

4.1 Experimental Probability

- is the **observed probability** (relative frequency) of an **event**, A, in an experiment.
- is found using the following formula:

$$P(A) = \frac{\text{number of times } A \text{ occurs}}{\text{total number of trials}}$$

Note: probability is a number between 0 and 1 inclusive. It can be written as a fraction or decimal.

Simulations

Describe a simulation that models:

a) A hockey player who scores on 17% of the shots he takes.

- Roll a die. Let 1 represent a goal.

Why? Because 1 out of 6 = $1/6 = 0.16666\dots = 16.7\%$
or 17%



Simulations

- A simulation is an experiment that has the same probability as an actual event.
- Flip a fair coin $\rightarrow \frac{1}{2}$
- Roll a fair die $\rightarrow 1/6, 2/6, 3/6, 4/6, 5/6$
- Draw a card from a standard deck (52)
 $\rightarrow \frac{1}{2}, \frac{1}{4}, 1/13, 1/52, \text{ others}$
- Spin a spinner \rightarrow any (realistically 12 or fewer)

Simulations

Describe a simulation that models:

b) A baseball player whose batting average is 0.300

- Put 3 red balls and 7 blue balls in a bin. Drawing a red ball represents a hit.



Simulations

Describe a simulation that models:

c) A randomly chosen student having a birthday during the school year

- Roll a die. Any number other than 1 represents the student having a birthday during the school year.

Why? Because 5 out of 6 = $\frac{5}{6} = \frac{10}{12}$
and the school year is 10 out of 12 months!

