

6-4 Relative Frequency vs. Probability

Warm-up

Toss a coin and record your outcomes.



Toss #	Outcome
1	T
2	H
3	H
4	T
5	T
6	T
7	H
8	T
9	H
10	H

Toss #	Outcome
11	H
12	T
13	T
14	T
15	H
16	H
17	H
18	T
19	H
20	H

$$T = 9$$
$$H = 11$$

Vocab	Definition	Example
Outcome	possible Results in an experiment	[Ex] Heads or Tails
Event	Set of Outcomes	[Ex] Rolling a die: 1, 2, 3, 4, 5, 6

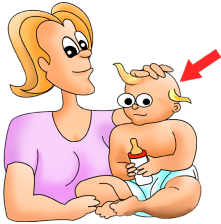
Relative Frequency (Real-experiment)	Probability - Theoretical
1. Experimental = $\frac{\text{Actual}}{\text{Real}}$	1. How likely it will happen
2. 0 means <u>it did not happen</u>	2. 0 means <u>it's impossible</u>
3. 1 means <u>it occurred every time</u>	3. 1 means <u>it always happen</u>
4. Complement = $1 - r$, $r = \text{relative frequency}$	4. Complement = $1 - P$, probability
5. $\frac{\text{\# of times event occurred}}{\text{\# of times it could occur}}$	5. $\frac{\text{\# of outcomes}}{\text{\# of total Outcomes}}$

Similarities

- Both have to be between 0 and 1.
Ex: Less likely \rightarrow more likely
- Both have complements
Ex: $1 - p$, $1 - r$

Examples

1. Find the relative frequency of boys born to total births for the year when 4,158,000 babies were born and 2,129,000 were boys.



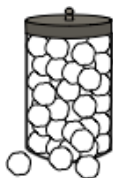
$$\frac{\text{boys}}{\text{total}} = \frac{2,129,000}{4,158,000} = .51 = \frac{51\%}{1}$$

2. There are 4 green gumballs and 5 red gumballs in a jar.

1. How many total outcomes are there?

$$\frac{9 \text{ gumballs}}{5/9}$$

2. What is the probability of grabbing a red gumball?



$$P = \frac{\text{What you're looking for}}{\text{total}} = \frac{5}{9}$$

Coin Toss

What is the **probability** of tossing a coin and it landing on heads? Put in decimal form.

.5 ✓ Tails? .5

$$\frac{1}{2} = .5$$

Using the chart you created in the warm-up, what is your **relative frequency** of flipping a coin and it landing on tails?

Tails: Total Outcomes

9 : 20 = .45 = 45 %

(ratio)

(fraction) (percent)