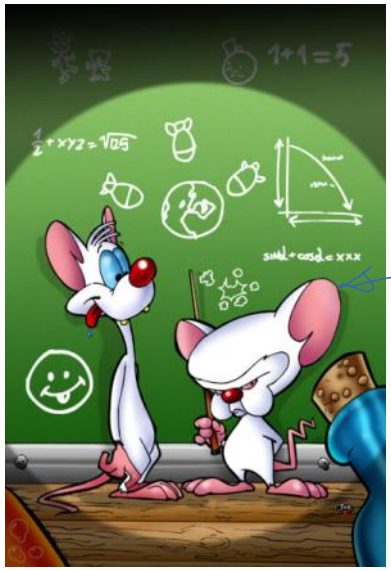
Experimental Probability

Thursday, 15 February 2018 8:05 pm

Questions to be done once the teaching has finished:
Year 7 Textbook
Exercise 8I
Questions: 1, 2, 3, 4, 5, 6, 7, 9

Experiments!!!!





In Science we do lots of experiments.
We do this to help us find things out or to prove if something is true or false.

In Mathematics, we can do experiments too.



When we toss a coin 50 times do we really get 25 heads and 25 tails?

Because there is an even chance of getting a Head or a Tail, we would expect there to be 25 Heads and 25 Tails if we throw a coin 25 times.



Experiment
If you have a coin on you, I want you to draw the following table in your book and toss a coin 50 times. Take it in turns to toss it. 25 times each. Every time you get a Head put a tally in the Heads column, every time you get a tail, put a tally in the Tails column

	Heads	Tails
Tally	IIII	IIII IIII

Did you get 25 heads and 25 tails?
The chances are you didn't.

Difference between theoretical probability and experimental probability

Without doing an experiment we THINK that the probability of throwing a HEAD would be $\frac{1}{2}$

Without doing an experiment we THINK that the probability of throwing a 6 on a fair 6-sided dice would be $\frac{1}{6}$

When we don't do an experiment and we take a "good guess" we can this the theoretical probability because the results are just a theory.
When we do an experiment we can find the experimental probability.

E.g. Here are the result from when I threw a dice 100 times.

Number	1	2	3	4	5	6
Frequency	15	15	15	20	10	25

We can see that when I did this experiment there **isn't an equal chance** of getting each of the numbers.
We can work out the experimental probability by reading a number of the table!

Pr(6) $= \frac{25}{100} = \frac{1}{4}$

Pr(odd)

Pr(1) = 15/100 = 3/20



$$Probability = \frac{Number\ of\ successes}{Total\ number\ of\ trials}$$

15/100

Different ways they can give you information

Example: A list

1, 2, 4, 5, 2, 6, 3, 1, 3, 6

Pr(1) = 2/10 = 1/5

Example: A table

Colour	Red	Black	White	Blue	Purple	Green
Number of cars	21	24	25	20	3	7

45, 70, 90, 93, 100

Pr(Green) = 7/100 (7%)

Example Question:

1 A 6-sided die is rolled 10 times and the following numbers come up: 2, 4, 6, 4, 5, 1, 6, 4, 4, 3.

a What is the experimental probability of getting a 3? 1/10

b What is the experimental probability of getting a 4? 4/10 = 2/5

c What is the experimental probability of getting an odd number? 3/10