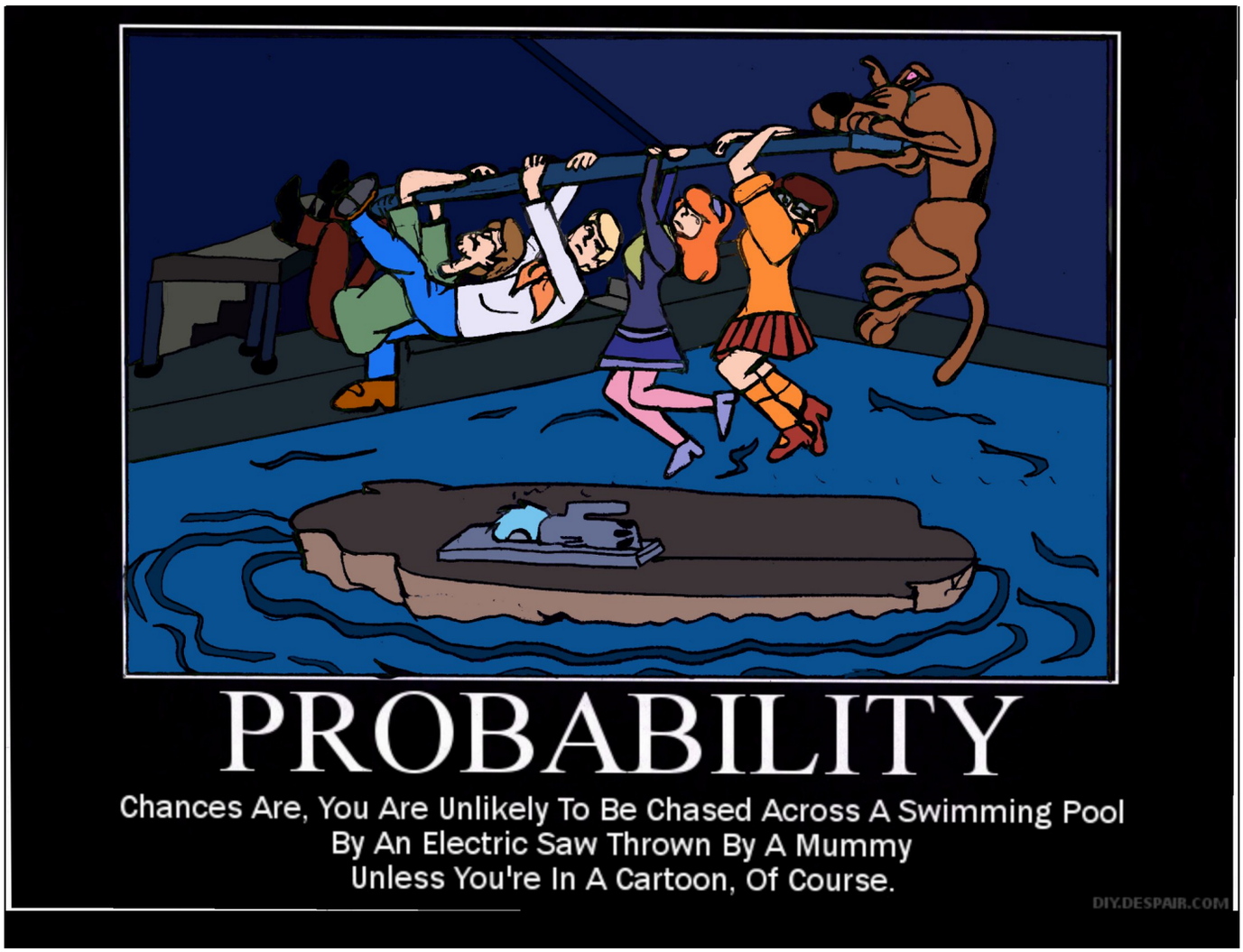
Curriculum Outcomes:

(SP5) Demonstrate an understanding of the role of probability in society.

Student Friendly:

What is Probability and where do you see it?
What types of probability are there?


PROBABILITY
Chances Are, You Are Unlikely To Be Chased Across A Swimming Pool
By An Electric Saw Thrown By A Mummy
Unless You're In A Cartoon, Of Course.
DIY.DESPAIR.COM

"Relax I know this road perfectly!
I've been driving it all my life!"

Assumptions

(Click for video)

Describe the assumption each person is making.

A thing that is accepted as true or as certain to happen, without proof: "they made certain assumptions about the market".

Theoretical & Experimental Probability

(Click for video)

Theoretical Probability (Information is already given.)

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

Experimental Probability

$$\frac{\text{\# of favorable outcomes}}{\text{total outcomes}}$$

(_____
.)

Theoretical

of favorable outcomes
# of possible outcomes

The probability of spinning purple is ....

Experimental

of favorable outcomes
total outcomes

Spin the spinner 8 times to determine the probability of getting Purple.

Blue	Purple	Orange	Red
I		IIII	II

Probability

- **theoretical probability** - the actual probability based on possible outcomes.

Theoretical

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

ex: P(head) = 1/2, P(3 on a die) = 1/6, P(club) = 1/4

- **experimental probability** - measured through performing trials.

Experimental

$$\frac{\text{\# of favorable outcomes}}{\text{total outcomes}}$$

ex: spinner, flip a coin, draw a card, roll a die, etc...

There are two ways to find Theoretical Probability

1. Tree Diagrams 2.. Calculating the probability.

Example: what is the probability that you will get a tail when you flip a coi and a 2 when you roll a die.

1. Tree Coin Die Outcomes

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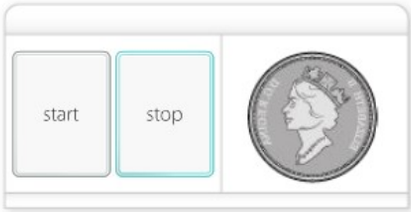
Subjective Judgment

To determine outcome based on how you feel.

You win $1 000 if the coin lands on heads, you must pay $1 000 if the coin lands on tails.

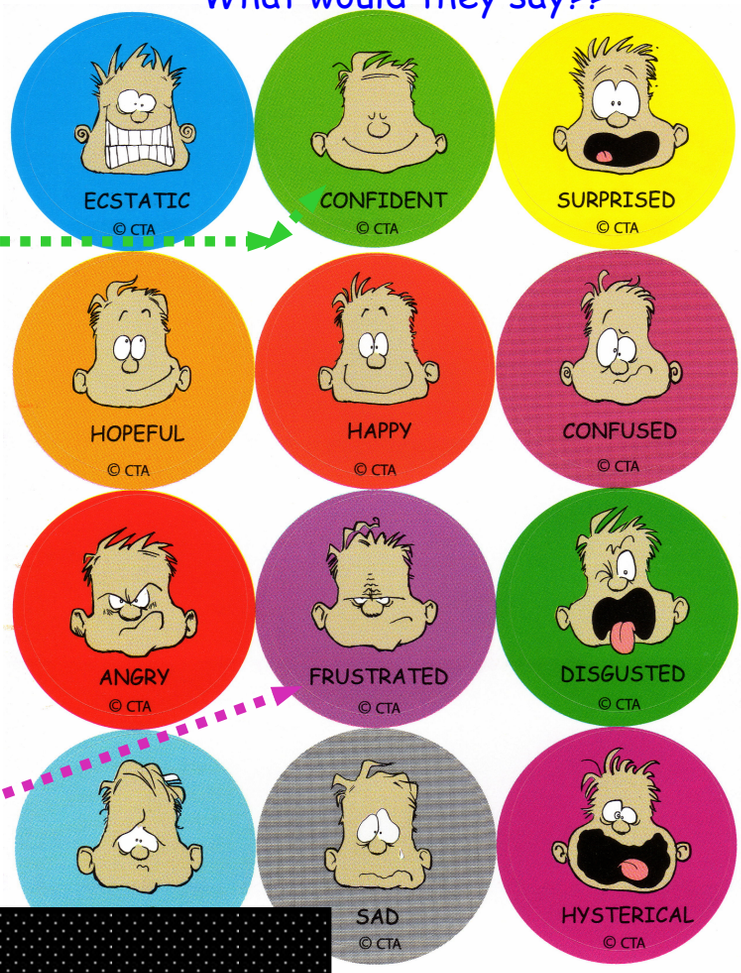


Even though there is a 50% chance of getting heads,

what would they say??

"Flip the coin.. it will be heads for sure, I always win!!"

What would they say??



Subjective Probability

To determine probability based on how you feel.

"I don't care if you flip the coin or not, I never win!!"

What would they say??

"Flip the coin.. it will be heads for sure, I always win!!"

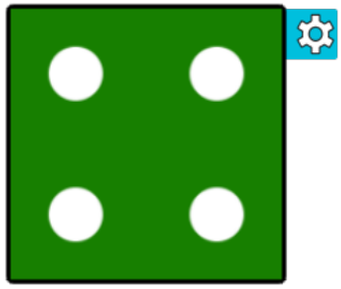
"I don't care if you flip the coin or not, I never win!!"

It is Jack's experience that 4 out of 5 times the prize in the cereal box is found at the bottom of the box.

So, Jack opens the bottom of the cereal box to find his prize.

Explain how his decision is based on Theoretical probability, experimental probability or subjective judgment

His past experience is that the prize is at the bottom...
Experimental probability



Two friends are rolling a die. Out of eight rolls made, a "4" came up 7 times.

Amith predicts the next roll will likely not be a "4", since each number has an equal chance of being rolled.

Maria decides the die is unfair since 7 out of 8 rolls revealed a "4".

Explain how their decision is based on Theoretical probability, experimental probability or subjective judgements

Amith

In theory, Amith knows that each number has a 1/6 chance of being rolled...

Theoretical probability

Maria

Based on the experimental probability, she felt the die must be unfair.

Subjective judgement

In past baseball games, Alice made 2 hits for every 5 times she went up to bat.

In the next game, suppose Alice goes up to bat. What is the probability that she will get a hit? What assumptions are you making?

- Probability.... 2 out of 5

  $\frac{2}{5}$ = 0.4 or 40%

- The next team she plays will have an [redacted] s the teams she has played before.

For each assumption, explain how the predicted outcomes might change if the assumption changes.

- If the next team has [redacted], then she will probably not get 2 out of 5 hits.
- If the next team has [redacted], then she will probably get more than 2 out of 5 hits.

erase erase

Using Probability to support Opposing Views

Jon wants to learn how to snowboard but does not want to take lessons. His mother insists that Jon take lessons, Jon and his mother find an article that claims...

Mother....

Son....

Lessons are important because....beginners are prone to accidents. erase

erase I shouldn't take lessons because.. many people get injured during lessons.

Class/Homework

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Questions :
3,4, 5,7,9,10