Performance Task: What's the Better Buy?

Adapted from http://www.ait.net/lessons/Math_5.pdf

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).

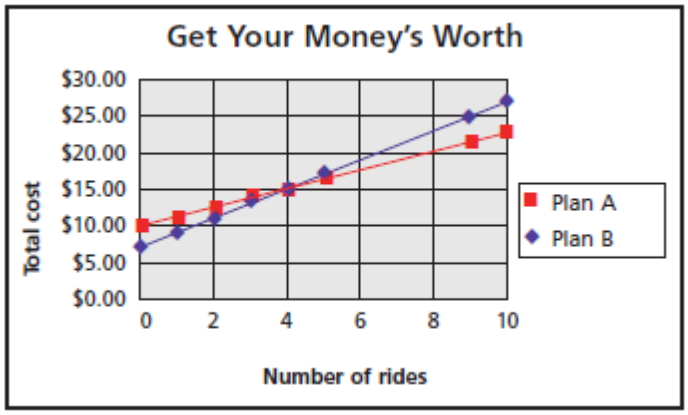
MCC5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

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

Students in fourth grade were exposed to generating numerical patterns given one rule. In fifth grade, students are generating numerical patterns given two rules and representing them on a coordinate grid. Previous tasks in this unit provided exposure to the coordinate grid and how to graph ordered pairs. Students will see that Plan B starts off being the better deal and costs less for fewer rides. However, the two Plans will intersect and Plan A quickly becomes the better buy. See the graph below.



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

- "What's the Better Buy" recording sheet

GROUPING

Individual/Partner/Small group task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION:

Comments: In this task, students will have to factor in the admission cost at the beginning of the numerical pattern. This may need to be discussed because students will most likely want to begin at zero.

This summative task represents the level of depth, rigor, and complexity expected of all fifth grade students to demonstrate evidence of learning. The purpose of the task is to introduce real life problem solving and banking skills, while reinforcing the concepts of decimals taught throughout the unit.

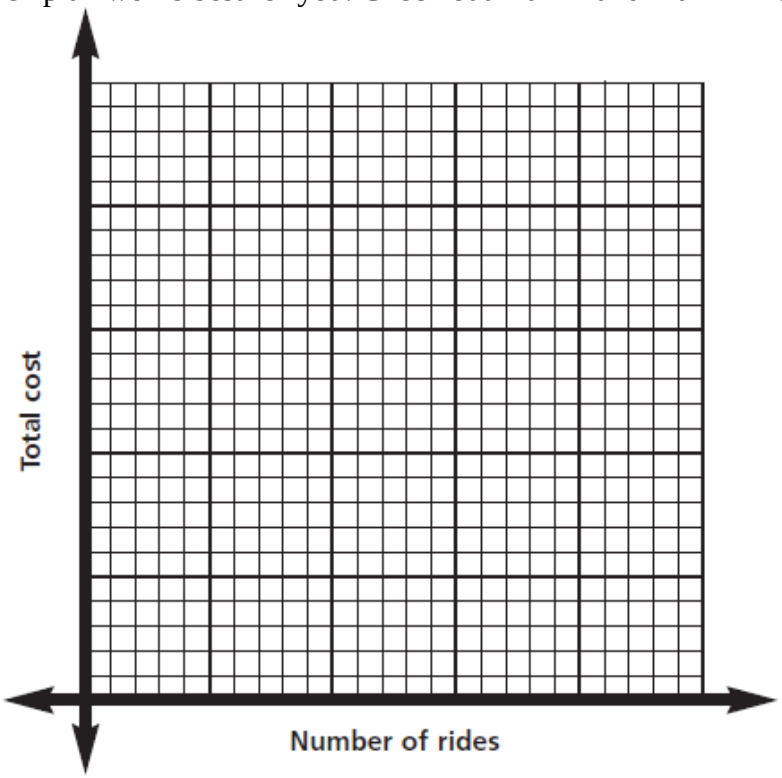
Students should be given opportunities to revise their work based on teacher feedback, peer feedback, and metacognition which includes self-assessment and reflection.

Suggestions for Classroom Use

While this task may serve as a summative assessment, it also may be used for assessment and/or as a project. It is important that all elements of the task be addressed throughout the learning process so that students understand what is expected of them.

TASK:

A new amusement park has just opened in your town and you want to make sure you get as many rides as possible for your money. The park has two cost plans for visitors. Each plan includes a fee for admission and an additional charge for each ride. It's up to you to decide which plan works best for you. Check out Plan A and Plan B in the boxes beside the graph.



PLAN A	
Price of admission:	$10.00
Cost per ride:	$ 1.25

PLAN B	
Price of admission:	$7.00
Cost per ride:	$2.00

Complete the table for each plan to generate ordered pairs and create a graph to represent your results. Be sure to add numbers to the x and y axis before plotting your points. Highlight each plan with a different color. Review your results and create an argument for which plan you feel is the better buy.

Plan A-Rule:

Number of Rides	Total Cost
0	10.00
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Plan B-Rule:

Number of Rides	Total Cost
0	7.00
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Which plan is the better buy? Justify your reasoning. _____
_____
_____

FORMATIVE ASSESSMENT QUESTIONS

- 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?

DIFFERENTIATION:

Intervention

- Remove the admission cost and have students begin from zero to plot points.

Extension

- Give students the task of creating a possible third plan that "fits" between the first two and compare it to the two original plans. Students can poll classes to see which of the three would be more popular with consumers and justify why it should replace one of the other two.

Name _____ Date _____

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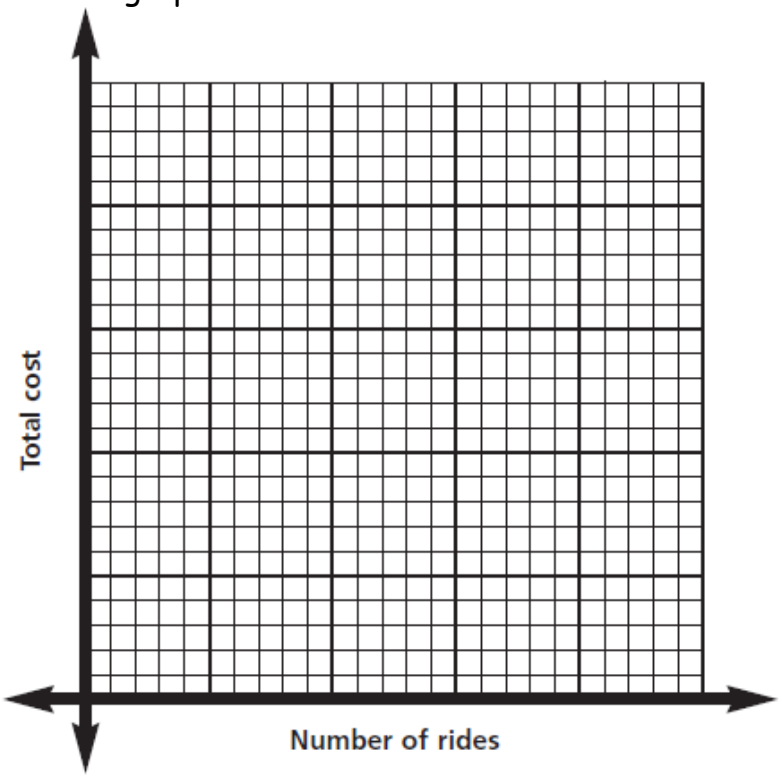

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