Introduction to Functions - Day 3
Notes

Name Key
Date 0 Period

All around you, things occur in patterns. Once you observe a pattern, you can predict information beyond and between the data observed. The ability to use patterns to make predictions makes it possible for you to run to the right position to catch a fly ball or to guess how a story will end.

Leaky Larry did an experiment to determine the rate at which a leaking faucet loses water. He recorded the data he observed in the table below.

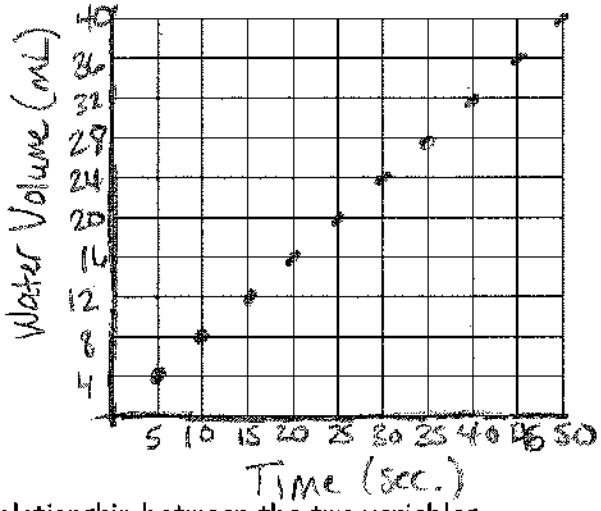
Time (sec.)	5	10	15	20	25	30	35	40	45	50
Water Volume (ml)	4	8	12	16	20	24	28	32	36	40

1. What variables did Larry investigate in his experiment? Which variable represents the independent and which variable represents the dependent quantity?

x - time — independent

y - water volume — dependent

2. Make a coordinate graph of the data Leaky Larry collected. Be sure to label the axes.



3. a) Describe the relationship between the two variables.

positive, as time increases 5secs, H_2O volume increases 4mL.

b) What is the domain?
$\{5, 10, 15, 20, 25, 30, 35, 40, \ldots\}$
$x \geq 0$

What is the range?
$\{4, 8, 12, 16, 20, 24, 28, 32, 36 \ldots\}$
$y \geq 0$

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$y = \frac{4}{5}x$

4. If a faucet dripped at the same rate as Larry's did, how much water would be wasted in 2 minutes? 2 min = 120 sec 5 sec intervals = $\frac{120}{5} = 24$

4 mL per 5 sec = $4 \times 24 =$ **96 mL**

In 2.5 minutes? 150 sec $\frac{4}{5}(150) =$ **120 mL**

In 3 minutes and 15 seconds? 195 sec $\frac{4}{5}(195) =$ **156 mL**

Explain how you made your predictions.

$y = \frac{4}{5}x$

5. If a faucet dripped into a one-liter measuring container at the same rate as Larry's experiment, how long would it take for the container to overflow?

1 Liter = 1000 mL

$1000 = \frac{4}{5}x$

$x =$ **1250 sec**

6. Besides time, what other variables might affect the amount of water in the measuring container?

Answers will vary (ex: splashing, etc)

7. If a faucet leaked at the same rate as Larry's experiment, how much water would be wasted in one month? (Assume a month has 31 days.) Explain how you arrived at your answer.

$31 \text{ days} \left|\frac{24 \text{ hrs}}{1 \text{ day}}\right| \frac{60 \text{ min}}{1 \text{ hr}} \left|\frac{60 \text{ sec}}{1 \text{ min}}\right| = 2678400 \text{ sec}$

$y = \frac{4}{5}(2678400) =$ **2,142,720 mL**

8. Due to the shortage of water in our area, the San Antonio Water System charges its customers \$0.152 for every 10 liters of water used. Use this information and your answer from question 5 and 7 to figure out the cost of the water wasted by a leaking faucet in one month in San Antonio. (Assume a month has 31 days.) Explain how you arrived at your answer.

Bonus

① 2142720 mL $\times \frac{1 \text{ L}}{1000 \text{ mL}} = 2142.72$ L per month

② How many 10 L are in 2142.72?

214.272

③ For every 10L = \$.152

214.275 × .152 = **\$32.57**