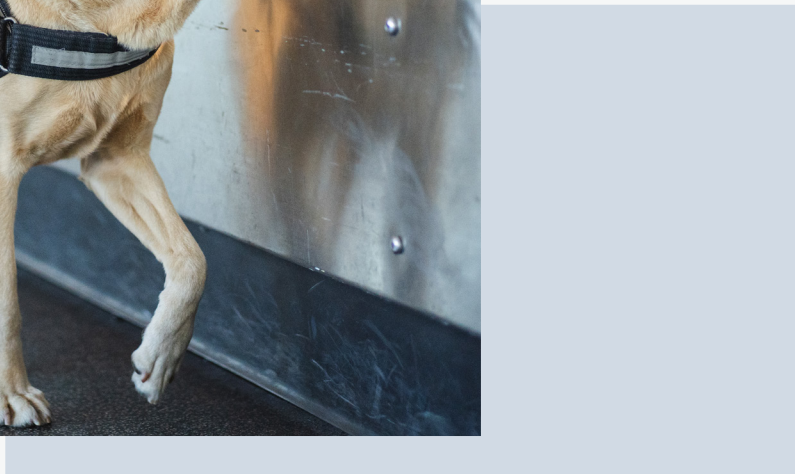




**Australian Government**  
**Department of Agriculture,  
Fisheries and Forestry**

# Biosecurity champions

Teacher guide – Year 4





# Learning areas and Australian Curriculum content

## Design and Technologies

Describe the ways of producing food and fibre ([AC9TDE4K03](#)).

## English

Listen for key points and information to carry out tasks and contribute to discussions, acknowledging another opinion, linking a response to the topic, and sharing and extending ideas and information ([AC9E4LY02](#)).

Use comprehension strategies such as visualising, predicting, connecting, summarising, monitoring and questioning to build literal and inferred meaning, to expand topic knowledge and ideas, and evaluate texts ([AC9E4LY05](#)).

## Humanities and Social Sciences

The importance of environments, including natural vegetation and water sources, to people and animals in Australia and on other continents ([AC9HS4K05](#)).

Develop questions to guide investigations about people, events, places and issues ([AC9HS4S01](#)).

Locate, collect and record information and data from a range of sources, including annotated timelines and maps ([AC9HS4S02](#)).

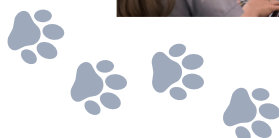
Interpret information and data displayed in different formats ([AC9HS4S03](#)).

Propose actions or responses to an issue or challenge that consider possible effects of actions ([AC9HS4S06](#)).

## Science

Consider how people use scientific explanations to meet a need or solve a problem ([AC9S4H02](#)).





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## Lesson objective

Students learn how pests and diseases spread and the role biosecurity measures play in preventing these threats in Australia. Through engaging discussions prompted by images, videos and worksheets, students will grasp why biosecurity is fundamental to safeguarding Australia’s environment, human health and economy. This activity emphasises the significance of biosecurity in agricultural settings. Students will explore how biosecurity measures prevent the spread of pests and diseases on farms, learning through a scenario-based approach. They will engage in group discussions, develop a biosecurity management plan using action cards and create educational bookmarks summarising key biosecurity concepts. Students will engage in a biosecurity challenge, which highlights some of the biosecurity considerations necessary when hosting international events. The challenge is structured to cater to various learning levels and encourages comprehensive engagement and teamwork.

## Lesson overview

**Activity 1 – Pests, diseases and biosecurity (20 to 30 mins)**

**Activity 2 – Biosecurity on the farm (40 mins)**

**Activity 3 – Biosecurity challenge (60 mins)**



## Success criteria

### 1. Understand and explain biosecurity basics

I can explain what biosecurity is and why it is important for protecting Australia's environment, agriculture and health from pests and diseases.

### 2. Identify biosecurity measures on farms

I can list and describe specific biosecurity measures that farmers implement to protect crops and livestock from pests and diseases.

### 3. Apply biosecurity knowledge in practical scenarios

I can apply my knowledge of biosecurity to develop a management plan for a farm scenario, demonstrating how to prevent the spread of pests and diseases.

### 4. Collaborate and participate in the biosecurity challenge

I can actively participate in the biosecurity challenge, collaborating with peers to solve biosecurity-related problems and demonstrate comprehensive understanding through various learning activities.

## Additional information

### Junior Biosecurity Officer certificate

Students colour a paw print on the [Junior Biosecurity Officer certificate](#) for each completed activity, visually tracking their learning journey with Frankie the biosecurity detector dog.

### Take home challenge

Students become biosecurity champion 'graduates' by completing the [take home challenge](#). They can test their carer's knowledge by quizzing them on biosecurity trivia and interviewing them about their experiences with biosecurity rules and regulations.

### Biosecurity poster (assessment)

The [biosecurity awareness campaign poster](#) for Year 2 to 5 invites students to create an educational poster on the importance of biosecurity, incorporating interactive elements like flaps, pop-ups and QR codes. This activity enhances understanding through creative engagement. A [marking rubric](#) is available for teachers.

### Surveys and feedback

The [student survey](#) may be used for students to assess understanding pre- and post-lesson, while the [teacher survey](#), available online, gathers feedback from educators about student performance and resource value.

## Resources and equipment



### Activity 1 – Pests, diseases and biosecurity

1. **Worksheet 1a – Stimulus images: at the airport**
2. [Australia’s biosecurity – DAFF \(1:46\)](#)
3. [Our biosecurity detector dogs safeguarding Australia \(2:52\)](#)
4. **Worksheet 1b – Fact sheet: pests, diseases and biosecurity**
5. **Worksheet 1c – Sentences: pests, diseases and biosecurity**



### Activity 2 – Biosecurity on the farm

1. Butchers paper, markers
2. **Worksheet 2a – Farm manager biosecurity action cards**
3. **Worksheet 2b – Farm manager biosecurity template cards**
4. Digital devices
5. **Worksheet 2c – Biosecurity bookmarks**
6. Scissors, laminator



### Activity 3 – Biosecurity challenge



1. [You can be a Biosecurity Champion too!](#)
2. [Travellers and Tourists \(3:25\)](#)
3. [Keep it out \(1:53\)](#)
4. **Worksheet 3a – Biosecurity challenge**
5. **Worksheet 3b – Biosecurity challenge answer sheet**
6. Timer, playdough, matchsticks, scissors, ruler, pipe cleaners, paper
7. Digital devices



## Lesson guide

### Activity 1 – Pests, diseases and biosecurity

Students will explore pests and diseases and how they spread. Through class discussions and interactive activities, students will understand how important biosecurity is to prevent the entry and spread of biosecurity threats in Australia and why these measures are crucial for safeguarding Australia's environment, plants and animals, human health, jobs, the economy and our way of life.

1. Project or distribute copies of **Worksheet 1a – Stimulus images: at the airport** to generate a discussion about what is happening in the image. Pose questions to students such as:
  - What do you think is happening in this scene?
  - Who is the person in the uniform?
  - Why do you think this is happening?
  - What might happen if this action was not performed?
2. If suitable, encourage a class discussion about students' experiences with overseas travel and ask them if they have noticed what procedures are in place when they enter and exit Australia. Focus on biosecurity procedures (such as disposing of fruit in biosecurity bins, asking where they have travelled and declaring items such as food and wood products), rather than immigration. Promote a discussion on why Australia has these procedures in place to prevent the entry of pests and diseases and the threats they may pose if they were to enter the country.
3. Introduce the term biosecurity by writing 'Biosecurity' in a central area, leaving a space between 'bio' and 'security'. Encourage a class discussion to define the two and then the entire word. Record student responses. **Answers page 10** 
4. View the video **Australia's biosecurity – DAFF** (1:46) to learn about Australia's biosecurity systems and how important it is to be protected from pests and diseases.
5. Optional: view the video **Our biosecurity detector dogs safeguarding Australia** (2:52) to learn about the work biosecurity detector dogs do at seaports, airports and mail centres to detect biosecurity risks.
6. Distribute **Worksheet 1b – Fact sheet: pests, diseases and biosecurity**. Students read the information either individually, in small groups or as a class. Then, they use the information to complete the sentences on **Worksheet 1c – Sentences: pests, diseases and biosecurity**.
7. Project the worksheet answers and discuss student responses. **Answers page 10** 



## Activity 2 – Biosecurity on the farm

Students will understand the importance of biosecurity measures in preventing the spread of pests and diseases on farms. They will learn practical steps to protect farm animals and crops by creating and implementing solutions to biosecurity problems/scenarios.

1. Write 'Biosecurity on the farm' in a central area. Allocate students into groups of four and provide each student with butchers paper and a marker. Set a timer for five minutes and ask students to record their ideas about the following questions.
  - Why is biosecurity important on farms?
  - What would be some of the consequences of farmers not knowing what biosecurity is?
  - What do you think a 'Biosecurity Management Plan' is?
2. Allow time for students to share their ideas with the class.
3. Provide groups with one copy of **Worksheet 2a – Farm manager biosecurity action**. As a class, read the information and introduce the scenario on page one. Provide students with scissors and ask them to cut out all eight action cards and distribute them equally amongst the group.
4. Students follow the instructions on the cards, starting with Action card 1. They must complete the actions and record their responses on **Worksheet 2b – Farm manager biosecurity template cards** before moving to the next card.

*Note: some template cards require the use of a digital device for research.*

**Suggested answers page 11** 

5. After completing the cards, each group shares their biosecurity plan, and individual students design a series of three bookmarks on **Worksheet 2c – Biosecurity bookmarks** summarising an area of biosecurity from either Activity 1 or Activity 2.



### Activity 3 – Biosecurity challenge

Students will participate in the biosecurity challenge, a collaborative activity centred on the importance of biosecurity in the context of hosting international events. This group challenge combines competitive elements with scenarios requiring teamwork, problem-solving and a deep understanding of the importance of protecting Australia’s people and environment. Each event is designed to accommodate various learning styles, fostering a sense of achievement and responsibility among participants. Depending on the literacy and comprehension skills of the class, teachers may choose to access this activity (Activity 3 – Biosecurity challenge) from either the Year 3, 4 or 5 resources. Complexity of the biosecurity challenge varies according to year level.

1. As a class, view the video content from the website [You can be a Biosecurity Champion too!](#) Go to the video presented by Catrina Rowntree, [Travellers and Tourists \(3:25\)](#) and [Xyllela and exotic vectors \(scroll to the Keep it out video focused on Xyllela fastidiosa \(1:53\)\)](#) to introduce/remind students about the importance of tourists and travellers keeping Australia safe from exotic pests and diseases.
2. Allocate students into groups of two to five, considering year level, literacy and comprehension skills.
3. Determine the appropriate version (Year 3, 4 or 5), challenge type (A or B) and distribution option (i, ii or iii) for each class.

Version	Description
<b>Year 3</b> Two–three questions per event	Recommended for years 3–4 classes with mixed literacy and comprehension skills. Ideal for students who need guidance in research, group collaboration and recording responses.

<b>Year 4</b> Four questions per event	Best suited for years 3–4 or classes with more developed literacy and comprehension skills. Designed for students capable of independent research and collaborative work.
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<b>Year 5</b> Five questions per event	Best suited for years 4–5 or classes with more developed literacy and comprehension skills. Designed for students capable of independent research and collaborative work.
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Challenge type	Description
<b>A</b> Time challenge	Groups record start and finish times, competing with other groups to complete the challenge in the shortest time.
<b>B</b> Class challenge	The class works together, completing challenges to collect coloured paw prints as a unit.

Distribution option	Description
<b>i</b> One to five	Distribute the first event of the biosecurity challenge to each group. As students complete each event, a new event is collected until all five events have been completed.
<b>ii</b> Random	Assign each group a randomly selected event page. As students complete each event, a new event is collected until all five events have been completed.
<b>iii</b> All five	Provide each group with all five event pages. Groups complete all events in any order until all five events have been completed.





4. Project or distribute the introductory page of **Worksheet 3a – Biosecurity challenge** for students to observe. As a class, read the instructions detailing the different events that groups will complete:
  - Event 1 Rapid response multiple choice quiz.** Quick-fire questions to kickstart your adventure, challenging your knowledge and speed.
  - Event 2 Teamwork trek.** Work together to navigate through complex problems that test both your teamwork and biosecurity understanding.
  - Event 3 True or false trivia.** Sharpen your accuracy with rapid true or false decisions that require keen judgement.
  - Event 4 Problem-solving puzzle.** Engage in a series of diverse challenges that demand strategic thinking and effective communication.
  - Event 5 Research raid.** Uncover essential information to improve our defences.
5. Answer any questions from students to ensure clarity and understanding of the tasks.
6. Distribute **Worksheet 3b – Biosecurity challenge answer sheet** to each group.

*Note: ensure students have access to digital devices, paper and rulers to complete Event 5: Research raid.*
7. Encourage students to collaborate and share ideas openly while solving the event questions presented on the worksheets. If groups are working on one event at a time (distribution option i or ii), they should return the completed questions to a central area and collect the next set of event questions until all events are complete. Ensure that the groups collect all five coloured paw prints.
8. At the end of the challenge, provide groups with examples of suggested responses, discuss any questions, and if applicable, recognise a winning group based on time (challenge type A) or performance and teamwork. **Answers page 12** 



## Answers

### ③ Activity 1 – Pests, diseases and biosecurity

3. Bio – means living, like a person, plant or animal.

Security – means to keep things safe.

Biosecurity is all about keeping living things (people, livestock, pets, animals, plants, and crops for food and fibre) safe from harmful pests and diseases. Biosecurity involves measures to prevent the entry and spread of pests and diseases into Australia.

### Worksheet 1c – Sentences: pests, diseases and biosecurity

1. Biosecurity involves measures to prevent the **entry** and **spread** of pests and diseases into Australia.
2. Brown marmorated stink bug.
3. Indigenous rangers' knowledge of **Country** enables them to protect Australian borders from biosecurity risks.
4. Department of Agriculture, Fisheries and Forestry (DAFF) or the Australian Government.
5. Pathogens.
6.
  - 1 The environment, native plants and animals.
  - 2 Plants and animals that produce food and fibre.
  - 3 Human health.
  - 4 Jobs and the economy.
  - 5 Our way of life.
7. Answers will vary. A strong biosecurity system means that all people, our environment, plants and animals and our way of life are protected from the threat of exotic pests and diseases.
8. Throw it in the special biosecurity bins or declare it on an Incoming Passenger Card because biosecurity officers may need to inspect it.
9. We all have a **role** to play in protecting Australia's biosecurity, including government agencies, industry and members of the public.



## Activity 2 – Biosecurity on the farm

### Worksheet 2b – Farm manager biosecurity template cards

1. Suggested answers:

#### Template card 1: Biosecurity training

Biosecurity refers to the measures and precautions taken to protect against the introduction and spread of harmful organisms to animals, plants and humans, aiming to prevent disease outbreaks and environmental damage. Biosecurity encompasses everything from farm hygiene and animal health checks to the regulation of imports and exports to prevent disease transmission.

#### Template card 2: Check fencing and borders

In Australia, animals like small birds, possums, bandicoots and insects are capable of fitting through fences due to their small size and agility, often navigating barriers with ease to explore or find resources.

#### Template card 3: Animal health record

Australia has approximately 25 million cattle, 70 million sheep and 2.5 million pigs (2024 data).

#### Template card 4: Quarantine area setup

Animals arriving from overseas are subject to quarantine periods that vary depending on the type of animal and the country of origin. For example, cats and dogs from approved countries must typically undergo a quarantine of at least 10 days in Australia. However, horses can be required to stay in quarantine for a minimum of 14 days, and livestock such as cattle and sheep may face quarantine periods that range from 10 to 30 days, depending on health assessments and biosecurity risk evaluations.

#### Template card 5: Learning to identify key symptoms

Farmers with large, extensive farms or those who manage a large number of livestock may find it harder to spot symptoms of illness in their animals because they may not be able to monitor each animal closely or regularly. Additionally, the vast area and large herd sizes can dilute individual attention, making it difficult to identify and respond to signs of disease or distress quickly.

#### Template card 6: Collaboration with an expert

1. What specific measures should I take to prevent this bacterial threat from entering and spreading on my farm?
2. Can you recommend any current treatments or vaccines that are effective against this bacteria and suitable for use on my livestock?

#### Template card 7: Emergency plan review

1. Plans for isolating infected animals to prevent the spread of the bacteria to healthy stock.
2. Rules for disinfecting equipment and guidelines for people about protective measures and hygiene practices.

#### Template card 8: Collaborating with others

Answers will depend on individual student groups.



## ➤ Activity 3 – Biosecurity challenge

### Event 1: Rapid response multiple choice quiz

Question 1: B

Question 2: B

Question 3: B

Question 4: A

### Event 2: Teamwork trek

Suggested answers could include:

#### Obstacle 1

##### Crop damage

These pests may directly damage crops by feeding on them, leading to reduced yields/production of essential food crops like fruits, vegetables and grains. This can result in shortages and increased food prices.

##### Spread of plant diseases

Insects often act as vectors or carriers for plant diseases. They can rapidly spread diseases that were not previously present, further reducing the productivity of agricultural areas.

##### Increased use of pesticides

To combat the new threat posed by these pests, farmers might need to increase their use of pesticides. This could lead to higher production costs, potential health risks for consumers and wildlife, and possibly affect the quality of the food produced.

#### Obstacle 2

##### Loss of biodiversity

Native plants form the foundation of local ecosystems, supporting a variety of wildlife, including insects, birds and mammals. If these plants are outcompeted and displaced, it could lead to a decline in native biodiversity, disrupting ecological balance.

##### Alteration of ecosystem functions

Native plants play critical roles in their ecosystems, such as maintaining soil health, regulating water cycles and preventing erosion. The invasive plant could alter these essential ecological functions, leading to long-term environmental degradation, which could affect water quality, soil fertility and the overall health of the ecosystem.



### Obstacle 3

#### Enhanced biosecurity and screening procedures

Implement strict biosecurity measures for all incoming animals and livestock, including thorough health screenings at ports of entry. This would help detect and isolate any potentially diseased animals before they enter the general population.

#### Travel and import restrictions

Temporarily restrict or closely monitor the importation of animals and animal products from regions currently experiencing outbreaks of the disease. This could involve suspending imports or implementing additional certification and testing requirements for incoming livestock.

#### Rapid response and containment teams

Establish dedicated rapid response teams that are ready to act quickly in case an infection is detected. These teams would be responsible for the containment management and disinfection of affected areas to prevent the spread of the disease to the wider livestock population and beyond.

### Obstacle 4

Answers will vary for this activity.

### Event 3: True or false trivia

Question 1: True

Question 2: True

Question 3: False

Question 4: False

### Event 4: Problem-solving puzzle

#### Problem 1

Suggested answers could include:

#### Things you should do:

- Check what goods you can bring into Australia on the Australian Department of Agriculture, Fisheries and Forestry website.
- Declare if you are carrying a certain food, plant material or animal product on your Incoming Passenger Card.
- Take the item to be assessed by a biosecurity officer when you arrive in Australia.

#### Things you should not do:

- Proceed through border control without declaring the item.
- Hide the item in your luggage.
- Attempt to bypass biosecurity checks by using a different exit.

**Problem 2****Implement movement controls**

Quickly establish controls on the movement of animals and animal products within and around the affected area to prevent the disease from spreading to other farms or regions. This could include roadblocks or checkpoints to monitor and regulate the transport of livestock.

**Enhance surveillance and reporting**

Increase surveillance and encourage prompt reporting of any unusual sickness in animals from farms in and around the affected area. This would involve veterinary checks and possibly setting up a hotline or online reporting system for farmers to quickly communicate any suspicious symptoms or livestock deaths.

**Problem 3****Immediate assessment and monitoring**

Identify the unfamiliar species and their potential impact on the local marine ecosystem. Set up ongoing monitoring programs to track their spread and behaviour and assess their interactions with native marine life.

**Containment and management strategies**

Develop and implement containment strategies to prevent the spread of these non-native species into broader areas. This could include physical barriers or targeted removals where feasible. Additionally, management strategies such as adjusting water sports activities to minimise disturbance and potential spread of these species should be considered.

**Problem 4**

Answers will vary but could include:

**1. Gloves**

Protect the hands of cleaning and maintenance staff, allowing them to handle waste and potentially contaminated items safely. This helps prevent the direct contact and transmission of pathogens, enhancing the safety and hygiene of the cleanup process.

**2. Bin systems**

Encourage attendees to dispose of their waste properly. Placing clearly labelled bins (recyclable, compostable, non-recyclable) throughout the venue facilitates waste segregation and reduces the likelihood of cross-contamination and overflow (potentially encouraging pests), keeping the venue cleaner and more sanitary.

**3. Rubbish trucks**

Essential for the efficient removal of accumulated waste from the venue. Regularly scheduled waste collection by these trucks ensures that waste does not build up at the venue, which could otherwise lead to unsanitary conditions and attract pests.

**4. Masks**

Protecting the respiratory health of staff working within waste management is crucial, especially in areas where dust or potentially infectious aerosols might be present. This protective measure helps prevent the inhalation of harmful substances and contributes to maintaining health standards during the event.

**5. Chemical sprays**

These sprays are used to disinfect surfaces and areas that are frequently touched or are likely to be contaminated by waste and spills. Regular application helps kill bacteria and viruses that could lead to disease, ensuring a hygienic environment for both attendees and staff.

## Event 5: Research raid

### Task 1

The five Olympic rings are a well-recognised symbol designed to represent the unity of the five inhabited continents (Africa, America, Asia, Europe and Oceania) coming together in the Olympic movement.

#### Designer

Baron Pierre de Coubertin, who founded the modern Olympic Games, also designed the rings.

#### Date designed

The design was completed in 1913.

#### Representation

Each of the five interlocking rings is coloured differently (blue, yellow, black, green and red) on a white background. These colours were chosen because at least one colour appeared on the flag of every country in the world at that time. The interlocking nature of the rings symbolises the coming together of athletes from across the world to compete in the Olympic Games, promoting a spirit of global unity and friendship.

### Task 2

Suggested answers could include:

#### Witchweed (*Striga spp.*)

##### Agricultural impact

Witchweed is a parasitic plant that attaches to the roots of various agricultural crops, including corn, sorghum and sugarcane. It saps nutrients from these crops, severely stunting their growth and significantly reducing yields. This could lead to massive agricultural losses.

##### Environmental impact

Although primarily an agricultural threat, if introduced, Witchweed could spread to native ecosystems, attaching to native plants and disrupting local biodiversity.

#### *Xylella fastidiosa*

##### Agricultural impact

*Xylella fastidiosa* is a bacterial pathogen that affects over 660 plant species by blocking the water transport system. It causes symptoms like leaf scorch, wilt, dieback and eventual death. Its introduction could devastate industries such as viticulture, citrus, olive and almond.

##### Environmental impact

*Xylella fastidiosa* could infect native trees and plants, altering ecosystem structure and function and potentially leading to severe ecological consequences similar to those in other affected regions, such as Europe and the Americas.

### Task 3

Students model the organism, for example, by using a ruler to measure paper/playdough and creating a shield-shaped body for the brown marmorated stink bug model, ensuring it measures between 1.5 and 1.7 cm in length. Students could also consider the bug's natural colour patterns, incorporate them into the design, and use matchsticks to craft six proportional legs. For the antennae, find a suitable material like thin wire or stiff paper strips to represent their distinct banded appearance accurately.



Brown marmorated stink bug

Image: © Department of Agriculture, Fisheries and Forestry



**Task 4**

The pathogen SARS-CoV-2, responsible for COVID-19, spread to Australia as a result of global travel. This virus has significant effects on human health, ranging from mild symptoms like cough and fever to severe respiratory distress and even death. Additionally, long-term effects known as 'long COVID' include fatigue, cognitive impairments and ongoing respiratory difficulties, impacting many who recover from the initial infection.





## References

### Activity 1

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## Other resources

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We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.



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