TEACHER'S NOTES

TAKE A CHANCE

OVERVIEW

Aimed at key stage 2 (9-11 years)

(Prep time 5 mins/class time 30 mins)

Learners engage with the concepts of likelihood and risk and practise their skills using visual examples. They then watch a video story about two children who have an inherited genetic condition and consider the likelihood of a baby being born with the same condition.

CURRICULUM LINKS

- Mathematical understanding: use data to assess likelihood and risk and develop an understanding of probability through computer simulations, games and consideration of outcomes of everyday situations
- Mathematical understanding: discuss, sort and order events according to their likelihood of occurring

LEARNING OBJECTIVES

- To calculate simple probabilities and express them in terms of fractions and words
- To compare different probabilities with one another
- To consider the probability of real events and scenarios

YOU WILL NEED

- A bag of some sort (which you can't see inside)
- 20 sweets, in two different flavours (say 6 of one flavour and 14 of the other)
- **Take a chance** worksheet (provided), one for each learner
- Internet access

PREPARATION

- Print off enough copies of the **Take a chance** worksheet for each learner

Activity

- Introduce the activity by explaining that you have a bag of sweets. There are two flavours of sweets in the bag: one you like, one you don't. Ask the class how you could work out how likely it is that you will pick a sweet you like.

- You can work this out by collecting data about the sweets in the bag. Take the bag around the room, ask each learner to draw out a sweet and note its flavour on the board. When the bag is empty, summarise the results: for instance, the class took 20 sweets out of the bag and, of those, 6 were the yummy flavour. So in 20 gos, you got the sweet you wanted 6 times. This means the likelihood of getting the yummy sweet is 6 in 20, or 3 in 10. You can also write this as a fraction: 3/10.

- Write the words **'impossible'**, **'unlikely'**, **'likely'** and **'certain'** on the board. If the probability of getting the sweet you like is 3/10, ask the class what word they would use to describe how likely it is. The correct answer is 'unlikely', because there are more chances (7 out of 10) of you getting the sweet you don't like.

Activity
continued

🔹 Use the **Take a chance** worksheet to practice working out the likelihood of similar scenarios. Note that if there are 10 sweets and 10 yummy ones the probability is 1 (certain), because you will always get the sweet you want. If there are 20 sweets and 20 nasty ones the probability is 0 (impossible), because you will never get the sweet you want.

🔹 Explain that you want the class to watch a film about two children, Carys and George. As they watch, ask learners to remember what condition the children have, and how they got it. Watch Carys and George's video story at:

http://www.genesareus.org/filmlibrary/carysandgeorge

🔹 Ask structured questions to draw out information about Carys and George's condition and what the likelihood of being born with it is. For example:

🔹 **Carys and George's dad says they were the 1 in 30,000 that had the achondroplasia gene. What does this mean?**

For every 30,000 children born, one baby will probably have the gene, so the likelihood is 1/30,000.

🔹 **Which of the words written on the board would describe this?**

This is a relatively unlikely situation.

🔹 **If Carys or George got together with a tall person, the likelihood of their child having the achondroplasia gene would be 'fifty-fifty'. What does this mean?**

There is a fifty per cent chance something will happen, and a fifty per cent chance it won't. So if you do something 100 times, you would expect to get one result 50 times, and the alternative result 50 times – like having 100 sweets, of which 50 are yummy ones. The likelihood is 50/100 or 1/2.

🔹 **Which of the words written on the board would describe this?**

Because there is a fifty-fifty chance, it is equally likely and unlikely that the child would have achondroplasia.

EXTENSION

Learners discuss what odds they are comfortable with in different situations. Given a range of probabilities and situations, the class votes on which are acceptable and unacceptable. For instance:

🔹 **If the likelihood of being struck by lightning is 1/10,000,000, would you go out in a thunderstorm?**

🔹 **If the likelihood of winning the lottery is 1/14,000,000, would you bother to buy a ticket?**

Both these scenarios are relatively unlikely, but people's views might be influenced by whether the potential outcome is positive or negative.

FURTHER information

You can play these online probability games on an interactive whiteboard:

http://www.subtangent.com/maths/higher-lower.php

http://www.bbc.co.uk/schools/ks2bitesize/maths/data/probability/play.shtml

Listen to the BBC World Service discuss the psychology behind chance and luck:

http://www.bbc.co.uk/worldservice/sci_tech/features/figure_it_out/lottery.shtml

TAKE A CHANCE
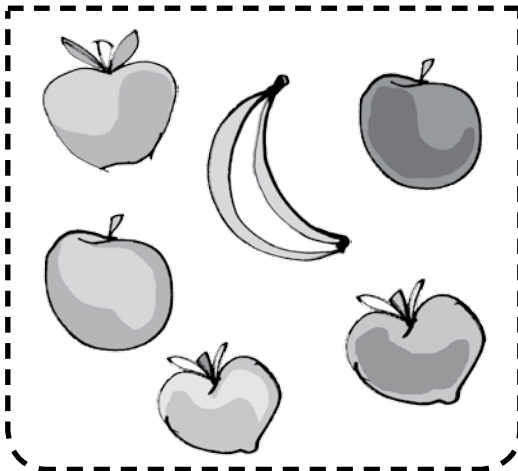
JEANS FOR GENES DAY
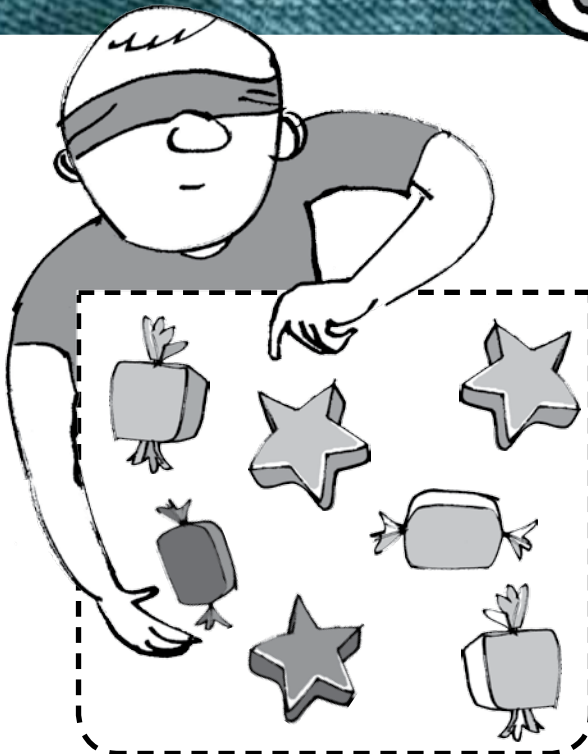
Work out the likelihood of each example and circle the word which describes how likely the event is. The first one has been done for you.
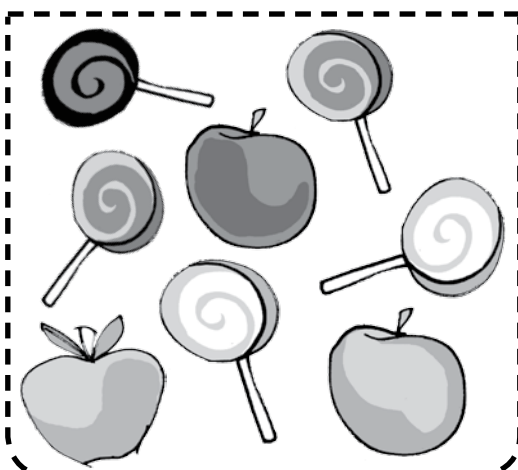
The likelihood of picking a square sweet is: 4/7

It is impossible / ~~unlikely~~ / likely / certain

that you will pick a square sweet.

The likelihood of picking a banana is: _____

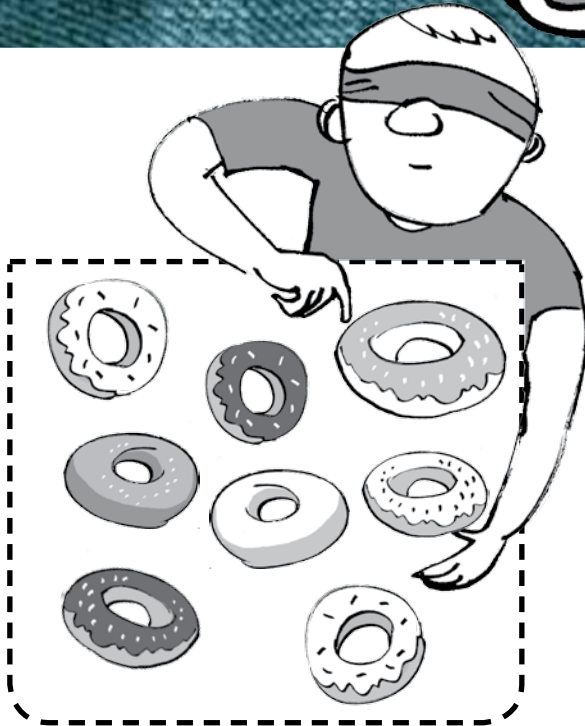It is impossible / unlikely / likely / certain

that you will pick a banana.

The likelihood of picking a lollipop is: _____

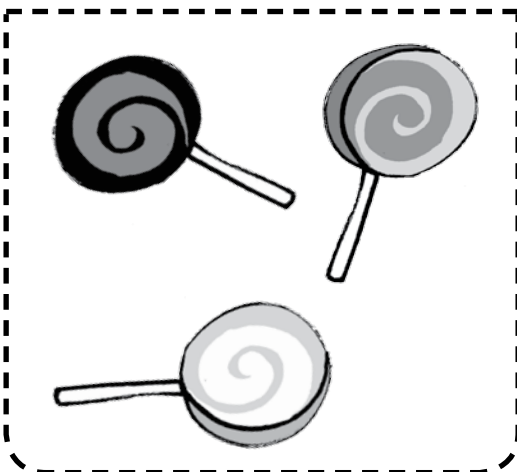It is impossible / unlikely / likely / certain

that you will pick a lollipop.

It is more / less likely that you will pick a lollipop than an apple.

TAKE A CHANCE

JEANS FOR GENES DAY

The likelihood of picking a doughnut is: _____
impossible / unlikely / likely / certain
that you will pick a doughnut.

The likelihood of picking a banana is: _____
It is impossible / unlikely / likely / certain
that you will pick a banana.

The likelihood of picking a fairy cake is: _____
It is impossible / unlikely / likely / certain
that you will pick a fairy cake.