Module 1: Section 1D: A Closer Look at the Standards for Mathematical Content: Seventh Grade Sample Tasks

Task 1:

Exercises 1–3



 A golf store purchases a set of clubs at a wholesale price of \$250. Mr. Edmond learned that the clubs were marked up 200%. Is it possible to have a percent increase greater than 100%? What is the retail price of the clubs?

Task 2:

1. The equation p = 21.5b represents the price, p, for b boats rented during the 8th grade field trip to the lake. Does a value of 6.5 for b make sense in this situation? Why or why not? Show your work.

Answer: No because b stands for the amount of boats



Task 3:



Student Work Sample	Standard of Mathematical Content	Degree of	Standards of Mathematical
	Focus	Alignment	Practice (SMP) Focus
Sample Task 1: Define the second se	Can you identify the targeted content standard(s) for this task?	 None/Weak Partial Strong 	Can you identify the targeted practice standard(s) for this task?
Sample Task 2: 1. to coustor p = 21. Streptonents the price c, for b boats remed during the the prade field in prior the table to boar a value of 6.5 for b make some in this simulation? Why or why net? Show your work work the table to boar a value of 6.5 for b make some in this simulation? Why or why net? Show your work work the table to be a value of 6.5 for b make some in this simulation? Why or why net? Show your work work work work work work work wor	Can you identify the targeted content standard(s) for this task?	 None/Weak Partial Strong 	Can you identify the targeted practice standard(s) for this task?

Participant Guide

Student Work Sample	Standard of Mathematical Content	Degree of	Standards of Mathematical
	Focus	Alignment	Practice (SMP) Focus
Sample Task 3: Student 4 Traphing Inequalities 1) $x \ge -2$ $4 \Rightarrow -2 \Rightarrow -$	Can you identify the targeted content standard(s) for this task?	 None/Weak Partial Strong 	Can you identify the targeted practice standard(s) for this task?

Module 1: Section 1D: A Closer Look at the Standards for Mathematical Content: 7th Grade Sample Tasks

Facilitator's Guide

Throughout facilitation of this activity it will be important to remind participants:

- Use the grade-level overview to determine the relevant cluster(s) to look at more closely
- Questions regarding Standards for Mathematical Practices will only be indicated where specific practices were identified within the source of the task alignment. Additionally, emphasize to participants the statement at the end of each cluster within the *KAS for Mathematics*, "The identified mathematical practices, coherence connections, and clarifications are possible suggestions; however, they are not the only pathways."

Sample Task 1:

This assignment is strongly aligned to the standards.

OVERVIEW

Seventh-grade students solve word problems about price markups and markdowns. This assignment is strong because it requires students to interpret realworld scenarios and solve them mathematically, while allowing students to practice grade-level operations with percents.

RELATED STANDARDS

We looked at how well the assignment aligned to the following standards:

- KY.7.RP.3 Use percents to solve mathematical and real-world problems.
 - a. Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, a part and a percent, given two of these.
 - b. Use proportional relationships to solve multistep ratio and percent problems.

WHY IS THIS ASSIGNMENT STRONGLY ALIGNED?

This assignment is well-aligned with seventh-grade standard KY.7.RP.3, which requires students to solve multi-step problems involving ratios and percents in real-world contexts. This assignment includes two word problems about percents related to price markups and markdowns (a real-world example named explicitly in the standard document). Problem #1 also involves multiple steps (finding the value of a 25% markdown and a 30% markdown, and calculating how much more was saved at the greater discount).

This assignment allows students to engage with the conceptual understanding and application targeted by standard KY.7.RP.3. Solving multistep ratio and percent problems in real-world contexts—like calculating price markups and markdowns—builds students' application skills. Asking whether it is possible to have a percent increase of more than 100%, as problem #2 does, allows students to draw on their conceptual understanding of proportional relationships.

Practice Standards

This assignment allows students to engage with two mathematical practice standards. Interpreting what the word problems are asking students to do gives students the chance to engage with Mathematical Practice Standard #1 ("Make sense of problems and persevere in solving them"). Explaining whether it is possible to have a percent increase of more than 100% gives students the chance to engage with Mathematical Practice Standard #3 ("Construct viable arguments and critique the reasoning of others").

Sample Task 2:

This assignment is partially aligned to the standards.

OVERVIEW

Seventh-grade students respond to two questions about the proportional relationship between price, number of items or people, and total cost. This assignment is partially aligned with a seventh-grade standard. While both problems appropriately involve equations representing proportional relationships, neither requires students to create the equations themselves.

RELATED STANDARDS

We looked at how well the assignment aligned to the following standard:

- KY.7.RP.2 Recognize and represent proportional relationships between quantities
 - c. Represent proportional relationships by equations.

WHY IS THIS ASSIGNMENT PARTIALLY ALIGNED?

This assignment is partially aligned with seventh-grade standard KY.7.RP.2.C, which requires students to represent proportional relationships with equations. Both problems involve equations about the proportional relationship between price, number of items or people, and total cost, which follows the example provided in the Clarifications for this standard. However, neither problem requires students to create the equations themselves.

This assignment attempts to build students' conceptual understanding as required by standard KY.7.RP.2.C, but it only does so superficially. Problem #1 requires students to understand that the value of variables must make sense within a given context, but students were exposed to this type of conceptual understanding of variables in sixth grade. Furthermore, the problem makes no connection to proportional relationships. Problem #2 could require students to draw upon their understanding of proportional relationships, but it's also possible for students to answer correctly simply by relying on their procedural knowledge of linear equations and slope (for example, slope = rise/run).

Practice Standards

This assignment allows students to engage with Mathematical Practice Standard #3 ("Construct viable arguments and critique the reasoning of others") because it asks students to explain the error made by another student. However, this would be a stronger opportunity if students had to independently evaluate the response without knowing that it was incorrect.

Sample Task 3:

This assignment is weakly aligned to the standards.

OVERVIEW

Seventh-grade students graph inequalities on a number line. This assignment is weak for seventh grade because it is more closely aligned with a sixth-grade standard. Seventh-grade students should be working with more complex inequalities and graphing them instead of representing them on a number line.

RELATED STANDARDS

We looked at how well the assignment aligned to the following standard:

KY.7.EE.4 Use variables to represent quantities in a real-world or mathematical problem and construct equations and inequalities to solve problems by reasoning about the quantities.

b. Solve word problems leading to inequalities of the form px + q > r, px + q < r, $px + q \ge r$, $px + q \le r$; where p, q and r are specific rational numbers. Graph the solution set of the inequality and interpret it in context of the problem.

WHY IS THIS ASSIGNMENT WEAKLY ALIGNED?

This assignment is more closely aligned with sixth-grade standard KY.6.EE.8, which requires students to work with inequalities in the form of x > c or x < c and represent solutions of inequalities on number lines. In seventh grade, students should work with more complex inequalities in the form of px + q > r or px + q < r—and that involve non-whole numbers and negative numbers—and graph the solution on the coordinate plane. Seven of the 12 problems in this assignment do involve negative numbers, but none involve non-whole-numbers, more complex inequalities, or graphs.

Standard KY.7.EE.4b targets conceptual understanding, procedural skill/fluency and application. Solving inequality problems in the context of word problems builds students' application skills, graphing the solution on the coordinate plane builds students' procedural skill, and interpreting the solution in the context of the problem builds students' conceptual understanding. This assignment did not include any word problems or ask students to interpret their solutions in any way, and therefore didn't allow students to build their application skills or conceptual understanding. It did build students' procedural skill in representing simple inequalities on a number line, but that is a skill that students should be building in sixth grade, not seventh grade.

Practice Standards

This assignment doesn't allow students to engage with any mathematical practice standards. None of the problems asked students to solve word problems about inequalities and represent the solutions in graphs on the coordinate plane, like standard_KY.7.EE.4b requires. As a result, students didn't have the opportunity to engage with either of the two related practice standards, Mathematical Practice Standard #1 ("Make sense of problems and persevere in solving them") and Mathematical Practice Standard #4 ("Model with mathematics").

*Please note that inclusion of these sample tasks does not represent that this task is endorsed by or rejected by the Kentucky Department of Education. Inclusion of these tasks was for the sole purpose of allowing participants the opportunity to investigate the content standards within the *Kentucky Academic Standards for Mathematics* more closely. All tasks were selected from https://tntp.org/student-work-library.