# Predicting the Unpredictable

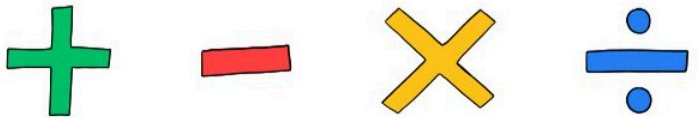
Sample spaces and theoretical probability




Created with LessonDino.com · AI lesson planner with checkable sources

# Heads or six?

- A coin toss and a dice roll are fair, so every outcome is equally likely.





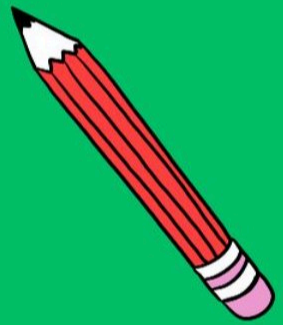
Created with LessonDino.com · AI lesson planner with checkable sources

$a^2+b^2=c^2$

# Fair means predictable

1. Equally likely: each outcome has same chance
2. Mutually exclusive: only one outcome happens
3. Sample space: list of all possible outcomes
4. Theoretical probability = favourable ÷ total



Created with LessonDino.com · AI lesson planner with checkable sources

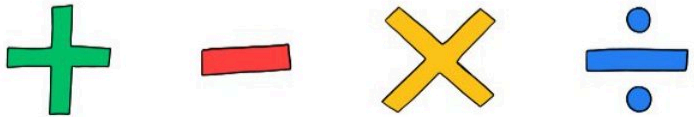
# Single vs combined

## Single event

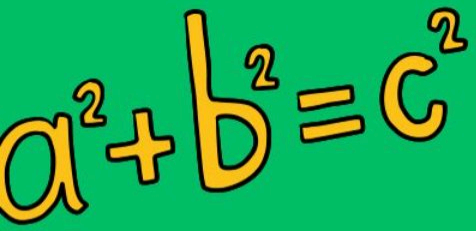
- One coin: H, T
- One die: 1, 2, 3, 4, 5, 6
- Total is easy to count

## Combined event

- Two coins: HH, HT, TH, TT
- Coin + die: 2 x 6 = 12 outcomes
- List systematically to avoid missing

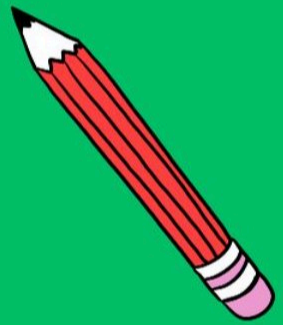


Created with LessonDino.com · AI lesson planner with checkable sources




# What would you test?

## Which experiment would you most like to try in class?

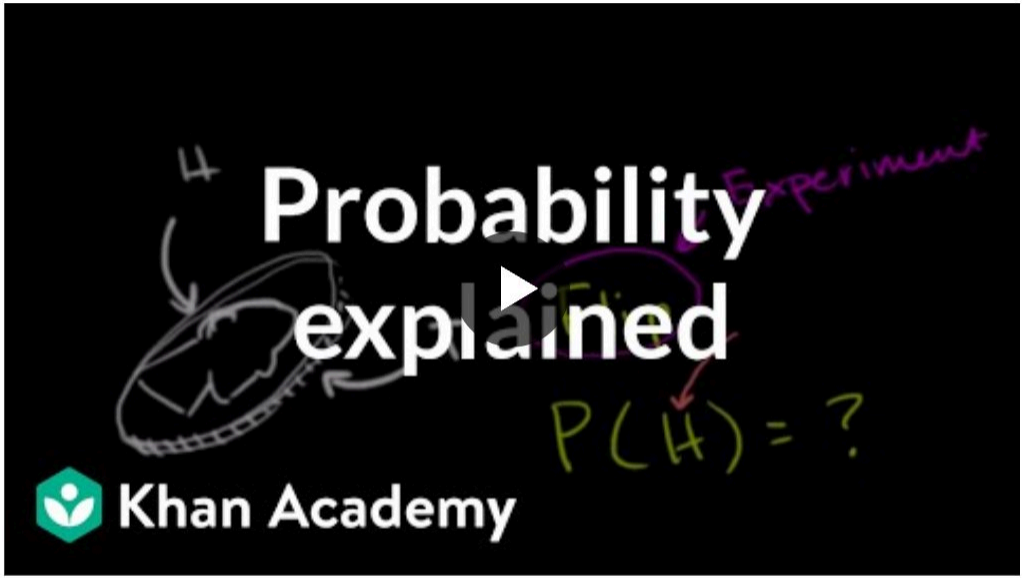


- **A** Flip a coin twice
- **B** Roll two dice
- **C** Spin two colour spinners

Vote with your hands, then explain why.

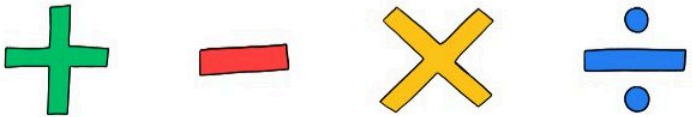
Created with LessonDino.com · AI lesson planner with checkable sources

# Watch: sample spaces



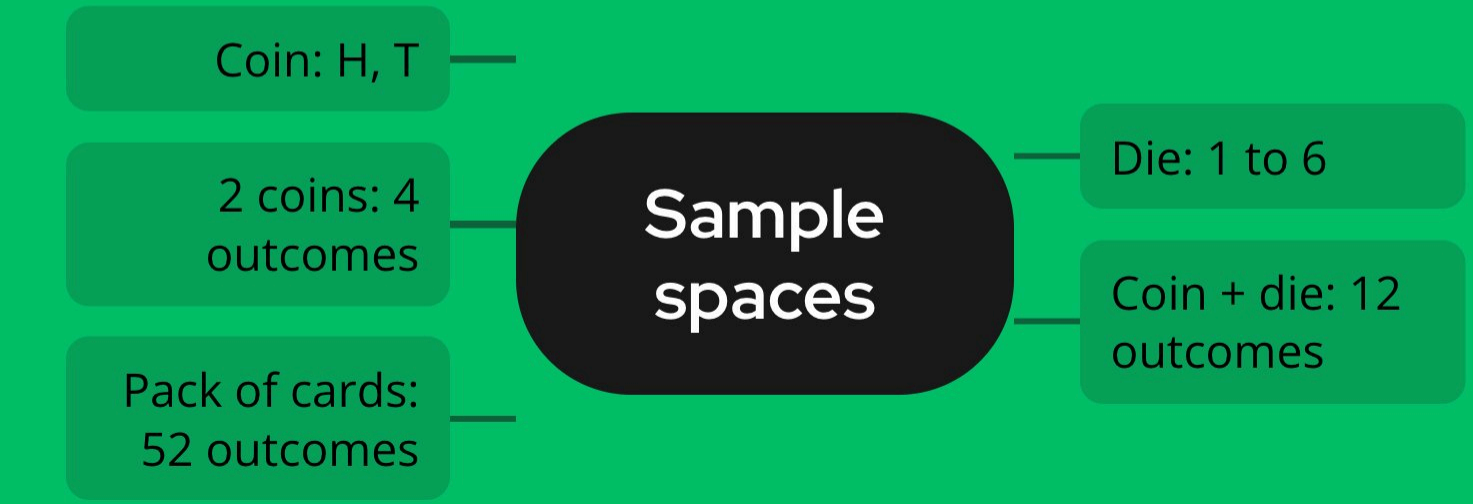

▶ 0:00 – 4:30

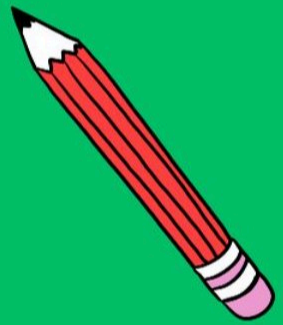
- Spot the sample space for a coin
- Spot the sample space for a die



$a^2+b^2=c^2$

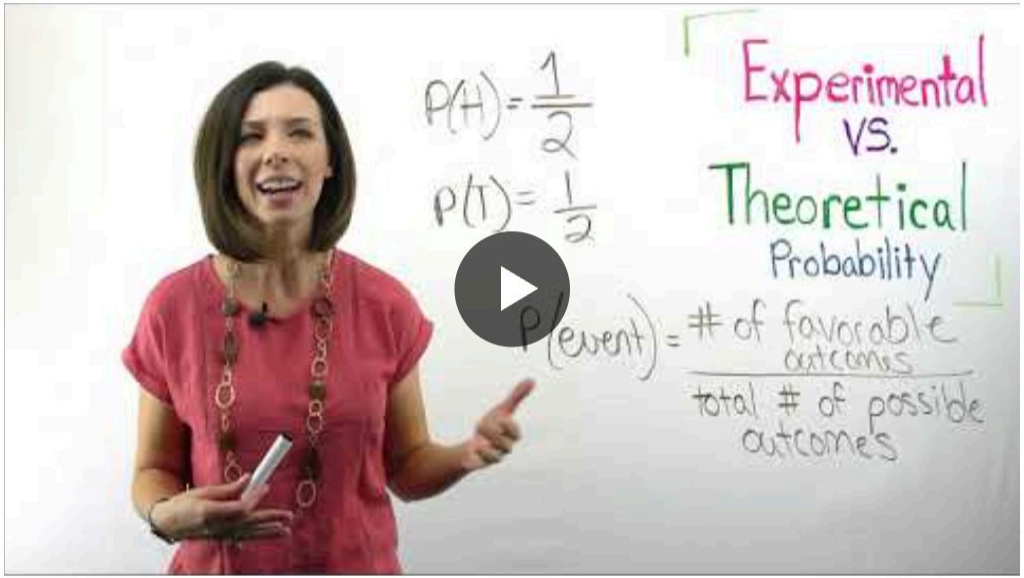
# Mapping sample spaces



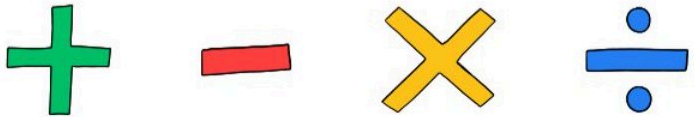
Created with LessonDino.com · AI lesson planner with checkable sources

# Watch: theory vs reality




▶ 0:00 – 4:26

- Hear theoretical vs experimental difference
- Listen for favourable over total



$a^2+b^2=c^2$

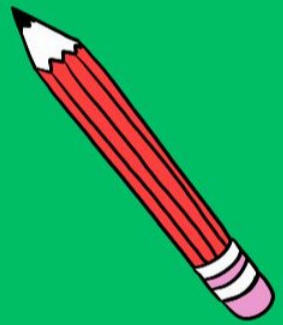
# Your task

**In pairs, list sample spaces and calculate three theoretical probabilities.**

1. List all outcomes neatly in a table or grid
2. Count total and favourable outcomes
3. Write each probability as a fraction

**10 min**

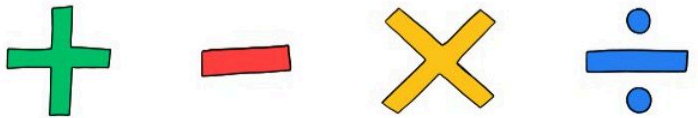
**In pairs**



Created with LessonDino.com · AI lesson planner with checkable sources

# From list to answer

List all equally likely outcomes → Count total outcomes → Count favourable outcomes → Calculate favourable ÷ total



$a^2+b^2=c^2$

## Think, pair, share

Two dice are rolled. Why is a total of 7 more likely than a total of 2?




Created with LessonDino.com · AI lesson planner with checkable sources

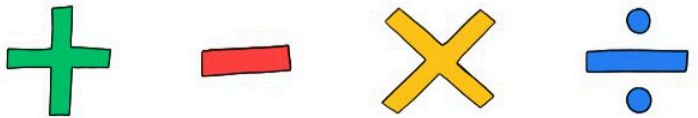
# True or false?

Flipping a coin twice has 4 outcomes in the sample space.

A coin and a die together have 7 possible outcomes.

The probability of rolling a 5 on a fair die is 1/6.

Theoretical probability = favourable outcomes ÷ total outcomes.





Created with LessonDino.com · AI lesson planner with checkable sources