

**HOW GENETIC  
INFORMATION IS  
PASSED ON THROUGH  
OUR GENES**  
(KEY STAGES 2, 3 & 4)

# SCIENCE LESSON PLAN



DURATION: 60 MINUTES



**forget me not  
children's hospice**

Charity No. 1110457

# THE BIG PICTURE

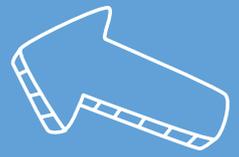
## THIS WILL HELP PUPILS TO UNDERSTAND

- ➔ That cells contain DNA
- ➔ Identify how genetic material is passed from generation to generation
- ➔ Discuss how genetic material gives us all particular characteristics and how this can also cause illness



## FOR THIS LESSON YOU WILL NEED:

- Life limiting disorders sheet (Resource 1)
- The Read & Reduce activity sheet (Resource 2a, 2b or 2c depending on key stage) (Extension: Resource 3: Edible DNA)



### BREAKING THE ICE:

Start by asking the class a series of questions to get them thinking about our characteristics (the way we look).

In groups of 3 or 4 get them to try to identify: "How can you tell people apart?" "Why are some people tall, short, dark skinned etc?" "Why are some people female, some male?"

Then pose the question: "Who has ever been told they look like their auntie / dad / cousin etc?" and ask them if they can work out why this might be

Go on to explore the idea that we inherit some of the way we look from our birth parents and it is passed on when the female egg is fertilised, by the male sperm, and the foetus starts to form.

### TALKING POINT:

The main focus of the lesson is to identify that chromosomes are made of DNA. Every cell in the human body (apart from red blood cells) contain 23 pairs of chromosomes. 23 come from the birth father and 23 from the birth mother to join up to make pairs.

On each chromosome is separated into shorted section, of DNA, that are called genes. These genes will dictate our eye colour, skin colour, natural height etc, but can also give us certain illnesses (eg cystic fibrosis & sickle cell anaemia). When the sperm and egg cells are formed the 23 pairs of chromosomes divide so that there are 23 single chromosomes in each sperm and egg. However, this is a completely random process so you cannot predict which genes are in which sperm or egg. It also means you cannot predict which characteristics the baby will have (you cannot predict what the baby will look like).

When cells are made the protein strands of DNA have to be copied and occasionally mistakes are made in this process. This leads to 'gene mutation' that can lead to 100s of disorder from something as simple as different coloured eyes to extremely rare and sometimes debilitating disorders.

### CLASS ACTIVITY:

Using work sheet 1, in groups, ask pupils to discuss some of the difficulties faced by children with genetic disorders and the treatments they face.

Building on the knowledge gained from the introduction and group discussions ask pupils to work individually (or in pairs depending on reading age / key stage) and complete the 'Read & Reduce' activity (sheet 2a:KS2 / 2b:KS3 / 2c:KS4)

### CHECKING UNDERSTANDING:

Ask pupils to explain, using only their own diagrams / images from the 'Read & Reduce' activity to explain how a child's characteristics (the way they look) are caused by the chromosomes in their cells and how sometimes the genes on those chromosomes can cause disabilities or disorders.



### EXTENSION:

- Make Edible DNA (resource 3) discuss how the base pairs link and how a very small change in the structure could cause life-limiting disorders.
- Research to discovery of DNA