

COMMON CORE

State Standards

ALGEBRA I

Math Exemplar Performance Task

SAMPLER

MATHEMATICS



Collaborative, Inc.

Supporting Today's Educators, Shaping Tomorrow's Leaders

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INTRODUCTION

The Common Core Institute is pleased to provide student **Performance Task Items** and the resource of **Online Planning Coach Modules** for teachers as they plan their units and/or lessons leading up to the performance tasks. The **Performance Task Items** have been created for Mathematics for grades 3-8 and the following secondary courses: Algebra I, Geometry, and Algebra II. **Performance Task Items** are aligned to the Common Core State Standards and focus on critical focus areas. These resources, designed by educators, for educators, can be used district-wide, school-wide or by teachers in individual classrooms.

The purpose of the **Performance Task Items** is to provide insight into how deeply a particular student understands the expectations embedded within one or more standard. Each task presents students with a complex, real-world challenge in which the scenario, role, process and product are authentic. Students must then demonstrate that they have the skills and knowledge to complete the task.

The intent of this resource is not so much to be utilized as a summative assessment but to help you as an educator plan backwards for student success. These resources help you plan instruction purposefully and design student tasks/experiences that require higher levels of cognitive demand to address the rigor and depth of knowledge required for students to be college and career ready.

Understanding the Organization and Structure of the Resources

The **Performance Task Items Resource Package** contains the performance task for that grade level or course, a rubric for scoring, sample questions or articles, and an accompanying **Online Planning Coach Module** to serve as your “personal coach” as you plan units/lessons. We highly suggest that you view the **Performance Task Introduction Module** to learn the purpose of performance tasks, how they differ from other assessments, and how performance tasks can drive instruction in your classroom. Next, you will want to view the **Online Planning Coach Module** for your specific grade/course. Each **Online Planning Coach Module** walks you through the specific performance task including the rubric for scoring, and offers helpful hints and tips to help you plan your unit/lesson leading up to the administration of the performance task, including common student misconceptions. The suggested purpose of the performance task items is to be used as a formative assessment, the information collected from the rubrics provides critical data to guide and scaffold instruction as you differentiate student experiences.

Performance Task Item: Movie Ticket Packs

Grade Level: High School Algebra 1

TASK OVERVIEW/PURPOSE

Focus Area: Creating and solving equations that model real-world applications.

Core Ideas of Focus Area:

- Real-world problems are described by creating and solving equations and inequalities.
- Equations describe numbers and relationships.
- Equations can be solved using arithmetic and algebraic rules and equivalences.

Learning Targets:

Students should be able to:

- Create equations in one variable to model real-world situations.
- Create equations in one variable and use them to solve problems.
- Define a quantity of interest to represent any numerical relationship (where there is a quantity of interest).
- Rearrange formulas to highlight a quantity of interest using the same reasoning as in solving equations.
- Recall properties of equality.
- Solve multi-step equations in one variable.

COMMON CORE STATE STANDARDS

Common Core Domain: Algebra

Sub-Domain: Solving Equations

Cluster: Create equations that describe numbers or relationships.

Standard

- HSA-CE.A.1: Create equations and inequalities in one variable and use them to solve problems.
- HSA-CE.A.4: Rearrange formulas to highlight a quantity of interest using the same reasoning as in solving equations.

Sub-Domain: Reasoning with Equations and Inequalities

Cluster: Solve equations and inequalities in one variable.

Standards:

- HSA-REI.A.3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Practice Standards:

- HS.MP.2: Reason abstractly and quantitatively.
- HS.MP.4: Model with mathematics.
- HS.MP.5: Use appropriate tools strategically.

PERFORMANCE TASK PLANNING GUIDE

- HS.MP.6: Attend to precision.
- HS.MP.7: Look for and make use of structure.

IDEAS FOR PLANNING & SCAFFOLDING

- After part 1, have student groups create a basic equation that models the original scenario.
- After part 2, have students identify important information that may augment their original equation.
- Introduce new concepts through the use of essential academic vocabulary.
- Give clear verbal explanations to portray key concepts and relationships.
- Connect new information or skills to what students have already learned.
- Provide additional instruction or support to students who lack necessary background.
- Model the steps in the strategy, using a think-aloud process.
- Allow students to work in groups and discuss ideas and methods.

Student Misconceptions:

- Students might set up an equation, but put the numbers or variables in the wrong place.
- Students might have difficulty identifying the appropriate inverse operation or might use the operation that appears in the equation in order to find a solution.
- Students might believe they should automatically divide a larger number by a smaller number when dividing.

QUESTIONS FOR REFLECTION

For Teacher:

- What went well in this lesson?
- Did all the students achieve the outcomes?
- What evidence do I have?
- What would I do differently next time?

For Students:

- How are equations used to describe numbers or relationships and solve problems?
- What are the steps and strategies to justify a solution to a problem?
- How can creating equations for real-life scenarios help us plan for real-life events?

IDEAS FOR EXTENDED LEARNING

- Have students research prices of items they would like to purchase and determine the length of time needed to be able to afford the items based on an income and tax rate. The rates could be determined by the teacher or by actual jobs the students may have (or want to have).

MATERIALS/RESOURCES

- Performance Task (copies or projected)
- Manipulatives, if needed
- Calculator, if needed

PERFORMANCE TASK STUDENT MATERIAL

Name: _____

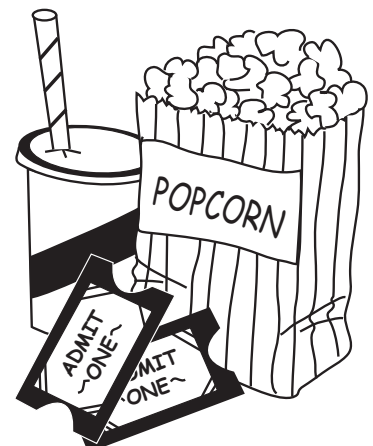
Algebra I Performance Task Movie Ticket Packs

Your part-time job pays \$7.25 an hour. You would like to take a group of friends to the movies. You work exactly 6 hours a week.

1) Using the information above, determine which party packs you can afford after 4 weeks of working. Provide evidence for your solutions.

Cozy Pack \$100.00	Ten Pack \$100.00	Grande Pack \$100.00
5 tickets	10 tickets	16 tickets
5 large popcorns	5 large popcorns	8 medium popcorns
5 large drinks	5 medium drinks	6 small drinks

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2) The state has begun taxing all part-time employees at an 11% rate. With this new paycheck deduction, how many hours will you have to work in order to afford the Ten Pack? Provide evidence to support your answer.

3) You would like to save time figuring out how many hours of work will be needed to afford any of the movie packs. Create an equation for this problem, modeling the scenario, including the tax deduction. Solve this formula for the number of hours (h) you must work.

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PERFORMANCE TASK SCORING RUBRIC

Performance Task

Movie Ticket Packs

Focus: Solving equations and inequalities in one variable; creating equations in one variable; rearranging formulas to highlight a quantity of interest.	Depth of Knowledge Level	Points	Possible Section Points	Total Points Earned by Student
<p>1. 1 point for each correct answer that shows student work: Examples: Student can afford Cozy Pack. Student can afford Ten Pack. Student cannot afford Grande Pack. Example: Evidence: Student earns \$174.00 in 4 weeks.</p>	2	1 1 1	3	
<p>2. 1 point for correct answer Student can still afford the Ten Pack.</p> <p>1 point for evidence Student takes home \$154.86.</p>	1	1		
<p>3. 1 point for assigning & declaring variables Example: price = p, hours = h, weeks = w</p> <p>2 points for creating a system of equations or inequalities Example: $p \leq 7.25(6)w - 10$ $p \leq 7.25(h) - 5(h)(.11)$</p> <p>2 points for solving equation or inequality for the number of hours Example: $p = 7.25w - 10$ $174 = 7.25w - 10$ $184 = 7.25w$ $w = 25.38$ Evidence may be awarded based on Evidence.</p>	2	1 2 2	5	
TOTAL POINTS			10	

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PERFORMANCE TASK RUBRIC INTERPRETATION

RUBRIC INTERPRETATION (source: Oregon Department of Education)

(10) Full Conceptual Understanding: The student uses all relevant information to solve the task.

- The student's answer is consistent with the question/problem.
- The student is able to translate the problem into appropriate mathematical language.

(5) Partial Conceptual Understanding: The student extracts the "essence" of the task, but is unable to use this information to solve the task.

- The student is only partially able to make connections between/among the concepts.
- The student's solution is not fully related to the question.
- The student understands one portion of the task, but not the complete task.

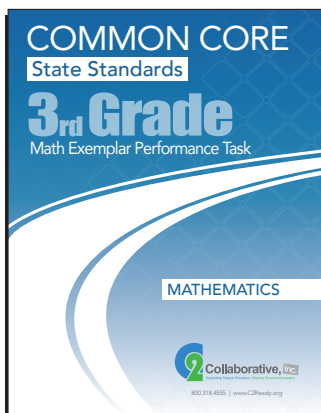
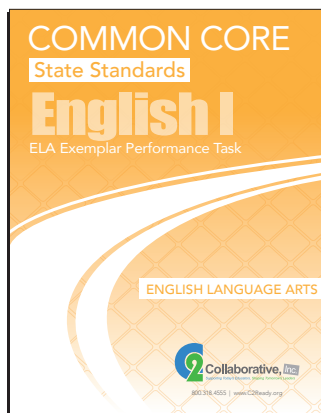
(0) Lack of Conceptual Understanding: The student's solution is inconsistent or unrelated to the task.

- The student translates the problem(s) into inappropriate mathematical concepts.
- The student uses incorrect procedures without understanding the concepts related to the task.

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C2Collaborative, Inc. provides the following materials for enhanced classroom instruction aligned to meet the needs of 21st Century learners.



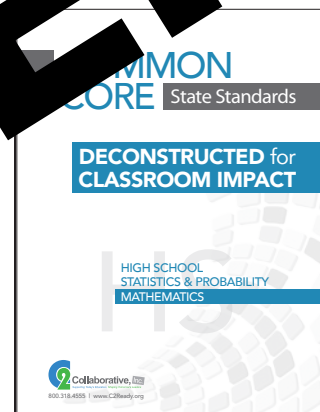
**ELA & Math Exemplar Performance Tasks
Grades 3 and Up**

This teacher-friendly tool is designed for both instruction and formative assessment.

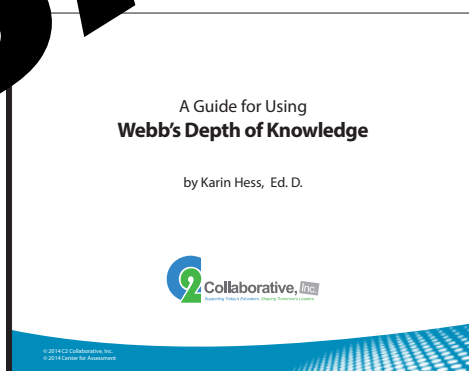
Performance Tasks can provide insight into how deeply a particular student understands the expectations embedded within one or more standard.

**Common Core State Standards
Deconstructed for Classroom Impact
Available for ELA & Math, K-12**

Plan instruction with everything you need at your fingertips: Learning Progressions, Big Ideas, Essential Questions, Deconstruction of Standards, Depth of Knowledge, and more.



SAMPLELER



A Guide for Using Webb's Depth of Knowledge

An indispensable spiral-bound resource printed on glossy card stock for ensuring assessment, instructional activities, and standards are all aligned by the level of cognitive demand.

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