

Social, Emotional and Academic Development (SEAD) Lesson Plan for Mathematics

GRADE LEVEL/COURSE AND MATH STANDARD(S)

Course: Geometry

HS.G.CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

HS.G.GPE.B.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*

INTRODUCTION

The tasks are teacher created and utilize the lesson planning template from [Stride 3: A Pathway to Equitable Math Instruction: Creating Conditions to Thrive \(pages 13-14\)](#).

The lesson is intended to:

- Help students identify common mistakes and errors when completing the Distance Formula as a way to help students display precision and critique the work of another person while being reminded of common mistakes they themselves may have made when solving.

SEAD THEME

<input type="checkbox"/>	Identity
<input checked="" type="checkbox"/>	Discourse
<input type="checkbox"/>	Agency
<input type="checkbox"/>	Belonging

SMP(S) TO SUPPORT THE SEAD THEME

<input checked="" type="checkbox"/>	SMP 1: Make sense of problems and persevere in solving them.
<input type="checkbox"/>	SMP 2: Reason abstractly and quantitatively.
<input checked="" type="checkbox"/>	SMP 3: Construct viable arguments and critique the reasoning of others.
<input type="checkbox"/>	SMP 4: Model with mathematics.
<input type="checkbox"/>	SMP 5: Use appropriate tools strategically.
<input checked="" type="checkbox"/>	SMP 6: Attend to precision.
<input checked="" type="checkbox"/>	SMP 7: Look for and make use of structure.
<input checked="" type="checkbox"/>	SMP 8: Look for and express regularity in repeated reasoning.

LESSON OBJECTIVE/GOAL

Objectives of lesson:

- Deepen understanding of common mistakes made when completing the Distance Formula (utilizing mistakes from their previously completed work, called “Ms. McDaniel’s Mistakes”).
- Engage in discourse about common mistakes in order to be more precise when solving using the Distance Formula.

STEPS

1. Students pick up the Bell Work pages as they walk into class, or [the slides](#) can be displayed.
2. The directions on the board tell them to look through the problems and find Ms. McDaniel’s “Mistakes” and fix them.
3. Once most students are finished finding the mistakes, discuss as a whole class. Engage in discourse with the students about errors and mistakes with each problem and how Ms. McDaniel should have done it.
4. Explain to the students that all of the mistakes on the Bell Work were mistakes that I have seen them make when solving Distance Formula problems. Discuss how mistakes are something we can learn from and ways to check their work moving forward.

Find the Distance Between A(1, 3) and B(7, 9)

$$\begin{aligned}D &= \sqrt{(1 - 3)^2 + (7 - 9)^2} \\D &= \sqrt{(-2)^2 + (-2)^2} \\D &= \sqrt{(4) + (4)} \\D &= \sqrt{8}\end{aligned}$$

Find the Distance Between A(4, 3) and B(7, 9)

$$\begin{aligned}D &= \sqrt{(4 - 7)^2 + (3 - 9)^2} \\D &= \sqrt{(-3)^2 + (-6)^2} \\D &= \sqrt{(-9) + 36} \\D &= \sqrt{27}\end{aligned}$$

Find the Distance Between A(6, 9) and B(2, -8)

$$\begin{aligned}D &= \sqrt{(6 - 2)^2 + (9 - -8)^2} \\D &= \sqrt{(4)^2 + (1)^2} \\D &= \sqrt{16 + (1)} \\D &= \sqrt{17}\end{aligned}$$

Find the Distance Between A(3, 2) and B(-2, 5)

$$\begin{aligned}D &= \sqrt{(3 - -2)^2 + (2 - 5)^2} \\D &= \sqrt{(-2)^2 + (0)^2} \\D &= \sqrt{(4) + (0)} \\D &= \sqrt{4}\end{aligned}$$

SUMMARY/REFLECTION OF LESSON

I like to do this type of Bell Work or mini-lesson a day or two after I teach the Distance Formula, and after the students have had some time to do practice on their own. I have found that the students start out as super cautious because the Distance Formula can be overwhelming at first, but once they start getting more comfortable with it, they start to get quick and careless. I have found that this type of activity is a good way to remind them to watch out for common mistakes, like a double negative or that squaring a negative number will result in a positive number.

It was fun to watch the students “pick on” me for making careless mistakes, and I heard comments like I should have known better and not made a particular mistake. When I revealed to my students that all of the mistakes were ones I had already seen them make, they started to rethink their comments to me and some even admitted to remembering a time when they had made the same mistake I had shown in a problem.

For an activity like this, you can easily change the “mistakes” to match the common errors your students may be making, or adapt the number of errors your students need to find and how to discuss (small group, whole class, written explanation, etc.).