CHOREO GRAPH ACTIVITY #4: THE SHAPE OF THINGS: CREATING SIMPLE GRAPHIC DESIGNS USING COORDINATES AND TRANSLATIONS

Students will first explore the concepts of graphing ordered pairs and moving between coordinate points via translations. After, students explore the power of coordinates and translations to create their own graphic designs and shapes in the app.

LEARNING GOALS
1. Students will master how to translate a point or object across a grid using coordinates in Choreo Graph.
2. Students will create their own personalized picture or intricate shape using translated points in Choreo Graph.
3. Students will explore the power of coordinates by recreating a partner’s creation using only written coordinates.
4. Students will use math language to talk about translations and share their creations.

PREP
Instructor should have foundational knowledge of Choreo Graph app.
For review go to:
noticing.nysci.org/apps/choreo-graph/choreo-graph-overview/

MATERIALS
• Chart with coordinate plane labeled with x-axis and y-axis (all four quadrants). Graph chart paper a plus!
• Markers
• Design notebooks (optional)
• iPads with Choreo Graph app.
• Picture dictionary (Spanish-English version supplied).

KEY VOCABULARY
• Translate/translations
• Point
• Coordinates
• Coordinate plane
• Ordered pair
• X-axis
• Y-axis
GETTING STARTED

Shape Creations

- In Choreo Graph, have students make an outline of a simple shape (such as a heart, square) using translated points.
- To begin, ask students if they can figure out how to “move” a point (this can be any small image cut out in the starting Build screen) from one place to another after turning on the grid and translate tools in Choreo Graph. Have students write down the coordinates of each point and then hand the list to a friend. See if the friend can recreate the picture on their iPad.

Guiding Questions:

- How did you use the grid? What can it tell you?
- How did you use the coordinates to create your design?
- Were you able to get the same thing your friend created just using coordinates? Why or why not?

Share and Present

Students will share their creations with a partner or small group. As they describe their creation, they should highlight the process they used to make it.
GOING DEEPER: MATH TOOLS AND TALK

Show students this video short about translation:
[https://www.youtube.com/watch?v=gBGW7JbGcI8](https://www.youtube.com/watch?v=gBGW7JbGcI8)

On a large coordinate plane chart, encourage students to help you identify coordinate pairs for a set of points. Each student will place a point somewhere on the coordinate plane chart and name the coordinates, writing them on the chart (x,y).

Next, model translation on the iPad. Turn on translate and grid features, then draw a shape using coordinate points and translation lines (Use your own or a student’s coordinates).

• Draw a shape in Choreo Graph, keeping track of coordinates, by soliciting them from the class and writing them on the board (instruct students to write the coordinate points in their notebook).
• Encourage students to share coordinate points with a friend and challenge them to create the same shape/image.

SENTENCE FRAMES FOR USING MATH LANGUAGE

1. *My first point is _______ (coordinate pair). My second point is _______. This is my first translation.*

2. *I translated my points to create a ________ (shape).*

3. *It was ____________ (easy/difficult) to create my partner’s shape because _____________________.*

QUESTIONS FOR UNDERSTANDING

• Why would it be important to write down your coordinates as you translate your points?
• How do the graphs under the coordinate grid connect to your translations?

TIP: Sentence Frames for Using Math Language can be useful, but be sure to use any modalities necessary to encourage different forms of expression (e.g., drawing or acting out). Remember: We are looking for mathematical understanding and language development, not just vocabulary use.
DIGITAL DESIGN IN CHOREO GRAPH

Tell as Story
Students will animate a scene using translations in Choreo Graph. They will create a story that uses a character who “translates” or moves around a background and solves a “problem.” For example, students may use translation to recreate an athletic move, such as scoring a soccer goal or hitting a home run. (See examples here from noticing.nysci.org.)

Have students write down or keep track of the coordinates of each translation so that they can use them if they want to repeat or recreate the steps. Explain that this is their opportunity to utilize a sport or activity that they love and enjoy. Students’ projects will take them places you never thought they would, and let their creativity flow.

Share and Present
Students will present their translation scenes to the class. They can use the Sentence Frames for Using Math Language to talk about the math they used in the process.

EXTEND YOUR LEARNING
Empower ELLs at any level from beginners to commanding to be empowered to extend their thinking (maybe this is an intro to the ideas below) by:
- Creating a pair of symmetrical translation pictures in Choreo Graph. The pictures should move symmetrically over a line of symmetry.
- Writing a story, a poem or a song to go with a translation.
- Using translation to create an “invention” that solves a problem! For example, a machine that follows a two-year-old around to clean up messes!

TIP: Although sharing and presenting can be a difficult task for many ELLs, once they are comfortable, you will be surprised at what they have to offer. Allow for students to communicate in whatever way they choose. In some cases, this may include a translator or they will attempt to bring across their thoughts even if “code switching” is present.