

Driving Mr. James - Real Life Math Day 2

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VITAL INFORMATION

Subject(s)	Mathematics
Topic or Unit of Study	Mathmatics for Traveling.
Grade/Level	Special Education HS
Objective	<ol style="list-style-type: none">1. Make sense of problems and persevere in solving them. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway.2. Reason abstractly and quantitatively. Mathematically proficient students make sense of quantities and their relationships in problem situations.3. Model with mathematics.
Summary	In this lesson, students will learn and apply the kinds of calculations and data that are necessary to formulate answers to questions about traveling.

IMPLEMENTATION

W (Where, Why & What)	Students will be exposed to thought processes about something they do or will do just about everyday but in terms of math. This information is practically important and a method to get them interested in what math has to offer them. It should make math less theoretical and more personal. Students are expected to be able to create and solve equations that help them learn about traveling.
H (Hooked & Hold)	<p>So far we've learned about going places. You have created and answered questions about how long it would take to go to places like Disneyland from Banning. We also made questions about how many miles we traveled. We are going to review that but what other questions can we ask about traveling besides how long it will take, or how many miles we drove?</p> <p>Students should offer different ideas. If they are stuck, prompt them with:</p> <p>How about how fast should we drive?</p> <p>How much will it cost?</p> <p>How many gallons of gas will we need?</p> <p>How many times should we fill up the tank?</p> <p>What about questions of time?</p> <p>What if we have a trip that we can't make in a day?</p>
E (Explore & Experience)	<p>Students will review previous week's lesson which was to create and solve questions about how many miles did one drive if one were going x mph and drove for y hours. (In this case, two students were absent so this will be new).</p> <ol style="list-style-type: none">1. Present the powerpoint slide that shows "How many miles (how far) have we gone?"2. Review the inputs that are needed: Speed and length of time driven.3. Using Projector, fill in sample data "10 mph" @ 2 hours.4. Ask how do we figure that out how far we have traveled? (multiply speed times time [20 miles]). Students write equations in notebooks. Students will answer and discuss. Do 50 mph @ 2 hours. Repeat as necessary with new data until students show comprehension of the ideas.5. State "Last week we used this type of equation, "100 / 50" what did this tell us? The answer is we were talking about how long a trip took. Discuss why this is different and why we have to use different equations.<ol style="list-style-type: none">1. The point is to have students realize that math is a tool and we need to use different tools for different jobs and we can use the same tools differently to get different results.6. Students will now create 1-2 of their own problems in pairs or by themselves and present to the class.<ol style="list-style-type: none">1. As an extra incentive, they can add "tricky parts" to their questions like the color of the car or added information.7. Repeat lesson for How fast did we go? <p>Introduction: "Very good, now we can ask another question: How fast were we driving?"</p> <ol style="list-style-type: none">1. Show the powerpoint slide with the "How fast were we driving" information.2. Using Projector, fill in sample data 2 hours driving time and 20 miles distance.3. Ask how do we figure that out how fast were we driving? (Divide distance by time) Students will answer and discuss. Students write equations in notebooks.Repeat as necessary with new data until students show comprehension of the ideas.4. State "Last week we used this type of equation, "100 / 50" what did this tell us? The answer is we were talking about how long a trip took. Just a while ago we did $50 * 2 = 100$. Discuss why this is different and why we have to use different equations.<ol style="list-style-type: none">1. The point is to have students realize that math is a tool and we need to use different tools for different jobs and we can use the same tools differently to get different results.

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R (Rethink, Revise & Refine)

Students should be thinking and asking questions at all times during the lesson but especially when they are creating their own question and when they are answering pay attention to what their individual needs are. Some students will have difficulty choosing the data and issues with calculating the answer. This is an opportunity to review the lesson. Some students may create such a difficult question that the they themselves or the others cannot answer it. Try to guide them toward something reasonable why at the same time letting their imaginations flow.

E (Evaluate)

Mastery - Student can create a question with the proper data and formulate the correct answer consistently. Allow for accommodations with the use of technology.

Learning - Student can with help create a question but demonstrates that they do not understand the data relationships (Will provide an answer but use math that will not derive the correct answer.) Allow for scaffolding.

Pre-understanding - Student demonstrates he/she is not grasping the intended lesson. Cannot create a question nor provide an answer even with scaffolding.

T (Tailored)

Lesson is presented visually with auditory support. Students will also write notes and prepare written problems. Students will verbally present or write their questions. Students will discuss and think about what they are trying to accomplish.

This lesson can be tricky because we are now building upon previous lessons in some ways but in others the changes in thinking to derive new information might be confusing to some.

Student	Accommodations/Notes	Strategies
Lucien	Extra time Positive Affirmation Note: Lucien is sole Geometry student in this class. He is working independently. My goal is to get him on Acellus.	Works well alone with materials he can readily understand and that require writing. Avoid confrontational situations.
Debbie	Extra time Instructions repeated.	Provide sentence starters.
Breana	Considerations for her health status - tires easily and is sometimes weak. Repeat instructions.	Engage her learning and thinking. Encourage her question asking. Likes to come to the board.
Barry	Barry is transitioning from ED to SAI. Relatively new to class	Keep involved. Positive affirmation.
Marea	Also relatively new to class Repeat and simplify instructions Calculator	Have her work with Debbie. Remind her to stay in her seat and focused.
Anthony	Requires bathroom breaks Needs periodic physical relief times.	Reword instructions if necessary. Repeat instructions. Keep on task. Positive affirmation. Temper his expressiveness.

O (Organized)

This lesson built upon a previous lesson where we calculated the time it took to travel to X. Further lessons will add in calculating the cost of gas, miles per gallon, etc. Students will extend the equations they are creating in futures to create equations with variables. Students will then be able to work with simplifying and manipulating these equations to produce and understand algebraic principles.

MATERIALS AND RESOURCES

Instructional Materials (handouts, etc.)

Students will also have the opportunity to work on the "Your Question Building Supplies" Worksheet which includes information to create and sentence starters.

Resources

- Materials and resources:
PPT
White board /Pens
Projector
- Technology resources:
Powerpoint.
- The number of computers required is 1.
- Students Familiarity with Software Tool:
NA

STANDARDS & ASSESSMENT

Standards

CA- California Common Core State Standards (2012)

Subject: Mathematics

Standard for Mathematical Practice:

1. Make sense of problems and persevere in solving them. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

Standard for Mathematical Practice:

2. Reason abstractly and quantitatively. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

Standard for Mathematical Practice:

4. Model with mathematics. Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

Grade: High School

Content Area: Algebra

Domain:

Creating Equations A-CED

Area: Create equations that describe numbers or relationships

Standard:

1. Create equations and inequalities in one variable including ones with absolute value and use them to solve problems in and out of context, including equations arising from linear functions.
 - 1.1 Judge the validity of an argument according to whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step. (CA Standard Algebra II – 11.2)

Assessment/Rubrics

During the lesson, check for progress. The worksheet will also provide assessment information.