Name: **Date:** **Period:**

Rate of change is finding how one quantity changes in relation to another (another way to ask about SLOPE). When the rate of change between **any two quantities** reduces to the same unit rate, you have a **LINEAR RELATIONSHIP**. A linear relationship has a **CONSTANT RATE OF CHANGE**.

A computer programmer charges customers per line of code written. Consider the **change** in the lines of code and the $.

+50 +50 +50

Lines of Code	50	100	150	200
Cost ($)	1,000	2,000	3,000	4,000

+1000 +1000 +1000

$$\frac{\text{change in cost}}{\text{change in lines of code}} = \frac{\$1000}{50} \quad \textbf{Reduce} \quad \frac{\$20}{1}$$

} This is the UNIT RATE

Since they all reduce to the **same unit rate (constant rate of change)**, this is a linear relationship.

Once you have the UNIT RATE, you can interpret your answer based on the problem:

The rate of change is **$20** per **one** line of code.

Use the table to find the rate of change. Determine whether the relationship is linear (constant rate of change) and interpret your answer based on the actual problem.

The table shows the amount of money a booster club makes washing cars for a fundraiser.

Number of Cars	Money ($)
5	40
10	80
15	120
20	160

Use the information to find the rate of change (remember to reduce to unit rate).

Change in $
Change in Cars

Is the relationship linear (constant rate of change)?

Interpret your slope:

The number of dollars earned increases by $_____ for every car.

The table shows the number of miles a plane traveled while in flight.

Time (min)	Distance (mi)
30	270
60	540
90	810
120	1,080

Use the information to find the rate of change (remember to reduce to unit rate).

Is the relationship linear (constant rate of change)?

Interpret your slope:

The table shows the number of students that buses can transport.

# of buses	2	3	4	5
# of students	144	216	288	360

Use the information to find the rate of change (remember to reduce to unit rate).

Is the relationship linear (constant rate of change)?

Interpret your slope:

Determine whether the relationship between the two quantities described in each table is linear. If so, find the constant rate of change as a UNIT RATES. If not, explain your reasoning.

1. Money Earned per hour of Babysitting

Hours Spent Babysitting	Money Earned ($)
1	10
3	30
5	50
7	70

Rate of change:

Linear or Non-Linear

If linear, interpret your rate of change:

2. Temperature per Time in minutes

Time (min)	Temp (°F)
9	60
10	64
11	68
12	72

Rate of change:

Linear or Non-Linear

If linear, interpret your rate of change:

3. Number of Magazines Sold per Students

Number of Students	Number of Magazines Sold
10	100
15	110
20	200
25	240

Rate of change:

Linear or Non-Linear

If linear, interpret your rate of change:

4. Number of Apples per Tree

Number of Trees	Number of Apples
5	100
10	120
15	150
20	130

Rate of change:

Linear or Non-Linear

If linear, interpret your rate of change:

5. Fabric Needed for Costumes

Number of Costumes	2	4	6	8
Fabric (yd)	7	14	21	28

Rate of change:

Linear or Non-Linear

If linear, interpret your rate of change:

6. Distance Traveled on Bike Trip

Day	1	2	3	4
Distance (mi)	21.8	43.6	68.8	90.6

Rate of change:

Linear or Non-Linear

If linear, interpret your rate of change: