

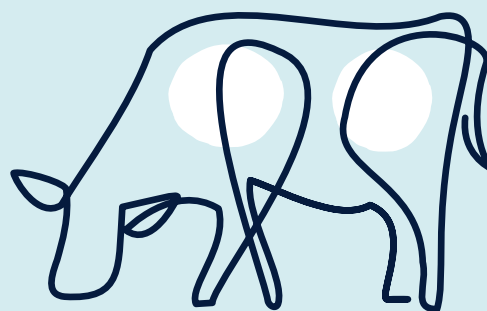
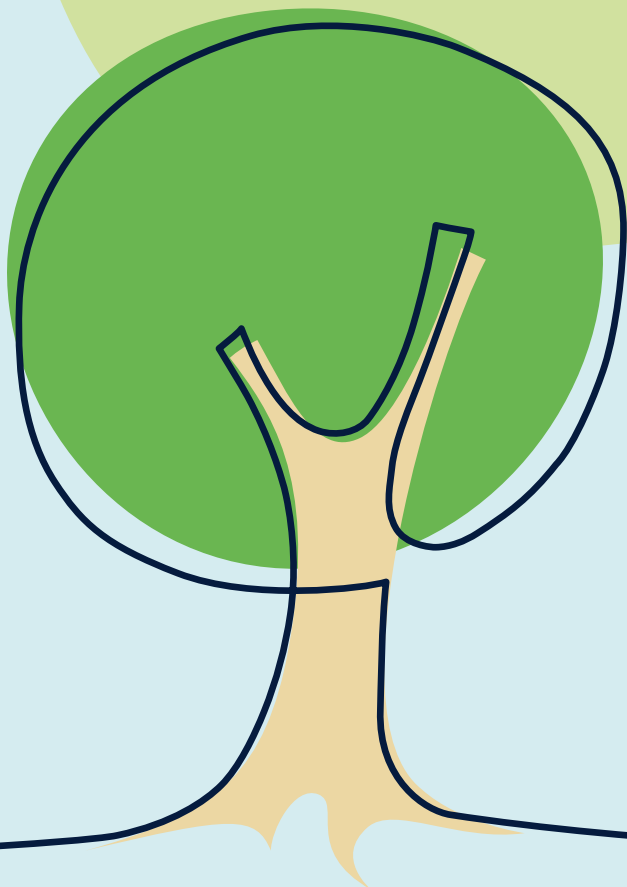
**DISCOVER
DAIRY**

YEARS
F-2

INQUIRY UNIT
**LIFE AS A
DAIRY COW**

**RAISING AND CARING
FOR COWS ON A FARM**

LEARN ALL
ABOUT DAIRY COWS



ACKNOWLEDGEMENTS

This online curriculum-linked resource was produced by Dairy Australia.

The curriculum-linked resource is designed to introduce young people to dairy foods and the dairy industry in Australia.

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The materials in the original educational resource were developed by Angela Colliver from Angela Colliver Consulting Services Pty Ltd.

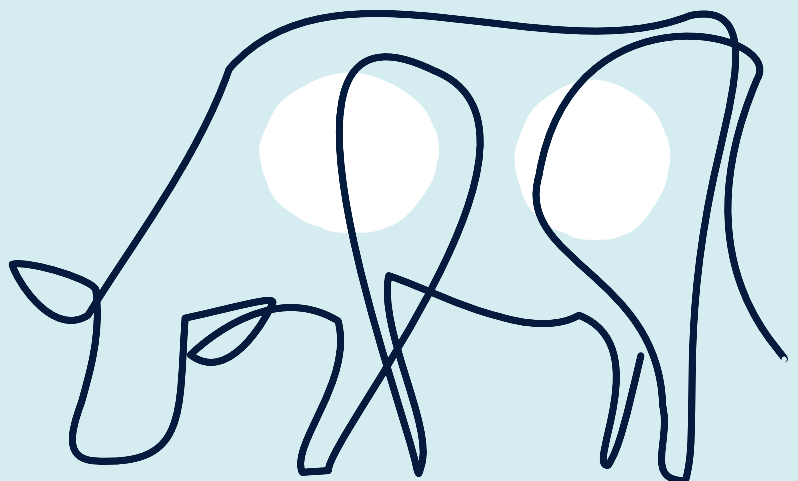
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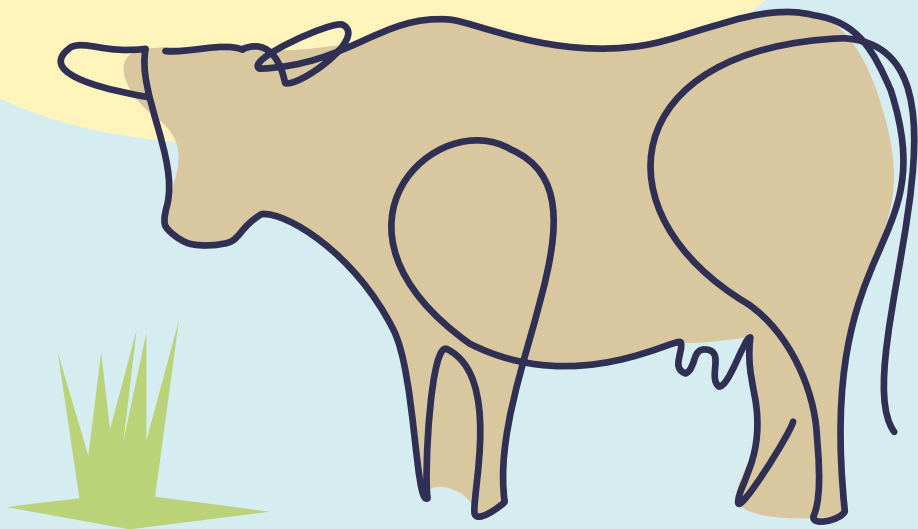
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FACT

**COWS EAT
20 KILOGRAMS OF FOOD
PER DAY & CAN DRINK
100 LITRES OF WATER
IN ONE DAY**



INTRODUCTION

This Foundation to Year 2 unit of work aims to help teachers and students investigate and understand more about the Australian dairy industry. It follows an inquiry based approach to learning, where the goal is for students to make meaning of their learning. This resource endeavours to use information about dairy farming as stimulus for the learning journey, whereby students become internally motivated to explore, make connections and analyse.

The unit can be taught as presented or used as inspiration to form an inquiry unit that fits with your school's scope and sequence. Teachers are provided with suggested inquiry-based learning experiences, supporting investigation into milk production and the processes farmers use to raise their dairy cows in order to bring us milk and dairy products.

We encourage teachers to assess the needs of their class, adapting the content and activities in this unit accordingly. The activities provided aim to spark student curiosity and inspire them to generate their own questions to investigate.

In this unit, students will:

- Explore and define the systems used to raise dairy cows.
- Discover the methods and technologies used on Australian dairy farms to support milk production.
- Explain ways dairy cows are bred, raised and cared for.
- Develop solutions, and use and apply concepts/ideas about how dairy cows are bred, raised and cared for.
- Select tools, equipment and techniques to design a drawing, recording or model.
- Revisit the processes used in their work; reflect on and evaluate what they know about how dairy cows are bred, raised and cared for to produce milk; and how their own family consumes milk.

Supporting student and teacher resources mentioned throughout this unit can be found at dairy.edu.au



EDUCATIONAL APPROACH

The activities found in this unit follow the six phases of 'solution fluency', based on the 21st Century Fluencies model created by Crockett et al (2011).



Step one: Define

The 'Define' phase begins with lessons that mentally engage students with a challenge, problem, question and task. This phase captures their interest, provides an opportunity for them to express what they know about the topic and understandings being developed, and helps them to make connections between what they know and the new ideas.



Step four: Design

The 'Design' phase provides opportunities for students to apply what they have learned to new situations, to map production processes and so develop a deeper understanding of the challenge, problem, question or phenomenon. It is important for students to extend explanations and understanding using and integrating different modes such as diagrammatic images, written language and media.



Step two: Discover

The 'Discover' phase includes activities in which they can explore, investigate, research, read, discuss, gather, organise and compare knowledge and data. They grapple with the challenge, problem, question or phenomenon and describe it in their own words. This phase provides a context and enables students to acquire a common set of experiences that they can use to help each other make sense of the new knowledge or understandings.



Step five: Deliver

The 'Deliver' phase has two stages; production and publication (or presentation). In the production phase the task comes to life, this is the doing phase. At the end of this phase, the student task should be completed. Next, they present or publish their work sample to an audience.



Step three: Dream

The 'Dream' phase enables students to imagine and develop possible solutions and explanations for the challenge, problem, question and task they have experienced. The significant aspect of this phase is that the students' explanations follow substantive conversations and higher order thinking experiences.



Step six: Debrief

The 'Debrief' phase provides an opportunity for students to revisit, review and reflect on their own learning and new understanding and skills. This is also when students provide evidence for changes to their understanding, beliefs and skills.

CURRICULUM LINKS

This unit of work has been designed as a series of activities based on the content descriptors of the Australian Curriculum identified in Foundation to Year 2 Science and Design and Technologies.

| | Foundation | Year 1 | Year 2 |
|-----------------------------|---|--|--|
| Science | Science Understandings: Biological sciences Living things have basic needs, including food and water (ACSSU002) | Science Understandings: Biological sciences Living things have a variety of external features (ACSSU017) | Science Understandings: Biological sciences Living things grow, change and have offspring similar to themselves (ACSSU030) |
| | Science as a Human Endeavour: Nature and the development of science Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE013) | Science as a Human Endeavour: Nature and the development of science Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE021) | Science as a Human Endeavour: Nature and the development of science Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE034) |
| | | Science as a Human Endeavour: Use and influence of science People use science in their daily lives, including when caring for their environment and living things (ACSHE022) | Science as a Human Endeavour: Use and influence of science People use science in their daily lives, including when caring for their environment and living things (ACSHE035) |
| Technologies | Design and Technologies: Knowledge and Understanding Explore how plants and animals are grown for food, clothing and shelter and how food is selected and prepared for healthy eating (ACTDEK003) | | |
| Cross-curriculum priorities | Sustainability All life forms, including human life are connected through ecosystems on which they depend for their wellbeing and survival (01.2) | | |
| General capabilities | Literacy Information and Communication Technologies (ICT) Capability Critical and Creative Thinking | | |

FACT

**ON AVERAGE,
A DAIRY COW PRODUCES
6,070 LITRES OF MILK
EVERY YEAR**



STEP 1: DEFINE



Purpose

To provide students with opportunities to:

- Gather information about student's prior knowledge on; dairy farms, different types of dairy cows raised there, and what they produce
- Organise their existing ideas
- Develop skills in making connections between different ideas
- Set directions for an investigation
- Provide data for assessment purposes

Start with a story

Select an appropriate children's picture book to inspire student interest and generate discussion about life on dairy farms.

Introduce students to dairy cows, dairy farms and the people who raise dairy cows and produce milk. Explore the idea that farms can be places where lots of animals, including dairy cows, are raised.

Think, pair, share

Ask students to think about what they already know about where their milk comes from, and about the people who produce it. Ask students to share their ideas with a partner.

After sharing, record as a whole class and list key ideas on the board.

Categorise these ideas into three groups; what is known about:

1. milk production
2. raising dairy cows
3. people who raise them

Ask students to think of some questions they would like to have answered about dairy cows. For example, do all cows make milk?

Record responses and display them for the remainder of the unit. Support the students in conducting research and investigations to answer these questions by completion of the unit.

Personal responses

Find out what students currently know about dairy cows and dairy farms, and what each produce. Encourage students to tell, write or draw their ideas. Display these for future reference.

Ask each group to report back to the class, synthesise their ideas and collate these for future reference. Display responses around the classroom.

Brainstorm

Ask students to brainstorm everything they already know about dairy cows. Use stimulus such as; what dairy cows look like, what covers their body, their shape, main features, whether they have curly or straight tails, the sounds they make, their colouring, their food, shelter needs etc.

Create a four-part display. Title the four parts 'What we know about dairy cows', 'What we want to find out', 'What we have discovered' and 'Other things we would like to explore'. Use 'What we know' as a source for class sharing.

Stimulate thinking by focusing on interesting aspects about dairy cows.

For example:

- Can dairy cows be pets?
- How are dairy cows raised?
- How are dairy cows bred and farmed?
- Where are dairy cows farmed in Australia?

Brainstorm ideas about how dairy cows are raised and what they produce.

Setting the task

Note This is a suggested assessment task.

Explain to the class that their task will be to work in small groups (2-3 students) to find out more about how dairy cows are bred and raised to produce milk. Explain that each group will; observe videos and interactive learning objects, and record and collect information about dairy cows and what they need to grow on a farm in order to produce milk.

The scenario

Dairy Australia is inviting schools to create a safe and stimulating environment for dairy cows to live and produce milk. To be comfortable and contented, dairy cows need space, shelter, lots to eat and clean drinking water.

If they have access to these, they should then produce milk for us to drink.

Your task is to imagine what the ultimate dairy farm might look like!

Your group can either, write and draw, video or design and make a model of the ultimate dairy farm accompanied by a piece of writing about how dairy cows are bred, raised and cared for.

Explain that later in the unit, each student will also explore how families that consume milk produced by dairy cows use the milk, and for what purpose. Explain that each student will talk to a family member to find out the recipes they like to cook that contain milk.

Group roles

Introduce students to a range of roles they can consider when undertaking their task.

- **Discoverer** – ask questions, find information, and solve problems. Research dairy cows; what they need, how they are raised, who raises them and how they produce milk (note that all students should take on this role).
- **Scribe** – records ideas about the investigation.
- **Creative whiz** – creative thinkers who can communicate their findings using art, digital tools, photography, models, music or role play.
- **Tech genius** – uses technology tools.
- **Praise reporter** – encourages the group.

Learning logs

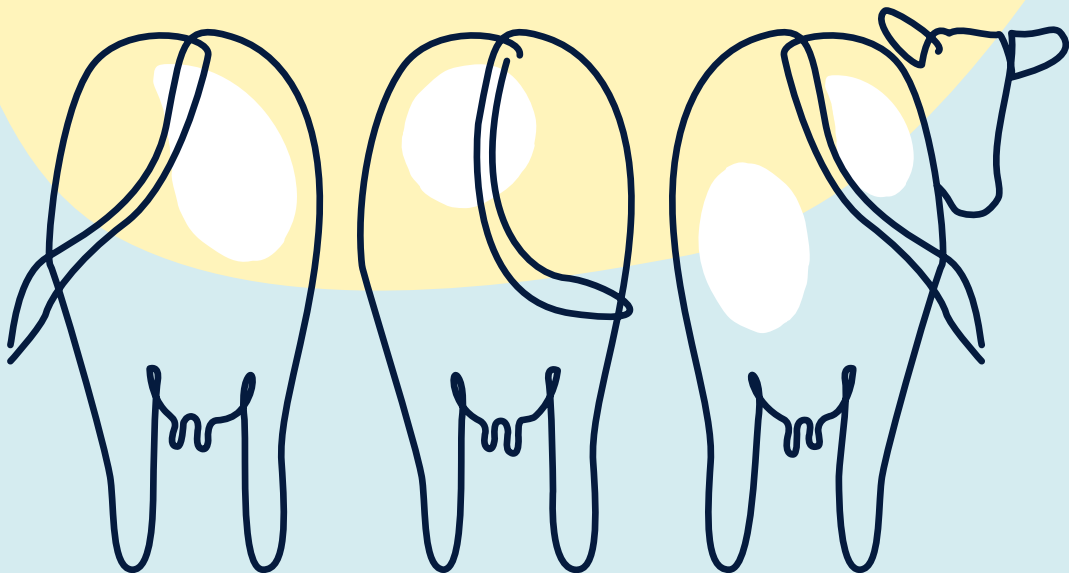
Learning logs are useful for assessment purposes. Students can complete an entry at the beginning of the unit and then revisit it regularly during, and again at the end of the unit to demonstrate their changed understandings.

At the end of the activities in the 'define phase', invite students to draw/write/scribe ideas and questions about their task using a table like the one below.

| What I know | What I'm not sure about | What I want to know |
|-------------|-------------------------|---------------------|
| | | |
| | | |
| | | |
| | | |
| | | |

FACT

**THE AVERAGE
HERD SIZE
IS 273 COWS**



STEP 2: DISCOVER



Purpose

To provide students with opportunities to develop their understanding of:

- Dairy cows, what they eat and where they live
- A dairy cow's basic needs
- A dairy cow's features
- Why cows make milk
- Where our milk comes from
- How dairy farmers raise their animals
- The features of dairy farms
- The forthcoming experiences in the 'Dream' stage of the inquiry

Where does our milk come from?

Remind the class that they will be creating an 'ultimate' dairy farm for dairy cows.

Explain to students that in Australia there are many breeds of dairy cows, the most popular breeds are the Holstein, Jersey and Aussie Red Cows. Find out more about the seven main breeds of dairy cows and play the [Discover Dairy cow breeds](#) interactive.

Challenge students to find seven pop up cards with information about each breed and use the audio button to hear about them too.

Ask students to match four breeds of dairy cows to patterns and colours on their hides using **Resource 1.1** (found at the end of this guide).

Explain to the groups that their task is to start researching and find out what the students at this school learned about dairy cows. Invite students to replay the interactive to find out:

- Who takes care of dairy cows?
- When is a dairy cow considered an adult?
- What are a baby cow and male cow called?
- What do dairy cows eat?
- What do dairy cows need to be healthy?
- How do dairy cows chew their food?
- How many stomach compartments does a dairy cow have?
- How is milk produced by dairy cows?

Talk more about dairy cows and their features. Using an image of dairy cows from the [Discover Dairy](#) website, ask students to observe the variety of external features of dairy cows. Share and list these features (udder, teats, hooves, horns, ears, mouth, nose, eyes, tail, body).

Create a 'Word Wall' in the class describing the external features of dairy cows.

Undertake some more 'picture research' and ask students to count the eyes and legs, note the colour and shape of the dairy cows and discuss their texture.

Ask students to learn more about the 'internal features' of dairy cows. Talk about the fact that they have four stomach compartments, each of which performs a special function.

Demonstrate this by playing the animation [How do dairy cows make milk](#).

Why do cows make milk?

Ask students what they know about where their milk comes from and the people who help get it from the farm to our homes. Allow time so that students can share their ideas with a partner. Make a list of sentences and phrases as a whole class. Categorise these into groups regarding; what is known about milk production, raising dairy cows, and what is known about the people who raise them. Ask students questions. Record the responses and display them. Support them in seeking answers to their questions. Ask students to consider the question 'Why do cows make milk'? Encourage students to make guesses and assess suggestions. For example: 'Cows might make milk because....' Find out more about why cows actually make milk using the digital resources on the [Discover Dairy](#) website. Revisit understandings about how dairy cows, like other living things, have offspring named calves which, like babies, need milk.

What is life like for a dairy farmer?

Talk about how calves drink milk from the mother's udder by sucking on her teats. Using plastic or disposable gloves and milk (or water), ask students to experiment and show how the udder, like the glove, needs to be sucked/squeezed to get the milk out.

1. Place water or milk in the plastic disposable glove
2. Tie off the plastic glove with some string
3. Puncture one of the fingers with a pin
4. Squeeze the punctured finger simulating the sucking action. Display a picture or diagram of a dairy cow on the interactive white board. Ask students to label the dairy cow's external features that are important in explaining how cows feed their calves. Invite students to recall and locate where the four stomach compartments are (that turn the grass the dairy cow has eaten into nutrients that are needed for cow health and milk production).

Explore deeper

Introduce students to the Discover Dairy website. Model how they can navigate and access resources about dairy cows.

Ask students to explore and find information about what dairy cows need to grow and be healthy on the dairy farm (food, water, space and shelter). Add these words to your word wall.

Ask students to record any information they might need for their ultimate dairy farm.

Find an information book or a [video](#) featuring an Australian dairy farmer.

Share the resource with students and ask them to recall features of the dairy farm that might be included on their 'ultimate dairy farm' for dairy cows. Discuss:

- Where do dairy cows graze and eat?
- How do they get to the milking shed?
- What does the milking shed look like?
- What does the milking shed contain?
- Where do the cows wait to be milked?
- What keeps the dairy cows in the paddocks?
- What needs to be opened and closed to let dairy cows in and out of the paddocks and milking shed?
- Where are the baby calves housed and fed?
- Where is the dry food kept?
- How does the milk tanker come onto the dairy farm to collect the milk?

In their groups, ask students to draw or write about any distinctive dairy farm features they have learned. For example:



Source: Drawing by Lexie, 5 years old.

Farmer stories

Find more case studies that feature Australian dairy farmers. Use a variety of resources including videos, website information, and video conferencing.

Talk to students about the people they saw working on a dairy farm. Discuss what jobs they do on dairy farms.

Using **Resource 1.2** (found at the end of this guide) ask students to identify the jobs a dairy farmer would most likely do on a dairy farm.

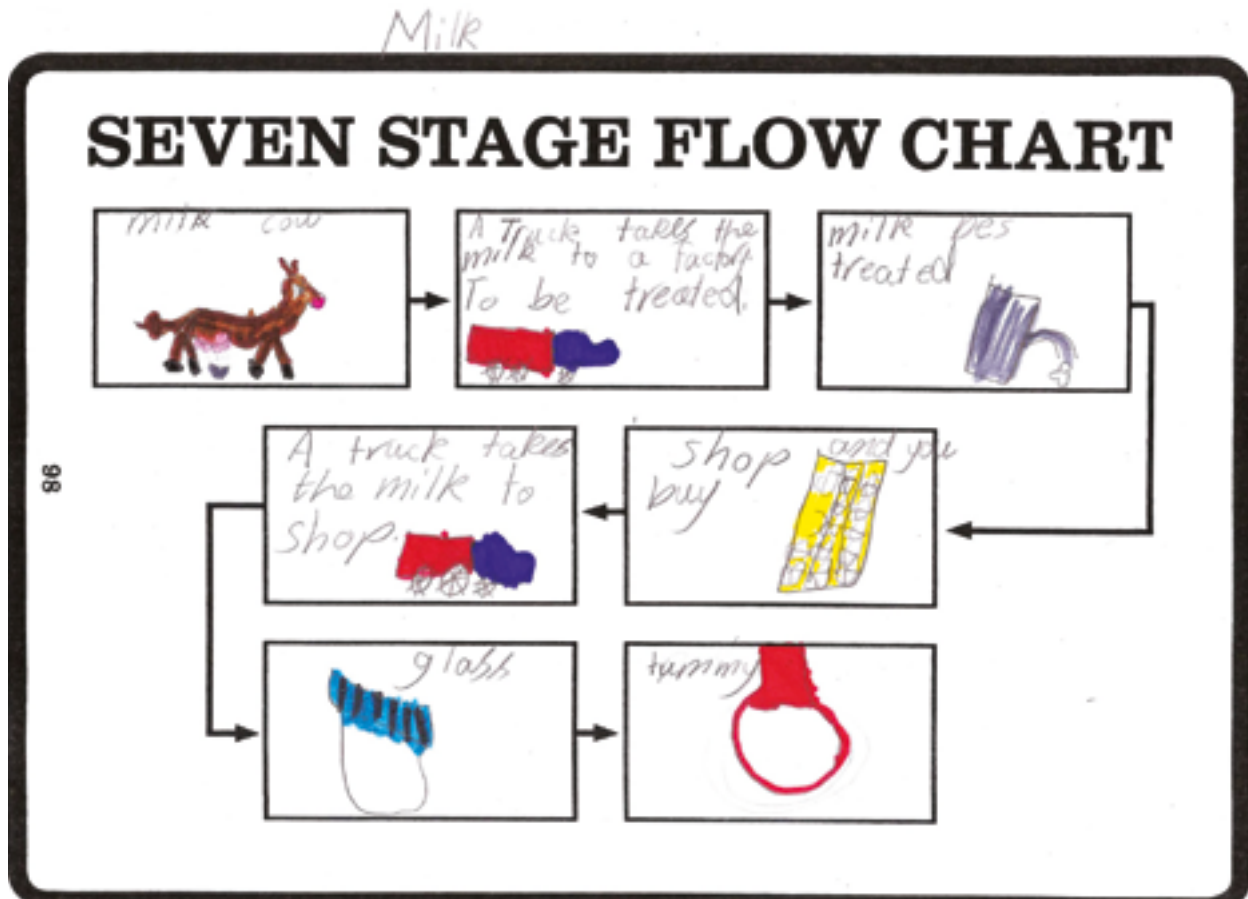
Where does our milk come from?

Explore the Discover Dairy resources to learn more about where our milk comes from and the steps involved in the production of milk.

Play the interactive activity [Farm to Plate](#) with students and discuss the steps.

In groups, ask students to design a simple flow chart or storyboard explaining where our milk comes from and the steps involved in the production of milk.

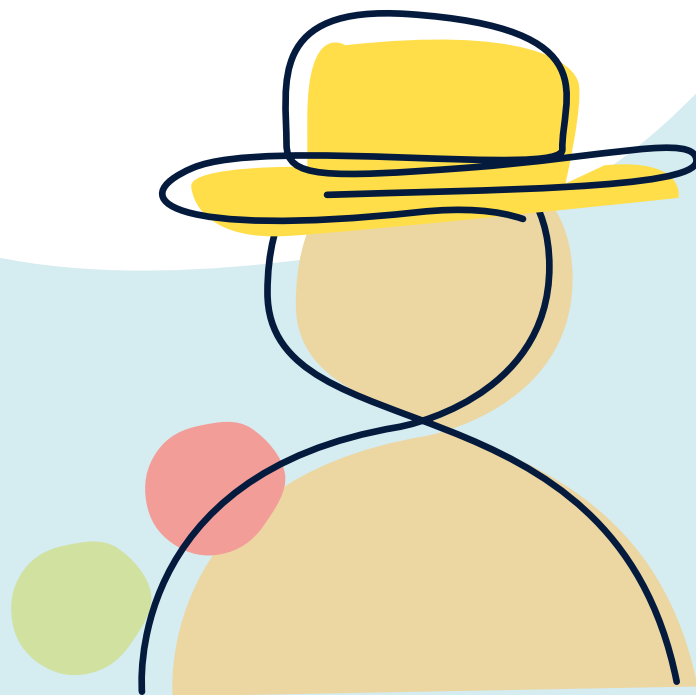
See **Resource 1.3** (found at the end of this guide).



Source: Year 1 student in Ms Cole's class, Jones Hill State School, Queensland.

FACT

**98% OF AUSTRALIAN
DAIRY FARMS
ARE FAMILY-OWNED
BUSINESSES**



STEP 3: DREAM



Purpose

To provide students with opportunities to:

- Envision a solution for their 'ultimate' dairy farm
- Brainstorm and share ideas
- Explore possibilities
- Imagine and visualise their product

Visualising the ultimate dairy farm

Ask students to lie on the ground in positions of relaxation, listening silently to music. Encourage students to:

- Visualise their 'ultimate' dairy farm
- Imagine the dairy farm, what it contains, who works there, etc.
- Look through a window onto their 'ultimate' dairy farm
In groups, ask students to describe for each other what they have visualised.

Share ideas

Ask students to share ideas regarding what they might create. Expand on student ideas using questions for clarification. Encourage the extension ideas.

For example:

- What might you create?
- What do you think it might look like?
- How will you make it work?

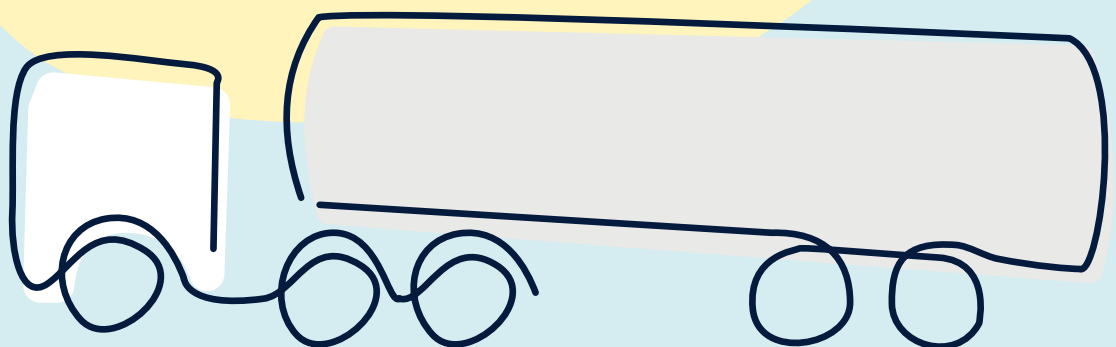
Creative activity

Encourage groups to choose a preferred creative activity to develop their 'ultimate' dairy farm.

- Write
- Draw
- Paint
- Record
- Build
- Present

FACT

**MORE THAN 100,000
AUSTRALIANS RELY
ON THE DAIRY INDUSTRY
FOR THEIR LIVELIHOODS:
INCLUDING VETS, SCIENTISTS,
MECHANICS, FEED SUPPLIERS
& BUSINESS ADVISORS**



STEP 4: DESIGN



Purpose

To provide students with opportunities to:

- Describe how dairy cows are bred, raised and cared for on farms
- Design and create their 'ultimate' farm
- Explore if their family uses milk produced by dairy cows
- Develop skills of formulating questions and gathering data
- Develop communication skills, oral language and active listening
- Develop the understanding of how we can learn from others

Raising and caring for dairy cows

Using the information gathered, each group prepares a presentation with their creation of an 'ultimate' dairy farm, explaining how dairy cows are bred, raised and cared for on the dairy farm.

Remind the students that they can choose their own creative method to model their ultimate dairy farm to support their information.

- Art – drawing, painting etc.
- Prototype – build a simple model
- Technology – digital tools

Invite students to begin drafting their work sample. Encourage students to use their creativity as part of their presentation.

Safety requirements

Review rules on personal safety, group safety, and classroom and furniture safety with students.

Ask each group to establish a work station and gather the materials and tools they require. Discuss the importance of safely storing their model or design.

Explanations

In groups, ask students to begin developing their explanation of their 'ultimate' dairy farm, accompanied by a written description or drawn diagram, of how dairy cows are bred, raised, and cared for.

Remind them to go back and interpret the evidence they have viewed, read, and discussed in previous activities.

Ask students to think about how they might explain the features and concepts of their 'ultimate' dairy farm to an audience.

Discuss the use of labels, headings, and captions and how they can be used in drawings, illustrations, and models to explain details.

Research task

Explain to students that they will be exploring their family's choice of milk type, the uses of milk produced by dairy cows, how, and for what purpose. Explain that each student will talk to a family member to find out about how their family cook different recipes using their chosen type of milk.

Some classes may include students and family members who are non-dairy eaters, it is important to acknowledge and explore other non-dairy sources of milk replacement.

If possible, ask students to bring in their recipes to share with the class.

Involving families

Reinforce the work being done at school and provide families the opportunity to share in what the students are learning about. As a suggested home activity, students might 'interview' or talk to a family member about their favourite milk-based recipe or how they cook different meals and snacks using milk.

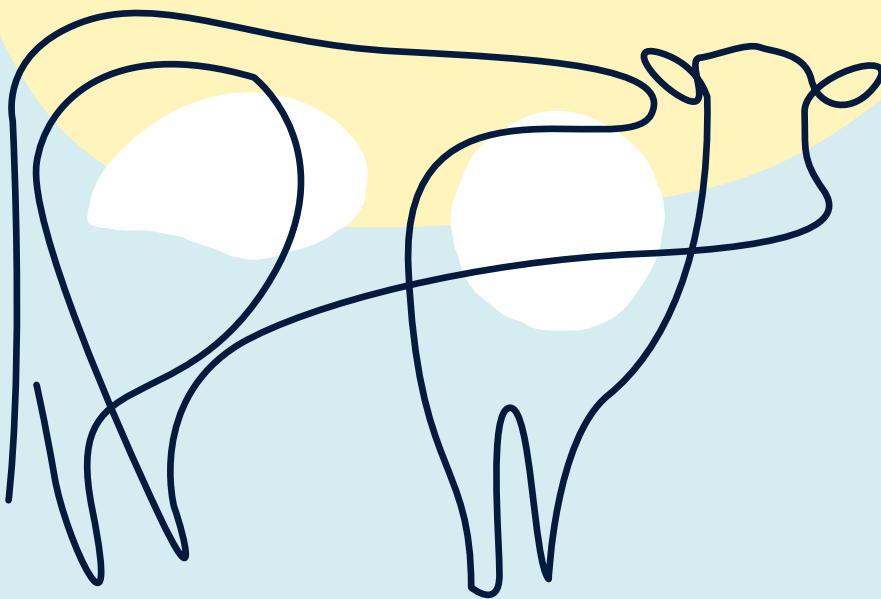
Ask students to draft a range of questions they might use to find out about how their family cook different recipes using milk and their favourite milk-based recipe.

Invite students to practice asking questions with each other.

The students' 'interview' findings, including photos, can be shared with the class the following day.

FACT

COWS BELONG TO A GROUP OF ANIMALS CALLED RUMINANTS, WHICH HAVE FOUR STOMACH COMPARTMENTS THAT DIGEST FOOD TO MAKE MILK



STEP 5: DELIVER



Purpose

To provide students with opportunities to:

- Share how their family uses milk
- Apply what they have learned and communicate how milk is used by their family
- Share their favourite recipe
- Plan their investigation of their 'ultimate' dairy farm
- Share investigation findings

Making sense of the data

A number of strategies can be used to help students make sense of the information the class has gathered about their family's use of milk.

Some suggestions are:

- Prepare graphs and collate the class information about the ways milk is consumed or cooked with
- Compile a class e-Book of recipes based on the information gathered by the class
- Email Dairy Australia and tell them about the favourite recipes

Email: schools@dairyaustralia.com.au

Going further – planning of presentations

Invite students to confirm the idea planned for their presentation of their ultimate dairy farm.

Students will then create a final plan for completing the presentation. Ask them to summarise in a journal log or reflection, what they have learned about dairy farms, dairy cows, and how they produce milk.

Students then rehearse and fine-tune their presentation of their 'ultimate dairy farm'.

Consider hosting a 'Discover Dairy show & tell' to showcase the students' work to the school, parents, and community.

Delivering the presentation

Note This is the suggested assessment activity.

Invite students to put their plan into action and present using their models, videos or drawings of the 'ultimate' dairy farm to an audience!

STEP 6: DEBRIEF



Purpose

To provide students with opportunities to:

- Revisit and reflect on their final products and the process used to determine what was done well and what could be improved
- Provide a source of data for assessment
- Insights into students' understandings and attitudes, as well as their perceptions of their own strengths and areas for improvement

Reflect on the presentation

Involve students in a debrief and ask them to review their final products, and the processes they used to design and create them.

Ask questions like:

- What worked well?
- What didn't?
- How could it have been improved?
- Was the ultimate farm feasible?
- Can it be accomplished?

Reflections

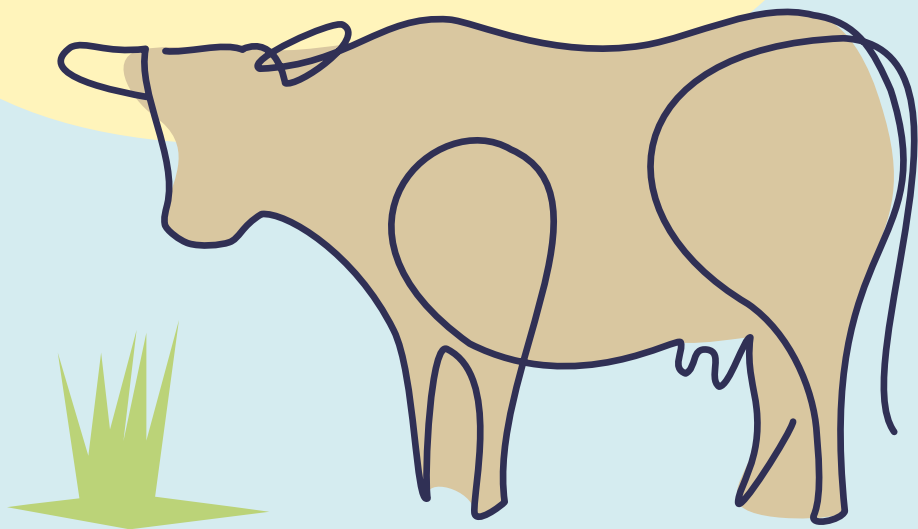
Ask students to circle the smiley faces below to describe how they feel about their learning journey, and how they self-evaluate their efforts in class.

| | | | |
|---|-----------------------|-----------------------|-----------------------|
| I liked discovering information about dairy cows and dairy farms. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I liked imagining and exploring possibilities for the ultimate dairy farm idea. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I liked creating a plan of the design idea. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I did my best work presenting the group's work. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I worked well with my group. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I helped create a design, recording or model. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I could tell you about the things I have learned. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Ask students to also draw or write about what they enjoyed learning about in the unit. See **Resource 1.4**.

FACT

**AUSTRALIA'S
5,700 DAIRY FARMS
WITH OVER 1.56 MILLION
COWS PRODUCE AROUND
9.23 BILLION LITRES
OF MILK A YEAR**



COW BREEDS

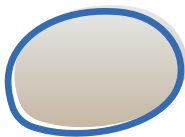
Try to find a breed of dairy cow that matches the colours and patterns illustrated below. Draw an arrow between the matches.



Guernsey cow



Holstein cow



Jersey cow



Ayrshire cow



DID YOU KNOW...
THERE ARE SEVEN MAIN
BREEDS OF DAIRY COWS
IN AUSTRALIA.

JOBS

There's much more to life on a dairy farm than milking cows.

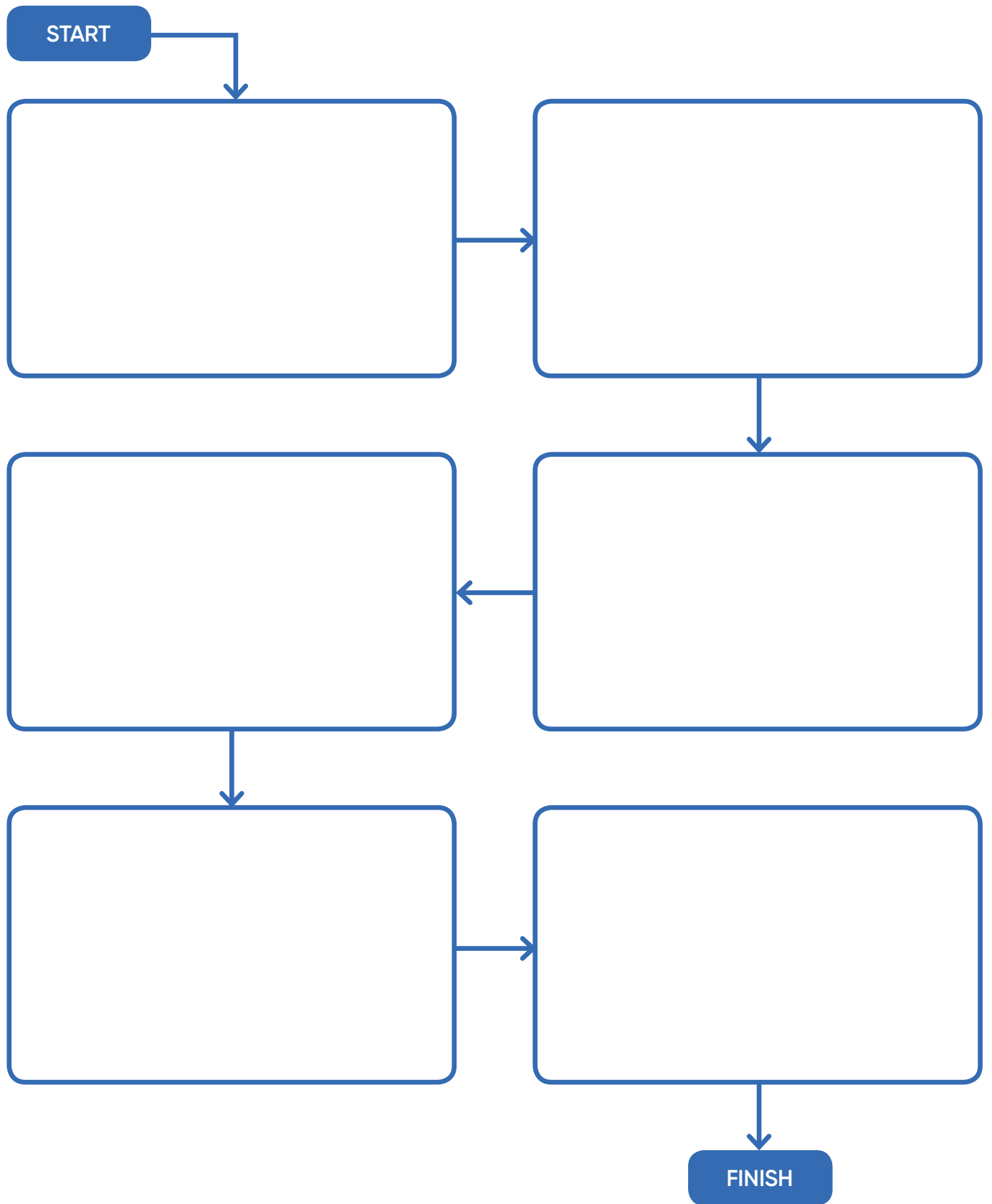
Put a tick next to the jobs a dairy farmer would most likely do on a dairy farm.

Cross out the jobs they wouldn't have to do.



FARMERS ARE KEPT
VERY BUSY CARING
FOR THEIR COWS AND
THE ENVIRONMENT!

Resource 1.3 Flowchart or storyboard



DISCOVER DAIRY

dairy.edu.au

