

The Overland Trail: Shoelaces

Aim: How do we use and evaluate algebraic expressions?

Do now: Write an expression that represents each situation:	
a) Alexis has at least 3 notebooks (n) in her bookbag.	
b) Damian can do at most 15 push-ups. (p).	

As we read aloud, underline any word you think might be important. Write a question mark next to anything you don't understand. Draw a box around the question or task you are being asked to complete, if any.

Setting Out with Variables

You've formed your Overland Trail families, gotten your supplies together, and started off on the journey from Westport, Missouri, toward Fort Laramie, Wyoming. The journey becomes more difficult. Everything changes as the trip progresses—supplies run out and need to be replenished, people fall sick and sometimes die, families decide to turn back, weather and terrain cause the wagon train to alter course. You will see how variables, equations, and algebraic expressions may have helped the settlers plan their journey and meet its challenges.

You will track the progress of your families during a series of activities tied to places and events along the Overland Trail. Variables, expressions, and equations will help you along the way.



Vocabulary/Concept Bank

Important term	Definition

Shoelaces

Shoelaces are one small item that must be taken on the Overland Trail. In this activity, you will consider how much of this commodity is needed. Assume that everyone's shoes and boots already have laces. You want to be able to replace each lace once during the journey. Also assume that each pair of shoes or boots needs its own laces.



Here is some detailed information about shoelace requirements.

- Each man needs to bring two pairs of boots and one pair of shoes.
- Each woman needs to bring one pair of boots and two pairs of shoes.
- Each child needs to have three pairs of boots.
- A shoelace for each adult boot is 48 inches long.
- A shoelace for each adult shoe is 32 inches long.
- A shoelace for each child's boot is 24 inches long.

Man	Pairs	Amount of Shoelaces	Length Per Lace (in)	Total Length of Shoelace (in) (Amount of Shoelaces x Length Per Lace)
Shoes				
Boots				

Woman	Pairs	Amount of Shoelaces	Length Per Lace (in)	Total Length of Shoelace (in) (Amount of Shoelaces x Length Per Lace)
Shoes				
Boots				

Child	Pairs	Amount of Shoelaces	Length Per Lace (in)	Total Length of Shoelace (in)
Shoes				
Boots				

1. How many inches of shoelace does a woman need?				
2. How many inches of shoelace does a man need?				
3. How many inches of shoelace does a child need?				
4. Find the total length of shoelace needed for the specific Overland Trail family for which you are responsible.	<table border="1"> <tr> <td>number of women in the family _____</td> </tr> <tr> <td>number of men in the family _____</td> </tr> <tr> <td>number of children in the family _____</td> </tr> </table>	number of women in the family _____	number of men in the family _____	number of children in the family _____
number of women in the family _____				
number of men in the family _____				
number of children in the family _____				
5. Describe in words how you used your answers from Questions 1,2, and 3 to get your answer to Question 4.				

Vocabulary to be used during the discussion:

Algebraic expression

Coefficient

Variable

Substitution

Evaluate

Product