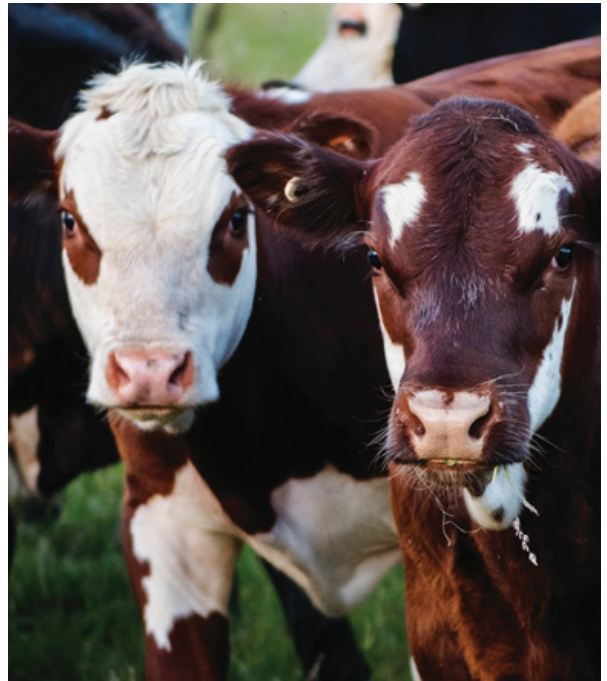


# FUTURE FARM SAFETY FOR LIFE

## FARM SAFETY RESOURCE PACKAGE TEACHER GUIDE YEAR 7-10



farm  
safety  
ace



• ASSESS • CHANGE • ENGAGE



# ACKNOWLEDGEMENTS

This curriculum linked resource was produced by Primary Industries Education Foundation Australia, under funding from the Commonwealth Department of Agriculture, Fisheries and Forestry, through the National Farm Safety Education Fund: Improving Farm Safety Practices.

The resource is designed to teach high school students how to become proactive leaders in the area of farm safety.

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**DISCLAIMER:** This Resource Package is intended as a general guide only and is designed to increase risk awareness amongst children on farms. It is not legal advice and does not take the place of proper individualised safety plans, WHS training or any other tailored steps which may be necessary to protect the health and safety of children on farms. Teachers are responsible for generating their own risk assessments for activities/experiments detailed within this resource in accordance with their school's WHS policies.

# CONTENTS



|         |  |
|---------|--|
| Page 1  | <b>Future farm safety for life</b> – Information and user guide  |
| Page 3  | Curriculum links   |
| Page 6  | Hierarchy of Control   |
| Page 7  | <b>Introductory activity:</b> Hierarchy of Control   |
| Page 9  | <b>Activity 1 (a):</b> Animal Safety – Stock Handling<br>AC9HP10P08, AC9HP10P09, AC9TDE10K01, AC9TDE10K02, AC9TDE10K06, AC9S10I01    |
| Page 10 | <b>Activity 1 (b):</b> Animal Safety – Zoonosis<br>AC9HP10P08, AC9HP10P09, AC9TDE10K01, AC9TDE10K02, AC9TDE10K06                     |
| Page 11 | <b>Activity 2 (a):</b> Chemical Safety – Safety Data Sheets, Labelling & Storage<br>AC9HP10P08, ACTDE10K01, AC9E10LY06               |
| Page 12 | <b>Activity 2 (b):</b> Chemical Safety – Chemical Spread<br>AC9HP10P08, ACTDE10K01, ACTDE10K02, AC9TDE10K03, AC9TDE10K06             |
| Page 13 | <b>Activity 3 (a):</b> Electrical Safety – Overhead Power<br>AC9HP10P08, ACTDE10K01, ACTDE10K02, AC9TDE10K03, AC9TDE10K06, AC9S10I01 |
| Page 14 | <b>Activity 3 (b):</b> Electrical Safety – Underground Power<br>AC9HP10P08, ACTDE10K01, ACTDE10K02, AC9TDE10K06                      |
| Page 15 | <b>Activity 4:</b> Emergency Procedures<br>AC9HP10P08, AC9HP10P09  |
| Page 16 | <b>Activity 5:</b> Machinery Safety<br>AC9HP10P08, ACTDE10K02, AC9TDE10K06, AC9E10LY06   |
| Page 17 | <b>Activity 6:</b> Mental Health<br>AC9HP10P08, AC9HP10P09, AC9HP10P10, AC9E10LY06   |
| Page 19 | <b>Activity 7:</b> Noise Safety<br>AC9HP10P08, AC9HP10P10, AC9TDE10K06, AC9S10I05  |
| Page 22 | <b>Activity 8 (a):</b> Quad Bike Safety – General Use<br>AC9HP10P09, ACTDE10K01, ACTDE10K02, AC9TDE10K03, AC9TDE10K06, AC9E10LY06    |
| Page 24 | <b>Activity 8 (b):</b> Quad Bike Safety – Carrying Heavy Loads<br>AC9HP10P09, AC9TDE10K03, AC9TDE10K06                               |
| Page 25 | <b>Activity 9 (a):</b> Tractor Safety – Access<br>AC9HP10P09, ACTDE10K02, AC9TDE10K03, AC9TDE10K06                                   |
| Page 27 | <b>Activity 9 (b):</b> Tractor Safety – Rollover and Run Over<br>AC9HP10P09, ACTDE10K02, AC9TDE10K03, AC9TDE10K06                    |
| Page 28 | <b>Activity 10:</b> Workshop Safety<br>AC9HP10P10, ACTDE10K01, AC9E10LY06  |



Health & Physical Education

Design & Technologies



Science

English

# FUTURE FARM SAFETY

## FOR LIFE



This package has been developed by Primary Industries Education Foundation Australia, with funding from the Department of Agriculture, Fisheries and Forestry.

It aims to ensure students become safety focused when on farms and see every situation on a farm through a safety lens to prevent farm accidents. This education package will form the basis for student's attitudes and practices towards farm safety, with the objective of ensuring safer farm practices in the future.

Agriculture as an occupation is recognised as one of the top three most dangerous jobs in Australia, with many workplace fatalities and injuries being recorded each year. Australia has many agricultural industries and whilst many have potential hazards that are specific to that industry, there are many crossover safety issues that are present on all farms.

This package utilises the Hierarchy of Control as a basis on which students can build their safety knowledge. It allows for students to work through the different levels of safety implementation, utilising the area of innovation and problem solving, as farming continues to evolve in the 21st century.

The project is based on the term **Safety A.C.E** The acronym stands for:

**A - ASSESS**      **C - CHANGE**      **E - ENGAGE**

**ASSESS** Students are to work on the idea that every activity on the farm has the potential to cause harm. They are instructed to observe everything and every activity around them and assess the risk of possible harm to themselves or those around them. The risk can be seen as 'high' or 'low' and then change can be implemented before proceeding.

**CHANGE** With the students' knowledge of the Hierarchy of Control, they will see what change is needed to ensure the activity's risk of harm is minimised. Each lesson in this manual will refer to the Hierarchy of Control and how it can be applied in the relevant context.

**ENGAGE** Once a student has assessed a farm situation and applied change where necessary (according to the Hierarchy of Control) they and others are able to safely engage in the task.

It is hoped that the A.C.E process will become ingrained into a student's way of thinking, and they will see themselves as a Safety A.C.E mentor to those around them.

# FUTURE FARM SAFETY

## FOR LIFE

This package provides a vast range of resources to support teachers to promote and teach farm safety in the classroom.

The program is designed for Year 9 and 10 students, but content is also relevant for students in Years 7 to 8. All activities are linked to the Australian Curriculum (Version 9.0). Many of the objectives align with the Health and Physical Education learning area; however, cross-curricula objectives are also highlighted.

It is not a requirement to teach all activities in the package, as each activity can be taught as a stand-alone lesson. It is necessary, however, to ensure that **the introductory lesson on Hierarchy of Control is the first lesson delivered irrespective of how many activities are being taught.** Teacher planning will allow decisions to be made so that relevant activities can be taught that fit with the current school and community climate. The effectiveness of the resource will not be compromised by teaching certain activities and omitting others.

The background information component of each activity is aimed to be explicitly taught to students. Many activities also include an 'Extra Extra' section. This is extension and complementary work that allows for curriculum modification where needed. Teachers are encouraged to contextualise these activities where appropriate to current school/community needs.

QR codes linked to secondary sources are provided throughout the resource.



**Digital copies of worksheets along with links to VR videos are available for download through the Primezone website:**

[www.primezone.edu.au](http://www.primezone.edu.au)



# CURRICULUM LINKS

## AUSTRALIAN CURRICULUM V9

### HEALTH AND PHYSICAL EDUCATION

**General Capabilities:** Literacy, Critical and Creative Thinking, Personal and Social Capability

| CURRICULUM LINK  | CONTENT DESCRIPTOR   | LESSON   |
|--|--|--|
| <b>AC9HP10P08</b> Plan, rehearse and evaluate strategies for managing situations where their own or others' health, safety or well-being may be at risk.   | <p>Critiquing the appropriateness and effectiveness of help and support services available for young people in the local community.</p> <p>Planning and practising responses to emergencies where they may be required to administer first aid to a friend or stranger, including CPR.</p>   | <p>1 (a,b)<br/>2 (a,b)<br/>3 (a,b)<br/>4<br/>5<br/>6<br/>7</p> |
| <b>AC9HP10P09</b> Critique health information, services and media messaging about relationships, lifestyle choices, health decisions and behaviours to evaluate their influence on individual attitudes and actions. | <p>Critiquing health information and services that provide advice and support on issues targeted at specific groups of young people including support with substance use, healthy food choices, fitness and exercise plans, mental health support, sexual health and safety.</p> <p>Evaluating strategies and actions to increase personal safety and planning to promote these in the school and community.</p> | <p>1 (a,b)<br/>4<br/>6<br/>8 (a,b)<br/>9 (a,b)</p>             |
| <b>AC9HP10P10</b> Plan, justify and critique strategies to enhance their own and others' health, safety, relationships and wellbeing.  | <p>Investigating community-action initiatives young people have started that have a positive influence on the health and wellbeing in their communities.</p> <p>Designing and evaluating strategies that enhance their own and others' mental health and wellbeing, such as regular physical activity, positive self-talk, consistent sleep habits, mindfulness and social connection.</p>                       | <p>6<br/>7<br/>10</p>  |

## DESIGN AND TECHNOLOGIES

**General Capabilities:** Literacy, Critical and Creative Thinking, Personal and Social Capability, Numeracy, ICT Capability

| CURRICULUM LINK   | CONTENT DESCRIPTOR  | LESSON  |
|---|---|---|
| <b>AC9TDEI0K01</b> Analyse how people in design and technologies occupations consider ethical, security and sustainability factors to innovate and improve products, services and environments. | Recognising the impact of past designed solutions when creating solutions for preferred uses.   | 1 (a,b)<br>2 (a)<br>3 (a,b)<br>8 (a)<br>10                  |
| <b>AC9TDEI0K02</b> Analyse the impact of innovation, enterprise and emerging technologies on designed solutions for global preferred futures.   | Examining real-world problems and understanding basic needs when considering designed solutions.  | 1 (a,b)<br>2 (b)<br>3 (a,b)<br>5<br>8 (a)<br>9 (a,b)        |
| <b>AC9TDEI0K03</b> Analyse and make judgments on how the characteristics and properties of materials are combined with force, motion and energy to control engineered systems.                  | Explaining the way common machines interact and combine properties of materials, force, motion and energy efficiently.<br><br>Calculating forces, reactions and loads in structures and analysing the relationship between materials of properties, forces and safety.  | 2 (b)<br>3 (a)<br>8 (a,b)<br>9 (a,b)                        |
| <b>AC9TDEI0K06</b> Analyse and make judgements on how characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions.       | Justifying decisions when selecting from a broad range of technologies - tools, equipment, processes materials, systems and components.<br><br>Analysing and explaining the ways in which properties and characteristics of materials have been considered in the design of a product with specific requirements. | 1 (a,b)<br>2 (b)<br>3 (a,b)<br>5<br>7<br>8 (a,b)<br>9 (a,b) |



## SCIENCE

**General Capabilities:** Literacy, Critical and Creative Thinking, Personal and Social Capability, Numeracy, ICT Capability

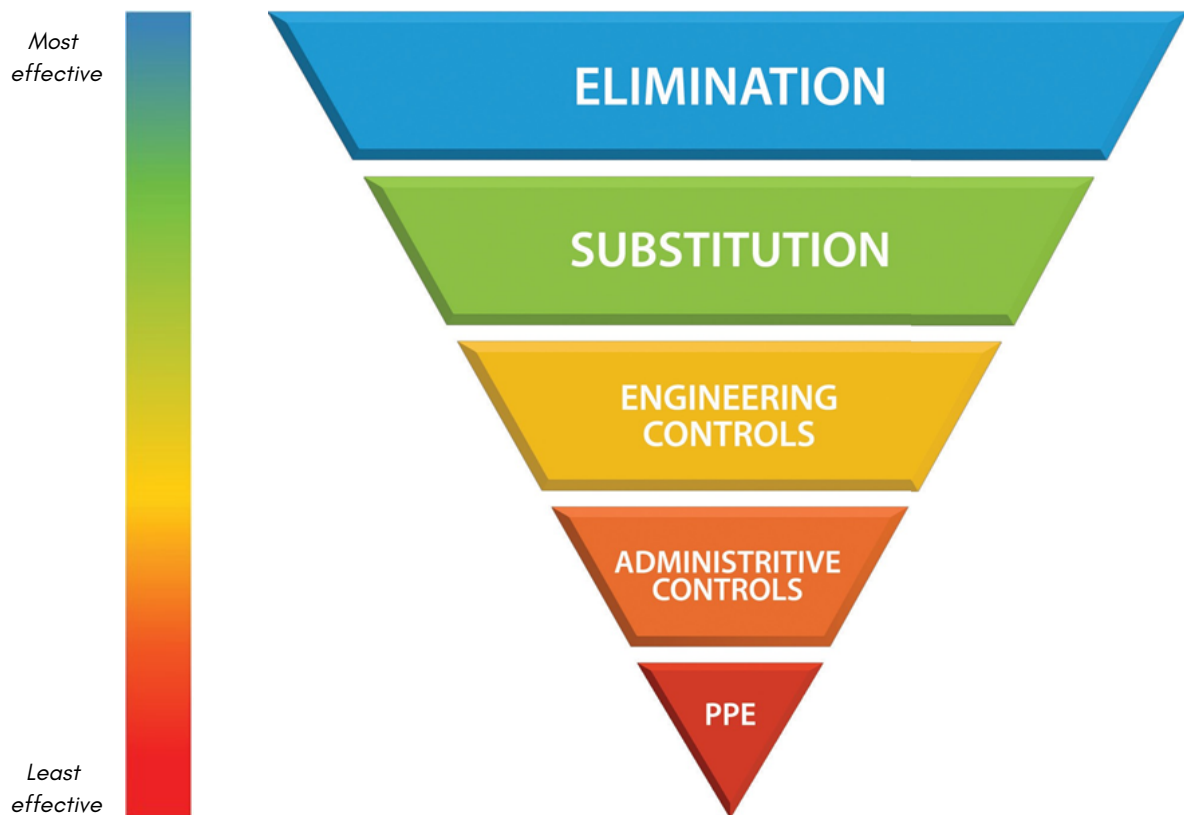
| CURRICULUM LINK  | CONTENT DESCRIPTOR  | LESSON         |
|--|---|----------------|
| <b>AC9SI0I01</b> Develop investigable questions, reasoned predictions and hypotheses to test relationships and develop explanatory models.       | Discussing how a tested hypothesis may lead to further predictions and testing to determine if the prediction is supported.   | 1 (a)<br>3 (a) |
| <b>AC9SI0I05</b> Analyse and connect a variety of data and information to identify and explain patterns, trends and relationships and anomalies. | Representing speed and acceleration data from investigations or simulations in tables and graphs and comparing how much these facilitate the identification of relationships. | 7              |

## ENGLISH

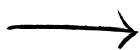
**General Capabilities:** Literacy, Critical and Creative Thinking, Personal and Social Capability, ICT Capability

| CURRICULUM LINK   | CONTENT DESCRIPTOR                                   | LESSON                         |
|---|--|--------------------------------|
| <b>AC9EI0LY06</b> Plan, create, edit, and publish written and multimodal texts, organising, expanding and developing ideas through experimenting with text structures language features, literary devices and multimodal features for specific purposes and audiences in ways that may be imaginative, reflective, informative, persuasive, analytical and/or critical. | Creating informative texts that explain and analyse. | 2 (a)<br>5<br>6<br>8 (a)<br>10 |

# HIERARCHY OF CONTROL



**REMOVE**



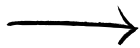
Physically remove the hazard

**SWAP**



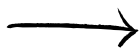
Replace the hazard

**ORGANISE**



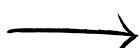
Isolate people from the hazard

**DIRECT**



Change the way people work

**COVER**



Protect the worker with  
Personal Protective Equipment



# HIERARCHY OF CONTROL



Use this lesson as an **introductory activity** to help familiarise your students with the Hierarchy of Control and the ways it can be applied to a variety of contexts.

### Learning intention

To raise awareness of

- The Hierarchy of Control as a safety system.
- The Safety A.C.E Framework and how it can be applied.

### Success criteria

Students can

- Apply the Hierarchy of Control system to a situation in the home environment via instructional video.

### Background information

The Hierarchy of Control is a system for controlling risks in the workplace. The Hierarchy of Control is a step-by-step approach to eliminating or reducing risks. It ranks risk controls from the highest level of protection and reliability, through to the lowest and least reliable protection.

### Resources

- Hierarchy of Control Hazard Sheet (provided next page)
- Recording device
- Video (*Safety's Hierarchy of Controls with Examples*) - Access via URL below or scan for link  
<https://www.youtube.com/watch?v=7kwW1wz0g0>



### Instructions

1. Ask students if they have hurt themselves at home and collate a list of responses. Is there any way this hazard could have been avoided? What measures do they put in place at home to minimise injuries to the people that live there?
2. Introduce the term 'Hierarchy of Control'. Explain that it is a term used in industries to minimise harm to workers. It can also easily be applied in all other situations.
3. Watch the video [Safety's Hierarchy of Controls with Examples](#) (4:26).
4. Further explain that some Hierarchy of Control frameworks include 'Isolation' between the Substitution and Engineering Controls. This requires workers to isolate the hazard by placing some sort of barrier between the worker and the risk factor for protection.
5. Ask students to choose a situation at home that they could use as an example of how to apply the Hierarchy of Control. Use the Hierarchy of Control Hazard Sheet to record answers.
6. Invite students to make an informative clip (like the one seen earlier) explaining how the Hierarchy of Control can be applied in this situation. They may choose to add some humour like the clip has also done.
7. Allow time for students to create their informative clips and share them with the class.
8. Explain to students that the Hierarchy of Control is forming the basis of the Safety A.C.E lessons with regard to ways we can make farm safety a priority.

# HIERARCHY OF CONTROL HAZARD SHEET



Hazard identified: \_\_\_\_\_

| HIERARCHY OF CONTROL RISK MEASURE | HOW COULD YOU REDUCE THE HAZARD? |
|-----------------------------------|----------------------------------|
| <b>Eliminate</b>                  |                                  |
| <b>Substitute</b>                 |                                  |
| <b>Engineering Controls</b>       |                                  |
| <b>Administrative Controls</b>    |                                  |
| <b>PPE</b>                        |                                  |



This is the first of two lessons investigating Animal Safety. Activity 1 (a) focuses on the safety issues that need to be considered when handling stock.

### Learning intention

To raise awareness of

- The health and safety risks associated with stock handling on farms.
- Applying the Safety A.C.E framework in reference to stock handling.

### Success criteria

Students can

- Identify how an animal's panoramic vision affects its behaviour.
- Apply the Safety A.C.E framework to working around animals.
- Design a safe stockyard that minimises harm to stock and workers.

### Background information

Farm livestock can cause injuries and fatalities to those who are around them if you are not always vigilant. Characteristics of livestock such as their large frames, panoramic field of vision, poor depth perception, territorial nature and unpredictable behaviour have the potential to cause significant injuries to humans.

### Resources

- Milk carton
- Tape
- Mirrors
- Balloon
- Video (*Mother cow defends newborn calf*) - Access via URL below or scan for link:

<https://www.youtube.com/watch?app=desktop&v=AluRqjNRVIA>



### Additional supporting resources



An **Animal Safety VR video and accompanying student worksheet** can be accessed as further resources to support the teaching of animal safety in your classroom. Visit [www.primezone.edu.au](http://www.primezone.edu.au) and search for 'Farm Safety' to access these resources.

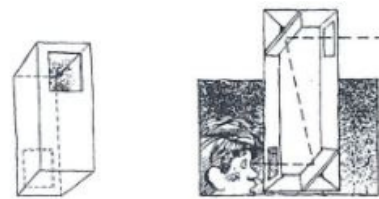
### Instructions

1. Explain to students that livestock can sometimes react unpredictably or be frightened easily due to their panoramic field of vision and poor depth perception. This lesson is designed to give students a better understanding of how this may affect animal behaviour and in turn impact the safety of people working with them.

2. Instruct students on how to construct their view finder:

a) Using the carton in an upright position, cut one window at the bottom of the carton (square shape) and one window on the other side but this time at the top of the carton

b) Tape mirrors inside (as shown in illustration)



3. Instruct students to hold the carton up to one eye. Ask them to walk around room with both eyes open, while still holding the carton up to one eye. Allow students to walk around for a few minutes, taking note of how their sight is different to what they are used to. While students are moving around the room, at an unexpected time, burst the balloon. Discuss how unexpected noises can startle us if our vision is obscured and relate this to animal behaviour.

4. Watch the video [Mother cow defends newborn calf](https://www.youtube.com/watch?app=desktop&v=AluRqjNRVIA) (1:00). Discuss what the mother cow was doing and why. Discuss signs of aggression displayed by the cow.

5. Using the Hierarchy of Control (focus on administrative controls), list four aspects students should remember as they approach livestock (you may want to look at various video clips to identify animal behaviour and warning signs). We cannot necessarily control the animals' behaviour but our own behaviour can certainly influence theirs.

EXTRA  
EXTRA!

View the video [Safe stockyard design](https://www.youtube.com/watch?app=desktop&v=ceYMvQHSAk) (9:56). List all of the safety factors that need to be considered when designing stockyards. Think of your own school farm and design a new stockyard area that will incorporate all of these elements.

<https://www.youtube.com/watch?app=desktop&v=ceYMvQHSAk>





This is the second lesson investigating Animal Safety. Activity 1 (b) focuses on diseases associated with animals and the safety precautions needed to prevent cross-infection.

### Learning intention

To raise awareness of

- The health and safety risks associated with stock handling on farms.
- Applying the Safety A.C.E framework in reference to stock handling.

### Success criteria

Students can

- Explain what zoonosis is and how it is transferred from animals to humans.
- Identify proactive measures people can take to ensure zoonosis does not occur.
- Design an easy-to-use hand wash station for farmers.

### Background information

Zoonosis is a disease which can be transmitted to humans from animals. Some examples of zoonoses include ringworm, salmonella infection and rabies. You can prevent zoonoses by keeping your animals healthy, staying away from wild animals and always washing your hands after touching animals.

### Resources

- Small buckets of animal feed.
- Animal brushes.
- Small bottle of baby oil.
- Glitter.
- Cup/mug.
- Hand soap.
- Stuffed 'farm' animals.
- Disposable gloves.



### Instructions

1. Divide the class into small groups. Provide each group with a stuffed animal, feed samples, animal brushes and a bucket. Place the equipment on a table. Explain to the groups that they need to get their animal ready for a show by completing the following tasks:
  - a) 'Inspect' the animal to make sure it is ready for show.
  - b) Mix different feed samples in the bucket.
  - c) Place a small amount of glitter on each animal. The glitter represents bacteria/virus/disease on an animal.
  - d) Students in each group (EXCEPT ONE who will wear disposable gloves instead) rub baby oil on their hands.
  - e) Students are to touch/brush/feed their animal and handle the equipment (including the student with the gloves). They should also touch other groups animals/feed, shake hands with one another, and pick up the cup/mug.
  - f) Ask students to reflect on the spread of the 'disease' (glitter). Prompt questions may include:
    - What has happened to the glitter? How has it spread?
    - If the glitter represents disease, what does this mean for humans and animals?
    - What happened to the person wearing gloves? Did they spread any glitter? How?
    - What was the purpose for wearing gloves?
  - g) Ask students to wash their hands in water WITHOUT soap. Did the glitter disappear/reduce? How did it look for the person who was wearing gloves (who removed them to wash their hands)?
  - h) Wash hands again but this time WITH soap for at least 30 seconds (including under fingernails). What can we observe about the glitter now?
2. On completion of the activity, students discuss and record how the transmission of germs/disease occurs and the ramifications for animals and humans. Discuss how wearing PPE helps to prevent disease transmission. Is there any other area of the Hierarchy of Control that could be employed to minimise cross-contamination of this kind?

EXTRA  
EXTRA!

### Set a design task for students:

Design a portable hand washing station that farmers can easily transport on their farms so that high levels of hand hygiene can be enforced at all times.



This is the first of two lessons investigating Chemical Safety. Activity 2 (a) focuses on the rules and regulations that must be adhered to when using chemicals on farms.

### Learning intention

To raise awareness of

- The hazards and risks associated with the use and handling of farm chemicals.
- Applying the Safety A.C.E framework in reference to the storage and handling of chemicals.

### Success criteria

Students can

- Identify where we learn about the properties and correct handling of chemicals.
- Identify the correct and appropriate ways to store chemicals.
- Explain the relevance and importance of handling chemicals safely.

### Background information

Chemicals are defined as any substance that has similar characteristics and are used to have an impact on something else. Chemicals are used on farms to help or hinder growth and are used for a variety of reasons. When used correctly and according to directions, chemicals should be safe. That is why it is extremely important that all rules and regulations are followed. If they are not, then chemicals have the potential to become life threatening.

### Resources

- Post-It notes
- Signs: 'Least Harmful'/'Most Harmful'
- Safety Data sheets:  
<https://www.safeworkaustralia.gov.au/safety-topic/hazards/chemicals/safety-data-sheets>
- Video (*On-farm Chemical Safety*) - Access via URL below or scan for link:  
[https://www.youtube.com/watch?v=9\\_SBcZHLnwY](https://www.youtube.com/watch?v=9_SBcZHLnwY)



### Instructions

1. Ask students what they know about farm chemicals. What are they used for? How do they know they are chemicals?
2. Brainstorm all the chemicals students know and write each chemical on post it notes and place on the board. Using a continuum of 'least harmful to most harmful', ask students to place the names of the chemicals along the continuum.
3. Discuss with students: What makes a chemical 'harmful'. Who/what can they be harmful for?
4. Introduce Safety Data sheets to students and provide them with a sample data sheet (see link provided under Resources heading). Discuss why Safety Data sheets would be necessary in a farm context.
5. Watch the video [On-farm Chemical Safety](#) (5:34). Ask students to take notes and record all the different steps that can be taken to ensure the minimisation of harm from chemicals on farms.
6. Invite students to work through the Hierarchy of Control in relation to chemical safety. What is applicable? Is elimination of the use of chemicals an option? For example, replacing weed killer around the house OR on a bigger scale, replacing the use of herbicides?

### Additional supporting resources



A **Chemical Safety VR video and accompanying student worksheet** can be accessed as further resources to support the teaching of chemical safety in your classroom. Visit [www.primezone.edu.au](http://www.primezone.edu.au) and search for 'Farm Safety' to access these resources.

EXTRA  
EXTRA!

Watch the video [Chemical Handling](#) (2:00) and ask students to write a voice-over narration to go with the video relating to chemical safety.

<https://www.youtube.com/watch?v=dzX6laPPmiw>





This is the second lesson investigating Chemical Safety. Activity 2 (b) focuses on the risks associated with the spray and drift of chemicals on farms and how these risks can be mitigated.

### Learning intention

To raise awareness of

- The hazards and risks associated with the use and spraying of farm chemicals.
- Applying the Safety A.C.E framework in reference to chemical spray and drift.

### Success criteria

Students can

- Understand the concept of chemical spread and drift relating to the spraying of chemicals on a farm.
- Highlight the implications and ramifications of chemical spread on farms.
- Identify ways to minimise chemical spread on farms.

### Background information

Chemical exposure can take place in many ways depending on the chemical and the form it comes in. Being swallowed, inhalation, absorption through the skin, contamination of clothing or eye exposure are examples of how exposure can occur. Many times people are unaware they have been exposed and often chemical poisoning does not present straight away.

### Resources

- 3 x spray bottles filled with different coloured water (use food colouring to change water colour)
- Poster paper.
- Fan.
- Video (*Use Farm Chemicals Safely*) - Access via URL below or scan for link:

<https://www.youtube.com/watch?app=desktop&v=TlhAx1eXdc>



### Instructions

1. Discuss with students the terms 'spray' and 'drift'. Ensure all students understand the terms and then build on this with the term 'chemical spray and drift'.
2. Discuss which machinery items on a farm have the potential to cause chemical drift (*for example, boom sprayers, spot sprayers*).
3. Draw a farm on the poster paper. In the illustration, ask students to include an orchard, the family home, family members, a dam and animals.
  - a) Ask one student to spray the orchard with the water mixture standing 10cms away. Observe where the liquid goes.
  - b) Repeat the experiment but this time, stand 40cms away. What do you notice? What implications would these observations have for a farm?
  - c) As an extension to this activity, set up the fan and draw the picture again. Face the fan towards the picture and turn it on. Repeat the activity of spraying the coloured water onto the picture. Observe where the liquid goes. What do you observe about this activity. How does it compare to the previous one?
4. Discuss the results of each of these experiments with the students. What does it teach us about the dangers of chemical spray and drift? What implications does this have for the safety of farmers and their families?
5. Watch the video [Use Farm Chemicals Safely](#) (7:15). Discuss the issues raised in the video.
6. Look at the Hierarchy of Control and identify the layer that farmers could most easily implement to ensure the safety of themselves and their family.

EXTRA  
EXTRA!

Ask students: Are there any ways the hazard of chemical spray and drift can be removed by using engineering principles? Look at existing boom sprays and observe if there are any design changes that can be made.





This is the first of two lessons investigating Electrical Safety. Activity 3 (a) focuses on the potential dangers associated with overhead powerlines and ways to avoid these dangers.

### Learning intention

To raise awareness of

- The health and safety risks associated with electricity on farms.
- Applying the Safety A.C.E framework to electrical safety on farms.

### Success criteria

Students can

- Identify overhead powerlines as a potential danger on farms.
- Identify machinery on farms as potential conductors of electricity in raised and lowered positions.
- Design a visual graphic that conveys relevant information to users of farm machinery.

### Background information

When farming equipment gets too close to powerlines, results can be fatal. Farmers and workers need to be aware of the dangers of overhead powerlines. You don't have to make contact with a powerline for it to be fatal. Electricity can jump if equipment or machinery gets too close to powerlines.

### Resources

- Pictures and specifications of farm machinery (for example tractors, harvesters, boom sprays, augers) to be sourced prior. Machines should be ones that are relevant to town/community context.
- Video (*Jason Daniel's Story, WorkSafe Queensland*) - Access via URL below or scan for link:

<https://www.youtube.com/watch?v=EfoSBpB2NPA>



### Instructions

1. Brainstorm with students what they know about safe use of electricity in general. Are students aware of any safety issues regarding electricity on farms?
2. Explain to students that one type of electrical danger on farms can come from overhead powerlines. They can be particularly dangerous if they come into contact with machinery being operated by people.
3. Watch the video [Jason Daniel's story, WorkSafe Queensland](#) (8:37). **Please note:** This video contains a description of an electrocution incident. Ascertain whether viewing the video is appropriate within your context based on knowledge of your students.

Discuss the issues raised in the video with students. Ask for feedback - did anything in the video surprise the students?

4. Explain that in order to prevent accidents like this happening, it is important that farmers know the heights of their machinery in lowered and raised positions (this includes while loading, unloading and excavating), as well as knowing the height of the powerlines on their property. They should also be aware that powerlines sag in heat and sway in winds.

5. Ask students to inspect the collection of images/specifications of various types of farm machinery. Students should:

- a) Draw a chart that represents information regarding the height of different types of machinery.
- b) Take the information from one of the machines and design a large sticker that can be placed in a prominent position in/on the machine that warns users of the height of the machine and the hazard that it could potentially cause if it comes too close to powerlines.

6. Discuss with students: Which layer of the Hierarchy of Control does the above activity fit into? Can it be more than one?

EXTRA  
EXTRA!

Aerial markers have been cleverly designed to help farmers clearly see where powerlines are. Watch the video [Look Up and Live: Spinning Powerline Markers](#) (0:56) to learn about how they work. Ask students: Can these designs/models be improved upon for your farm/school farm? <https://www.youtube.com/watch?v=swNAyr-MgG0>





This is the second lesson investigating Electrical Safety. Activity 3 (b) focuses on the potential dangers associated with underground power and ways to avoid these dangers.

### Learning intention

To raise awareness of

- The significance of electrical safety on farms as a work site.
- Applying the Safety A.C.E framework to electrical safety on farms.

### Success criteria

Students can

- Identify underground power cables as a source of danger on farms.
- Understand the role of the 'Before You Dig' organisation and how it assists with knowing the location of underground power.
- Explain the 5 Ps of Safe Excavation.

### Background information

Underground electrical cables are particularly dangerous as they are hidden from view. Before doing any work involving trenching or drilling holes, it is necessary to take steps to find out if underground electrical cables are at or near where the work is to be done.

Underground cables could be affected by any dirt moving activities, such as soil ripping, installing drains, building fences, harvesting, or any structures being built on a farm. The depth of cables and power lines can change over time due to erosion, other digging projects and uneven surfaces.

### Resources

- Website (*Before You Dig Australia*) [www.byda.com.au](http://www.byda.com.au)
- Video (*Excavation Safety - Underground Electric Cable Damage*) - Access via URL below or scan for link:  
<https://www.youtube.com/watch?v=UJQ-A9CsK2I>



### Instructions

1. Ask students to compare the differences between overhead power lines and underground power lines. What is significantly different about them? From a hazard point of view, what are the implications of this?
2. Ask students to consider if they would be able to identify where underground power lines exist at their own home, school or farm.
3. Watch the video [Excavation Safety - Underground Electric Cable Damage](#) (0:54). Ask students to identify the potential hazards in this scenario.
4. Explain the role of the 'Before You Dig' organisation (*providing free referrals to community members detailing the location of underground cables on their property*). Ask students to research the organisation by visiting the Before You Dig Australia website ([www.byda.com.au](http://www.byda.com.au)). Take particular note of the **5 Ps of Safe Excavation** located on the Best Practice Guidelines page.
5. Ask students to apply the 5 Ps of Safe Excavation to the video watched earlier. How could the workers in the video have worked in a safer way by applying these steps?
6. As a class, identify which layers of the Hierarchy of Control the 5 Ps fit into. Do they all fit into the same layer or does each 'P' fit into its own layer? Ask students to design their own 'Electrical Hierarchy of Control' pyramid.

**IMPORTANT NOTE** Even if information from outside services has been sought, care must still be exercised! Not all underground electrical cables are identified by such a service (for example, privately owned underground electrical conductors).

EXTRA  
EXTRA!

During excavation work it is important to watch for warning signs of underground cables (such as orange tape). Students can research other markers that are resistant and able to withstand the environment that the markers will be buried in.



This lesson introduces students to the different ways they can be prepared for and respond to emergency situations that may arise on a farm.

### Learning intention

To raise awareness of

- On-farm emergency procedures and knowledge of how to respond in emergency situations.
- Applying the Safety A.C.E framework to emergency situations on farms.

### Success criteria

Students can

- Develop on-farm emergency procedures.
- Identify and become familiar with the use of the Emergency Plus app and St John's First Aid app.

### Background information

The best defence against every emergency situation is preparedness. It is a good idea for every family member and farm worker to be trained in First Aid, CPR and the use of a fire extinguisher.

Farms can be quite isolated, and it is vital that assistance is able to be administered before emergency personnel arrive as this can quite often take time.

### Resources

- Mobile phones/tablets with St Johns First Aid app and Emergency Plus app installed.
- First Aid kits.
- Video (*What to expect when you call Triple Zero*) - Access via URL below or scan for link:

<https://www.youtube.com/watch?v=bSfyu9Ri4n0>



### Instructions

1. Ask students to consider examples of what could quantify as an 'emergency' on farms. Emergencies could range from being large scale (*bushfire*) to individual (*snake bite*).
2. Discuss the importance of knowing what to do in an emergency. Why is it important? (*Decreases response time, increases rescue efficiency, decreases the chance of further injury to the victim and rescuers, the law requires it*).
3. Identify the procedure of calling Triple Zero. What kind of information would you expect to be asked when making a Triple Zero call in an emergency? Watch the video [What to expect when you call Triple Zero](#) (3:12) to learn about the information an ambulance service may ask you to provide in an emergency situation.
4. Role play a Triple Zero emergency call with students. Questions you might ask include
  - What service is needed?
  - What is the address of the emergency?
  - Provide a brief description of what happened
  - What is the age of the patient?
  - Is the patient conscious/breathing?
5. Explain the importance of having current Emergency Information Cards accessible on farms. Allow students to search online to view various templates that are available for use. Examples include:
  - [Farmsafe Australia - Farm Emergency Information](#)
  - [SafeWork NSW - Farm Emergency Card](#)
6. Show students the Emergency Plus app. As a class, work through each section on the screen and discuss the purpose of each section. Ask students to offer suggestions as to the benefits of this app. Discuss if there are any disadvantages (such as lack of mobile coverage). Are there ways to navigate these disadvantages?
7. Show the students the St John's First Aid app and demonstrate how it can help in an emergency where first aid is required to be administered. Ask students to choose a situation listed and role play the scenario of administering first aid, as per the guidelines on the app. This may require the use of a first aid kit.

EXTRA  
EXTRA!

The Emergency Plus app uses the term 'what3words' to help people describe their location in an emergency situation. Watch the video [Use the Emergency+ app with what3words to help Triple Zero \(000\) find you faster](#) (0:46) to understand how this system works. Ask students to draw a 3x3m grid over a map of the school. Using the app, determine 'what3words' you would use to describe each grid. <https://www.youtube.com/watch?v=SftAYPuEdsA>





This lesson addresses the dangers and risks associated with operating farm machinery. Particular focus is given to working safely around the Power Take Off (PTO) shaft of a machine, which has been responsible for numerous farm injuries.

### Learning intention

To raise awareness of

- The health and safety risks associated with the operation of farm specific machinery.
- Applying the Safety A.C.E framework to machinery safety on farms.

### Success criteria

Students can

- Describe PTOs and the ways in which they can potentially cause harm or injury.
- Identify the need for safeguarding PTOs.

### Background information

Machines such as chaser bins, augers and post hole diggers offer huge value to the farming industry however they are not without risk. Farmers and farm workers are at risk of fatal or serious injury when operating farm machinery.

PTO (Power Take-Off) is the shaft that transfers the power of the tractor to another machine that doesn't have an engine. It is very powerful and dangerous. It turns extremely fast and does not allow for any reaction time when accidents occur. Protection is usually in the form of a shield/guard to stop things from getting caught in it.

### Resources

- Video (*Alive and Well: Mark's story*) – Access via URL below or scan for link:

[https://www.youtube.com/watch?v=fUZZSDulopA&list=PLoBHj3WqW30y-qnIMiPai-6BS8B-Q\\_kud&index=2](https://www.youtube.com/watch?v=fUZZSDulopA&list=PLoBHj3WqW30y-qnIMiPai-6BS8B-Q_kud&index=2)



- Video (*Joany's Story*) – Access via URL below or scan for link:

<https://www.youtube.com/watch?v=YtnbK9m-TLo>



### Instructions

1. Discuss with students the types of machinery that can be used on farms (*plough, auger, baler, seed drill, post hole digger etc.*) and the purposes they are used for. If possible, investigate any examples of machinery used on the school farm.
2. Explain that farm machinery accounts for a high proportion of injuries or deaths on farms and therefore machinery use must be taken very seriously. One reason for these high risks are the fast-moving parts associated with machines (for example, the Power Take-Off or PTO). Inspect and identify the location of the PTO on the school tractor. Explain that **PTO guards** are essential in order to protect users from entanglement in the fast-moving shaft.
3. Ask students to research and record the current standards and requirements that are in place relating to PTO guards. Students should identify the risks associated with PTOs and describe the measures that users should take to minimise injury, with reference to the Hierarchy of Control.
4. Provide students with the opportunity to view two real-life stories associated with farm machinery accidents: [Alive and Well: Mark's story](#) (3:07) & [Joany's Story - Joany Badenhorst for SafeWork NSW](#) (4:47).  
**Please note:** These videos describe farm machinery accidents. Ascertain whether viewing the videos is appropriate within your context based on knowledge of your students.
5. After viewing these stories, ask students to design an advertising campaign to teach people about the risks involved in farm machinery use, detailing the steps that should be taken to prevent injury.

### Additional supporting resources



A **Machinery Safety VR video and accompanying student worksheet** can be accessed as further resources to support the teaching of machinery safety in your classroom. Visit [www.primezone.edu.au](http://www.primezone.edu.au) and search for 'Farm Safety' to access these resources.



This lesson provides students with opportunities to investigate the range of organisations, services and support networks available to support people experiencing mental health challenges in rural areas.

### Learning intention

To raise awareness of

- Mental health and safety for individuals and communities in regional and remote areas.
- Applying the Safety A.C.E framework to issues related to mental health.

### Success criteria

Students can

- Identify a range of organisations/services that offer support and explain the type of support that they provide.
- Brainstorm ideas for new services/programs that could provide support to people experiencing mental health challenges within their community.

### Background information

The reported prevalence of mental illness in rural and remote Australia appears similar to that of major cities. However, access to mental health services is substantially more limited than in major cities (National Rural Health Alliance Inc, 2017).

Living and working in rural and regional areas on farms can make it difficult to access appropriate support when issues arise. This lesson aims to give students a better understanding of where and how to access support if needed.

### Resources

- Support Organisation Database worksheet (provided over page)

- Video (*It's time to talk about mental health*) – Access via URL below or scan for link:

<https://www.youtube.com/watch?v=wqARToYNHS8&t>



- Article (*'Bugger all rainfall prompts teenager to hold farmer fitness classes during his school holidays*) – Access via URL below or scan for link:

<https://www.abc.net.au/news/rural/2019-01-24/forget-the-farm-and-hit-the-gym/10692856>



### Instructions

**1.** Discuss with students the varying stress factors that can be felt by people living in rural and remote areas. Examples may include isolation and loneliness, exposure to natural disasters such as drought, financial pressures of the agriculture industry, and youth unemployment. Regular exposure to stress factors such as these can contribute to psychological distress and mental health conditions such as depression and anxiety.

**2.** Watch Joe's story – [It's time to talk about Mental Health](#) (3:24). After viewing, ask students to comment on the different measures Joe put in place when he knew his mental health was deteriorating. List the people/places he went to seek help.

**Please note:** This video describes issues relating to mental health challenges. Ascertain whether viewing the video is appropriate within your context based on knowledge of your students.

**3.** Explain to students that there are now many mental health services and support organisations accessible to people in rural and remote areas. Students will research various organisations to find out the type of support they offer and create a database of relevant information (use the Support Organisation Database worksheet).

**4.** In addition to these large organisations, there are many examples of people establishing services or programs on a smaller scale to offer support to members of their community. One such example is the [Fit Farmer Program](#), established by a NSW teenager in his town.

**5.** Ask students to brainstorm ideas about new services, events or programs that could be established within their own community to bring people together and address mental health safety.

EXTRA  
EXTRA!

As a class, revisit the Hierarchy of Control. Discuss how this model could be applied to addressing mental health safety. Is it practical?

Could this 'clinical' approach be applied in this instance?

# SUPPORT ORGANISATION DATABASE



Research the following organisations to understand the services and support they provide and how they can be accessed. Add any additional organisations that you discover during your research, or local services/organisations that operate within your community.

| Organisation name    | Services provided | Mode of support<br>(e.g. phone, online, face-to-face) | How to access |
|----------------------|-------------------|---|---------------|
| Beyond Blue          |                   |   |               |
| Lifeline             |                   |   |               |
| Black Dog Institute  |                   |   |               |
| Headspace            |                   |   |               |
| This Way Up          |                   |   |               |
| MindSpot             |                   |   |               |
| Are You Bugged Mate? |                   |   |               |
| Mental Health Online |                   |   |               |
| Kids Helpline        |                   |   |               |
|                      |                   |   |               |
|                      |                   |   |               |



This lesson focuses on the potential risks associated with noise when operating farm equipment or machinery and ways to prevent hearing loss or damage.

### Learning intention

To raise awareness of

- The health and safety risks associated with the operation of farm specific machinery.
- Applying the Safety A.C.E framework to noise safety on farms.

### Success criteria

Students can

- List possible causes of hearing damage on farms.
- Order the farm items (from most noisy to least noisy) based on decibels.
- Apply engineering design process to design and test headphones that absorb sound.

### Background information

Noise from agricultural machinery and other sounds around the farm can cause permanent hearing loss. Continued and long-term exposure to noise can cause irreparable damage to hearing and the effects of this damage are often not fully realised for a number of years. Hearing loss affects quality of life and cannot be corrected.

### Resources

- Decibels on the Farm worksheet & answer guide (provided over page)
- Video (*What's louder? Let's measure in decibels*) - Access via URL below or scan for link:

<https://www.youtube.com/watch?v=rAx3fH-u00A>



### Instructions

1. Discuss what noise is (*various sounds, usually unwanted or unpleasant*) and which part of our body detects it (*ears via the sense of hearing*).
2. Ask students to list all the noises you hear on a farm/that are specific to agriculture. Once listed, categorise them as 'working' noises (like motorbikes) or 'general' noises (like people talking).
3. Ask students to brainstorm what they know about hearing and the ways in which hearing can be damaged by excessive noise. Pose the question - why is protecting our hearing important?
4. Explain to students that we measure sound in decibels. Watch the video [What's louder? Let's measure in decibels](#) (4:36) to learn more about how sound is measured.
5. Provide students with the Decibels on the Farm worksheet. Ask students to match each farm activity with their average noise in decibels. Compare student's answers with the information provided in the answer guide. Which answers surprised students the most?
6. Ask students to work through the Hierarchy of Control and discuss different ways we can minimise the damage on our hearing from farm noises. Note, students may want to go straight to PPE, however it is important to remind students to work through the Hierarchy, as PPE is the least effective option. Collate all suggestions and complete a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis on one of them.



Set a design task for students: **Design and construct a pair of headphones that absorb sound.**

EXTRA  
EXTRA!

### Instructions

- Ask students to research and investigate different types to headphones to assess materials and features.
- Provide students with materials and allow time for experimentation and construction.
- Once designs have been constructed, test the effectiveness of the headphones for sound absorption (bells, buzzers, computer generated sounds may be used for testing purposes).

### Possible materials

- Noise absorbing materials (cloth, sponges, foam, cotton balls, carpet samples, cotton batting).
- Headbands.
- Stretchy material/elastic.
- Cups.
- Rubber bands, masking/duct tape, scissors, glue.

# DECIBELS ON THE FARM



Match each farming activity with their approximate average decibel noise level.



Tractor (without cabin)

106 (ear icon)



Firearms

89 (ear icon)



Header

100 (ear icon)



Auger

140 (ear icon)



Chainsaw

93 (ear icon)



Orchard sprayer

98 (ear icon)



Pig shed at feeding time

90 (ear icon)

92 (ear icon)



Angle grinder



# DECIBELS ON THE FARM - ANSWER GUIDE



Match each farming activity with their approximate average decibel noise level.



92 (ear icon)

Tractor (without cabin)

140 (ear icon)



Firearms

90 (ear icon)



Header

93 (ear icon)



Auger

106 (ear icon)



Chainsaw

89 (ear icon)



Orchard sprayer

100 (ear icon)



Pig shed at feeding time

98 (ear icon)



Angle grinder



This is the first of two lessons investigating Quad Bike Safety. Activity 8 (a) focuses on the identification of risks associated with quad bike use on farms and ways in which these risks can be minimised.

### Learning intention

To raise awareness of

- How quad bikes are used on farms and how injuries can occur.
- Applying the Safety A.C.E framework to quad bike use on farms.

### Success criteria

Students can

- Identify the various uses of quad bikes on farms.
- List the potential for injuries on quad bikes dependent on the quad bike use.
- Create an information visual for safe quad bike use for teenagers.

### Background information

There have been at least 136 fatalities associated with quad bike use in Australia between 2011–2019. Around 15% of deaths involve children. More than half of all quad bike deaths are because of rollovers. The main causes of death by rollovers are asphyxiation, crush and head injuries. Quad bikes are one of the leading causes of death and serious injury on Australian farms.

The risk of a rollover increases if the quad bike is travelling on uneven ground or slopes, travelling at high speed, towing an attachment or carrying a heavy or unstable load. Risks of a serious incident are also increased when operators:

- Are inexperienced.
- Carry passengers.
- Do not have the physical strength to ride actively.
- Are under the influence of alcohol or drugs.
- Are not wearing suitable personal protective equipment such as a helmet.

Children are at greater risk of serious injury and death while operating quads. Adult sized quad bikes should not be operated by children. Even the smaller youth quads have been involved in fatal incidents in Australia.

Quad bike accidents are common and can happen very easily.

### Resources

- Quad Bike Information sheet (provided over page)
- Video (*Alicia's Story - Quad bikes on farms*) – Access via URL below or scan for link:

[https://www.youtube.com/watch?app=desktop&v=CYH8\\_9NnREk](https://www.youtube.com/watch?app=desktop&v=CYH8_9NnREk)



### Instructions

1. Discuss with students the many reasons that quad bikes are used on a farm (including for recreation). List these on the board. Individually go through and apply the Hierarchy of Control to assess which layers of control are applicable relating to each different task the quad bike is used for.
2. Discuss the possible injuries that can occur from misuse of quad bikes. Ask students – Are most children knowledgeable about the expectations/rules/guidelines of quad bike use? How can we improve this knowledge for future generations?
3. Watch the video [Alicia's Story - Quad bikes on farms](#) (4:15). Discuss with students the issues raised in this video. **Please note:** This video tells the story of a death resulting from a quad bike accident. Ascertain whether viewing this video is appropriate within your context based on knowledge of your students.
4. Explain to students that they are to create an information brochure that could be distributed to farms. The brochure should present the information provided on the Quad Bike Information Sheet in a visually appealing and engaging way and should target teenagers as the audience. The brochure can be designed on paper or using digital graphic design programs.

From October 2021, general use quad bikes must also have an OPD (operator protection device). The OPD aims to protect the rider from the risk of serious injury/fatality as a result of being crushed/pinned in the event of a rollover. It does this by holding the quad bike off the ground and meeting minimum stability requirements.

EXTRA  
EXTRA!

Ask students: Can you think of other ways to redesign a quad bike to prevent injuries associated with rollovers? You will need to investigate choice of materials and how the design would affect the overall performance of the bike.

# QUAD BIKE INFORMATION SHEET



Present this information in your brochure. Remember to make your brochure visually appealing and engaging to ensure the important safety messages are conveyed.

1. Decide if a quad bike is the right vehicle for the activity.
2. When you purchase a new quad bike, use the hang tag to compare the stability of different models.
3. If you purchased a quad bike for a farm before the requirements in the safety standard commenced, you should fit an OPD. See if your state or territory provides a rebate to improve the safety of the quad bike.
4. Ensure you are properly trained before you ride a quad bike.
5. Maintain the bike so it is in safe condition.
6. Read the owner's manual and observe the manufacturer's safety warnings and recommended use of the vehicle.
7. Before you leave for a quad bike ride, always tell someone where you plan to go and when you expect to return.
8. Always wear a helmet.
9. Wear protective clothing and gear such as goggles, long sleeves, long pants, boots and gloves/hand protection.



This is the second lesson investigating Quad Bike Safety. Activity 8 (b) focuses on the implications of carrying heavy loads on quad bikes to the vehicle's centre of gravity.

### Learning intention

To raise awareness of

- How quad bikes are used on farms and how injuries can occur.
- Applying the Safety A.C.E framework to quad bike use on farms.

### Success criteria

Students can

- Demonstrate how adding additional weight to an object can cause the centre of gravity to shift.
- Apply this knowledge to the safe use of quad bikes on farms.

### Background information

Gravity is the pulling force between two objects due to their masses. Centre of gravity is the balance point of the object.

Quad bikes and ATVs are often used for moving and transporting things around the farm. While this is extremely useful and effective, it is important to remember that placing items on the bike for transporting alters the centre of gravity on the bike.

When the centre of gravity is moved, the quad bike is less stable and more likely to tip over if the rider does not take this shift into account when riding the bike. A quad bike is most stable when the centre of gravity is low and most centred. When people or other objects are added to the bike, the centre of gravity moves TOWARD the extra weight.

### Resources

- Video (*Quad bikes - the right tool for the job?*) - Access via URL below or scan for link:  
[https://www.youtube.com/watch?v=4dvTLvZ4e\\_M](https://www.youtube.com/watch?v=4dvTLvZ4e_M)



- A long, thin stick (metre ruler, broomstick, PVC pipe, dowel rod or any stick of similar length).
- A variety of objects to act as weights.
- Masking tape.
- Marker.

### Instructions

1. Watch the video [Quad bikes - the right tool for the job?](#) (3:29). As a class, make a list of farm tasks that could compromise the stability of a quad bike and change the bike's centre of gravity (for example, carrying hay bales on the back of the quad bike; pulling a trailer carrying heavy equipment).

2. Explain to students that they are going to demonstrate how the centre of gravity of an object can easily change when weight is added to it. This demonstration can be conducted as a whole class activity or in small groups.

- Support the stick by resting each end on top of the index fingers.
- Slowly slide the fingers together until they meet. The point at which the fingers meet will be the stick's centre of gravity. Place a mark on the stick (with a marker/piece of tape) to record the location of the centre of gravity.
- Return index fingers to support each end of the stick. Place a weight at some point along the stick (attach with masking tape if needed). Repeat the process of sliding the index fingers together to find the new centre of gravity. Mark this point.
- Repeat with the addition of varying weights at different points along the stick. Ask students to compare and contrast the results with reference to the amount and the position of the weights. How did these factors affect the stability of the stick?

3. Discuss the implications of this centre of gravity demonstration on how we use quad bike on farms. How could the Hierarchy of Control be implemented in a situation where quad bikes were planning on being used to carry unsafe loads?



EXTRA  
EXTRA!

Side by side vehicles (SSV) are seen as safer than quad bikes on farms. Is this true? Ask students to research the statistics of injuries on farms sustained on SSV compared with quad bikes.



This is the first of two lessons investigating Tractor Safety. Activity 9 (a) focuses on safe tractor access (from the ground to the seat) when mounting and dismounting tractors.

### Learning intention

To raise awareness of

- The use of tractors on farms and how injuries can occur.
- Applying the Safety A.C.E framework to tractor use on farms.

### Success criteria

Students can

- Understand the requirements of safe tractor access.
- Design and construct a model representing safe tractor access.

### Background information

Vehicles account for more than 75% of workplace deaths in the agricultural industry. Tractors are widely used across all aspects of the agricultural industry and range from small lawn tractors to large, powerful, highly specialised vehicles.

All machines can be hazardous when they are operated improperly. It is an Occupational Health and Safety legislation in all Australian states and territories for employers to provide adequate information, induction, instruction, training and supervision to employees. This includes the operation of tractors. An essential component of this is knowing how to approach and access the tractor.

Safe tractor access reduces the capacity for accidents to occur when getting onto (mounting) and getting off (dismounting) the tractor. Tractors are usually mounted on the left-hand side, so it is assumed that no access is needed on the right, however this needs to be checked for individual tractors and if there is access available on the right, then a safe access path needs to be established on this side also.

### Additional supporting resources



A **Tractor Safety VR video and accompanying student worksheet** can be accessed as further resources to support the teaching of tractor safety in your classroom. Visit [www.primezone.edu.au](http://www.primezone.edu.au) and search for 'Farm Safety' to access these resources.

### Resources

- Box to represent tractor (students may decorate and detail as they wish!). Must include wheels, cabin and operator's seat.
- Various craft and construction materials (such as cardboard, popsticks, pipe cleaners, flywire, mesh, material).
- Scissors, tape/glue, split pins.
- Safe Tractor Access Guidelines sheet (provided over page).

### Instructions

1. Discuss with students the many reasons that tractors are used on a farm. List these on the board. Individually go through and apply the Hierarchy of Control to assess which layers of control are applicable relating to each different task the tractor is used for.
2. Explain to students that there are different rules and regulations that tractor manufacturers must adhere to in order to ensure safe tractor access for operators. Although access can vary from vehicle to vehicle, older style tractors often have poorly designed access points (missing handrails, insufficient steps).
3. Introduce the design task to students. The task can be completed individually or in small groups.
  - Design and construct a model of a tractor.
  - Demonstrate that safety measures that have been included to ensure safe access to the vehicle for operators.
  - Use the guidelines provided on the Safe Tractor Access Guidelines sheet to assist with your design.
  - Write an explanation of how each safety measure included in the design improves the functionality and safety of the tractor for operators.
4. Allow time for students to design/construct their tractor models and write their explanation. Invite students to present their models to the class and explain the features they have included that promote safe access for tractor operators.

### Set a research task for students:

Research the different types of materials that are currently used for access points (steps, handrails). Make a list of the pros and cons for each material. Is there a material that is more suitable for certain environments or farm types?

EXTRA

EXTRA!

# SAFE TRACTOR ACCESS GUIDELINES



Use these guidelines to assist in the design of your tractor model. You will need to scale the measurements for your individual model. Record this scale information and present it with your finished design.

An upright handrail (30 - 40mm diameter) should be provided on the left-hand side of the steps. A small handrail is also required on the rear mudguard side of the access path. The space between the handrail and the access platform must be filled in using mesh.

Padding may be required on door frames and cabin roof edges where the operator's head may hit when getting in and out of the tractor.

Steps should be the same size/slope and should follow a straight line or smooth curve. Brightly coloured, non-slip nosing on the step edges ensures good visibility and safety.



Guards should be installed between the access platform and the wheels to prevent contact between the tyres and the operator.

The bottom step should be **no more than 400mm** from the ground, with its outer edge close to the line of the outside of the left-hand rear tyre. It may be desirable to hinge the bottom step from a point inside the next step up, so it is free to move upwards, clear of the ground (especially if tractor will be working in boggy conditions).

Comfortable steps have a **rise of no more than 200mm** and tread **depth no less than 240mm**. The material for the steps/footplates should be a non-slip grating so the ground can be seen.



This is the second of two lessons investigating Tractor Safety. Activity 9 (b) focuses on the risk of rollover and run over when using tractors and the ways in which these risks can be mitigated.

### Learning intention

To raise awareness of

- The use of tractors on farms and how injuries can occur.
- Applying the Safety A.C.E framework to tractor use on farms.

### Success criteria

Students can

- Identify the variables that can contribute to 'tipping points' for tractors.
- Compile a list of recommendations for operators to follow with regard to tractor safety.

### Background information

Sideways rollovers and backflips account for most of all rollovers and the risk of tractor run over is always present wherever tractors are working.

Driving on slopes and uneven terrain is dangerous due to the shift in the vehicle's centre of gravity. Turning on slopes is extremely dangerous and will most likely result in the tractor tipping. Having attachments on the tractor can increase the chance of rollovers and tipping.

It is essential that operators are aware of the dangers that this can present if not accounted for when working with tractors.

### Resources

- Images of tractors with/without rollover protective structures
- Video (*Tractor Rollover Demonstration*) - Access via URL below or scan for link:  
<https://www.youtube.com/watch?v=yPnuW8VIFVs>
- Video (*Tractors - A crushing blow*) - Access via URL below or scan for link:  
<https://youtu.be/iWCPNpD2OrM>



### Instructions

1. Show images to students of tractors with/without rollover protective structures (ROPS). Ask students to comment on the differences between the two types of tractors and how they imagine the invention of the ROPS has impacted driver safety.
2. Explain to students that since the introduction of mandatory ROPS on tractors in Australia in 1982, there has been a 72% reduction in fatalities from tractor rollovers (Worksafe Qld). Watch the [Tractor Rollover Demonstration](#) (4:07) video to understand the importance of ROPS on tractors. Ask students to write an explanation of the outcome of this demonstration.
3. As a class, compile a list of all the factors that might affect a tractor's stability and cause it to tip and rollover. Answers may include uneven terrain, pulling heavy attachments, speed, reckless driving. Ask students to choose one factor from the list and apply the Hierarchy of Control. How could the risks associated with this issue be avoided?
4. Explain to students that being crushed or run over by moving tractors can also be a serious risk on a farm, even for the driver of the tractor. Watch the video [Tractors - A crushing blow](#) (2:13) to learn more about how to avoid these types of injuries.
5. Based on students' understanding of the causes of tractor rollover and run over/crushing accidents, ask them to compile a list of recommendations for operators to follow with regard to tractor safety.



Example of tractor without ROPS



Example of tractor with ROPS



This lesson focuses on the role of farm workshops and investigates the types of injuries that can be acquired if poor workshop conditions exist.

### Learning intention

To raise awareness of

- The role of workshops on farms and an understanding of how injuries can occur in them.
- The Safety A.C.E framework for workshop design.

### Success criteria

Students can

- Identify hazards associated with farm workshops.
- Assess risks associated with farm workshops.
- Design and plan a farm workshop that adheres to safe farm work practices that will minimise the potential for harm.

### Background information

Serious injury and even possible death can occur in farm workshops. Many jobs are undertaken in workshops, including welding, cutting, drilling, chemical use, using power tools and changing tyres.

Poor layout of workshops, noise, ergonomic problems, poor ventilation, lack of lighting and inappropriate use of storage can all contribute to undesirable workshop conditions.

### Resources

- Farm Workshop Images sheet (provided over page)
- [Safety in the Farm Workshop: A Practical Guide](#) (PDF)

### Instructions

1. Discuss the role of the farm workshop with students. Who has access to it and what different types of jobs are completed there?
2. As a class, compile a list of the individual jobs that may take place in a farm workshop. Next to each job, write a possible risk or injury that could occur when performing the task (for example, Welding - Eye lacerations & noise damage).
3. Provide students with copies of the Farm Workshop Images sheet. Ask them to make assessments on the safety of these workshops based on the following criteria:
  - Light
  - Ventilation
  - Storage
  - Ease of movement
  - Equipment/machinery use

Students should comment on any potential risks that are identified and explain how they would address these safety risks. Additionally, students should identify where safety measures have been implemented within the images.

4. Provide students with access to the [Safety in the Farm Workshop: A practical guide](#) document prepared by the University of Sydney. From the contents page, students should choose a topic under the *Hazards, risk and risk controls in the farm workshop* heading and research the information provided on this topic within the guide.

5. Ask students to present the information they have learnt about their chosen topic. The presentation should include information on
  - The hazards and risks associated with this workshop safety topic.
  - The corresponding controls that can be implemented to reduce the risk of injury.

Information may be presented in the form of a poster, multimedia product, demonstration or oral presentation.

Set a design task for students: **Design a safe farm workshop**

Your company has been tasked with designing a workshop for a farm so that all potential hazards are minimised, and the space is efficient in its design. Your client has a large agricultural farm, and the workshop will be used for maintenance of farm equipment, chemical use, welding, some basic mechanical work and storage. Use the [Safety in the Farm Workshop: A Practical Guide](#) document to help with planning and ideas.

EXTRA  
EXTRA!



# FARM WORKSHOP IMAGES



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