



GENETHICS

Explores and examines the ethical issues connected with genetic engineering.

Year 10

Subject

Biological Science

Covers

SU, SHE & SIS requirements of the Australian curriculum

in2science.org.au

Meet a Mentor

Jessica is studying a Bachelor of Arts/Science at Monash University

What are you aiming to do when you finish your course?

At the moment I'm enjoying studying both genetics and psychology. When I finish I think I'd like to do Honours which is another twelve months, where we get to choose our own research project, and if I like that I'll keep studying and do a PhD. But then again a Masters in Education or Genetic Counselling also appeal ... I'm still making up my mind because there are so many possibilities!

What impact do your studies have on your life?

Genetics and psychology help us understand what makes us the way we are – how much is predetermined by the genes we inherit and how much is influenced by circumstances and how much is determined by the interactions between our genetics and our environment. But I wonder if there is a part of our personality that can't be explained by either?

Why did you get involved with In2science?

I've always enjoyed helping friends with difficult concepts and in the back of my mind I have always wondered if I might enjoy teaching. Volunteering for In2science gives you an experience in schools without committing to that career path.



Curriculum Links

Use and influence of science

Advances in science and emerging sciences and technologies can significantly affect people's lives, including generating new career opportunities (ACSHE195).

- Investigating the applications of gene technologies such as gene therapy and genetic engineering

The values and needs of contemporary society can influence the focus of scientific research (ACSHE230)

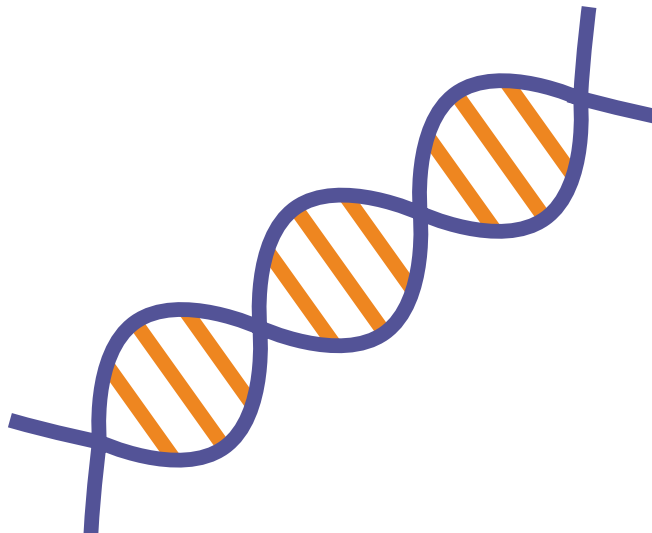
- Considering the use of genetic testing for decisions such as genetic counselling, embryo selection, identification of carriers of genetic mutations and the use of this information for personal use or by organisation such as insurance companies or medical facilities

People can use scientific knowledge to evaluate whether they should accept claims, explanations or predictions (ACSHE194)

- Describing how science is used in the media to explain a natural event or justify people's actions

Possible Activities

- Extract DNA (eg: from strawberry/kiwi fruit/ banana) learn.genetics.utah.edu/content/labs/extraction/howto
- Build a DNA molecule yourgenome.org/teachers/origami.shtml
- Make a DNA bracelet with code from a cat, dog or platypus. genome.gov/27541804
- Discuss films/books such as 'My Sister's Keeper' and 'Never Let Me Go', which explore ethics in genetic engineering.



Further resources

www.latrobe.edu.au/in2science/resources

australiancurriculum.edu.au/Science/Curriculum/F-10

Lesson Idea

Aim

To engage in the ethical debate surrounding genetic engineering.

Lesson Outline

- Starter – select a scenario (eg: GM food or cloning) and create a class mind-map
- Discuss the scientific potential of genetic engineering and ethical questions that arise. Consider social, ethical, legal, psychological and philosophical angles
- Poll students who they think should make decisions about ethics? (Individual, parent, doctor, politician, priest, judge, selected committee etc)
- Group students into stakeholder groups – eg: lawyers, doctors, parents. Outline a scenario (eg: from learning resources section of the GTAC website) and ask each group to consider it in character!
- Groups present findings/debate ethical questions *Ethical Behaviour*
- Find articles both for and against topic *ICT capability*
- Homework project – produce a poster eg: GM food good/bad for personal point of view.

Example Ethical Questions

- Should parents be allowed to choose their child's gender?
- Should the government have a database of everybody's DNA?
- Should animals/plants be cloned?
- Is genetically modified food good or bad?

Science as a Human Endeavour

Who is affected by scientific research?

Who does the research?

Who decides what is allowed?

Who should decide?

Curriculum Links

Biological Science Year 10

The transmission of heritable characteristics from one generation to the next involves DNA and genes. (ACSSU184)

Mentor Support

How your In2science mentor can assist.

Whole class

- Mentor acts as a judge in a case, students present their arguments for and against.

Small Groups

- Work with stakeholder groups to keep them in character and answer technical questions.

One-on-one

- Prompt with questions to promote deep understanding. Play the devil's advocate!