3.3 Lesson 2 Sample space diagrams with Grim dice

1) A normal coin is flipped twice. What could happen? What is the chance of each outcome?

2) What about if it were flipped three times?

3) What if the coin were unfair and had $P(\text{Heads}) = 0.4$.

4) Pick red and olive dice. Which dice was better? What could happen when you roll the dice?

5) Sometimes it is better to use a grid to show all the possible outcomes. How many Red wins? How many Olive wins? What is the probability of Olive winning?

6) Repeat with Red and Blue dice

7) **Comparing methods** Is it better to roll the dice many times or create a sample space diagram? What advantages does a sample space diagram have? What disadvantages does it have?

hints accuracy , no assumptions, fair dice, experimental, fun.

8) **Investigation** Look at the yellow and magenta dice. Which do you think is better? Why? Prove it using a method of your choice.

9) **Investigation** Look at the yellow and olive dice. Which do you think is better? Why? Prove it using the method you think is fastest

10) **Conclusion** Draw a diagram showing which dice colours beat the others. Can you devise a strategy to beat 2 other players when rolling the dice?

Red die					

(Olive die)

On average which dice wins?

What is the probability of that dice wimming?

Olive die					

(Blue die)

On average which dice wins?

What is the probability of that dice wimming?

Red die					

(Blue die)

On average which dice wins?

What is the probability of that dice wimming?

	Magenta die				
Yellow die					

On average which dice wins?

What is the probability of that dice wimming?

	Yellow die				
Olive die					

On average which dice wins?

What is the probability of that dice wimming?

	Magenta die				
Red die					

On average which dice wins?

What is the probability of that dice wimming?