

**?**

**W2K**

**Lesson Question**

**Words to Know**

*Fill in this table as you work through the lesson. You may also use the glossary to help you.*

.

from a

.

from a

**Determine** the value of a slope

**Determine** the value of a slope

**Recognize** different types of slopes.

**Lesson Goals**

|  |  |
| --- | --- |
|  | to determine the value of |
|  | the amount of change in output that occurs based on change in input |
|  | the ratio of the change in the dependent values (outputs) to the change in the independent values (inputs) between two points on a line |
|  | an imagined or projected sequence of events |

## Identify Trends in Graphs

Examine the graphs. What can you tell about the data?

The graph is horizontal. The rate of change is 0.



*y y*

*y*

*x x*

*x*

* • • Neither increasing nor decreasing

**Slide**

## Differentiating Positive and Negative Slope

This table represents the **scenario** of a change in water temperature over time, where *x* is seconds and *y* is the Fahrenheit temperature.

Determine from the table if the **rate** is increasing, decreasing, or neither.

**Evaluate** the **slope** for this scenario.

**2**

|  |  |
| --- | --- |
| ***x*** | ***y*** |
| *x*1 = 3 | *y*1 = 70 |
| 6 | 75 |
| *x*2 = 9 | *y*2 = 80 |
| 12 | 85 |
| 15 | 90 |

*y*  *y*

Slope = 2 1

* *x*

*x*

2 1

# 80 

=

#  3

10

= 6

Slope =

# 3

**Slide**

## Using the Scale vs. Using the Squares

**MISCONCEPTION**

**Using the *scale*** when counting rise to find slope.

run

**2**



### 10

**se**

**6**

=

**un**

**r**

*y*

**0**

**80**

**ri**

= **1**

**0**

**60**

**40**

ru

n

=

6

=

3

**20**

e

ris

**Temperature (°F)**

*x*

**Time (seconds)**

**5**

**1**

**2**

**1**

**9**

**6**

**3**

**Using the *squares*** when counting rise to find slope.

run

### 100

**1**

**ise**

**4**

=

**un**

**r**

*y*

**Temperature (°F)**

**80**

**r**

=

=

un

r

1

se

ri

**60**

**40**

### 20

*x*

**Time (seconds)**

**5**

**1**

**2**

**1**

**9**

**6**

**3**

When you’re trying to use rise over run, you want to make sure you absolutely use the . You want to never simply count the .

**4**



slope.

When the graph of a line falls from left to right, that line has a

**6 8 10**

**Time (months)**

**2 4**

*x*

**4000**

**2000**

fall 1000

= =

run

The graph of the value of a car represents a ***negative*** slope of –500.

* What is the slope?

**run (**−**)**

**rise (**+**)**

*y*

**10000 fall**

**8000 (**−**) run (**+**)**

**6000**

**Value of a Car**

**Total Value ($)**

**Slide**

**Differentiating Positive and Negative Slope**

In this table, *x* represents months and

*y* represents value of a car.

Determine from the table if the rate is increasing, decreasing, or neither.

What is the slope for this scenario?

Slope = *y*2  *y*1

*x*2  *x*1

7000

= 8  2

= 3000

6

=

As the values of *x* increase, the values of *y* decrease, so we say the rate is

.



|  |  |
| --- | --- |
| ***x*** | ***y*** |
| 2 | 10,000 |
| 2 | 9,000 |
| 6 | 8,000 |
| 8 | 7,000 |
| 10 | 6,000 |

**Slide**



and negative slopes can be found everywhere in the

Examples of

world around us.

**Negative Slope**

**Positive Slope**

**Positive vs. Negative Slope in the Real World**

**Positive, Negative, and Zero Slopes**

In the table, *x* represents hours and Determine from the values in the table if

*y* represents the speed of a car. the rate is increasing, decreasing, or neither.

What is the slope for this scenario?

Slope = 2 1

*y*  *y*

*x*  *x*

2 1

We’ll choose two points from the table.

Slope =

55 

5  1

= 0

4

=

Lines that have a slope of 0, as you extend from left to right, are horizontal.

**6**

**9**

|  |  |
| --- | --- |
| ***x*** | ***y*** |
| *x*1 = 1 | *y*1 = 55 |
| 3 | 55 |
| *x*2 = 5 | *y*2 = 55 |
| 7 | 55 |
| 9 | 55 |

**Slide**



**Time (hours)**

All horizontal lines as you extend from left to right have a slope of 0.

**10**

**8**

**6**

**4**

**2**

*x*

**20**

=

run

rise

=

**(2, 55) (4, 55)**

**40**

rise

run

**60**

* Slope

•

**100**

**80**

*y*

Car Speed

**Positive, Negative, Zero, and No Slope**

In the table, *x* represents time in seconds and *y* represents the distance (in feet)

a ball is from the ground.

What is the slope?

Slope = 2 1

*y*  *y*

*x*  *x*

2 1

Slope =

  8 2  2

=

0

Slope

We can never divide a number by 0, so we have no

at 2 seconds.

This would mean that the ball is two different distances off of the ground, which is not possible.

**Speed (mph)**

**9**

**11**

|  |  |
| --- | --- |
| ***x*** | ***y*** |
| *x*1 = 2 | *y*1 = 8 |
| *x*2 = 2 | *y*2 = 13 |

**Slide**

Thrown Ball

*y*

**18**

* Slope

**16**

**Distance from Ground (inches)**

* + rise run

3)

2, 1

(

**12**

**8** (2, 8)

rise run

= = no slope

# 0

**5**

*x*

**11**



**4**

**1**

**2**

**3**

**4**

### Time (seconds)

We have no slope. Any vertical line has slope, or we can say the slope is .



**Summary** Exploring Slope

**?**

How are slopes different from each other?

**Lesson Question**

**Answer**

*Use this space to write any questions or thoughts about this lesson.*