



Desmos Playing Catch Up 3 Act Task

CONTEXT

The students in our 8th grade math class are currently learning about linear systems. This lesson will challenge them to think about how two runners and their trajectories can be plotted on a line graph, shown on a table, and represented as an equation. The lesson will last about 50 minutes.

COMMON CORE STANDARDS

STANDARDS FOR MATHEMATICAL PRACTICE

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

GOALS

What are your goals for the lesson? Specifically, by the end of the lesson, 1) what do you want students to *know*? 2) what do you want students to be able to *do*? and 3) what you want them to *understand*?

1. Students will know that math and algebra are a part of our everyday lives and are applicable even to sporting events.
2. Students will be able to represent and solve systems of two linear equations in chart, line graph, and equation forms.
3. Students will understand that there are many ways to represent the same mathematical equation.

ANTICIPATORY PLANNING

Put yourself in the shoes of your students. Where in the lesson do you anticipate that they will struggle, and why? What questions about procedures and/or about the content, do you anticipate that they might pose? How will you respond?

Students might be familiar with the appropriate procedure but if they are not comfortable applying what we have learned about Linear Systems in other problems then they might not be able to apply the procedures to this problem.

Students might not know where to start with their charts, line graphs, and equations. I can help them by encouraging them to choose the method that makes the most sense to them or one they have felt successful using in the past.

Students might work at different paces. The students who finish quicker will be asked to explain their reasoning and then potentially be asked to share their ideas with the class. These students could also continue on to the extension of the problem. Students who work more slowly can be supported by the teacher or fellow classmates at their table.

PROCEDURE

Please provide specific descriptions of all activities, including estimated times and who/what/where, scripts of key points you plan to emphasize and questions that you plan to ask, and examples of what students might think or do.

Act One: The QUESTION

- **Introduce the Activity**
 - We have been studying Linear Systems. Today we are going to examine them in a different way.
- **Show the image/video**
 - Students are shown the video of Julio and Rich running next to each other
- **Elicit noticings and wonderings**
 - Take a look at the video in Slide 1. What are you noticing and wondering about this video?
 - Possible questions to pose include:
 - Are there any questions that we could solve by making a table? A graph?
 - What quantities do you see? What could you count? What could you measure?
 - What relationships do you see?
- **Pose the focus question**
 - There were so many great wonderings and noticings. What I'm wondering is, when will the two runners meet up with each other?
 - Students predict and sketch when they think the runners will catch up to each other on Slides 2 and 3
- **Ask for Estimates (optional)**
 - Students write down an estimate in their math binders, then write down two more estimates – one that is too low and one that is too high. Next, students discuss the questions and determine the information they need. They test their ideas in the next act.

Act Two: GATHERING INFORMATION and WORK TIME

- **What do we know? What do we need to know to answer the question?**
 - Students move through Slides 4 through 8 to gather more information
 - They show their thinking through a graph, a chart, and an equation then make a prediction of when the two runners will meet up with each other
- **Student Work Time- what strategies will you be looking for? How will you “nudge” students?**

Tell me about your math thinking.

How did you approach this problem?

Did you try to solve with a graph, a chart, or an equation first? Why?

What does this number represent?

Why did you do that?

How did you know that it's a ____ problem?

What did you do next? Why?

Was that enough to find out ____? What else do you need to do?

What do you plan to do next?

Your strategy helps us solve this problem. Would you share it with the class later?

Act Three: CONNECTING MODELS (choose one or both)

- **Compare and Connect Strategies (which strategies will you look for?)**
 - Students will submit their predictions in graph, chart, and equation forms
- **Show the Reveal**
 - Slide 9 shows the answer

Closing the lesson (synthesizing, checking for understanding, or connecting to the future):

- Ask students to share some of the strategies they used to solve the problem and show the class their graphs, tables, and equations

DIFFERENTIATION/ACCOMMODATION

How might you provide multiple means of representation, multiple means of expression, and multiple means of engagement? Consider how you will meet the needs of three specific focus students, labelled below.

Special Needs / IEP: I will provide references to other similar projects we have done in the past and encourage the student(s) to look through their math binder for ideas on how to solve this new problem.

Emerging Bilingual: I will check in with them to make sure they understand what is being

asked of them and what the problem is asking.

Ready for challenge: They will be encouraged to continue on to the extension part of the Playing Catch-up lesson.

FORMATIVE ASSESSMENT

How will you assess students' thinking throughout the lesson? What are key moments to check for understanding?

During the lesson, I will be listening and asking questions to check for comprehension, strategic thinking, and mathematical discussions. I will be looking for similar and differing strategies amongst the students. If students are coming up against obstacles I will try to assist them by asking questions or showing how their thinking might be similar to someone in their group. Key moments to check for understanding will be while they are making their graphs, tables, and equations in the second act of the task.

SUMMATIVE ASSESSMENT

How will you know if your students meet the goals of the lesson? What artifacts of student work will you collect?

Each student will show their work through the Desmos website. I will assess their predictions, sketches, graphs, tables, and equations by reviewing their work on the website and moving about the room to see and hear what they are doing during the lesson.

MATERIALS & PREP

What materials will you need to prepare ahead of time? How will the room be set up? What other logistical considerations do you want to plan for? Provide links to documents and/or slides if applicable.

Materials:

Playing Catch Up Lesson from Desmos Website

(<https://teacher.desmos.com/activitybuilder/custom/5818fb314e762b653c3bf0f3>)

Computers or tablets

Scratch paper

Pencils

Classroom setup:

Students are in their assigned seats at tables that seat four students.