

Take a ten-sided die (or other random number generating tools - a pack of cards with the picture cards removed, a calculator, a phone app...) and generate three numbers. Construct a triangle using these three numbers as the side lengths.

Generate a few more sets of numbers and draw some more triangles. What do you notice?

Here are some questions you might like to consider:

- Can you draw more than one triangle from each set of three numbers?
- When is it possible to construct a triangle from the three numbers generated?
- Is there a quick way to tell if it will be possible to construct a triangle?

Here is a game you could play:

Start with 10 points. Roll three dice. If a triangle can be drawn, you gain a point, if it can't, you lose a point. If you reach 20 points you win the game, if you reach 0 you lose.

Which is the more likely result?

Here is a game you could play with another person:

Player A chooses an integer length between 1 and 10cm. Player B randomly generates the lengths of the other two sides. If a triangle can be drawn, Player B wins; otherwise they lose.

Is there a "best" length that Player A should choose?

Is this a fair game?

Now explore what happens if you generate 4 numbers and draw a quadrilateral.