

	RIVERTON & DISTRICT HIGH SCHOOL	<u>Grade:</u>
	Investigation: Year 10: Genetics Disorders	
	Name:	

Task Overview

In this task, you will investigate a genetic condition and explore not only the science behind it, but also how scientific knowledge is developed, used, and communicated in society.

You will explain how the disorder is caused by changes in DNA, mitosis or meiosis, and examine how scientific understanding influences real-world decisions, technologies, and ethical considerations.

This task emphasises:

- **Science as a Human Endeavour (SHE)**
- Being **curious** about scientific developments
- **Exploring scientifically** through research
- **Communicating with purpose**
- **Reasoning with evidence**

Assessment Options (Choose ONE)

- ☐ Infographic with written explanation (e.g. Canva + word)
- ☐ Slide presentation (PowerPoint, Sway etc) with speaker notes

Inquiry Focus (All Sections Required)

1. The Science Behind the Disorder

- What genetic change causes the condition?
- Does it involve a mutation, extra/missing chromosome, or another DNA change?
- Does it occur during meiosis, mitosis, or DNA replication?
- Explain how this happens using scientific terminology.

👉 *Capability link: Exploring scientifically*

2. From Cells to Systems

- What happens at the cellular level?
- What protein or process is affected?
- How does this lead to the symptoms seen in the body?

👉 *Capability link: Reasoning with evidence*

3. Evidence and Scientific Understanding

- What evidence do scientists use to understand this disorder?
- How has scientific knowledge about this condition changed over time?
- What technologies (e.g. genetic testing) have improved our understanding?

👉 *SHE focus: Development of scientific knowledge*

4. Impact on Individuals and Society

- How does this condition affect daily life?
- What supports or treatments are available?
- How does society respond to or support people with this condition?

👉 *SHE focus: Science in society*

5. Ethical and Social Considerations

- Are there ethical issues related to genetic testing, screening, or treatment?
- Should people always be tested for genetic conditions? Why/why not?
- How should scientific information be used responsibly?

👉 *Capability link: Reasoning with evidence*

6. Communicating Your Findings

- Present your ideas clearly for your chosen audience (e.g. students, parents, general public)
- Use appropriate scientific language
- Include diagrams or visuals to support understanding

👉 *Capability link: Communicating with purpose*

Bibliography (Required)

- All websites and pages listed
- Name of page. Web address. Example:

How much is nature vs nurture. <https://www.abc.net.au/listen/programs/healthreport/nature-nurture-genetics-environment/106106018>

- Do not give the google search address!!!! You need to go to the actual website. Example:
https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.abc.net.au/listen/programs/healthreport/nature-nurture-genetics-environment/106106018&ved=2ahUKEwi57pidgveSAxWvcGwGHfj3MysQFnoECBgQAQ&usg=AOvVaw2Z8Cx1s_aPQgGe7JuwwDUL
- A plagiarism and AI checker will be used to check your work.

Success Criteria

- ✓ I ask thoughtful questions and show **curiosity** about my topic
- ✓ I gather and organise information using **reliable scientific sources**
- ✓ I explain scientific ideas clearly using correct terminology
- ✓ I use **evidence** to support my explanations and ideas
- ✓ I consider **ethical and social impacts** of scientific developments
- ✓ I communicate my ideas clearly for my intended audience

Curriculum Links

Australian Curriculum v9.0 (AC9.0) – Science

- **Science Understanding**
 - AC9S10U01: Explain the role of meiosis and mitosis and the function of chromosomes, DNA and genes in heredity and predict patterns of Mendelian inheritance
- **Science as a Human Endeavour**
 - AC9S10H02: investigate how advances in technologies enable advances in science, and how science has contributed to developments in technologies and engineering
- **Science Inquiry**
 - AC9S10I08: write and create texts to communicate ideas, findings and arguments effectively for identified purposes and audiences, including selection of appropriate content, language and text features, using digital tools as appropriate

South Australian Curriculum Connections

Disposition: Curious

- Students ask questions about how genetic technologies impact people and society
- Students explore how and why scientific understanding changes over time

Capabilities:

- **Exploring scientifically** → Researching genetic conditions and evaluating sources
- **Communicating with purpose** → Presenting for a specific audience using appropriate formats
- **Reasoning with evidence** → Using scientific evidence to explain causes and justify ethical viewpoints

Student	Disorder	Student	Disorder
	Achondroplasia		Huntington's disease
	Albinism		Klinefelter syndrome
	Angelman syndrome		Marfan syndrome
	Colour blindness		Neurofibromatosis type 1
	Cri du chat syndrome		Phenylketonuria
	Cystic fibrosis		Prader–Willi syndrome
	Down syndrome		Sickle cell disease
	Duchenne muscular dystrophy		Tay–Sachs disease
	Fragile X syndrome		Thalassemia
	Haemophilia A		Turner syndrome