

TECHNOLOGY



Fun DNA

SEQUENCE 1

Age group	8-9 y.o
Prior knowledge	None
Material needed	Fun DNA box, - Twizzlers or liquorice sticks (for the sugar-phosphate backbone) - Gummy bears or marshmallows (for the nitrogenous bases) - Toothpicks or skewers (to connect the candies)
Subjects	Science, Biotechnology
Skills involved	A hands-on activity that introduces students to the concept of DNA
Time to carry out the sequence	1h

Step 1: Introduction

Disclaimer: Teachers must be very careful about the familiar children situations. Teachers can adapt the sequence if needed.

Ask the students which of their parents they resemble? Mom or Dad? Ask them if they know why? Ask if they've heard of heredity? Ask them if they heard about DNA?

Ask students if they know why we are different. Why are we like our brothers, sisters, parents or grandparents? Tell students that Inside every cell in your body, there's something called DNA. It's like a tiny, super important thread that holds all the



Co-funded by
the European Union

MY BOX OF STEAM (project nr. 2022-2-EE01-KA220-SCH-000099273) is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

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information your body needs to grow, stay healthy, and do all the amazing things it can do!

DNA is like a super tiny, super smart builder. It tells your body how to build and repair itself, just like a builder uses a blueprint to build a house.

DNA is a set of instructions, like a secret code, that tells your body how to grow and work. It's like a special recipe book that makes you who you are!

And guess what? Your DNA is special and unique, just like you! It's what makes you different from everyone else, like your hair colour, eye colour, and even some things you can't see, like how your body works inside.

Step 2. Discovering the content of the box

Use the storytelling resources and tell your students the story of DNA. Ask them if they know what DNA is. After that, let the students discover the content of the box. Give them enough time to examine everything.

Step 3. Creating a 3d DNA model

Have the students use the box and make a 3D DNA model. Let them experiment with it and see how it works. Follow the instructions from "How to create elements".

Step 4. Extension

DNA sequencing game: Kids can play a game called **DNA Play**, (tablet or whiteboard) where they arrange different DNA sequences in the correct order to understand how genetic information is encoded.

<https://apps.apple.com/ro/app/dna-play/id1033801524?l=ro>



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SEQUENCE 2

Age group	10-12 y.o
Prior knowledge	None
Material needed	Fun DNA Box, - A ripe strawberry(banana, kiwi) - Ziploc bag - Water - Dish soap - Salt - Rubbing alcohol - Coffee filter or cheesecloth - Small cup or container
Subjects	Science, Biotechnology
Skills involved	This simple DNA extraction activity lets students learn about this important biology topic.
Time to carry out the sequence	2 h

Step 1: Introduction

Disclaimer: Teachers must be very careful about the familiar children situations. Teachers can adapt the sequence if needed.

Explanation of heredity and DNA

Heredity is like a special gift from your parents, but instead of toys or clothes, it's all about the traits you inherit from them. Traits are things like your hair colour, eye colour, height, and even certain talents or abilities. Imagine your parents each have a special set of instructions inside them, kind of like a recipe book. These instructions are called genes. They're made of something called DNA, which is like a tiny code that tells your body how to grow and develop.

When you're born, you get a mix of genes from both your mom and your dad. It's a bit like mixing paint colours. Sometimes, you'll get traits that are just like your



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mom's, sometimes just like your dad's, and sometimes a mix of both.

For example, if your mom has curly hair and your dad has straight hair, you might end up with wavy hair because you have a mix of their curly and straight hair genes. Now, here's where it gets really cool. Sometimes, even if your parents don't have a certain trait, you might still get it! That's because genes can sometimes be tricky. They can carry information for traits that might skip a generation and show up in you.

Think about it like inheriting a family treasure that's been hidden away for years. Suddenly, it pops up in your generation!

But remember, everyone's combination of genes is unique, which is what makes us all different and special.

So heredity is like a big genetic treasure hunt, where you get to discover all the amazing traits you inherit from your family. And as you grow up, you might even pass some of those traits on to your own kids someday.

Step 2: Discovering the content of the box

Use the storytelling resources and tell your students the story. Ask questions related to the story. After that, let the students discover the content of the box. Give them enough time to examine everything. Tell them that the activity will be fun but that they have to watch what you do carefully because they will do the same thing.

Step 3: Experiment/Instructions

Here is a simple experiment to extract DNA from a strawberry:

1. Place the strawberry in a Ziploc bag and mash it up with your hands to break down the cell walls and release the DNA.



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2. Add a small amount of water to the bag and continue to mash the strawberry to create a liquid mixture.
3. Add a few drops of dish soap and a pinch of salt to the mixture and gently mix it together. The dish soap helps break down the cell membranes, while the salt helps release the DNA.
4. Filter the strawberry mixture through a coffee filter or cheesecloth into a small cup or container to remove any solid pieces.
5. Slowly pour rubbing alcohol into the cup, being careful not to mix it with the strawberry mixture. You should see a white, stringy substance form at the interface between the alcohol and the strawberry mixture - this is the DNA!
6. Use a toothpick or skewer to carefully lift the DNA out of the cup and observe it closely. Use a microscope.

Step 4: Discussion/Conclusion

This experiment demonstrates how DNA can be extracted from living organisms and provides a hands-on experience for kids to learn about genetics and molecular biology.

What did the DNA look like?

The spooled DNA looked like long, white, sticky fibers. The fibers can clump up, forming thick strands.

Step 5: Extension

DNA fingerprinting: Children can learn about DNA fingerprinting by using gel electrophoresis to separate and analyse DNA samples to solve a "crime" or identify a mystery organism.

