Australian Government

Department of Agriculture, Fisheries and Forestry

Biosecurity champions

Teacher guide – Year 5

JUNIOR BIOSECURITY OFFICER

Learning areas and Australian Curriculum content

Design and Technologies

Explain how and why food and fibre are produced in managed environments **(AC9TDE6K03)**.

English

Understand that language is selected for social contexts and that it helps to signal social roles and relationships **(AC9E5LA01)**.

Describe how spoken, written and multimodal texts use language features and are typically organised into characteristic stages and phases, depending on purposes in texts **(AC9E5LA03)**.

Use appropriate interaction skills including paraphrasing and questioning to clarify meaning, make connections to own experience, and present and justify an opinion or idea **(AC9E5LY02)**.

Plan, create, rehearse and deliver spoken and multimodal presentations that include relevant, elaborated ideas, sequencing ideas and using complex sentences, specialist and technical vocabulary, pitch, tone, pace, volume, and visual and digital features **(AC9E5LY07)**.

Humanities and Social Sciences

The management of Australian environments, including managing severe weather events such as bushfires, floods, droughts or cyclones, and their consequences **(AC9HS5K05)**.

Develop questions to investigate people, events, developments, places and systems **(AC9HS5S01)**.

Locate, collect and organise information and data from primary and secondary sources in a range of formats **(AC9HS5S02)**.

Evaluate information and data in a range of formats to identify and describe patterns and trends, or to infer relationships **(AC9HS5S03)**.

Develop evidence-based conclusions **(AC9HS5S05)**.

Propose actions or responses to issues or challenges and use criteria to assess the possible effects **(AC9HS5S06)**.

Science

Investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions **(AC9S5H02)**.

Contents

Lesson objective

Students will learn about the significance of biosecurity in protecting people, the environment and agriculture. They will understand Australia's comprehensive strategies to prevent pest and disease outbreaks, including the various services, organisations and groups tasked with these essential actions. Students will role-play as stakeholders in biosecurity management and design awareness campaigns tailored for primary school audiences. Through this process, they will also gain insights into the spread and movement of diseases and collaborate to solve scenarios, questions and research tasks.

Lesson overview

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

Activity 2 – Biosecurity stakeholders and creative campaigns **(60 mins)**

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

Success criteria

1. Understand biosecurity concepts

I can accurately define biosecurity and explain its role in protecting Australia's ecosystem, agriculture and population from pests and diseases.

2. Role-play stakeholder responsibilities

I can demonstrate an understanding of different stakeholders' roles in biosecurity by accurately role-playing their responsibilities and contributing to a simulated stakeholder meeting.

3. Design and articulate an awareness campaign

I can design a biosecurity awareness campaign tailored for primary school students, clearly articulating its purpose and key messages in both visual and textual formats.

4. Engage in collaborative problem-solving

I can actively participate in a group to solve biosecurity-related scenarios demonstrating effective communication and problem-solving skills.

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 stakeholders and creative campaigns

1. Become a biosecurity officer (4:53)
2. Country Handle with Care – Episode 6 Protecting Country (10:12)
3. **Worksheet 2a – Role-play: managing a biosecurity incident**
4. Frontline – Indigenous Biosecurity Rangers (3:21)
5. **Worksheet 2b – Design a biosecurity awareness campaign**

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 are the people in the uniform?
   - Why do you think this is happening?
   - What might happen if these actions were 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 11**
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 11**

Activity 2 – Biosecurity stakeholders and creative campaigns

Students will deepen their understanding of biosecurity and its importance through an interactive role-play in which they assume the roles of key stakeholders involved in a biosecurity incident. Following the role-play, students will design and develop their own biosecurity awareness campaign specifically tailored to engage and educate primary school audiences. This activity will illustrate the impact of effective public awareness campaigns in shaping behaviours and attitudes towards important social issues.

1. Visit Become a biosecurity officer and watch the video under Why biosecurity is important (4:53). Then watch the video Country Handle with Care – Episode 6 Protecting Country (10:12) to introduce the concept of stakeholders in Australian biosecurity.
2. Distribute **Worksheet 2a – Role-play: managing a biosecurity incident** to explore different perspectives and responsibilities in managing biosecurity incidents. Read the instructions and discussion topics together, and then use the scripted role-play on the worksheet to complete the activity. At points in the role-play, the students will ask questions of the participants. Assist in coordinating this and responding to the answers students provide.
3. Either divide students into small groups and allocate them roles as:
   a) Government official
   b) Biosecurity officer
   c) Producer
   d) Scientist
   e) Local council member

   Alternatively, nominate five students to perform the role-play in front of the class. Students act out the roles of the biosecurity stakeholders for the provided scenario.
4. After the role-play has been completed, consider the discussion topics and reflect on the challenges and solutions to the incident. Allow time for students to share their ideas. **See answers page 12**
5. Teachers may opt to complete the extension activities on **Worksheet 2a – Role-play: managing a biosecurity incident**.
6. Generate a discussion with the class about how messages of health awareness (anti-smoking campaigns) and desired behaviours (anti-littering, etc.) are conveyed to the public. Ask students about any posters, billboards or advertisements they have seen and record these in a central area. For example:

   - **Health awareness campaign:** SunSmart Campaign – 'Slip! Slop! Slap!'

   This iconic campaign encourages the public to slip on a shirt, slop on sunscreen and slap on a hat to prevent skin cancer. Updated in 2007 with the new slogan 'Slip, Slop, Slap, Seek, Slide' the campaign encourages five forms of sun protection: to seek shade and slide on sunglasses, in conjunction with slipping on a shirt, slopping on sunscreen and slapping on a hat.

   - **Public behaviour campaigns:** Keep Australia Beautiful – 'Do the Right Thing, Use a Bin'

   Focuses on reducing littering in public spaces, and promoting environmental cleanliness and responsibility.
7. Discuss the elements that make campaigns memorable (for example, slogans, visuals, humour and emotions).

8. Distribute **Worksheet 2b – Design a biosecurity awareness campaign**. Either individually or in pairs, students design a campaign to raise awareness about biosecurity issues using the provided templates or creating digital content. Campaign materials could include a:
    - Slogan
    - Bumper sticker
    - Transit advertisement
    - Poem, song or rap
    - New merchandise.
9. As a class, view Frontline – Indigenous Biosecurity Rangers (3:21) as an example of how positive community messages can be spread via various forms.
10. Display the completed awareness campaign materials around the classroom or school to engage the wider community and reinforce the importance of biosecurity.

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 an 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 *Xylella 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. Each group should select a group name for their challenge.
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
Year 3	**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.
Year 4	**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.
Year 5	**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.

Challenge type		Description
A	**Time challenge**	Groups record start and finish times, competing with other groups to complete the challenge in the shortest time.
B	**Class challenge**	The class works together, completing challenges to collect coloured paw prints as a unit.

Distribution option		Description
i	**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.
ii	**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.
iii	**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 13**

Answers

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 stakeholders and creative campaigns

Worksheet 2a – Role-play: managing a biosecurity incident

1. Suggested answers:

   Agricultural extension officer

   This role could be crucial in bridging the gap between research, government policies and practical application at the farmer level. They could provide insights into the current practices in agriculture that may either contribute to or help mitigate the spread of pests and diseases, offering direct communication channels to the farming community.

   Environmental scientist

   Given the scope of the pest impacting people, plants, animals and the environment, an environmental scientist could offer a broader ecological perspective. They would be able to assess and communicate the potential impacts on biodiversity and ecosystem services, which are critical in understanding the full scope of the outbreak.

   International biosecurity expert

   Since biosecurity threats are not confined by national borders and can be exacerbated by global trade and travel, having an international expert could provide a wider context and share global best practices and lessons learned from similar outbreaks elsewhere.

2. Student answers will vary depending on responses.

3. The scenario described in the role-play is plausible in Australia. In fact, Red Imported Fire Ants were detected in Australia in Queensland in February 2001. Since then, the National Fire Ant Eradication Program has been actively eradicating fire ants in areas of South East Queensland and related outbreaks in NSW.

   Biosecurity has played a critical role in reducing risk and shaping Australia to become one of the few countries in the world to remain free from the world's most invasive pests and diseases. While our status as an island nation has been a key factor in maintaining this position, biosecurity risks are growing and increasing in complexity, driven by factors such as climate change, unpredictable trade and travel patterns and changes in land use. Australia has over 60,000 kilometres of coastline offering a variety of pathways for exotic pests, weeds and diseases to enter the country.

Activity 3 – Biosecurity challenge

Event 1: Rapid response multiple choice quiz

Question 1: B

Question 2: B

Question 3: C

Question 4: B

Question 5: 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

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

Disruption of local marine life

Non-native aquatic species can become invasive, outcompeting native species for resources such as food and habitat. This disruption can lead to a decline in native species populations, altering the biodiversity and ecological balance of marine ecosystems. Some invaders may also be predators of local species, further endangering indigenous marine life.

Economic impact on fishing industries

The presence of invasive species can significantly affect local fishing industries. These species may deplete the stocks of commercially important fish either directly by preying on them or indirectly by competing for food sources. This can reduce the catch yields for fishers, potentially leading to economic losses and affecting the livelihoods of those dependent on the fishing industry. Additionally, the management and control of invasive species can be costly, further straining the resources of local fishing communities.

Obstacle 5

Answers will vary for this activity.

Event 3: True or false trivia

Question 1: True

Question 2: True

Question 3: True

Question 4: False

Question 5: False

Event 4: Problem-solving puzzle

Problem 1

Immediate quarantine and removal

To prevent further spread, the affected area should be quickly quarantined. This involves setting up barriers to restrict access and movement through the area. Simultaneously, efforts should be made to physically remove the invasive plant, ensuring that all parts, including roots and seeds, are eradicated to prevent regrowth.

Ongoing monitoring and management

After the initial removal, the site should be regularly monitored for any signs of the invasive plant returning. This should be part of a long-term management plan that includes the use of appropriate herbicides if necessary and the reintroduction of native plants to restore the natural habitat and compete against any resurgence of the invasive species.

Problem 2

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.

Problem 3

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 communicate any suspicious symptoms or livestock deaths quickly.

Problem 4

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 5

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 cane toad (*Rhinella marina*) was introduced to Australia in 1935 from Hawaii to control cane beetles damaging sugarcane crops. This introduction has negatively impacted local ecosystems, as cane toads are toxic and outcompete native species, leading to declines in native wildlife populations. Their proliferation continues to threaten Australian biodiversity.

Task 5

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

DAFF 2023a, *Australia's biosecurity*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

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Department of Agriculture 2019, *Our biosecurity detector dogs safeguarding Australia [YouTube]*, Canberra, accessed 21 August 2024.

Activity 2

DAFF 2024b, *Become a biosecurity officer*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

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Activity 3

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DAFF 2023b, *Xylella and exotic vectors*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

DAFF 2024c, *Catriona Rowntree – Travellers and Tourists*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

DAFF 2024d, *You can be a Biosecurity Champion too!*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

Other resources

DAFF 2023c, *Biosecurity Innovation Program*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

DAFF 2023d, *Biosecurity matters*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

DAFF 2023e, *Country Handle with Care – Costa and dirtgirl Tackle Biosecurity*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

DAFF 2023f, *Innovation Pilots Initiative*, Department of Agriculture, Fisheries and Forestry, accessed 21 August 2024.

DAFF 2023g, *Pests, diseases and weeds*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

DAFF 2024e, *Sending or ordering goods online from outside Australia*, Department of Agriculture, Fisheries and Forestry, Canberra, accessed 21 August 2024.

Department of Agriculture, Water and the Environment 2019, *Australia's National Priority Plant Pests (NPPP) playing cards: Beastie the Bug and novel coronavirus 2019 version [PDF 2040KB]*, accessed 21 August 2024.

Australian Government

Department of Agriculture, Fisheries and Forestry

Biosecurity champions

Student activities – Year 5

JUNIOR BIOSECURITY OFFICER

Activity 1: worksheet 1a – stimulus images

At the airport

1

2

3

Images: © Department of Agriculture, Fisheries and Forestry

Activity 1: worksheet 1b – fact sheet

Pests, diseases and biosecurity

Did you know?

Australia conducts careful screening of cargo and mail arriving from overseas to detect and intercept potential pest and disease threats.

Read and highlight the key points in the following information text

Australia is free from many of the world's most damaging plant and animal pests and diseases. Pests and diseases not native to Australia are capable of damaging our natural environment, destroying our food production and agriculture industries, and some could change our way of life. Australia's biosecurity system helps protect us from these pests and diseases.

What is a pest?

A pest is an unwanted living thing that causes problems for plants, animals and people. They could be insects, rodents or weeds that bother us or harm things we care about, like our pets, food and clothing materials. Pests can also spread diseases from one place to another.

- For example, in Australia, cane toads are pests because they poison animals that try to eat them. There are no specific predators or diseases that control cane toads, and they are spreading across Australia.
- An example of a pest that does not live in Australia is the brown marmorated stink bug. If it came here, it could quickly become a big problem for farmers and households because it eats over 300 types of plants and isn't easy to control with chemicals like pesticides. It also likes to hide in houses in cold weather, and, as its name suggest, it smells really bad, too.

Cane toad

Imported red fire ant

Brown marmorated stink bug

Image: © Department of Agriculture, Fisheries and Forestry

What is a disease?

A disease causes a living thing, such as a plant or animal, not to function properly and become unwell. Diseases are caused by bacteria, fungi or viruses.

We call these **pathogens**.

- Citrus canker, which is not present in Australia, affects citrus trees, making their leaves and fruit bumpy and ruining the harvest.
- Another example of a disease that Australia does not have is *Xylella fastidiosa* (pronounced zy-LEL-lah fas-tid-ee-OH-sah), a bacteria that causes a disease that kills many species of plants, including many of the crops that we rely on for food and fibre (for example, grapes and pears). There is no cure.

Citrus canker

Xylella fastidiosa infected leaves

Image: © John Hartman, University of Kentucky, bugwood.org

How do pests and diseases spread?

Pests can spread quickly through their movement. For example, insects may fly, crawl or hop from one place to another, spreading diseases as they go. People can also accidentally help pathogens spread when they travel, bringing plants or produce (fruit and vegetables), dirty shoes or sports equipment like golf clubs back from other countries to Australia. Pests and diseases can also hitch rides on vehicles, ships, aeroplanes or cargo containers on a boat, hiding in or on fruits, vegetables, grains, wood or soil, and travelling long distances to new areas. That's why it's essential to declare these items when travelling or sending goods to Australia so biosecurity officers can check for any biosecurity risks.

Dirt on shoes can carry pests and diseases

Fruit and vegetables can carry pests and diseases

Image: © Department of Agriculture, Fisheries and Forestry

How do we use the knowledge about how pests and diseases spread to protect Australia?

These threats can impact our industries, the environment, and the health of plants, animals and people. If we know how pests and diseases can get into our country, then we can put measures in place to keep them out and stop them from spreading if they do. This is known as biosecurity and it involves measures to prevent the entry and spread of pests and diseases.

Biosecurity involves careful inspection of luggage, mail, cargo and imported goods, checking for any high-risk or prohibited items such as seeds, plants, wood, meat, fruit and vegetables. Biosecurity detector dogs and technology such as X-ray machines are used to detect biosecurity risks that may contain pests and diseases.

Some items brought into Australia need to be declared on an Incoming Passenger Card if entering Australia by plane or ship. At the airport, you may have seen special biosecurity bins available to dispose of food and other risk items. Biosecurity officers may need to inspect some of the things you bring with you. If any biosecurity risk items are found, they may need to be treated, exported from Australia or destroyed. There are penalties for those who do the wrong thing when travelling to Australia or when ordering goods online.

The Australian Government works with other countries to manage biosecurity risks before they arrive in Australia.

Animal products such as meat can carry pests and diseases

Spot the robot dog

Things made from wood can carry pests and diseases

Images: © Department of Agriculture, Fisheries and Forestry

Why should you care about biosecurity?

Australia has many unique plants and animals that we want to keep safe. Introduced pests or diseases can disrupt the environment, leading to habitat destruction and biodiversity loss.

Pests and diseases could devastate crops and livestock used to produce food and fibre. They could damage and reduce the amount of food available to eat and threaten farmers' livelihoods, affecting people's jobs and the economy.

Some pests and diseases pose risks to human health. For example, mosquitoes can transmit diseases like dengue fever and malaria.

1. Protecting our **environment** and **native plants** and **animals** is important. Introduced pests or diseases can destroy habitats and reduce biodiversity.

Image: © Department of Agriculture, Fisheries and Forestry

Image: © Matt Dunn

2. Protecting our **crops** and **livestock** that produce food and fibre is important.

3. It is important to protect **jobs** and our **economy**.

Images: © Kat Allia

4. It is important to protect **human health**. Some pests and diseases can affect humans and make them sick.

5. It is important to protect **our way of life.**

Who is in charge of biosecurity?

The Department of Agriculture, Fisheries and Forestry (DAFF) manages the threat of biosecurity risks to Australia. State and territory governments also play a part.

Many others, including Indigenous rangers, also play a crucial role in protecting and taking care of Country. They help to take care of Country by managing feral animals, weeds, and fire and keeping a Top Watch! across northern Australia for pests and signs of diseases.

In fact, we all have a role to play in Australia's biosecurity. Governments, farmers, travellers and members of the public – YOU.

Image: © Department of Agriculture, Fisheries and Forestry

Activity 1: worksheet 1c – sentences

Pests, diseases and biosecurity

Using the pests, diseases and biosecurity fact sheet, fill in the blank spaces or answer the questions by recording responses in the spaces provided.

1. Biosecurity involves measures to prevent the _____ and _____ of pests and diseases into Australia.

2. Name the pest that smells awful and we DON'T want to enter Australia.

   _____

3. Indigenous rangers' knowledge of _____ enables them to protect Australian borders from biosecurity risks.

4. Who is in charge of biosecurity in Australia?_____

5. What is the name given to disease-causing organisms? _____

6. What are five key aspects safeguarded by having strict biosecurity measures in Australia?

   1. _____
   2. _____
   3. _____
   4. _____
   5. _____

7. Why should all people care about biosecurity?

   _____

   _____

8. What should be done if you have some food in your bag when flying to Australia after an overseas holiday?

   _____

   _____

9. We all have a _____ to play in Australia's biosecurity, including governments, farmers, travellers and members of the public.

Activity 2: worksheet 2a

Managing a biosecurity incident

Role-play activity

Instructions

- Allocate students to each role.
- Perform the role-play.
- Read the discussion topics as a group and consider the views about the scenario.
- Read the role-play extension activities and complete one/all of the activities.

Setting

A meeting room where important stakeholders have been convened urgently after an infestation of Red Imported Fire Ants (RIFA) was discovered in a popular local park.

Red Imported Fire Ants are an invasive species and can impact our environment, including agriculture, and restrict everyday activities such as barbeques, picnics and sporting activities. They inflict painful stings on people, pets and livestock and cause damage to ecological and agricultural systems.

Characters

- Government official (meeting chair)
- Biosecurity officer
- Producer
- Scientist
- Local council member

Role-play script

Government official: 'Welcome, everyone to the local control centre. We're here to address the recent discovery of Red Imported Fire Ants in our area. This is a serious threat – we must all work together to respond quickly. Let's start with introductions and initial thoughts.'

Biosecurity officer: 'Hi, everyone. The ants have been detected at multiple locations around the park. They threaten local agricultural production and our environment and could also impact people and pets with painful stings. We need to coordinate our efforts to handle this crisis quickly. We have established a control area within a 5-kilometre radius of the infested sites. This means movement restrictions will apply to high-risk material to stop further spread. My team is also setting up a surveillance and treatment program to eradicate the pest.'

Producer: 'I am very worried about my crops, farm and how this will impact my animals if the ants spread. I will keep a look out for this invasive ant and report any suspected sightings. If I do see anything, I will contact the Exotic Plant Pest Hotline.'

Scientist: 'I've studied the characteristics of these exotic invasive ants. They can spread quickly and cause much damage. Immediate action is crucial, and we must monitor the situation closely to prevent further outbreaks. The ants are an environmental pest native to South America. They have spread to the United States, China, Taiwan, Japan, the Philippines and some parts of Australia. Keep a look out. They are copper brown in colour, with a darker abdomen. They measure 2–6mm in length and are highly aggressive. A single fire ant nest can contain many different sized ants.'

Local council member: 'Oh goodness, there is certainly a lot of worry in the community about this. I think that timely, accurate and consistent updates would help our containment, control and eradication efforts. Maybe we could use an awareness campaign, social media, and local media to keep everyone informed. Does anyone have any good ideas of where to display posters and materials or how to spread the word quickly?'
(waits for response).

Government official: 'Excellent suggestions, everyone. I can see we are all concerned about this threat. Let's put these actions into motion immediately. We'll schedule a training session for all staff and volunteers. We will also maintain our rigorous inspection protocols at the borders to ensure the highest level of biosecurity.'

Scientist: 'Thanks everyone, I will work with the biosecurity officers to analyse the effectiveness of our eradication methods. This will help us change our strategies if we need to.'

Biosecurity officer: 'I'll make sure all the rules are followed in the control areas. This includes treatment and surveillance.'

Local council member: 'Thank you for acting so quickly. I'll organise a virtual meeting for community members to ask questions and receive updates, which will help maintain public trust and cooperation and make sure people feel safe and can help out where we need them. Do you think there is anything else the community should be doing to help at the moment?' (waits for response).

Government official: 'These are all excellent points. Each of you has an important role in both the immediate response and long-term management. Let's commit to these tasks and ensure we are proactive in our designated areas. Let's reconvene next week to review our progress and adjust our strategies as necessary.'

Discussion topics and extension activities

Discussion topics

1. Do you think that any important characters were missing from the role-play? If yes, who were they? Why do you think they should have been at the meeting?
2. What role would you like to be in real life? Why would you select this role?
3. Is it likely that this scenario could happen in Australia? Explain why you think this.

Role-play extension activities

Consider the views of a person organising a fun run in the local park and their concerns about the impact of the ants on their event.

Create a script for this new character and insert it into the role-play.

If you were in charge of designing a new technology that reduces Australia's biosecurity threats, what would it be?

Create a short script for this character that could be included in a role-play.

What other Australian biosecurity threats are you aware of in Australia?

Create three new settings for role-play scripts about these threats.

Activity 2: worksheet 2b

Design a biosecurity awareness campaign

Educating your school about biosecurity

Instructions

- The Australian biosecurity team needs your help!
- Your task is to design an awareness campaign to educate Australian primary school students about biosecurity risks from overseas.
- These risks could include hitchhiker pests, exotic diseases and what not to buy from overseas that can put Australia at risk.
- Your campaign will need to help people understand why biosecurity is so important and the impacts that these threats could have on Australia.

Your campaign should include:

A **slogan** to educate Australian students about the meaning and importance of biosecurity.

An engaging **bumper sticker** for a car/vehicle to support your biosecurity message.

A 'billboard on wheels' **transit advertising design** targeting primary school students. The design will be used on a school commuter bus to promote biosecurity awareness.

A short **rap, poem or song** encouraging students to learn about ways to decrease the risk of overseas biosecurity threats in Australia.

A new piece of **merchandise** to hand out to students that will encourage them to learn about Australian biosecurity.

Slogan

- A **slogan** to educate Australian students about the meaning and importance of biosecurity.

Bumper sticker

- An engaging **bumper sticker** for a car/vehicle to support your biosecurity message.

Billboard on wheels

- A 'billboard on wheels' **transit advertising design** targeting primary school students. The design will be used on a school commuter bus to promote biosecurity awareness.

Rap, poem or song

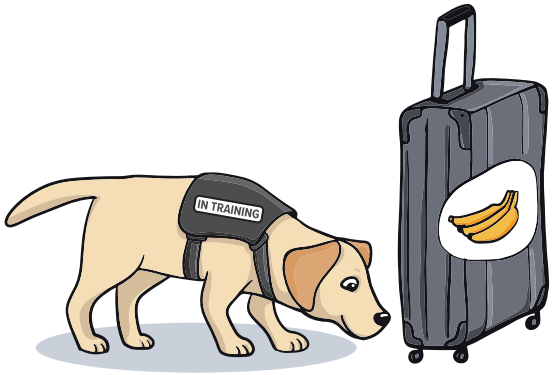
- A short **rap, poem or song** encouraging students to learn about ways to decrease the risk of biosecurity threats entering Australia.

New merchandise

- A new piece of **merchandise** to hand out to students that will encourage them to learn about Australian biosecurity.

Activity 3: worksheet 3a

Biosecurity challenge



Calling all biosecurity champions across Australia!

Prepare yourselves for the biosecurity challenge, an extraordinary quest in which you'll play detectives, scientists and guardians of our nation. This exciting competition is designed to demonstrate your problem-solving skills and commitment to protecting our precious environment.

As Australian biosecurity experts, you'll join forces in a mission to defend Australia from unseen threats. These threats loom especially large during international gatherings (like the Olympic Games and World Cup events), which can inadvertently introduce harmful stowaways that jeopardise our plants, animals and ecosystems.

Should you choose to accept this mission, you'll collaborate to solve pressing biosecurity challenges. Each successful solution earns your team a coveted colour paw stamp from Frankie the biosecurity detector dog, symbolising your progress and prowess. Strive to complete all five challenges to rise as the ultimate biosecurity champions.

Let the biosecurity challenge begin!

Event 1 Rapid response multiple choice quiz

Quick-fire questions will 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.

Event 1: Rapid response multiple choice quiz

In your groups, answer the questions. Tick the circles as you complete each one.

Question 1: What is a common method to prevent invasive plants and animals from entering Australia?

a) Mandatory inspections for all incoming passengers.
b) Inspection of mail, luggage and cargo at airports and ports that arrive from overseas.
c) A complete ban on all international travel and mail, luggage and cargo.
d) Seasonal closing of borders to certain countries.

Question 2: How are diseases prevented from spreading to Australian livestock from other countries?

a) By treating all livestock with medicines regularly.
b) Through pre-arrival health screenings and quarantine for imported animals.
c) Vaccinating every animal in Australia against all known diseases.
d) Only allowing native Australian animals to be farmed.

Question 3: What action can tourists take to protect Australian ecosystems?

a) Only visit ecosystems that are already well-known and popular.
b) Carry their own food and water at all times to avoid using local resources.
c) Respect wildlife and their habitats by observing rules and guidelines.
d) Avoid all activities that might spread pathogens.

Question 4: Which biosecurity measure helps to detect and manage pests at Australian borders?

a) Using robotic detection at all entry points to Australia.
b) Using biosecurity detector dogs trained to detect specific biosecurity risks.
c) Making it mandatory to have a two-week isolation time for all visitors to Australia.
d) Installing ultraviolet scanners to sterilise all incoming products.

Question 5: What is the definition of a pest?

a) An unwanted organism that causes problems for plants, animals or people, such as insects, rodents or weeds that harm our pets, food and clothing materials.
b) An unwanted insect that helps in pollination and controlling harmful bugs.
c) A type of plant used in medicine and food preparation for health benefits.
d) An unwanted organism that causes problems to only plants and can harm our pets, food, and clothing materials.

Don’t forget to stamp your green paw print and keep competing until your group has all five!

Event 2: Teamwork trek

In your groups, answer the questions. Tick the circles as you complete each one.

Obstacle 1:

Picture international guests arriving who unknowingly carry tiny insect pests in their luggage, threatening Australia's agriculture.

List three ways these pests could affect our food supply during the event.

Obstacle 2:

Imagine that the event has just started, and a beautiful but unknown plant used for decoration starts spreading uncontrollably.

What two things could happen if this plant outcompetes Australia's native plants?

Obstacle 3:

Suppose a foreign animal disease threatens to enter Australia just before the event, putting our livestock at risk.

What three steps could we take to protect Australia and prevent an outbreak?

Obstacle 4:

Visualise water sports gear being brought into the country introducing non-native species to our waters.

What are two ways these invaders might impact our marine ecosystems and local fishing industries?

Obstacle 5:

Consider the increased number of international guests entering Australia during the time of international events.

Create a slogan such as: 'Play Safe, Stay Safe: Protect Our Australian Home!' that encourages crowds to protect Australia's animals, people and environment when visiting.

Don't forget to stamp your black paw print and keep competing until your group has all five!

Event 3: True or false trivia

In your groups, answer the questions. Tick the circles as you complete each one.

Question 1:
Urban pest management is an important concern for cities hosting large public events, and strategies are needed to ensure venues remain pest-free.
True or false?

Question 2:
A mosquito-borne virus once threatened a global sports event, leading to the need for precautionary measures.
True or false?

Question 3:
Biosecurity detector dogs can help detect hidden pests and diseases. They are an important biosecurity strategy used in Australia and, therefore, very important during international events.
True or false?

Question 4:
When Australia hosts an international sporting event, all international athletes' luggage must undergo a quarantine period to prevent the spread of pests and diseases.
True or false?

Question 5:
At every international event, a special team of biosecurity agents use laser technology to scan all plants and animals entering the country to prevent the spread of invasive species.
True or false?

Don't forget to stamp your blue paw print and keep competing until your group has all five!

Event 4: Problem-solving puzzle

In your groups, answer the questions. Tick the circles as you complete each one.

Problem 1:

Imagine discovering an invasive plant spreading in a local park right before an international event.

What are two things that should happen to stop this plant from spreading?

Problem 2:

You're returning to Australia from your first international holiday and are unsure if you can bring back a gift for your friend.

What are three things you should do in this situation and three things you should not do?

Problem 3:

A farm near an international event venue reports a sudden outbreak of animal disease.

What two things could Australians do to help protect other animals and prevent the spread of the disease?

Problem 4:

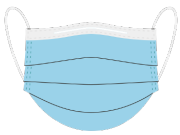
Fishers report spotting an unfamiliar marine species near an international water sports area.

What two measures can be taken to ensure these species do not harm the local marine life?

Problem 5:

An international event venue is facing challenges with waste management, leading to unsanitary conditions.

Select two items from below and explain how they could be used to address this issue.



Don't forget to stamp your yellow paw print and keep competing until your group has all five!

Event 5: Research raid

In your groups, answer the questions. Tick the circles as you complete each one.

Task 1:

Australian biosecurity is especially important when hosting large international events, like the Olympic Games.

Research the origin of the design of the five Olympic rings. Find out who designed them, the date they were designed and what they represent.

Task 2:

Identify a pest or invasive plant species that has been introduced to Australia or threatens invasion from overseas.

What is its name and what effect does/would it have on local ecosystems or agriculture?

Task 3:

Research the brown marmorated stink bug and create a scale model of the organism.

Use the brown marmorated stink bug link for help.
www.agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/plant/brown-marmorated-stink-bug

Task 4:

Research how the cane toad was introduced to Australia. Find out its scientific name (don't forget to write it in italics), when it was introduced, why it was introduced and what impacts it has had on the environment.

Use the Cane Toad fact sheet for help.
www.agriculture.gov.au/sites/default/files/documents/cane-toad-fs.pdf

Task 5:

Identify a pathogen (virus, bacteria, fungus) that has spread to Australia as a result of global travel that affects humans.

What is its name and what effects does it have on human health?

Don't forget to stamp your red paw print and keep competing until your group has all five!

Worksheet 3b

Biosecurity challenge answer sheet

Event 1: Rapid response multiple choice quiz

Question 1: _____

Question 2: _____

Question 3: _____

Question 4: _____

Question 5: _____

Event 2: Teamwork trek

Obstacle 1: _____

Obstacle 2: _____

Obstacle 3: _____

Obstacle 4: _____

Obstacle 5: _____

Event 3: True or false trivia

Question 1: _____

Question 2: _____

Question 3: _____

Question 4: _____

Question 5: _____

Event 4: Problem-solving puzzle

Problem 1:

Problem 2:

Problem 3:

Problem 4:

Problem 5:

Event 5: Research raid

Task 1:

Task 2:

Task 3: Paste your model or a picture of your model in this space.

Task 4:

Task 5:

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Acknowledgement of Country

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.

Australian Government
Department of Agriculture, Fisheries and Forestry

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