

Teacher/Adult's Side (1)

Liverpool Biennial

KS2 Science - Matching Genes

The learner will consider the similarities between humans and animals/plants in relation to Daniel Steegmann Mangrané's artwork, thinking about our genetic makeups, as well as characteristics that we share with other living things.

Estimated time = 30 mins

Curriculum Extract:

Plants

- Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow)

Living things and their habitats

- Recognise that living things can be grouped in a variety of ways
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- Recognise that environments can change and that this can sometimes pose dangers to living things.

Key terms:

- **Installation** - Installation art is a style of art that uses three-dimensional objects.
- **Feral** - Existing in a wild state, especially describing an animal that was previously kept by people.
- **Nature** - Nature is the physical world and everything in it that's not made by people.
- **Genes** - Genes carry the information that determines your traits, which are features or characteristics that are passed on to you — or inherited — from your parents. Each cell in the human body contains about 25,000 to 35,000 genes.
- **Respiration** - Respiration is the process that all living things go through to create the energy they need to live. It usually involves exchanging two gases—oxygen and carbon dioxide. Humans take in oxygen from the air and release carbon dioxide in **aerobic respiration**. Plants take in carbon dioxide from the air and release oxygen for **anaerobic respiration**.
- **Reproduce** - The process by which plants and animals create offspring.
- **Excretion** - Excretion is one of the most basic functions of life. It is the process of eliminating waste products of metabolism and other non-useful materials.
- **Nutrition** - Nutrition is the process by which the body nourishes itself by transforming food into energy and body tissues.

Children/Learner's Side (1)

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Artist: Daniel Steegmann Mangrané

LB2021 Project: Steegmann Mangrané's new outdoor installation, *La Pensée Férale* (2021) - which means 'The Feral Thought' in French - questions the position of humans in the world, allowing us to rethink the idea that humans and the cultures we have created are separate from nature.

The tree trunk at its centre is a scanned model of a Pau Rei, a native tree of the Atlantic Forest in Brazil, with the eye of an Indian pariah dog from Bangladesh at its centre. Surrounded by a newly planted forest of black beech trees, the work raises questions about our attitude towards our environment, reinforcing that nature is not without feeling.



La Pensée Férale, Daniel Steegmann Mangrané (2021)
Crown Street Park, Liverpool

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Although some humans like to think of themselves as separate from (and sometimes better than!) other animals and plants, we are much more similar to other lifeforms on Earth than most people think. We have a certain level of kinship with other living things, and we share genes with other life forms.

Genes carry the information that determines your traits, which are features or characteristics that are passed on to you – or inherited – from your parents. Each cell in the human body contains about 25,000 to 35,000 genes.

Activity Instructions:

1. Complete the matching game below. How genetically similar are we to other living things? Can you guess the correct answers? Once you have completed the activity, check out the answers below. You might be surprised!
2. We sometimes feel the connection between humans and other animals, as we share certain features (we all have eyes, for example). On page 5, there is a table which can now help you think about the similarities between humans and plants. Follow the instructions below to fill out the boxes.
 - a) Choose a plant, then write its name on the dotted line in the first empty column in the table.
 - b) For the middle column, you will compare the plant you have chosen to a human.
 - c) Choose an object that has never been alive and write its name on the dotted line in the last column.
 - d) Then think about your plant and answer each of the questions. If the plant does the characteristic in the list, write YES in the box.
 - e) If the plant does not do the characteristic, write NO in the box.
 - f) Then repeat this for the animal and for the object you chose.
3. Look at your answers. How many of these characteristics do humans share with plants? With this in mind, why is it important that we look after our environment?

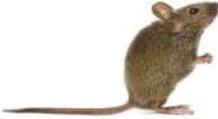
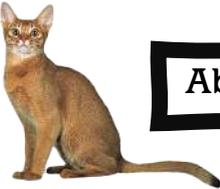
Answers for Matching Game

Cow	= 80%
Fruit Flies	= 61%
Chimpanzee	= 96%
Mouse	= 85%
Abyssinian Cat	= 90%
Chicken	= 60%
Banana	= 60%

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How genetically similar are we to other living things? Can you match the correct percentage with its corresponding animal/plant? One has already been done for you - we are 99.9% genetically similar to the next human!

	Gow	99.9%
	Fruit Flies	60%
	Chimpanzee	90%
	Mouse	96%
	Abyssinian Cat	61%
	Chicken	85%
	Another human	60%
	Banana	80%

Characteristics (Living things need to do all these things)	A plant	A human	An object that has never been alive
Movement - Does it show any movement?			
Respiration - Does it need air or oxygen?			
Sensitivity - Does it react to what is happening in its surroundings?			
Grow - Can it grow larger?			
Reproduce - Can it make more living things like itself?			
Excretion - Can it get rid of waste from itself?			
Nutrition - Does it need food for energy?			

We may, at first, think of ourselves as separate to our environment and the plants and nature that surround us. By filling in this table, you may begin to see that we share a lot of characteristics with plants – we are not as different as you might think!

We look after our family and our friends because we feel a deep connection with them. If we begin to recognise the connections we share with plants and our environment, we may think deeper about the ways in which we treat it.

Pictured right: Daniel Steegmann Mangrané, *La Pensée Férale* (working sketch), 2021.

