

Evolution and Inheritance: Lesson 2

Introduction to DNA

Science KS2 Year 6



Evolution and Inheritance: Lesson 2

Science

**Key Stage 2
Year 6**

Learning Aims:

- this lesson introduces children to DNA
- learning what DNA is will help children understand the mechanisms which drive evolution
- knowing about DNA will also help children understand the difficult concepts of this series, 'evolution and inheritance'

Key Vocabulary

Deoxyribonucleic Acid (DNA). Cell. Nucleus. Cytoplasm. Cell membrane. DNA helix.

These can also be found at the end of this PDF and can be placed on a learning wall as they are discussed in the presentation.

Cell

Cytoplasm

**DNA
helix**

Nucleus



Some Reading Links:

These books and websites are a great way to further engage children and deepen their interest and understanding of DNA.

1. The “DNA Detectives – To Catch a Thief” is an exciting, page-turner of a story, where the characters in the book use DNA to catch the pet thief who has stolen their pet dog, Milly. In the story, the children break into their Mum’s laboratory and extract DNA (just like the children will do in Lesson 3) from evidence they have collected. The story also recaps on what they have learnt in this lesson about DNA, cells and the nucleus. This book can be purchased via the following websites:
 - Primary Science – the DNA Detectives – Insight and Perspective.
<https://insightandperspective.co.uk/primary-science-the-dna-detectives>
 - The Little Story Telling Company: Books | Story telling and published author.
<https://www.thelittlestorytellingcompany.co.uk/>
2. “My DNA diary: All about you” by Lisa Mullan provides a great introduction to DNA for children. It also complements the information children have learnt in this lesson.
<https://www.goodreads.com/book/show/43602545-my-dna-diary>

Equipment

You will need (these will help complement the PowerPoint and bring the lesson to life):

- Lego kit or book of craft kit (such as paper aeroplanes). (These are optional to demonstrate instructions, and our PowerPoint shows a child looking at video instructions to help illustrate the point.)
- Game of Operation (this is also optional)
- Raisins
- Coffee granules
- Sugar
- Sand
- Balloon with 2m of wool inside and inflated
- Pen (to pop the balloon)
- 1m ruler
- Cards. These are on pages 6, 7, 8, 9 and 10 of this PDF, and can be used as a quiz (see slide 15).



PowerPoint Presentation

The accompanying PowerPoint presentation has 20 slides. At intervals throughout the lesson, we suggest asking the children what questions they might have. These can be collected throughout the unit of learning and added to the slide at the end of the lesson.

- Slides 1 and 2 introduce the lesson.
- Slide 3 introduces DN
- Slide 4 explains what DNA stands for.
- Slides 5 and 6 explain that DNA is a set of instructions for living things. You could first show children a Lego kit or craft book to explain that instructions are needed for these constructions, as a visual aid to help explain DNA.

Activity

- Slide 7 encourages children to think about what might be in their instructions, in their DNA. Get the children to write down 10 things that are in their instructions, in their DNA, e.g., hair, skin, eye colour, etc.
- Slide 8 explains that scientists have found the DNA instructions which control whether we can roll our tongue or whether we like Brussels sprouts.
- Slide 9 introduces cells and explains where DNA is located in our bodies. We talk about the cell, cell membrane, cytoplasm and nucleus. Ask the children to say the names of each part of the cell as we talk about them. It will help them to remember!
- Slide 10: we find out where cells are found in our bodies. If possible, you could use the game, Operation, where children have to make the nose glow to choose different parts of the body and decide if they are made of cells. If not, simply ask the children to choose different parts of the body. The aim is for the children to discover that red blood cells are the only cells which don't have DNA.
- Slide 11: we find out how many cells humans have in their bodies. Ask the children to guess how many they think it is before revealing the answer using "higher" and "lower" to encourage them. Compare the answer to seconds so the children can get an idea of how big this number really is.



- Slide 12: where possible use real items such as raisins, coffee granules, sugar and sand for this section to see if we can find out how small DNA is. Get the children to put their hands up if they think DNA is as big as a raisin, and so on for each item. Finally, ask them if they think it is even smaller.
- Slide 13: we have a close up look at different cells in our body. They are different sizes and shapes depending on their function. Ask the children which is their favourite. Test their knowledge of what the nucleus is by asking the children to identify what the round circle is in each of the cells (answer: Nucleus).

Activity

- Slide 14: place 2m of wool inside a balloon and inflate it. Show the children the balloon and explain this is a model of a cell. Obviously in real life it would be too small for us to see, but the DNA inside is the actual length of DNA in our cells if we could unravel it. Get someone to pop the balloon using a pen and then measure the length of the wool with a metre ruler. Explain the DNA is coiled up so it all fits into the cell in a structure called the “DNA helix”.

On Slide 15 there is a fun fact: all the DNA in all your cells, stretched out and put together, would be about twice the diameter of...(You could ask the children to guess what it could be). The answer is the Solar System!

Activity

- Slide 15: you will need the cards on pages 6, 7, 8, 9 and 10 of this PDF. This fun activity can either be done in the classroom, where the children give answers directly to the questions, or you could do it outside or in a school hall. Spread the answers around the area. The children must go to the correct answer. There are two possibilities for the number of cells in the body, 37 billion and 37 trillion (the correct answer). And two possibilities for the only cell in the body that doesn't have DNA, white blood cell and red blood cell (correct). The children have one minute to make their choices. It is always fun when they make last minute changes!



Activity

- Slide 16: you will need the cards on pages 6, 7, 8, 9 and 10 of this PDF. This fun activity can either be done in the classroom, where the children give answers directly to the questions, or you could do it outside or in a school hall. Spread the answers around the area. The children must go to the correct answer. There are two possibilities for the number of cells in the body, 37 billion and 37 trillion (the correct answer). And two possibilities for the only cell in the body that doesn't have DNA, white blood cell and red blood cell (correct). The children have one minute to make their choices. It is always fun when they make last minute changes!

Activity

- Slide 17: ask the children to do either of the following:
 - Draw a DNA helix, using the PowerPoint image as an example. Use black paper and get them to draw the DNA helix with chalk or draw a chalk DNA helix on the playground!
 - Make a model of a DNA helix. This can be done with cookies, sweets, origami or junk modelling (see weblink for details).
- Slide 18: weblinks for children to find out more about DNA and details of how to make models of DNA and cells from cookies, sweets and an origami DNA helix.
- Slide 19: this slide is kept blank so that you can add the children's questions, and carry them through this unit of learning.
- Slide 20: end of lesson.



Quiz questions



What is DNA?

**What is the name
of the special bag
which keeps your
DNA safe?**

**Where is the
DNA found in
your cells?**

**What is the only
cell in your body
which doesn't
have DNA?**

**Approximately how
many cells are in
your body?**



Quiz answers



**The
instructions
to build
anything
living**

Cell



Quiz answers



Nucleus

**White
blood
cell**



Quiz answers



**Red
blood
cell**

**37
billion**



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Quiz answers



**37
trillion**



Evolution and Inheritance: Keywords Flashcards



**Deoxyribonucleic
Acid (DNA)**

Cell

Nucleus

Cytoplasm

**Cell
membrane**

DNA helix



Deoxyribonucleic Acid (DNA)



Cell



Nucleus



Cytoplasm



Cell membrane



DNA helix

