Learning Targets

## Learning Targets

### Introduction to Exponential Functions

### Lesson 1: Growing and Growing

* I can compare growth patterns using calculations and graphs.

### Lesson 2: Patterns of Growth

* I can use words and expressions to describe patterns in tables of values.
* When I have descriptions of linear and exponential relationships, I can write expressions and create tables of values to represent them.

### Lesson 3: Representing Exponential Growth

* I can explain the connections between an equation and a graph that represents exponential growth.
* I can write and interpret an equation that represents exponential growth.

### Lesson 4: Understanding Decay

* I can use only multiplication to represent "decreasing a quantity by a fraction of itself."
* I can write an expression or equation to represent a quantity that decays exponentially.
* I know the meanings of “exponential growth” and “exponential decay.”

### Lesson 5: Representing Exponential Decay

* I can explain the meanings of $a$ and $b$ in an equation that represents exponential decay and is written as $y=a•b^{x}$.
* I can find a growth factor from a graph and write an equation to represent exponential decay.
* I can graph equations that represent quantities that change by a growth factor between 0 and 1.

### Lesson 6: Analyzing Graphs

* I can use graphs to compare and contrast situations that involve exponential decay.
* I can use information from a graph to write an equation that represents exponential decay.

### Lesson 7: Using Negative Exponents

* I can describe the meaning of a negative exponent in equations that represent exponential decay.
* I can write and graph an equation that represents exponential decay to solve problems.

### Lesson 8: Exponential Situations as Functions

* I can use function notation to write equations that represent exponential relationships.
* When I see relationships in descriptions, tables, equations, or graphs, I can determine whether the relationships are functions.

### Lesson 9: Interpreting Exponential Functions

* I can analyze a situation and determine whether it makes sense to connect the points on the graph that represents the situation.
* When I see a graph of an exponential function, I can make sense of and describe the relationship using function notation.

### Lesson 10: Looking at Rates of Change

* I can calculate the average rate of change of a function over a specified period of time.
* I know how the average rate of change of an exponential function differs from that of a linear function.

### Lesson 11: Modeling Exponential Behavior

* I can use exponential functions to model situations that involve exponential growth or decay.
* When given data, I can determine an appropriate model for the situation described by the data.

### Lesson 12: Reasoning about Exponential Graphs (Part 1)

* I can describe the effect of changing $a$ and $b$ on a graph that represents $f(x)=a•b^{x}$.
* I can use equations and graphs to compare exponential functions.

### Lesson 13: Reasoning about Exponential Graphs (Part 2)

* I can explain the meaning of the intersection of the graphs of two functions in terms of the situations they represent.
* When I know two points on a graph of an exponential function, I can write an equation for the function.

### Lesson 14: Recalling Percent Change

* I can find the result of applying a percent increase or decrease on a quantity.
* I can write different expressions to represent a starting amount and a percent increase or decrease.

### Lesson 15: Functions Involving Percent Change

* I can use graphs to illustrate and compare different percent increases.
* I can write a numerical expression or an algebraic expression to represent the result of applying a percent increase repeatedly.

### Lesson 16: Compounding Interest

* I can explain why applying a percent increase, $p$, $n$ times is like or unlike applying the percent increase $np$.

### Lesson 17: Different Compounding Intervals

* I can calculate interest when I know the starting balance, interest rate, and compounding intervals.
* When given interest rates and compounding intervals, I can choose the better investment option.

### Lesson 18: Expressed in Different Ways

* I can solve problems using exponential expressions written in different ways.
* I can write equivalent expressions to represent situations that involve repeated percent increase or decrease.

### Lesson 19: Which One Changes Faster?

* I can use tables, calculations, and graphs to compare growth rates of linear and exponential functions and predict how the quantities change eventually.

### Lesson 20: Changes over Equal Intervals

* I can calculate rates of change of functions given graphs, equations, or tables.
* I can use rates of change to describe how a linear function and an exponential function change over equal intervals.

### Lesson 21: Predicting Populations

* I can determine how well a chosen model fits the given information.
* I can determine whether to use a linear function or an exponential function to model real-world data.



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