

Incoming 9<sup>th</sup>  
Grade Summer  
Assignments  
for Math and  
Science

Name \_\_\_\_\_

Date \_\_\_\_\_

### Speed/Distance Word Problems

**Directions:** Solve each word problem and round all answers to the nearest tenth of a unit if necessary.

#### FORMULAS TO UTILIZE:

$$\text{speed} = \text{distance}/\text{time}$$

$$\text{distance} = (\text{speed})(\text{time})$$

$$\text{time}=\text{distance}/\text{speed}$$

1. Calculate the speed of a dog running West through a field if he is covering 23.7 meters in 54 seconds.
2. If an athlete runs south for a distance of 347 meters in 134 seconds what is her speed?
3. What is the speed of a baseball that travels 49 meters in 2.4 seconds? What is the baseball's speed?
4. What is the speed of a horse in meters per second that runs a distance east of 1.2 miles in 2.4 minutes?
5. Calculate the speed of a car that travels 556 kilometers northeast in 3.4 hours. Leave your answer in kilometers per hour.
6. If the distance covered by a jogger is 2,541 meters northwest through the park and the time it took to cover that distance was 43.6 minutes, what was the speed of the jogger?

7. Which object has a greater speed, a ball rolling down a 3.4 meter hill in six seconds or a fish swimming upstream and covering 5.4 meters in 0.4 minutes?
  
8. If Seneca decides to walk northeast across town to a store that is .95 kilometers away and she has only 25 minutes to get there, what speed does she need to maintain to arrive on time?
  
9. If a projectile flies north 387 meters in 5.8 seconds, what is its speed?
  
10. Calculate the speed of a mountain climber if that climber is moving northeast at a pace of 1.6 km in 1.4 hours?
  
11. Batman's bat mobile is travelling at 80m/s when it comes to a screeching halt in 7 seconds because of a moose crossing the road. What is the car's acceleration?

Name \_\_\_\_\_

Solve each equation.

1)  $-20 = -4x - 6x$

2)  $6 = 1 - 2n + 5$

3)  $8x - 2 = -9 + 7x$

4)  $a + 5 = -5a + 5$

5)  $4m - 4 = 4m$

6)  $p - 1 = 5p + 3p - 8$

7)  $5p - 14 = 8p + 4$

8)  $p - 4 = -9 + p$

$$9) -8 = -(x + 4)$$

$$10) 12 = -4(-6x - 3)$$

$$11) 14 = -(p - 8)$$

$$12) -(7 - 4x) = 9$$

$$13) -18 - 6k = 6(1 + 3k)$$

$$14) 5n + 34 = -2(1 - 7n)$$

$$15) 2(4x - 3) - 8 = 4 + 2x$$

$$16) 3n - 5 = -8(6 + 5n)$$

$$17) -(1 + 7x) - 6(-7 - x) = 36$$

$$18) -3(4x + 3) + 4(6x + 1) = 43$$

$$19) 24a - 22 = -4(1 - 6a)$$

$$20) -5(1 - 5x) + 5(-8x - 2) = -4x - 8x$$

## PROBABILITY

Probability is such an innate part of your life that you rarely think about it. However, every time you use a word like “might,” “may,” “undoubtedly,” “without fail,” or “maybe,” you are voicing a probability that an event will occur.

Scientists and mathematicians like to express probability more accurately. For example, if you toss a penny in the air, the probability (P) that it will land heads can be expressed:

$P = \# \text{ of times it lands heads} / \text{total number of coin tosses.}$

The number will be 5/10, which reduces to  $\frac{1}{2}$ . This means that you have a 1 out of 2 chance that the penny will land heads.

Life gets more complex when you introduce more possible outcomes. This experiment involves calculating and expressing the possibilities when 3 pennies are tossed simultaneously. Under these circumstances, what are the odds you will get three heads? Three tails? Two heads and a tail? What do you think will happen if you tossed four coins in the air?

### Problem:

How does one express the probability of an event and how does probability relate to science?

### Materials:

- Lab book and pencil (all experiments)
- Four pennies

## Procedure

### EXPERIMENT #1

1. Try tossing three pennies 16 times and writing down the outcomes.

Are the probabilities roughly the same as you calculated in step 2? Try tossing three pennies 24 times. Are the probabilities any closer?

Experiment Number	Toss 1	Toss 2	Toss 3	All three tails? (y/n)	All three heads? (y/n)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

1. **Experimental Probability:** Using your experiment, what was the experimental probability of:

- The probability of getting three heads: \_\_\_\_\_/24
- The probability of getting three tails: \_\_\_\_\_/24
- The probability of getting one heads and two tails. \_\_\_\_\_/24
- The probability of getting one tails and two heads. \_\_\_\_\_/24

2. **Theoretical Probability:** Create a sample space listing all the possible outcomes when flipping 3 coins:

One example is: TTH. List all other examples:

2.    3.    4.    5.    6.    7.    8.

How many outcomes are there? \_\_\_\_\_



Based on your sample space, what is the probability of getting three heads?  
\_\_\_\_/8 = \_\_\_\_%

Based on your outcomes, what is the probability of getting three tails? \_\_\_\_/8 = \_\_\_\_%

Based on your outcomes, what is the probability of getting one heads and two tails? \_\_\_\_/8 = \_\_\_\_%

Based on your outcomes, what is the probability one tails and two heads? \_\_\_\_/8 = \_\_\_\_%

**Were your probabilities from your experiment similar or different from the theoretical probabilities that you just calculated?**

## **EXPERIMENT #2**

1. Imagine you are conducting the experiment with only four pennies. Make a sample space represent all possible outcomes:

**Here are two examples:** HHHH    HHHT

Try to create all the rest of the examples:

2. How many different possibilities are there? \_\_\_\_\_ Calculate the probability of the following. Reduce your fractions to lowest terms:
  - The probability of getting four heads \_\_\_\_\_
  - The probability of getting four tails \_\_\_\_\_
  - The probability of getting three heads and one tail \_\_\_\_\_
  - The probability of getting three tails and one head \_\_\_\_\_
  - The probability of getting two heads and two tails \_\_\_\_\_
  - The probability of getting two tails and three heads. \_\_\_\_\_