*Task: The Fastest (Spotlight Task)

Task adapted from www.mikewiernicki.com

STANDARDS

MCC7.RP.2 Recognize and represent proportional relationships between quantities.
MCC7.RP.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
MCC7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MCC7.RP.2c Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.
MCC7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

STANDARDS FOR MATHEMATICAL PRACTICE

*1. Make sense of problems and persevere in solving them. Students make sense of ratio and unit rates in real-world contexts. They persevere by selecting and using appropriate representations for the given contexts.
*2. Reason abstractly and quantitatively. Students will reason about the value of the rational number in relation the models that are created to represent them.
3. Construct viable arguments and critique the reasoning of others. Students use arguments to justify their reasoning when creating and solving proportions used in real-world contexts.
*4. Model with mathematics. Students create models using tape diagrams, double number lines, manipulatives, tables and graphs to represent real-world and mathematical situations involving ratios and proportions. For example, students will examine the relationships between slopes of lines and ratio tables in the context of given situations.
5. Use appropriate tools strategically. Students use visual representations such as the coordinate plane to show the constant of proportionality.
*6. Attend to precision. Students attend to the ratio and rate language studied in grade 6 to represent and solve problems involving rates and ratios.
7. Look for and make use of structure. Students look for patterns that exist in ratio tables in order to make connections between the constant of proportionality in a table with the slope of a graph.
8. Look for and express regularity in repeated reasoning. Students formally begin to make connections between covariance, rates, and representations showing the relationships between quantities.

ESSENTIAL QUESTIONS
- What conditions help to recognize and represent proportional relationships between quantities?
- How are proportional relationships used to solve multistep ratio and percent problems?
- How do equations represent proportional relationships?

MATERIALS REQUIRED
- Videos for The Fastest – 3-Act task
- Recording sheet (attached)

TIME NEEDED
- 1 – 2 class periods

TEACHER NOTES
In this task, students will watch the video, then tell what they noticed. They will then be asked to discuss what they wonder or are curious about. These questions will be recorded on a class chart or on the board. Students will then use mathematics to answer their own questions. Students will be given information to solve the problem based on need. When they realize they don't have the information they need, they ask for it, it is given to them.

Task Description
The following 3-Act Task can be found at: http://mikewiernicki3act.wordpress.com/the-fastest/

More information along with guidelines for 3-Act Tasks may be found in the Comprehensive Course Guide.

ACT 1:
Watch the video: https://vimeo.com/94422434

Ask students what they noticed and what they wonder. Record responses.
Suggested question: How much faster is the cheetah than Usain Bolt?
Estimate. Write an estimate that is too high and an estimate that is too low.

ACT 2:
The following information is provided for students as they ask for it.

https://vimeo.com/94422437

ACT 3
Students will compare and share solution strategies.

- Reveal the answer. Discuss the theoretical math versus the practical outcome.

- How appropriate was your initial estimate?

- Share student solution paths. Start with most common strategy.

- Revisit any initial student questions that weren't answered.

Extension: Students requiring an extension to this task may wish to compare another animal to the fastest woman - https://www.youtube.com/watch?v=zoqqcXNSgf0 .

Intervention: Students needing support, may need it first in conversions involving fewer steps, so they can make sense of how their knowledge of miles per hour relates to other rates such as feet per second. Students can do this through investigations within the same measurement system. So, in the example above, give the speed of the cheetah in km/hr to keep the rates of each in the metric system.
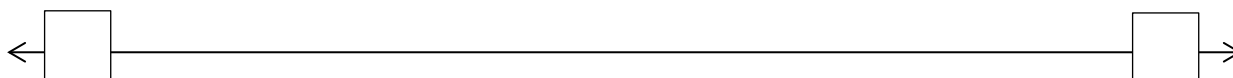
Task Title:_____   Name:_____

ACT 1

What did/do you notice?

What questions come to your mind?

Main Question:_____

Estimate the result of the main question? Explain?

Place an estimate that is too high and too low on the number line

Low estimate   *Place an "x" where your estimate belongs*   High estimate

ACT 2

What information would you like to know or do you need to solve the MAIN question?

Record the given information (measurements, materials, etc…)

If possible, give a better estimate using this information:_____

Act 2 (con't)
Use this area for your work, tables, calculations, sketches, and final solution.

ACT 3

What was the result?

Which Standards for Mathematical Practice did you use?	
□ Make sense of problems & persevere in solving them	□ Use appropriate tools strategically.
□ Reason abstractly & quantitatively	□ Attend to precision.
□ Construct viable arguments & critique the reasoning of others.	□ Look for and make use of structure.
□ Model with mathematics.	□ Look for and express regularity in repeated reasoning.