

LessonTitle: Beginning Rates of Change		Pre 6.4
Utah State Core Algebra Content Standard 2 Process Standards 1-5		
Summary		
In this lesson, students begin to examine rates of change using graphs, numeric tables, written stories, and equations all relating distance and time. They use these tools interchangeably to find the change rates.		
Enduring Understanding	Essential Questions	
Graphs, numeric tables, written stories and equations are all tools to represent and communicate mathematical information.	How do you relate and translate among word stories, numeric patterns, graphs, and equations? How do they all communicate a rate of change?	
Skill Focus	Vocabulary Focus	
<ul style="list-style-type: none"> • Tracking data • Unit rates and slope • Graphing linear equations 		
Materials		
Launch		
Explore		
Summarize		
Apply		
Assess		

Information

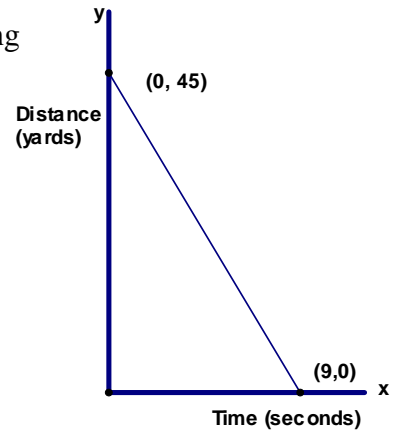
We also suggest looking at this NCTM i-math investigation “Learning about Rate of Change in Linear Functions Using Interactive Graphs: Constant Cost per Minute”.

<http://standards.nctm.org/document/eexamples/chap6/6.2/index.htm#applet>

Pre 6.4 Beginning Rates of Change

1) This graph shows the distance a horse traveled toward a barn and the time it took to get there. Which of these sentences is a good match for the graph?

- A. A horse was 9 yards from a barn, trotted toward it, reaching it after 45 seconds.
- B. A horse was 45 yards from a barn, trotted toward it, reaching it after 9 seconds.
- C. A horse was 45 yards from a barn, trotted toward it at a rate of 9 yards per second.
- D. A horse was 45 yards from a barn, trotted away from it at a rate of 9 yards per second.



2) Write everything you can say about the horse and the distance from the barn during this time.

3) Create a table at the right which also tells the story of the graph and your writing.

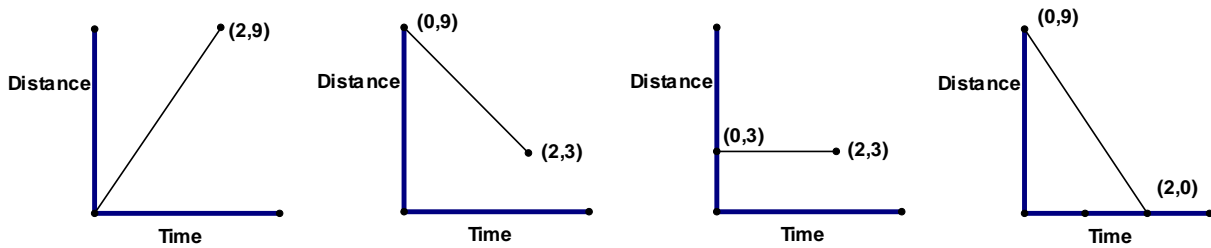
4) Write a story and sketch a graph for the three graphs from number 1 above which you didn't choose.

5) Write a story and create a graph for these tables.

Time (seconds)	Distance (meters)
0	0
2	6
4	12
6	18
8	24
10	30
12	36

Time (seconds)	Distance (meters)
0	24
1	20
2	16
3	12
4	8
5	4
6	0

6) A baby was 9 feet from the edge of the porch. He crawled toward the edge for 2 seconds. Then his mother picked him up a few feet before he reached the edge. Match the story to a graph below.



7) Write a story for the three graphs from number 6 which you didn't choose.

8) Mother was standing 20 feet from the edge of the porch. She ran toward the baby. Sketch a graph for this story. Explain the graph.

9) Create a graph for each of these stories.

- a) A dog was 25 meters away from the dog-house. It reached the dog-house after 5 seconds.
- b) A cat stood still for 3 seconds when she was 15 meters away from the dog. Then she ran further away. In five seconds she was 45 feet away.

10) Which equation tells the same story as the graph and the table?

Here is a graph and table which describes a runner's distance from the finish line in the last seconds of the race. Which equation tells the same story as the table and graph?

a) $y = 7x + 42$

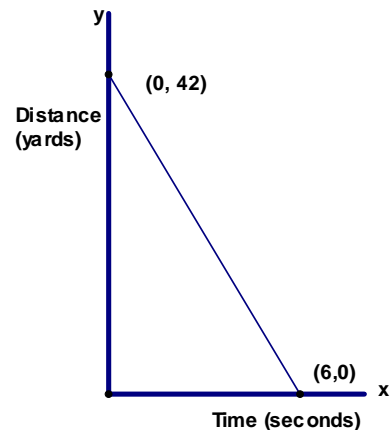
b) $y = 42 - 6x$

c) $y = 42 - 7x$

d) $y = 42x + 6$

Explain your choice.

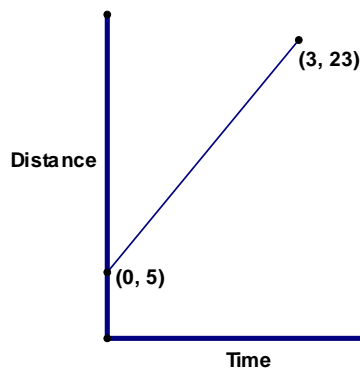
Time (seconds)	Distance (meters)
0	42
1	35
2	27
3	21
4	14
5	7
6	0



Check your chosen equation by testing every coordinate pair in your equation.

11) Here is another graph. Create a table for this graph,

Time	Distance



Write a story for this graph.

Which equation matches your story, the graph and the table?

a) $y = 5 + 6x$

b) $y = 5x + 23$

c) $y = 3x + 5$

d) $y = 5x + 3$

Explain your choice.

Check your chosen equation by testing every coordinate pair in your equation.