Constructing Task: First to Arrive

In this task, students will determine which vehicle will arrive at a destination first based on the speed traveled.

STANDARDS FOR MATHEMATICAL CONTENT

Analyze patterns and relationships.

MCC5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

Graph points on the coordinate plane to solve real-world and mathematical problems.

MCC5.G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).

MCC5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

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.

BACKGROUND KNOWLEDGE

The teacher may want to review the meaning of miles per hour and how it relates to the problem.

ESSENTIAL QUESTIONS

- How does the coordinate system work?

- How can the coordinate system help you better understand other map systems?
- How do coordinate grids help you organize information?
- How can we represent numerical patterns on a coordinate grid?
- What relationships can be determined by analyzing two sets of given rules?

MATERIALS

- "First to Arrive" recording sheet
- Centimeter grid paper

GROUPING

Individual task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION:

TASK:

Two vehicles are traveling along the same path for 5 hours. Vehicle A is traveling at a rate of 30 miles per hour. Vehicle B is traveling at a rate of 60 miles per hour. At the completion of the trip, which vehicle will have traveled the farthest? How much farther? Complete the tables and graph the data by creating a coordinate grid to justify your reasoning.

Car A: 30 MPH			Car B: 60 MPH	
Number of Hours	Total Miles		Number of Hours	Total Miles
0			0	
1			1	
2			2	
3			3	
4			4	
5			5	

FORMATIVE ASSESSMENT QUESITONS

- What is the coordinate for the horizontal axis?
- What is the coordinate for the vertical axis?
- Why do you need to plot your point where two lines intersect?
- How do you graph a point on the coordinate plane?
- How do you use an ordered pair to identify a point on the coordinate plane?
- How did you determine how to number your x and y axis?
- What numerical patterns do you notice?
- What are the relationships between the two numerical patterns?

DIFFERENTIATION

Extension

- Adjust the task so both cars have already traveled a certain number of miles. For example, Car A has already traveled 15 miles and Car B has only traveled 5. After traveling, who would have traveled the farthest?

Intervention

- Allow students to work with a partner or small group.

Name _____ Date _____

First to Arrive

Two vehicles are traveling along the same path for 5 hours. Vehicle A is traveling at a rate of 30 miles per hour. Vehicle B is traveling at a rate of 60 miles per hour. At the completion of the trip, which vehicle will have traveled the farthest? How much farther? Complete the tables, graph the data by creating a coordinate grid, and include a justification for your reasoning.

Car A: 30 MPH			Car B: 60 MPH	
Number of Hours	Total Miles		Number of Hours	Total Miles
0			0	
1			1	
2			2	
3			3	
4			4	
5			5	

Justification: