Probability and Odds:

In a recent survey, it was reported that of drivers who recently got in an accident, 75% of them were NOT eating food when they crashed their car. Is it therefore safer to eat while driving? Why or why not?

100% of men over 6 feet tall wear shoes that are at least size 9. My friend wears shoes that are size 10. Is he over 6 feet tall? Why or why not?

Definitions:

All the possible things that could happen ← Outcomes

Event

An outcome or a group of outcomes

Sample Space

Collection or number of all possible outcomes

Example - roll a die

Outcomes

1, 2, 3, 4, 5 or 6

event

- get a 2
- get a 3 or 6
- any odd number

Sample space

6 (possible outcomes)

Probability:

What are the odds?

How likely is an event?

$\frac{4}{17}$ ← # of possible ways that event can occur divided by sample space

Expressed as decimal, percent, or fraction

$\frac{6}{17}$ chance that I'll pull a blue-eyed monkey out of a bag

Example: 17 monkeys - 6 have blue eyes, 11 have red eyes

Theoretical vs. Experimental probabilities

Flip a coin ...

50% of heads

$\frac{50}{100}$ should be heads

$\frac{47}{100}$ actual heads when I flipped the coin

Theoretical probabilities describe the likelihood of an event

Experimental probabilities describe how many times the event ACTUALLY occurred in a given number of trials

How to Find Possible Outcomes:

1 coin

H
T

2 coins

H	H
H	T
T	H
T	T
1	2

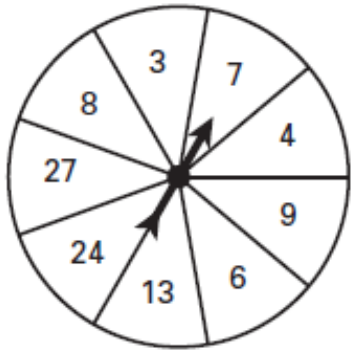
Make a table showing all possible outcomes for each activity:

Flip a coin:

Flip TWO coins:

What is the probability that the spinner stops on an even number? $\frac{4}{9}$

What is the probability that the spinner stops on an odd number? $\frac{5}{9}$



You spin the spinner 24 times. It stops on 27 twice. What is the experimental probability of stopping on 27? $\frac{2}{24} = \frac{1}{12}$

You spin the spinner 30 times. It stops on a multiple of 3 five times. What is the experimental probability of stopping on a multiple of 3? $\frac{5}{30} = \frac{1}{6}$

What are the odds in favor of stopping on a multiple of 4? 3/9 = 1/3

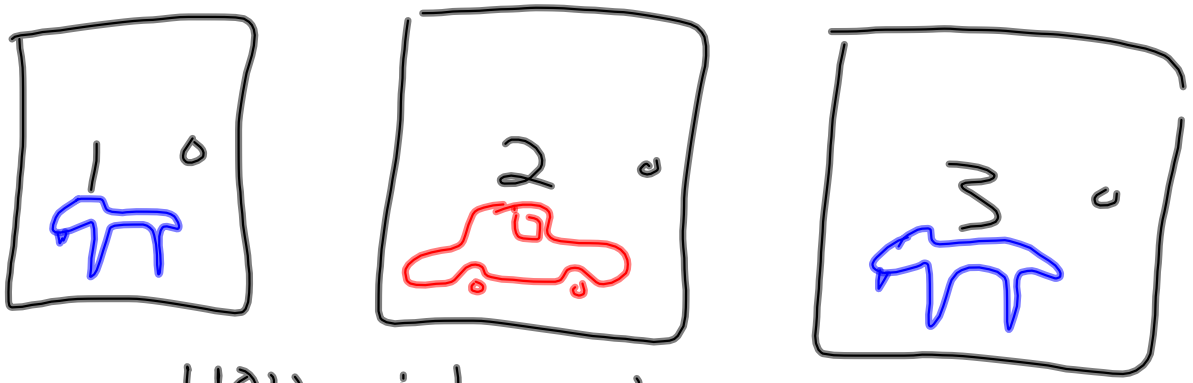
What are the odds against stopping on a multiple of 6? 7/9

$$\text{prob} = \frac{\#\text{ ways event}}{\text{sample space}}$$

$$\text{exp.} = \frac{\#\text{ actual occ.}}{\#\text{ trials}}$$

http://www.marilynvossavant.com/articles/gameshow.html

We'll come back to this one...



- you pick a door
- the host opens a different door: GOAT
- you can switch if you want

Homework:

~~p. 846, 3-6 (not 5), 9-12, 17-18~~

p. 846 #3, 9, 17