Let's Go Floor Shopping!

I. ASSESSMENT TASK OVERVIEW & PURPOSE:

Students will be asked to create a plan to lay new flooring in the living room and dining room of their own house. They will pick a type of flooring, certain color, style, and quality. Students will research these factors at different stores, such as Lowe's and Home Depot. Students will be using formulas such as area, equations to calculate and compare the best price options, and basic procedures such as including tax and special discounts on types of flooring. Their goal is to find the best combination deal to get to purchase what they want. They will create an equation to represent the total cost of their flooring choices for both rooms. They will show how they found their total cost by plugging in the value for the cost of flooring into their equation. Students will present their choices and calculations in a poster project to the class.

II. UNIT AUTHOR:

Amanda M. Dillon, Franklin County High School, Franklin County Public Schools.

III. COURSE:

Algebra 1

IV. CONTENT STRAND:

Algebra: Expressions & Operations, Equations

V. OBJECTIVES:

The student will be able to:

- Use the area formula to calculate how much flooring they will need to lay
- Research the cost of types of flooring at two different locations, using the internet
- Create equations for each store to calculate the better deal for their choices
- Calculate sales tax and discounts

VI. REFERENCE/RESOURCE MATERIALS:

Graph paper
Ruler
Calculator
Computer
Markers
Poster Board

VII. PRIMARY ASSESSMENT STRATEGIES:

The task includes an assessment component that performs two functions: (1) for the student it will be a checklist and provide a self-assessment and (2) for the teacher it will be used as a rubric. The assessment rubric for the task is intended to evaluate the work students have provided and ensure that their calculations and reasoning are correct.

VIII. EVALUATION CRITERIA:

Teacher assessment and benchmarks are attached at the end of this document.

IX. INSTRUCTIONAL TIME:

This activity should take two 90-minute class periods.

Let's go floor shopping!

Strand
Algebra

Mathematical Objective(s)

- The student will be able to use the area formula to calculate how much flooring they will need to lay
- The student will be able to create equations for each store to calculate the better deal for their choices
- The student will be able to calculate sales tax and discounts

Related SOL
A.1 (Expressions and Operations)
The student will represent verbal quantitative situations algebraically and evaluate these expressions for given replacement values of the variables.

A.4 (Equations and Inequalities)
The student will solve equations, including:

f) solving real-world problems involving equations.

NCTM Standards:

- use symbolic algebra to represent and explain mathematical relationships
- draw reasonable conclusions about a situation being modeled
- analyze properties and determine attributes of two- and three-dimensional objects
- draw and construct representations of two- and three-dimensional geometric objects using a variety of tools
- make decisions about units and scales that are appropriate for problem situations involving measurement
- analyze precision, accuracy, and approximate error in measurement situations
- understand and use formulas for the area, surface area, and volume of geometric figures
- use unit analysis to check measurement computations

Materials/Resources
Copy of the activity
Graph paper
Ruler
Graphing calculator
Poster board
Markers
Computer

Assumption of Prior Knowledge

- Students should know how to calculate rectangular area given the length and the width.
- Students need to know how to use percentages to calculate sales tax.

- Students need to know how to find the price of an item after a discount is applied.
- Students should know how to solve multi-step equations.
- Students need to know how to calculate the total cost for an area when given the price per square foot.

Introduction: Setting Up the Mathematical Task

You are planning to put down a new floor in your living room and dining room. You must choose a type of flooring, a certain color, style, or quality. Lowe's and Home Depot are both offering you special discounts. You will be researching the cost of each type of flooring at different stores to determine how much of each type of flooring you will have to buy and how much you will spend. You will create an equation to represent the total cost of your flooring choices for both rooms. You will also show how you found your total cost.

Student Exploration

Student/Teacher Actions:

- Students will work individually, follow the activity directions, and complete all requirements.
- Teachers should be walking around and monitoring student progress, providing guidance if there is a student that is struggling, and answering questions concerning project directions.
- The only two sites students should access are www.lowes.com and www.homedepot.com .
- Students may need to be reminded to take into account special promotions or discounts at specific stores and to include sales tax.

Monitoring Student Responses

- Students will use a ruler and graph paper to draw out their two rooms and provide measurements for each side. They will also decide which flooring they want to use in each room. Students will have to apply the formulas for area to calculate how much flooring they will need.
- Students should appropriately use the internet to research the cost of types of flooring at two different locations, Lowes and Home Depot.
- Students will calculate how much they will spend on flooring for both rooms, including sales tax and any special promotions or discounts the stores are offering.
- If students are moving quickly through the task, challenge them by asking what would happen if they picked a different type of flooring. Ask them how their total cost would change if their living/dining room was bigger/smaller.

Assessment List and Benchmarks

Students will be assessed on their poster display that includes their calculations. The benchmark is provided at the end of this document, and each part of the project has a detailed point value. Students will also self-assess their work using the rubric provided. The teacher will use the same rubric to assess the student's performance.

Performance Assessment Task – Algebra Name: _____

"Let's go floor shopping!" Date: _____ Block: _____

Directions:

You are planning to put down a new floor in your living room and dining room. You must choose whether you want laminate hardwood floors or carpet in each room. You also need to choose a certain color, style, or quality of flooring. Lowe's gives you a 15% discount if you spend more than $350 on carpet. Home Depot is having a tax-free weekend special on laminate hardwood floors. Research the cost of each type of flooring at different stores. How much of each type of flooring would you have to buy, and what is the total cost? You are looking for the best combination deal that you can get to purchase what you want. Create an equation to calculate the cost of flooring for both rooms. Show how you found your total cost. Make a poster to present to the class with your flooring choices and calculations.

Rubric - Let's go floor shopping!

	Category	0	1	2
I.	Organization	No thought was put towards organization.	Some organization was used, but there were parts of the poster that were still messy or disorganized.	The poster is well organized and easy to read.
II.	Problem statement and drawing of two rooms with dimensions	No drawings are provided.	Both rooms are included on the poster, but there are no dimensions included.	The problem statement is included, and the drawing of the two rooms is drawn to scale with dimensions.
III.	Choices of flooring for each room and how much of each type you will need	No thought was put towards including the choices of flooring and how much would be needed.	The choices of flooring for each room are described in detail, and how much of each type needed is not included. OR The amount of flooring needed is included, but the choices of flooring for each room are not provided.	Choices of flooring for each room are described in detail. The amount of each type of flooring needed is provided.
IV.	Work Shown (Equation)	No work/equation is provided to determine how an answer was calculated.	The equation used to calculate the total cost is provided, but no work is shown.	The equation used to calculate the total cost is provided, and work is also shown.
V.	Correct Work	The work is incomplete and/or the answer is incorrect.	There are some errors in the calculations, but all the work is present.	The work and answer are correct and present.
VI.	Total Cost	No total cost is included.	The total cost is included, but it is not written in proper format ($).	The total cost is included with proper tags ($).
VII.	Visuals	The poster is messy, and there is not a lot of color. The poster is difficult to follow.	The poster is somewhat difficult to read, but it is not very messy.	The poster is neat, and color is used to enhance the look of the poster. The poster is easy to read and understand.

Portion of Rubric Being Assessed	Point Value	Self-Assessment	Teacher Assessment
I. Organization	**2**		
II. Problem statement and drawing of two rooms with dimensions	**2**		
III. Choices of flooring for each room and how much of each type you will need	**2**		
IV. Work Shown (Equation)	**2**		
V. Correct Work	**2**		
VI. Total Cost	**2**		
VII. Visuals	**2**		
TOTALS			

Student Grade _____

Performance Assessment Task – Algebra Name: ____Sample Benchmark___

"Let's go floor shopping!" Date: _____ Block: _____

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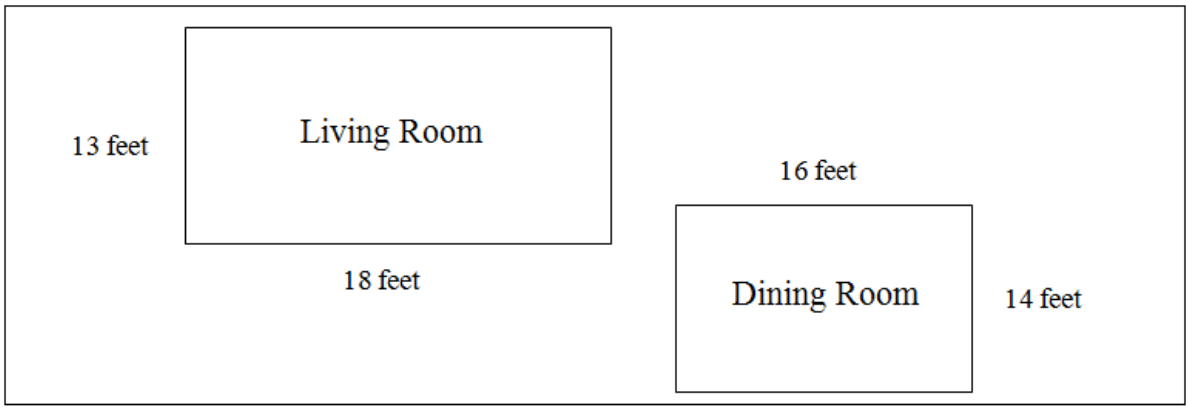


I chose to lay laminate hardwood floors in the living room and dining room. This way, I only have to look up the price of one type of flooring. The area of the living room is 234 square feet (18 feet times 13 feet), and the area of the dining room is 224 square feet (16 feet times 14 feet). The total amount of laminate hardwood flooring I would need is 458 square feet (234 + 224 square feet).

Research:

Laminate Hardwood Flooring
Lowes
allen + roth 6.14-in W x 4.52-ft L Saddle Handscraped Laminate Wood Planks $1.89/sq. ft.

Home Depot
Pergo XP Hawaiian Curly Koa 10 mm Thick x 4-7/8 in. Wide x 47-7/8 in. Length Laminate Flooring (393 sq. ft. / pallet) $2.46/sq. ft.

Students will have many different choices here. They may choose a specific color they like, or they might just look for the cheapest flooring.

Lowes
Cost Before Tax = Total Area * Price per Square Foot

CARPETIf Cost Before Tax is greater than $350, then:
Cost Before Tax = (1 – 0.15) (Total Area * Price per Square Foot)

Sales Tax = .053(Cost Before Tax)

TOTAL COST = Cost Before Tax + Sales Tax

Home Depot
Cost Before Tax = Total Area * Price per Square Foot
Special – No Sales Tax

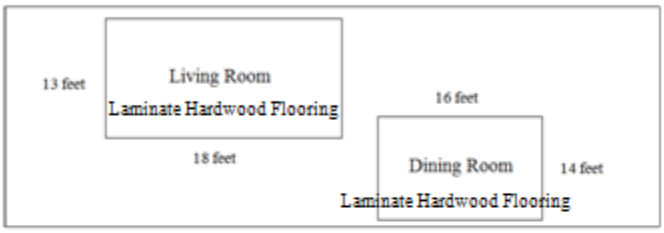
TOTAL COST = Cost Before Tax

Lowes	Home Depot
Cost Before Tax = 458 *1.89 = $865.62 Sales Tax = .053(865.62) = $45.88	Cost Before Tax = 458 * 2.46 = $1,126.68
TOTAL COST = 865.62 + 45.88 = **$911.50**	TOTAL COST = **$1,126.68**

Students will use the same formulas to calculate their totals, but their answers will change depending on the price per square foot. If students choose to use a different type of flooring, their equations will be entirely different.

Sample Poster

Ms. Dillon's Floor Plans



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It would cost $911.50 to lay down laminate hardwood flooring in both the living room and dining room.