In this activity,

You’ll create a card (or picture) using the basics of graphing.

Make this!

Ideas to Explore

Many STEM (Science, Technology, Engineering, and Math) careers use graphing to compare information or represent data visually. Computer scientists, architects, biologists and accountants (just to name a few) all use graphs as part of their work.

There are many types of graphs. The type of graph used depends on how you need to show data, or information, visually. Graphing, an important math skill, can also be used to make something fun and colorful. The possibilities are endless using graphs!
Words to Know:

**Graph** – a drawing used to represent information.

**Coordinates** – a set of values that show an exact position. On graphs it is usually a pair of numbers (see ordered pair).

**Plane** – a perfectly flat surface extending in all directions.

**Coordinate Plane** – a two-dimensional plane formed by the intersection of a vertical line called the y-axis and a horizontal line called the x-axis.

**Point** – the basic relationship displayed on a graph. Each point is defined by a pair of numbers containing two coordinates.

**Number line** – a line on which numbers are marked evenly.

**Axis** – a number line that helps make up a coordinate plane.

**Plot** – to mark on a graph or map.

**Ordered pair** – two numbers written in a certain order. Usually written in parentheses like this: (4, 17) showing movement on the x-axis (horizontal – 4) and movement on the y-axis (vertical – 17) to locate a point on a graph.

**Origin** – the beginning or starting point—usually “0” on a graph.

Stuff You’ll Need:

- **Card Template** (Five templates are included in this PDF, starting on Page 7)
  - Tracing Card Template (2nd grade and up): Flowers, Hot Air Balloon
  - Graphing Card Template (5th grade and up): Flowers, Blank Graph, Blank Grid
- Cardstock or paper *(use white if you plan to color your card)*
- Ruler
- Pencil
- Eraser
- Markers/crayons/colored pencils
- **Optional**: black marker for outlining
- **Optional**: scissors or paper cutter

Before you start!

- Print your Card Template(s) on paper or cardstock.
- **Watch this video** about the basics of graphing on a coordinate plane. It will be helpful if you plan to design your own picture using the Graphing Card Template - Blank Graph (Page 10).
Now, Make it by Tracing!

Step One
Using the Tracing Card Template - Flowes (Page 7), trace the lines to create a picture using a ruler and a pencil.

Step Two
Outline picture using black marker. (optional)

Step Three
Color your design including the background using markers, crayons, colored pencils or anything else you would like to try!
Step Four

To make into a card, fold paper in half like a book. If you want to cut the picture out so that it is just a picture, use scissors or a paper cutter. Write something inside your card. Remember to sign it!

Step Five

Give to someone important in your life!

Now, Make it by Graphing!

Step One

Using the Graphing Card Template - Flowers (Page 8), connect points to create a picture using a ruler and a pencil.

Then follow Steps Two through Five in the Make It By Tracing section to complete your card.
Want a Challenge?

See if you can plot this set of ordered pairs on the **Graphing Card Template - Blank Graph (Page 10)** to create a new picture!

**Shape #1**
- (5, 15)
- (16, 19)
- (16, 26)
- (9, 26)
- (5, 15)

**Shape #2**
- (5, 15)
- (4, 13)
- (3, 11)
- (3, 9)
- (4, 7)

**Shape #3**
- (4, 13)
- (6, 13)
- (6, 14)
- (4, 13)
- (3, 15)

**Shape #4**
- (2, 14)
- (3, 6)
- (5, 6)
- (3, 7)
- (3, 6)

**Shape #5**
- (4, 7)
- (4, 8)
- (5, 8)
- (5, 6)
- (3, 6)

What picture did you create?

Or....Try this!

Add new coordinates to the **Tracing Card Template - Hot Air Balloon (Page 9)** to create an interesting design to the envelope, or balloon, and basket of the hot air balloon.
One more? Okay!

Design your own STEM card! Challenge someone else to try to figure out your design using the provided Graphing Card Template - Blank Graph (Page 10)!

Share your design (and your coordinate pairs) for others to try at home!

Share it!

Share your card designs with us on your social channels tagging @BoeingAcademy for a chance to be featured!

Want More?

Suggested Reading/Additional Resources:

- Find an exciting read about math from The Museum of Flight Store!
- Think about math a little differently with former Museum of Flight guest speaker, Dr. Eugenia Cheng! Visit her website to watch interesting videos featuring math concepts, including this one about graphs!
- Play a game of classic Battleship to practice using coordinates!
- Research careers that use math and graphs in their daily work. This website is a great place to start!

Make it Connect!

What types of things could you graph in your life? Can you think of other ways coordinates are used?