Investigations

Investigating Dice

Probability

Single Possibilities

For this activity, you will need one 6-sided die.

Draw a frequency table with the following titles:

Score	Tally	Total	Prediction
1			
2			

In the score column, put the numbers: 1, 2, 3, 4, 5, 6.

You are going to throw the die 120 times. In the prediction column, write down the number of times that you think each number will come up.

Throw the six sided die 120 times. Put a tally next to each number as it is scored. Total up the tally.

Think about the following things:

- was your prediction accurate?
- is the total the same for each of the scores?
- as a class, add up the total number for each score. Is this the same? In percentage terms, is it nearer to the same than you got as an individual?

Double Possibilities

For this activity, you will need two 6-sided dice.

Again, draw a frequency table with the same headings as you used with the Single Possibilities, but this time, number down to 12 for the score instead of 6.

You are going to throw the dice 240 times and so you need to predict the total frequency that each score will attain out of the 240 throws. Make sure that the sum of your predictions is 240.

Throw the two 6-sided dice 240 times. For each occasion that a particular total comes up, tally a mark next to that score. Once you have thrown the dice 240 times, total up each of the tallies and record this in the totals column.

Compare the actual totals with your predicted totals. How did you do?

Draw a bar chart showing each score and charting the frequency of that score against it.

What comes up most often? Can you think why that is the case?

For each possible score on the two dice, list all the combinations of throwing that particular score.

Using this information, work out the probability of throwing each total score with two 6-sided dice.

Repeat this experiment, but this time using two 4-sided dice.

Then repeat it again using two 10-sided dice.

In each case, what are the most frequently thrown total scores?

Can you explain why this is the case?

Can you predict what should happen if you throw two 8-sided dice?

Test it and find if you were correct.

Multiple Possibilities

Choose two different types of die.

Examine the possible combinations of throw that are achievable with these two dice.

Make a prediction of the results you expect.

- Are there any results that are impossible?
- Which total score is most likely to come up?
- What is the probability of each possible score coming up?
- What assumption have you made?

Make a table showing the possible scores that can be achieved with the dice you have selected.

Throw the dice approximately 20 times the highest total score achievable. (ie if you pick a 4-sided dice and a 6-sided dice, the highest score achievable is 10. Therefore you should throw the dice 20 × 10 = 200 times. if you pick a 8-sided dice and a 12-sided dice, the highest score achievable is 20. Therefore you should throw the dice 20 × 20 = 400 times.)

Look at the percentages of the throws and the predicted outcomes. Are they the same?

Three dice

Repeat the previous experiments but use three 6-sided dice and then three dice that each have different numbers of sides.