

LessonTitle: Six Linear Function Performance Assessments Alg 5.7

Utah State Core Algebra Content Standard 2, 5 Process Standards 1-5

Summary

In this lesson, students have the opportunity to show what they know about linear functions. They are presented with several stories or situations involving linear change. They must organize the information to explain the growth using equations, numeric tables, graphs, and written explanations. The teacher can assign each group or student one or more tasks.

Enduring Understanding

Many real life situations involve linear growth. We can use our knowledge of linear graphs and equations to help us solve problems and make predictions.

Essential Questions

How does algebra help us communicate the stories of linear growth? What are the stories algebra helps us tell?

Skill Focus

- Identifying, communicating about, representing and problem solving in linear growth contexts.

Vocabulary Focus

Materials Graphing calculators

Launch

Explore

Summarize

Apply

Assess

5.7

Linear Function Assessments

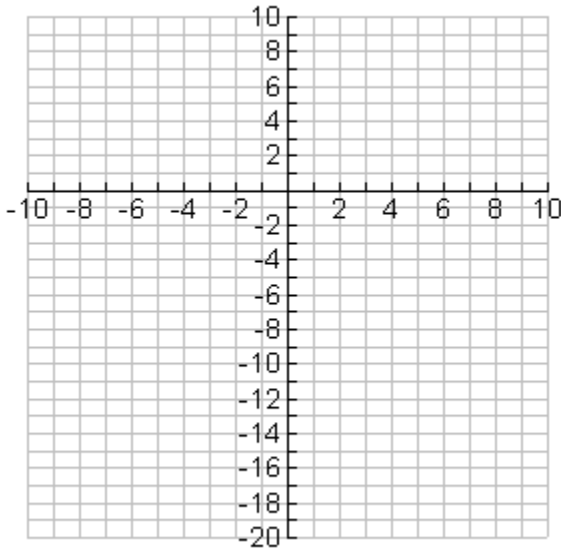
1) The Great Salt Lake's Decline

Eight years ago the level of the Great Salt Lake was 10 feet above normal. It has been steadily declining since that time. Two years ago it was 8 feet below normal levels.

Using this information, 1) figure out the rate of change, 2) create an equation for the change in the lake, 3) show the change on a graph, 4) complete the table, 5) tell the story of the Great Salt Lake and your thoughts about its' future.

Show all your work and explain all your thinking.

You may use a calculator. If you do, then tell how the calculator helped you or show what the calculator showed you.



Time in years	Depth in feet
x	y
	10
	6
	-5
	-8
0	
.5	
2	

2) Snowfall Assessment

It had been snowing at a steady rate for several hours when Mary woke up. It was the first storm for the year. When she left for school an hour later, she measured the depth at 4.5 inches. Eight hours later, it measured 16.5 inches.

Using this information, tell the story of the storm using numeric, graphic and symbolic (equation) representations. Then explain what your work shows using words.

Be certain to show all work and explain your thinking.

You may use a calculator. If you do, then tell how the calculator helped you or show what the calculator showed you.

3) Sunscreen Assessment

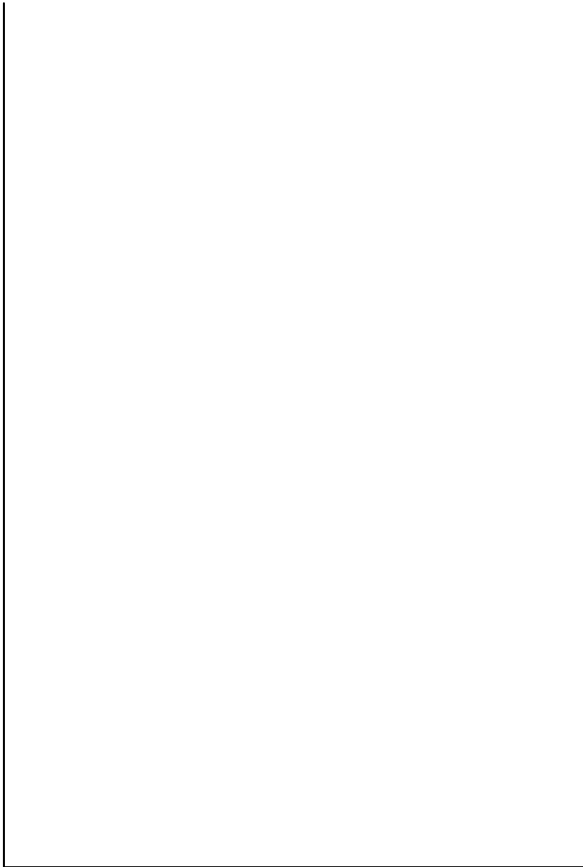
The amount of time you can spend in the sun without burning is related to the number of the sunscreen lotion you use. The table below is for a person who can stay in the sun without any sunscreen lotion for only 15 minutes without burning.

Sunscreen number, x	8	10	12	14
Time in minutes, y	120	150	180	120

How does increasing the sunscreen number by 2 change the time that can be spent in the sun?

Sketch a graph below.
Make certain the graph is labeled.

Write a formula for this function.
Show how you can create the
formula without the calculator.



Record the data into your calculator and create a graph.
Describe the x and y min and max used to create this graph in the calculator.

Check your formula using manual fit or linear regression. Show your results below.

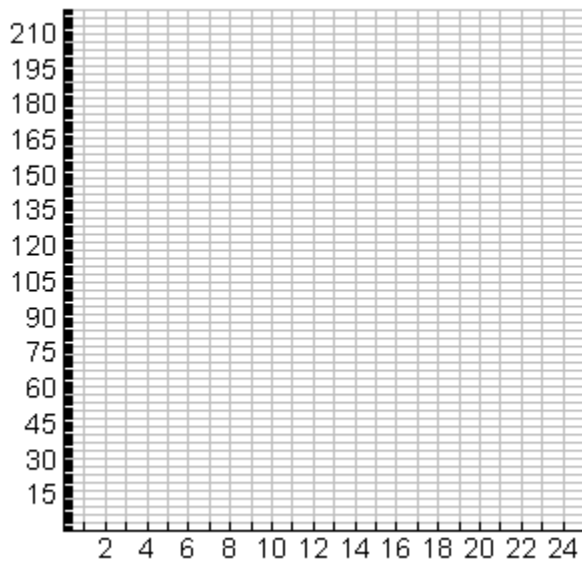
4) Losing Weight

Joe joined a weight loss program. He lost weight steadily. He was too shy to get on the scales until 3 weeks into the program at which time he weighed 190 pounds. Twelve weeks into the program, Horatio weighed 167.5 pounds.

Using this information, 1) figure out the rate of change, 2) create an equation for the Joe's progress, 3) show the change on a graph, 4) complete the table, 5) tell Joe's story and whether or not he should continue this pattern.

Show all your work and explain all your thinking.

You may use a calculator. If you do, then tell how the calculator helped you or show what the calculator showed you.



<u> </u>	<u> </u>
x	y
	185
10	
	140

5) A Growing Cactus

When Molly was born, her parents planted a cactus that was 1.5 feet tall. When she was 5 years old, the family moved and the cactus was 9 feet tall.

Using this information, tell the story of the plant's growth using numeric, graphic and symbolic (equation) representations. Then explain what your work shows using words.

Be certain to show all work and explain your thinking.

You may use a calculator. If you do, then tell how the calculator helped you or show what the calculator showed you.

6) Port Disney

Port Disney is a town in California. The school board of Port Disney thinks the best kind of elementary schools are small, neighborhood schools. So their schools have about 200 students each. About one-third of the population is of elementary school age. Port Disney's population has been increasing over the past twenty years and the growth trend is expected to continue. How many new schools will Port Disney need and when should they build them?

Port Disney Data

Year	Population
1980	24,567
1990	31,200
2000	39,312

- 1) Make predictions for the population of Port Disney for the next 30 years based on data from past years. Show all work, graphs, etc. to support your predictions.
- 2) Make recommendations for how many schools will be needed and when the schools should be built. Prepare your report to the school board, complete with graphs and conclusions.