Subways - Lesson 2 - Coordinate Translations - TD

Lesson Overview
Using coordinate notation can help show students the connection between horizontal and vertical motion. In this lesson, students will learn how every diagonal line can be thought of as a hypotenuse of a right triangle. This lesson reinforces coordinate notation and serves as a bridge into lesson 3, where the distance formula will be reviewed and used.

This is the starter map. Load this file onto student iPads as it is the correct aspect ratio. Students will see the map image in Choreo Graph and then create a subway map with this as the background. (Students can also use the subway map that they already designed from Lesson 1.)

One unit on the grid in Choreo Graph = ¼ mile = .25 mile

Riverville

Armstrong
Holiday
School
Bird
Thelonious
Simone
Museum
Miles
Hospital
Coltrane
Spalding
Jones
Fitzgerald

Learning Objectives:

| Coordinate Translations | Activity: Students will learn how to represent each line segment as a coordinate translation in the form: (x-h, y-k) and how this is a helpful notation to get started exploring efficiency of their map design. | Objective: SWBAT represent geometric translations using coordinate notation. |
What you need to get started: Set of iPads with the Choreo Graph app, student sheets

Time Needed: 1 Class period

Collaboration and Group Work
These lessons are designed for students to work individually, in pairs, or in groups. Each student should do all the work on their own sheets, and the iPad should be shared across group members as equally as possible.

We suggest that groups be no larger than four students. Four or more students in a group will require extra attention to make sure that every group member is contributing equally.

Lesson Plan
Introduction
1) Introduce the concept of Coordinate Translations. The student sheet provides an overview and an example with images. Expand on the introduction as needed.
2) Students are to use the maps they made in Lesson 1. If you are skipping ahead to this lesson, students will need to go through the steps to create a map. All the criteria for the maps are in Lesson 1.

To do:
1) Students will use the worksheet as a guide to the lesson, they will answer questions, included below.
2) Check for understanding as students progress through the worksheet.
3) If students finish early they can move on to the next lesson.

Sharing
1) With each lesson, spend some time allowing the students to share their work with the class. In this lesson, students can share how many stations it takes to get from Armstrong to Fitzgerald, Bird to Coltrane, etc.
2) You might also invite students to start thinking about aspects of their maps that could be improved upon. Example: Did you notice that some of your lines were unnecessary? Or that it could have been easier to get from one point to another if you had designed the map a little differently?

Wrapup
If necessary, have students label their iPads so they will be able to return to them for the next lessons.

Questions
1) Between which 2 stations on your map do passengers travel the furthest in the horizontal direction? What is that horizontal distance?
2) Between which 2 stations on your map do passengers travel the furthest in the **vertical** direction? What is that vertical distance?

3) Using the subways lines that you created on your map, the coordinates from your table, and coordinate notation, provide the series of translation steps the following trips:

   a) Armstrong to Fitzgerald
   b) Bird to Coltrane
   c) Simone to Spalding

4) Using the subway, and walking if necessary, use coordinate notation to describe how could a passenger get from Bird to the Museum?
The map students use for this lesson should look something like this map. Choreo Graph provides the coordinates and line segments representing the subway lines.