

Genetics: Examining the role of genetics in everyday NZ working life.

BUILD YOUR PERFECT HERD.

ESSENTIAL QUESTION

Can I create a Dream Team that will secure the future of NZ farms?

WHAT ARE WE LEARNING?

- Gather relevant scientific information to draw evidence-based conclusions.
- Describe the basic processes by which genetic information is passed from one generation to the next.
- Understand the role the NZ plays when it comes to innovation in genetics perspective.

TRY THIS WITH

- Year 9-10
- Students who enjoy working with real world scenarios.
- Students who love manipulating data for an outcome.

FIND

- Define
- Identify
- Select
- Relate
- Match
- Outline

As students enter the room, explain they will be testing to see who has the most moisture in their earwax (either dry or sticky).

Distribute cotton buds and complete the experiment.

Watch the crash course on genetics and discuss the terms dominant, recessive, heterozygous, homozygous, genotype and phenotype.

Discuss the term trait and have students create a class set of different traits.

Graph these traits using a class tally chart.

Introduce the class to Pedigree Charts and have students create their own chart for certain class or family traits.

Watch the 100 years of LIC video.

Introduce traits in the dairy industry and create a list that might be charted.



APPLY

- Review
- Associate
- Model
- Summarise
- Translate
- Explain

Complete the Mendel's Peas TedED Flipped Classroom 'Think' and 'Dig Deeper' Sections.

Create Punnett Squares based on the information gathered.

Play Pigeonetics and understand the impact of different traits.

Create their series of punnett squares based on their selection of a pigeon.

Discuss the pedigree charts created earlier.

Ask "Can you create punnett squares based on the family traits that were identified?"

Ask "what dominant traits would you, as a farmer, be looking for in your herd?"

Encourage students to include the factors below in their discussion:

- how much milk / milk fat can be produced?
- how many offspring does the cow have?
- are they susceptible to disease?
- what is their life expectancy?

Introduce the term Breeding Worth (BW) and explain its importance on a dairy farm.



PRODUCE

- Compile
- Hypothesise
- Validate
- Solve
- Dispute
- Justify

Show students the webpage "Bull Team".

Understand the impact of individual genetic defects tested for in Artificial Breeding Organisations.

- B = Bovine Leucocyte Adhesion Deficiency (BLAD);
- V = Complex Vertebral Malformation;
- S = Small Calf Syndrome and
- C = Citrullinaemia.

Explain that they will be creating their own Dream Bull Team of 6.

Highlight the section that indicates whether an animal has tested positive or negative for individual genetic conditions (B, V, S and C).

Use the Genetics Fact Sheet to understand Breeding Worth when compiling their dream team.

Question students so that they consider:

- their ability to improve their financial gain over the next 10 years
- their economic contribution
- their breed choice

Depending on the level of the class introduce additional complicating factors such as variations within the breed of herd.



SUCCESS CRITERIA

Students can check they have successfully completed the task by:

- Identifying and charting hereditary traits as a class.
- Explain the importance of the Breeding Worth on a dairy farm.
- Compile a dream team that meets the agreed criteria.

PRINCIPLES	VALUES	KEY COMPETENCIES	LEARNING AREAS	WORD BANK	KEY CONCEPTS
Cultural diversity Inclusion	Diversity Integrity Innovation Inquiry Curiosity	Using languages, symbols and texts Relating to others Participating and contributing	Science Mathematics and Statistics	1. Dominant 2. Recessive 3. Characteristics 4. Chromosome	1. Genetics 2. Hereditary 3. Punnett Squares 4. Pedigree