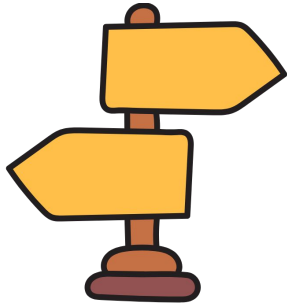
LOCATING THE MYSTERIOUS ANIMAL

Draw the given lines below to complete the outline of the mysterious animal that the navigators just met. Then, write the name of the animal inside the box below the image.

$\overline{FA}$ $\overline{NL}$

$\overline{EG}$ $\overline{CR}$

$\overline{JD}$ $\overline{OQ}$

$\overline{SE}$ $\overline{DN}$

$\overline{AJ}$ $\overline{SG}$

$\overline{LO}$ $\overline{KC}$

$\overline{RS}$ $\overline{QK}$

$\overline{EI}$
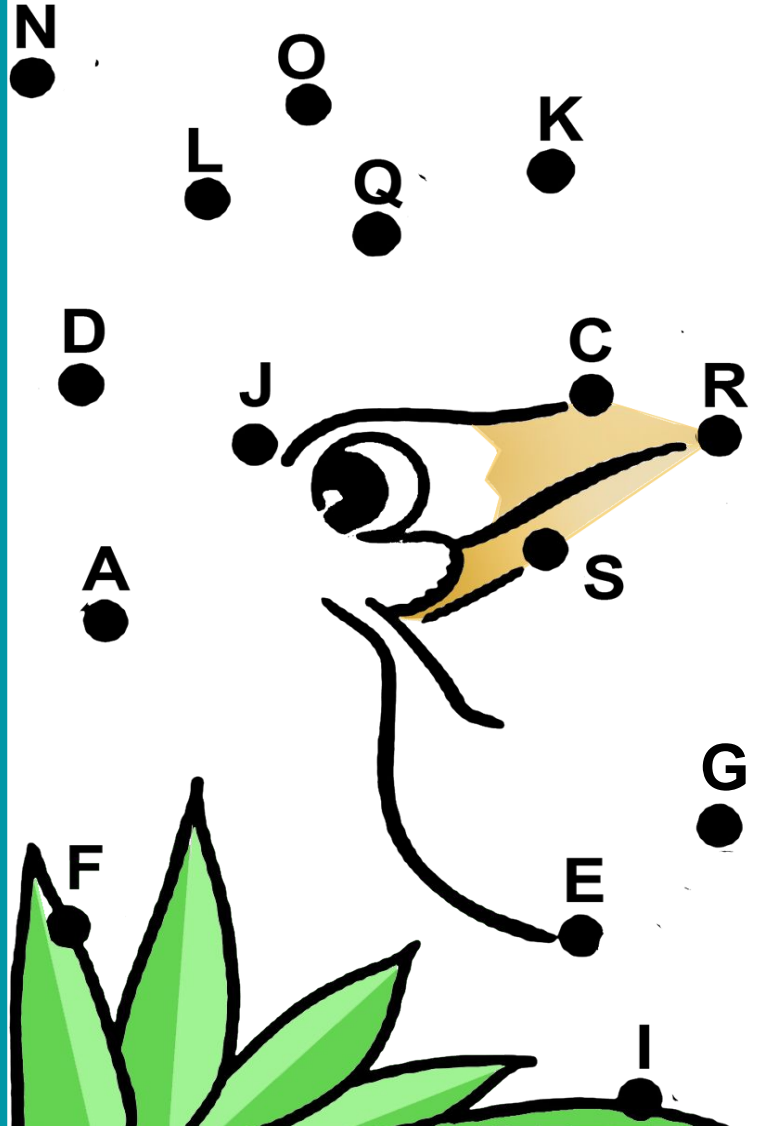
I am

_____.

THE MONOCULAR IMAGE

What a wonderful image seen through a monocular. Name all the lines, rays and lines segments.
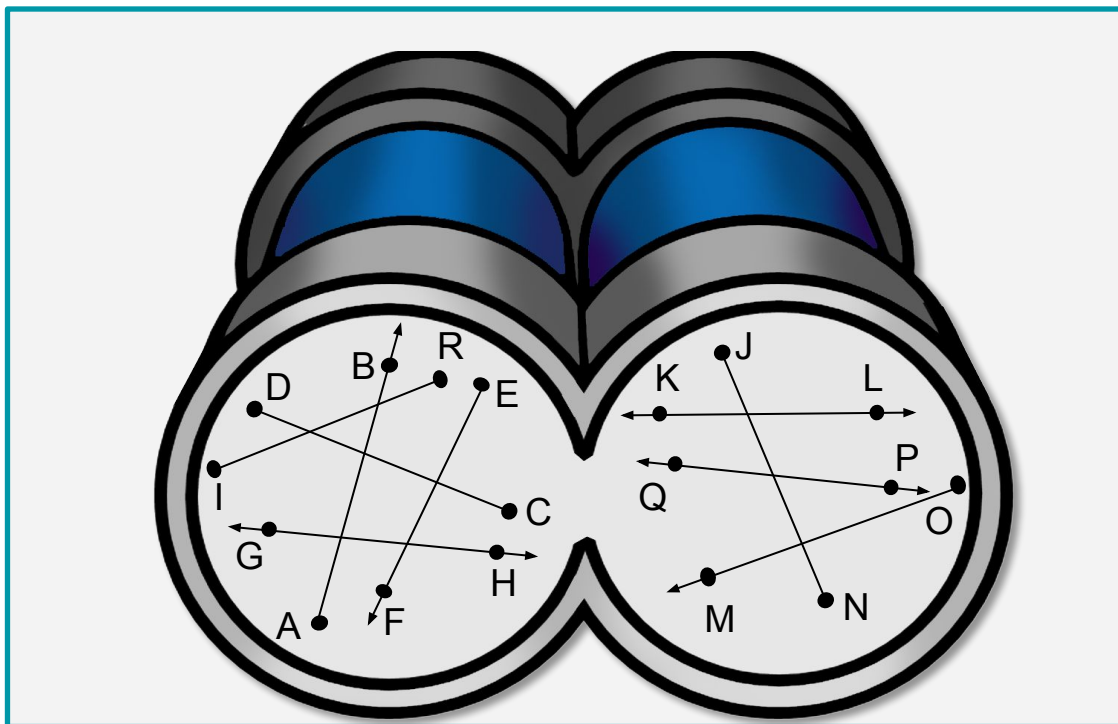
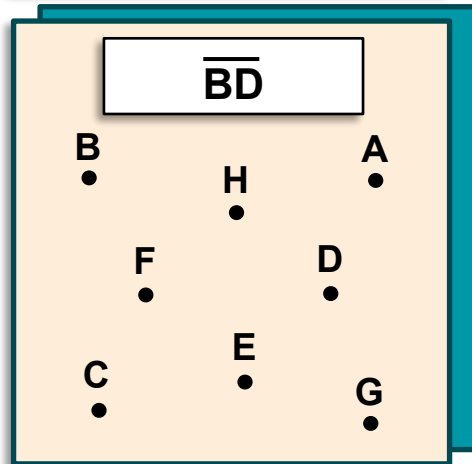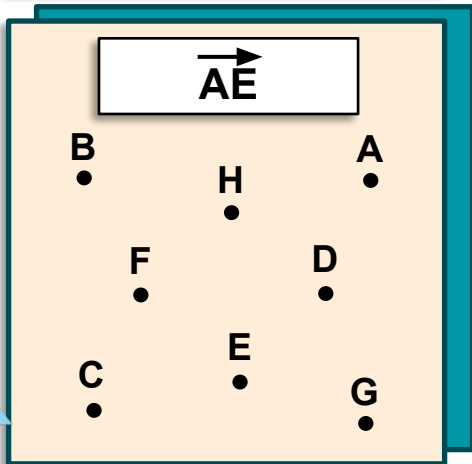| LINES	LINE SEGMENTS	RAYS
_____	_____	_____
_____	_____	_____
_____	_____	_____

LINE MAPPING

Like in a map, draw the following subset of lines. Use a ruler if necessary.

$\overline{CD}$

B
H
A
F
D
E
C
G

$\overleftrightarrow{GA}$

B
H
A
F
D
E
C
G

$\overrightarrow{AE}$

B
H
A
F
D
E
C
G

$\overline{BD}$

B
H
A
F
D
E
C
G

$\overrightarrow{GB}$

B
H
A
F
D
E
C
G

$\overleftrightarrow{BH}$

B
H
A
F
D
E
C
G
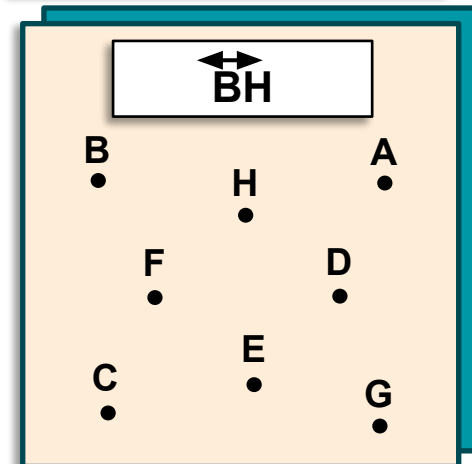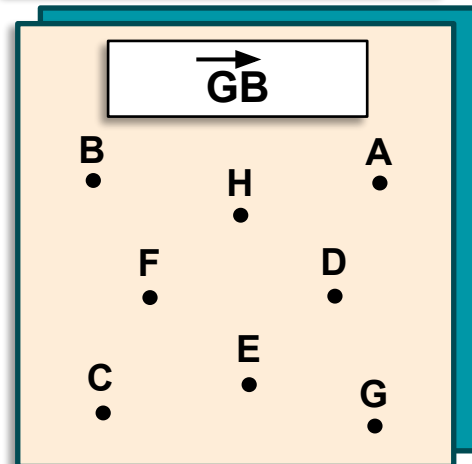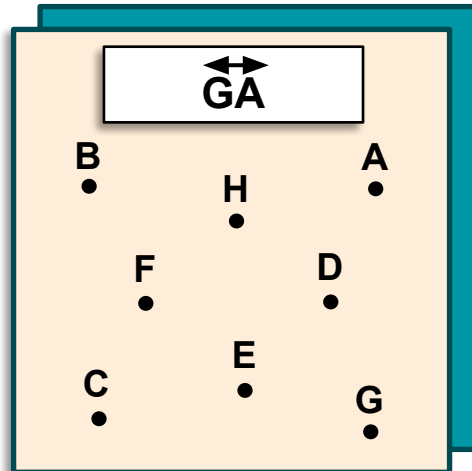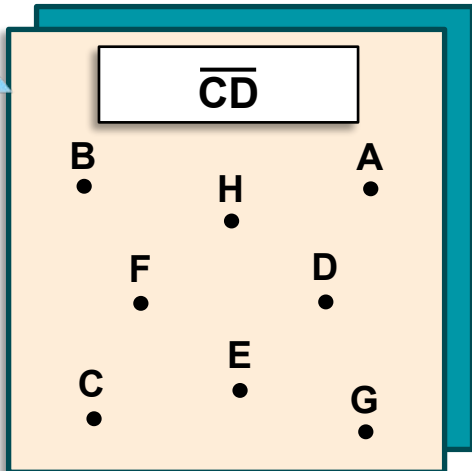
ANSWER GUIDE

Activity 1

1. TRUE 2. FALSE 3. FALSE
4. TRUE 5. TRUE 6. TRUE

Activity 2

1. Alaska
2. Canada
3. Greenland
4. United States
5. Philippines
6. Russia
7. China
8. Australia
9. Iceland
10. Brazil

Activity 3

1. Alaska- U.S.
2. Iceland - Australia
3. Greenland - Philippines
4. Canada - Russia
5. Philippines - China
6. Greenland - U.S.
7. Russia - Australia
8. Russia - China
9. U.S. - Brazil
10. Alaska - China

Activity 4

1. Line 2. Point 3. Point
4. Line 5. Line 6. Point

ANSWER GUIDE

Activity 5

1. There are 8 points. These are point A, point B, point C, point D, point E, point F, point G, and point H.
2. There are 4 line segments. These are line segment AF, line segment BG, line segment CH, line segment DE.

Activity 6

1. Point: tip of the ballpen, tip of the pencil, compass
2. Line: paper, ruler, pencil, pen, sharpener, axis of the globe

Activity 7

Segment: AD, DL, LE, EB, BG, GK, KJ, JF, FN, MN, CH, AI, IO, AO
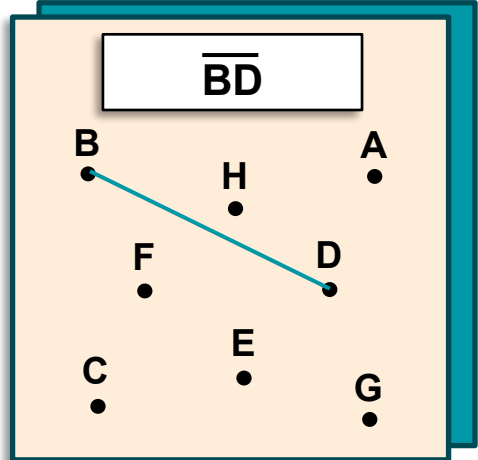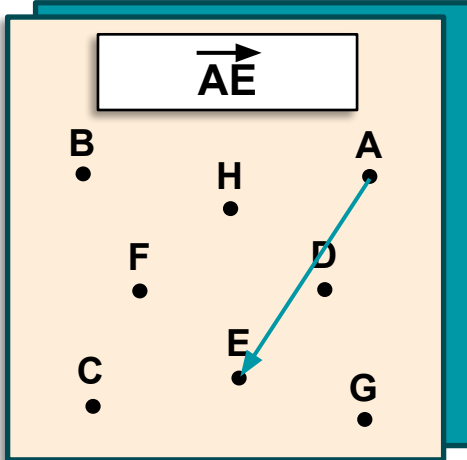
Activity 8

The image produces a chicken/rooster.

Activity 9

Lines: GH, KL, QP   Segment: IR, CD, JN   Ray: AB, EF, OM

Activity 10

CD

B A
  H
F D
  E
C G

GA

B A
  H
F D
  E
C G

$\overrightarrow{AE}$

B A
  H
F D
  E
C G

$\overline{BD}$

B A
  H
F D
  E
C G

$\overrightarrow{GB}$

B A
  H
F D
  E
C G

$\overleftrightarrow{BH}$

B A
  H
F D
  E
C G

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Understanding Factors and Multiples

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