Section 1-6: Probability

2 kinds of probability

Experimental Probability

Using the results of an experiment to predict future outcomes.

$$= \frac{\text{\# times an event occurs}}{\text{Total \# of trials}}$$

Theoretical Probability

Using knowledge of a situation to predict future outcomes.

$$= \frac{\text{\# of favorable outcomes}}{\text{Total possible outcomes}}$$

also known as: Sample space

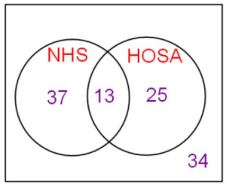
Is this Experimental or Theoretical Probability?

You want to predict what will happen the next time you spin this spinner. Find each probability as a fraction.

1. P(Factor of 12) = $\frac{5}{8}$
2. P(multiple of 3) = $\frac{2}{8}$
3. P(Prime #) = $\frac{4}{8}$
4. P(Red or Blue) = $\frac{6}{8}$
5. P(Blue and Mult of 4) = $\frac{2}{8}$
6. P(Prime # or Blue) = $\frac{7}{8}$

Is this Experimental or Theoretical Probability?

The Venn Diagram below shows after school activities that students belong to.



You will select a student at random, find each probability as a fraction.

1. P(NHS but not HOSA) = $\frac{37}{109}$
2. P(Neither HOSA nor NHS) = $\frac{34}{109}$
3. P(HOSA and NHS) = $\frac{13}{109}$
4. P(not NHS) = $\frac{59}{109}$

Is this Experimental or Theoretical Probability?

A survey of people's favorite fruit was conducted.
The results are shown below. Find each probability as a fraction

	Apple	Pear	Orange	Banana	Total
Male	73	64	80	51	268
Female	68	75	83	56	282
Total	141	139	163	107	550

1. P(Apple) $= \frac{141}{550}$

2. P(Banana or Orange) $= \frac{270}{550}$ (163 + 107)

3. P(Female and Pear) $= \frac{75}{550}$

4. P(Male or Apple) $= \frac{336}{550}$ (268 + 141 − 73)

5. If 75 more people are surveyed approximately how many of them will say that Banana is their favorite?

$\frac{107}{550} = \frac{x}{75}$

15 people

$P(\text{Bananas}) = \frac{107}{550} = 19.45\%$

$= .1945(75)$

When you roll a pair of dice:

How many different sums are possible when you roll a pair of dice?

2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 → 11 diff sums

Which sum do you think is least likely to occur?

2 & 12

Which sum do you think is most likely to occur?

Something near the middle

Probability Experiment:

Probability of getting a certain sum when rolling a pair of dice.

- Work in pairs.
- Your pair will roll two dice a total of 50 times and record the sum each time.
- Use your results to answer the following probability questions as a percent (nearest tenth):
  - P(rolling a sum of 9) =
  - P(rolling a sum of 3) =
  - P(rolling a sum of 7) =
- Record your results after the 50 rolls on the Promethean board.