

Lesson Plan

NEUROHEADWAY

Neuroscience Into Education

Lesson plan

- Review DNA and Genes
- What is DNA sequencing and cloning?
- How and why is DNA copied?

Objective	Slide	Time	Main Activity	Reflection	Success criteria
1. Introduction to DNA and sequencing	1		Introduction		Know that genes are made of DNA. Know that differences in DNA explain many differences across individuals.
	2	5	Review DNA and Genes.	Reflect on differences in the cells in our body (eg hair vs nails).	
	3	5	Review DNA bases. ACTIVITY: decode a gene together		
2. How can DNA be read?	4	5	Introduce sequencing. Explain that DNA is in our cells and can be taken out and "read".	Even though DNA is highly conserved, even across species, but there are always differences between individuals.	Understand that "reading" DNA is important and has potential to help.
	5		Introduce PCR		Know that PCR technology is commonly used across fields of research and enables DNA sequencing and DNA copying.
	6	10	Explain that complementary base pairing and known segments of DNA can be used to read DNA. Introduce primers.	DNA can be read with the help of DNA and other helping compounds.	
	7		ACTIVITY: determine complementary sequence for given primer.		
	8-9		ANIMATION: Primers and polymerase enable sequencing.		

	10-11		Introduce gene alterations behind lactose intolerance as an example.	Reflect on why you would want to know if you have lactose intolerance?	Know that DNA sequencing can reveal mutations in genes.
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Power point Example

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How can DNA be "read"?

- DNA is in (almost) every human cell
- To read DNA we need to :
 1. Take the DNA out
 2. Open the double helix structure
 3. Copy it with the help of other DNA (primers)!



Why?

- To understand inheritance, evolution, disease ... (research scientists)
- To diagnose and treat disease (doctors)
- To identify individuals, for example, at a crime scene (forensic scientists)