


## Concept: What's the Chance?

Name:

NOTE: *You will need one coin for this section*

### COMPUTER COMPONENT

**Instructions:** In  follow the **Content Menu** path:

**Probability > What's the Chance?**



Work through all Sub Lessons of the following Lessons **in order**:

- *Probability*
- *Probability Examples*
- *The Probability Scale*
- *Experimental Probability*

Additional Required Materials: *Coins*



As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

### SUMMARY

1. Demonstrate your knowledge of probability terms by filling the blanks. You may use the word bank below to help you.

The **probability** of an event is the same as saying the **likelihood** that a specific **result** will occur.

This may be written as a **fraction** =  $\frac{\text{number of } \mathbf{favorable} \text{ outcomes}}{\text{Total number of } \mathbf{possible} \text{ outcomes}}$

Total number of **possible** outcomes

<b>possible</b>	<b>fraction</b>	<b>probability</b>	<b>result</b>
	<b>likelihood</b>	<b>favorable</b>	

### OFF COMPUTER EXERCISES

*Theoretical Probability is the probability that you think the experiment will produce, before you have even started the experiment.*

1. Demonstrate your knowledge of *theoretical probability* by completing the table below.

	List of all Possible Outcomes	Favorable Outcome	Number of Favorable Outcomes	Probability
Toss 1 coin	heads, tails	tails	1	$\frac{1}{2}$
Roll 1 Die	1, 2, 3, 4, 5, 6	roll a 2	1	$\frac{1}{6}$
Roll 1 Die	1, 2, 3, 4, 5, 6	roll a 4 or 5	2	$\frac{2}{6}$ or $\frac{1}{3}$
Toss 2 Coins (order doesn't matter)	heads, heads, tails, tails	1 head, 1 tail	2	$\frac{2}{4}$ or $\frac{1}{2}$

2. Calculate the **Theoretical Probability** of tossing a head in the experiment of tossing a coin 30 times.

**Recall: Theoretical Probability is the probability that you think the experiment will produce, before you have even started the experiment.**

$$\frac{\text{favorable}}{\text{possible}} = \frac{1}{2} = \frac{x}{30} \quad \text{In 30 trials, the theoretical probability of tossing a head is 15.}$$

*Experimental Probability is the probability that the experiment will actually produce, because you will have conducted the experiment.*

**Remember:** Your predictions in Theoretical Probability and your results in Experimental Probability will not always be the same.

3. You will need to work with a partner for this question.
- (a) Toss a coin 30 times. Record each result in the tally chart below.

Heads	Tails

- (b) Express the total number of heads as a probability.  
This is the **Experimental Probability**.

**\* Results will vary.**

- (c) How do your results compare with your prediction in #2?

**\* Results will vary.**

- (d) How do your results compare with those of your classmates?

**\* Results will vary.**

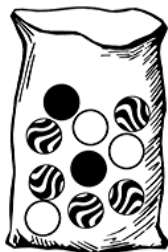
4. What is the probability of spinning the numbers 1 to 5 on Spinner A below?



*Spinner A*

The Probability of spinning 1 to 5 =  $\frac{5}{8}$  or **5** out of **8**.

5. What is the probability of picking a white marble out of a bag, which contains 2 black marbles, 3 white marbles, and 5 striped marbles?



Probability of a white marble =  $\frac{3}{10}$  or **3** out of **10**.

6. Consider all the possibilities a person has when getting dressed to go outside. For a person who has many clothing choices, the combinations are numerous, so we'll keep it simple. "Basic Bill" has the following choices for outdoor apparel:

Footwear	Jacket	Hat
-boots -sneakers	-parka -raincoat -jean jacket	-baseball cap -bucket hat -toque

(a) *Create a tree diagram to show all the possible clothing combinations.*  
How many possible outcomes are there for Bill if he must wear one of each item?

Footwear	Jacket	Hat
Boots	Parka	Baseball Cap
		Bucket Hat
		Toque
	Raincoat	Baseball Cap
		Bucket Hat
		Toque
	Jean Jacket	Baseball Cap
		Bucket Hat
		Toque
Sneakers	Parka	Baseball Cap
		Bucket Hat
		Toque
	Raincoat	Baseball Cap
		Bucket Hat
		Toque
	Jean Jacket	Baseball Cap
		Bucket Hat
		Toque

**Bill has 18 possible clothing combinations.**

(b) Are all the above clothing combinations equally likely? Explain.

**The combinations are equally likely if randomly drawn since one of each category is chosen.**

(c) What is the probability that Bill wears his jean jacket, baseball cap and sneakers?

$\frac{1}{18}$  or 1 out of 18.

7. The following table gives the number of birthdays each month for a class of 48 students.

Jan	Feb	Mar	Apr	Ma y	Jun e	July	Aug	Sept.	Oct	Nov	Dec
4	6	5	6	4	4	2	5	3	2	4	3

(i) What is the probability that a randomly picked student...

(a) has a birthday in May?  $\frac{\text{favorable}(\text{defectivesfound})}{\text{possible}(\text{tries})} = \frac{8}{10}$

(b) has a birthday in July?  $\frac{2}{48} = \frac{1}{24}$

(c) has a birthday in May, June or July?  $\frac{10}{48} = \frac{5}{24}$

(d) has a birthday during the two summer months?  $\frac{7}{48}$

(e) does not have a birthday during the two summer months?  $\frac{41}{48}$

(ii) How are the answers to (d) and (e) above related?

**When combined the two probabilities are certain, or have a value of 1.**

8. If a quality control check found that in a sample of 200 batteries, 6 were defective, how many batteries would you expect to be defective in a shipment of 1500 batteries?

$$\frac{\text{favorable}(\text{defectivesfound})}{\text{possible}(\text{tries})} = \frac{6}{200} = \frac{x}{1500}$$

**$x = 45$  You would expect 45 batteries to be defective.**

9. If Shelby usually sinks 8 out of every 10 baskets she tries, how many baskets would you expect her to get in a game where she tries to sink the ball 50 times?

$$\frac{\text{favorable}(\text{successful})}{\text{possible}(\text{tries})} = \frac{8}{10} = \frac{x}{50}$$

**$x = 40$  You would expect Shelby to sink 40 out of 50 basketball attempts.**

10. The probability of Pedro getting a strike in 3 games of bowling is  $\frac{2}{15}$ .

What is the probability of Pedro **not** getting a strike in 3 games?

**Pedro would probably not get a strike in 3 games 13 of 15 times. (Remember that the favorable and possible must total 1.)**