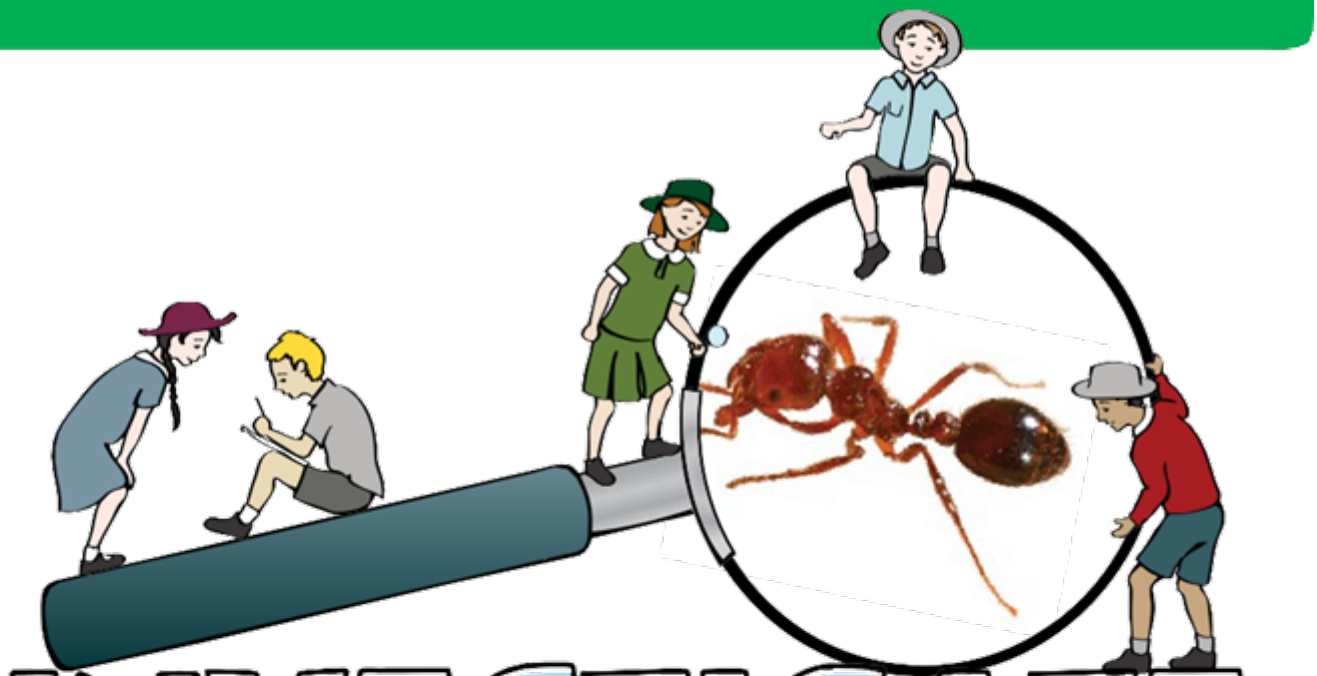
NSW GOVERNMENT

INVESTIGATE: Fire ants

Stage 3 Science & Technology unit of work

NSW Department of Primary Industries and Regional Development Schools Program



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INVESTIGATE: fire ants

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Disclaimer

The information in this document is based on knowledge and understanding at the time of writing (September 2024).

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INVESTIGATE: Fire ants

Contents:

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About this resource:

Background and aims

The *Investigate: fire ants* unit of work is an initiative of the NSW Department of Primary Industries.

The aim of Investigate: fire ants is to stimulate an interest in science, technology and agriculture in young people and to promote the teaching of these subject areas in schools.

Students will design and complete an investigation and create a communication product that aligns with outcomes from the NSW Science and Technology, English and Geography syllabuses.

This unit of work focuses on an emerging biosecurity threat, the red imported fire ant, which was detected at Port Botany in November 2014.

Fire ants can negatively affect our recreational spaces, agricultural production and out-compete native species.

Investigate resources provide authentic learning experiences to support students' development of science, technology and communication skills.

Real-world content guides the application of these skills in a meaningful learning context.

By participating in the Investigate competition students will understand and value the role that science plays in their everyday lives.

Intended audience

This unit of work is intended for teachers of Years 5 and 6 students working towards Stage 3 outcomes in the Science and Technology K-6 syllabus.

The activities in this unit assist students to achieve outcomes in the Living World and Information strands and in the skills areas of Working Scientifically and Working Technologically. Cross curricular links are made to Geography and English outcomes.

NSW Syllabus links:

Stage 3 NSW Science and Technology	
Knowledge	
ST3-4LW-S	examines how the environment affects the growth, survival and adaptation of living things
Skills	
ST3-1WS-S	plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusions
ST3-2DP-T	plans and uses materials, tools and equipment to develop solutions for a need or opportunity
Values and attitudes • value the importance and contribution of science and technology in developing solutions for current and future personal, social and global issues and in shaping a sustainable future • appreciate the importance of using evidence and reason to engage with and respond to scientific and technological ideas as informed, reflective citizens • value developing solutions to problems and meeting challenges through the application of Working Scientifically, and Design and Production skills	

Stage 3 Geography	
A student:	
GE3-2	explains interactions and connections between people, places and environments

Stage 3 NSW English	
A student:	
EN3-1A	communicates effectively for a variety of audiences and purposes using increasingly challenging topics, ideas, issues and language forms and features
EN3-2A	composes, edits and presents well-structured and coherent texts
EN3-3A	uses an integrated range of skills, strategies and knowledge to read, view and comprehend a wide range of texts in different media and technologies

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Safety and ethical considerations:

Safety policies are of particular relevance to the activities in this unit.

Students and their supervising teachers or parents should ensure that their science investigations are conducted in a responsible and safe manner.

It is essential that student activities are conducted according to procedures developed through appropriate risk assessments at the school.

Teachers should implement the following safety guidelines:

- Supervising adults are responsible for any handling of ants.
- Ants are treated humanely, without undue stress or anxiety.
- Correct cleaning and hygiene practices are followed prior to and following handling of foods, ants and field work.
- Foods used as bait lures are handled according to food safety standards as described on the NSW Food Authority website.

It is not expected that any fire ants will be detected in the science investigation; however, other stinging/biting insects may be encountered during the investigation and this possibility should be allowed for.

What should I do if I get stung?

Apply ice to relieve the swelling and pain. Gently wash the area with soap and water and leave any blisters intact. People who experience an allergic reaction after an ant sting should seek medical attention immediately.

Teaching and learning:

The learning sequence has been developed using the 5Es inquiry approach.

There are nine learning experiences across the five phases of inquiry. We encourage teachers to adapt their teaching to the local needs of students and allocate time for the learning experiences accordingly.

Activities provided in the learning sequence will guide you in designing and completing an investigation to check your school for fire ants.

You will learn about and research biosecurity measures and the red imported fire ant to design and test a lure for ants and fire ants.

Analysing your results will enable you to determine whether fire ants are present in your school.

Reporting on your results will involve creating a communication product to inform and educate your school community about fire ants, your investigation method and results.

Background information is provided throughout the learning experiences in break out boxes and hyperlinks to support teachers. Additional information and research resources are available on our website.

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INVESTIGATE: fire ants

Unit overview

ENGAGE
Learning experience 1: Ecosystems, food chains and webs
Students revise their understanding of ecosystems and the interactions of living and non-living things in an ecosystem. • Observe the interactions of living and non-living things Case study: interactions in your school ecosystem Discuss the implications of changes to an ecosystem
Learning experience 2: Biosecurity: measures for healthy and safe environments
Students are introduced to biosecurity and develop an understanding of biosecurity threats, types of biosecurity measures and the importance of these measures. • Introduce the term biosecurity • Outline and discuss biosecurity threats and how biosecurity protects our ecosystems and production systems. Watch and discuss 'Quarantine Questions' BTN story • Develop a biosecurity procedure
Learning experience 3: What we know about ants
Students outline their prior knowledge of ants and develop their understanding of ants through observation and shared learning • Examine students prior knowledge of ants Introduce fire ants and develop KWL chart Observations of ants in the school
EXPLORE
Learning experience 4: What in the world are fire ants?
Students develop their knowledge of fire ants and biosecurity measures through collaborative research and discussion • View media articles from the Botany Bay fire ant outbreak Research fire ants • Features of fire ants
Learning experience 5: Design your investigation
Collaboratively explore options to lure fire ants and develop a plan for your science investigation • Design and plan your investigation

Unit overview

EXPLAIN

Learning experience 6: Investigate ants in your school

Investigate ants in your school by luring them to an area, making observations, collecting and analysing results

- Complete investigation and collect results Collate and display results
- Discuss results, evaluate investigation and form your conclusion
- Celebrate your school currently being fire ant free (dependent on your results)

ELABORATE

Learning experience 7: Communicate your results and learning

Collaboratively design and prepare a way to inform your school and community about fire ants and communicate the results of your investigation.

- Decide on a communication product
- Design and prepare your communication product
- Communicate your understanding of fire ants and your investigation results

Learning experience 8: Working with biosecurity and fire ants

Students extend their knowledge of careers in agriculture and related industries through discussion, research and peer presentations.

- Brainstorm and discuss careers involved in the fire ants outbreak
- Research and develop a short presentation for peers on one of the careers

EVALUATE

Learning experience 9: Evaluate

Discuss and evaluate shared and individual learning.

- Review KWL chart

Learning sequence

Learning experience 1: *Ecosystems, food chains and webs*

Students revise their understanding of ecosystems and the interactions of living and non-living things in an ecosystem.

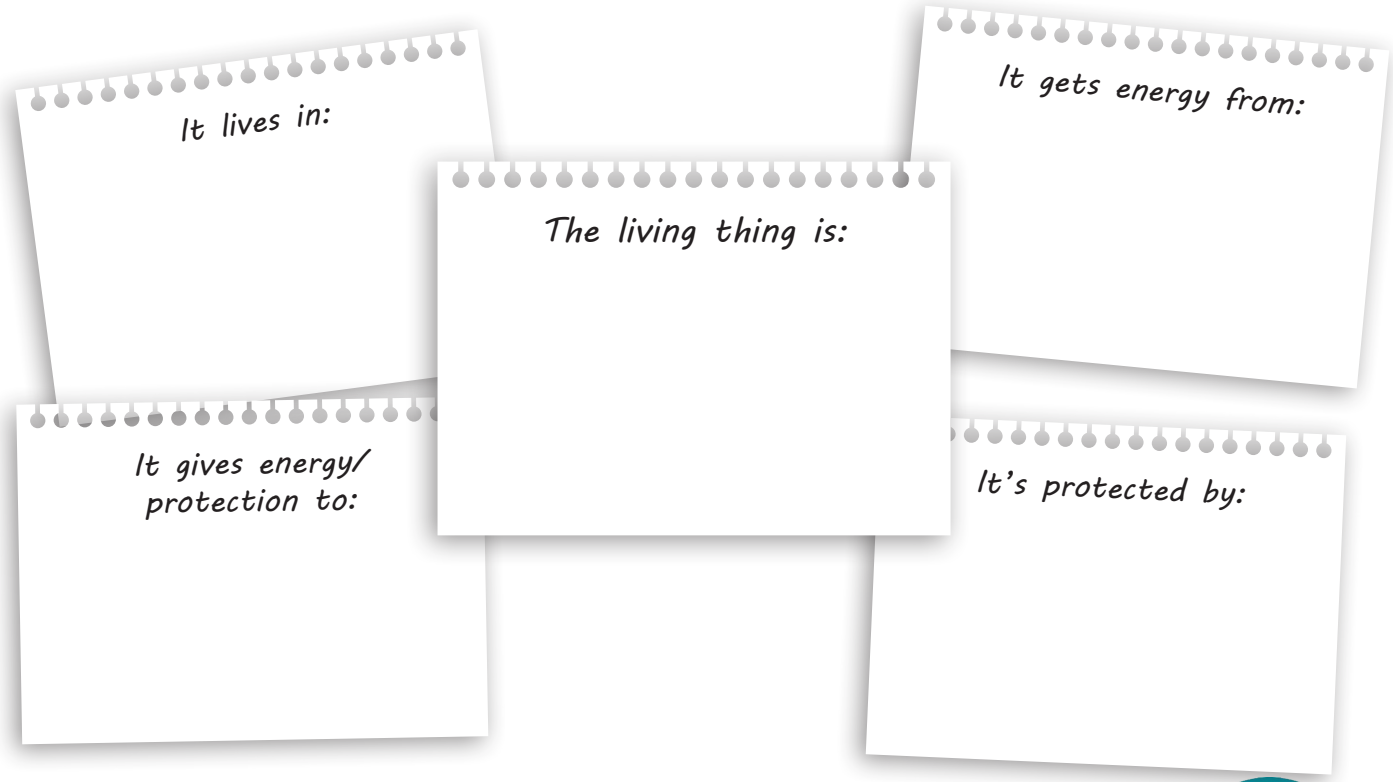
Observe and list living and non-living things in your school ground. Discuss the features of living and non-living things, their needs and how living things rely on each other.

Some good points to cover in your discussion are:

- Energy is needed to grow, reproduce and survive in ecosystems
- Living and non-living things provide energy for many species of animals, plants and organisms
- Some living things rely on non-living things to gain energy (e.g plants gain energy from the sun and rain water in order to grow)
- Some living things rely on other living things to gain energy (e.g many animals and organisms eat other animals and organisms in order to gain energy and grow)

Select a living thing in your school grounds and discuss the way that it relies on living and non-living things in its environment to survive. Complete the food chains and webs (interactions in our school) Activity 1 for an animal in your school grounds. The following example is a guide for completing the activity with your class.

Activity 1: *Food chains and webs - interactions in our school*



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Discuss what would happen if energy sources (e.g. an organism, the sun or water) in an ecosystem changed? What might the consequences of different changes to an ecosystem be?

Possible changes for discussion could be:

- Another living species is added to an ecosystem.
- A living species is removed from an ecosystem, for example if a living thing becomes extinct.
- The rate of a non-living energy source is increased, for example increased sunlight or rain to an area (climate change is a real example of this).
- The rate of a non-living energy source is decreased, for example decreased sunlight or rain (climate change is a real example of this).

NEED MORE?

Ecosystem, food chain and food web activities:

Ecosystem and Food Chains – Educational Video for Kids

Food Chains Interactive Game

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Learning experience 2:
Biosecurity: measures for healthy and safe environments

Students are introduced to biosecurity and develop an understanding of biosecurity threats, types of biosecurity measures and the importance of these measures.

Introduce biosecurity and discuss why biosecurity is important.

Explain that biosecurity helps to keep NSW and Australian ecosystems healthy by keeping out and controlling animal and plant diseases and pests such as weeds and pest animals.

Using localised biosecurity threats from the following list, or another of your choice, discuss the problems caused by the disease or pest.

Think about the potential impact of the disease or pest to local ecosystems, agricultural production and human activities.

- **Hendra Virus** – a zoonotic (can be spread from animals to humans) virus carried by flying foxes which spreads to horses and may be spread from horses to humans. Infected horses are generally euthanased on welfare grounds as they do not often recover from the disease. Infection in humans can cause flu-like illness which can progress and cause further complications and sometimes death.
- **Brucellosis** – a disease caused by infection with Brucella bacteria. The bacteria infects a range of animals and has been detected in feral pigs in Northern NSW. Brucella is zoonotic and may spread from pigs to dogs and humans and cause ongoing health problems.
- **Foxes** – predator animals which have a serious impact on many species of native fauna including wallabies, turtles, mallee fowl and numbats. Foxes also impact on agricultural production systems and are listed as a threat species in NSW.
- **Grapevine phylloxera** – a small aphid-like insect that lives and feeds exclusively on the roots of grapevines and occasionally on galls on grapevine leaves. Once phylloxera has infected a grapevine it almost always dies.
- **Myrtle rust** – a fungal disease which infects plants in the Myrtaceae family such as eucalypts, turpentine, bottlebrush, paperbark, tea tree and lilly pilly. Heavy infection of myrtle rust can cause death of the infected plant.
- **Paterson's curse** – a highly invasive weed which often becomes the dominant species in pastures as it crowds out native plants, grasses and agricultural pastures and crops. Paterson's curse is toxic to livestock and can significantly degrade the natural environment.

Students share their knowledge of and experiences with biosecurity threats and management practices.


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Explain to students that there are a variety of biosecurity measures and management practices that help keep us and our environments safe. **Ask** students if they know how we try to prevent the spread of diseases and pest animals and plants. Your list could include:

- Vaccinations for us, our pets and animals
- Not being allowed to take specific items to specified areas or across state borders, eg. You cannot take oranges into citrus growing areas.
- Having our bags checked at the airport
- Quarantining animals and livestock in yards or separate areas if they have been moved from a different property to control the spread of weeds and diseases
- Washing your hands after you have been playing with animals
- Controlling weeds to make sure they don't spread

Watch Behind the News story **Quarantine Questions** (Episode 14, 26 May 2015)

Discuss the news story and why the dogs had to leave the country. Imagine the dogs had been carrying a disease or pest when they came into Australia and brainstorm the potential consequences to our dogs or even cats, horses, livestock and native animals.

Collaboratively develop a procedure for bringing an animal or plant into their school from another area that includes measures to control the spread of weeds, pests and diseases.

Outline why it is important that people follow biosecurity and quarantine procedures.

What is biosecurity?

Biosecurity is defined as the protection of the economy, environment and community from the negative impacts of pests, diseases, weeds and contaminants.

How does biosecurity work?

Biosecurity includes measures to:

- prevent new pests, diseases and weeds from entering our country and becoming established
- manage established pests, diseases and weeds to eradicate them where feasible or lessen their impact
- ensure an appropriate preparedness and response capacity that is internationally recognised and meets our trading obligations and international treaties
- maintain or improve the status of Australia's biosecurity systems.

Why is biosecurity important?

- Australian flora and fauna are unique; by protecting them we protect our natural biodiversity, distinctive ecosystems and heritage.
- Australia's domestic and international markets demand products that are free of pests, diseases and contaminants.
- Biosecurity helps to keep food and other products from our primary industries safe from diseases such as Salmonella and pathogenic E. coli. Biosecurity also protects people from diseases that can be passed from animals to humans (called zoonoses), such as Hendra virus and Avian Influenza.

Biosecurity is a shared responsibility

Government, industry and the people of NSW working together to protect the economy, environment and community from the negative impacts of animal and plant pests, diseases and weeds for the benefit of all people in NSW.

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Learning experience 3:
What we know about ants

Students outline their prior knowledge of ants and develop their understanding of ants through observation and shared learning.

Accessing prior knowledge

Brainstorm and develop a mind map with students on what they already know about ants. This could include students' experiences, knowledge and understanding of:

- different types of ants
- why ants are important
- ant life cycles
- ant behaviours and characteristics
- what ants look like

Ask students to record what they know about ants using drawings, diagrams, labels or text in their workbooks or on plain paper.

If students record their prior knowledge on plainw paper ensure that their work samples are kept in workbooks, folders or a safe place as you will review these work samples later in the learning sequence.

Your KWL chart

Introduce students to the KWL chart you will be using to record your ongoing learning and knowledge throughout this unit.

Discuss the areas of the key areas of the KWL chart and explain that everything on the chart is 'fluid'-meaning it can be moved as more is learned, removed if students find that their prior knowledge was a misconception, and new information and questions added at any time.

Ask students to each write down one thing they know about ants and one thing they would like to know about ants. Discuss students' questions and knowledge as a class.

It is recommended your chart be openly available to students at any time throughout the learning sequence so they can add questions and their learning on it individually and during other periods of the day.

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How to use your KWL chart

When students come up with questions they should write them down and place them on the 'what we want to know' section.

Questions on the chart should be addressed and answered, through learning and research, throughout the learning sequence.

Once questions have been answered and the content is understood by students, this information may be placed on the 'what we learned' section of the chart.

You may choose to use an interactive KWL chart (**readwritethink KWL creator**) or the **KWL chart** provided.

Print your KWL chart on A3 paper and display in the classroom for students to post questions or learning on throughout the investigation.

Alternatively print a chart for each student to keep their own.

If you are using a printed KWL chart, sticky-notes or paper with blue tac are good options to write and display students input on as they can be moved on the chart.

Add your learning to your KWL chart at the end of each lesson.

Observe ants at your school

Ask students to think about ways in which you can learn about ants in order to answer your questions and guide them to the idea of observing ants in their natural habitat.

Brainstorm what could be learnt by observing ants. The following questions may be used to guide your students.

- Where did you see ants?
- What were the ants you saw near?
- What sort of areas do ants in your school like?
- What was the weather like when you were observing ants?
- Do you think the weather affects the ants?
- What time of day were you observing ants?
- Do you think the time of day would affect your observations?
- What were the ants doing?
- What did the ants look like?

Observe ants in your school reminding students to think about the questions you discussed while brainstorming. **Record** and discuss your observations.

If you feel that your class would benefit from more specific guidance to direct their observations the **Ant observation sheet** may be used.

Discuss your observations and what you learnt about ants answering the above questions. Encourage students to share their observations and learning

Remember to add your learning and questions to your KWL chart and record any learning and knowledge students have gained.

The short YouTube video **Life in the Undergrowth** by David Attenborough may be used by teachers to extend students' knowledge of Australian ants and ant biology.

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Learning experience 4:
What in the world are fire ants?

Students develop their knowledge of fire ants and biosecurity measures through collaborative research and discussion.

Fire ants in Australia

Introduce red imported fire ants to students explaining that they are a biosecurity threat. Ask students what it means if something is a biosecurity threat and whether they think we would want them in NSW/Australia or not.

Discuss what students know and want to know about fire ants and record this on your KWL chart.

Explain to students that you will be learning about fire ants in order to investigate whether they are present in your school. Ask students whether they think finding fire ants would be a positive result and then explain that the best result would be to not find any fire ants as they are a biosecurity threat.

View print and digital media articles from the November 2014 Port Botany fire ant outbreak.

Use these media articles to explain:

- fire ants are a state and national problem
- how fire ants could impact on NSW and Australia's ecosystems, production systems and human activity.
- the importance of keeping them out of New South Wales.

Discuss the ways fire ants move around and spread within in an area, country or continent and across continents.

Explain that fire ants are established in south-east Queensland and eradication processes there are continuing. Look at a map of Australia and discuss why fire ants in SE QLD could be a problem for NSW.

Fire ant infestations are located next door to NSW and because they can spread very easily we need to have surveillance and control programs in place to ensure that NSW remains fire ant free.

Research and discuss eradication processes in NSW and QLD. Outline how you can help prevent the spread of fire ants. See **NSW DPI's website** for a range of research resources.

QLD Government's **Fire Ant Identification video** is a great resource to illustrate movement, impact and identification of fire ants.

AntMaps demonstrates the dispersal of ants based on species. This link will show the movement and dispersal of fire ants.

Researching fire ants

Brainstorm possible ways to check your school for fire ants. Guide students toward the idea of developing a lure in order to attract ants to one area so that they can determine whether fire ants are present.

Ask students what information they will need to know about ants and fire ants in order to lure them and to identify fire ants apart from other ants. Record their responses to guide your research. The following list is provided as a guide:

- what food sources ants/fire ants prefer where you are most likely to find ants/fire ants
- what time of day ants/fire ants are most active
- what weather ants/fire ants are most active in
- what fire ants look like and how to tell them apart from other ants
- what to do if you think you have found fire ants

Research fire ants to answer the questions you generated as a class and/or complete the **fire ants research** page.

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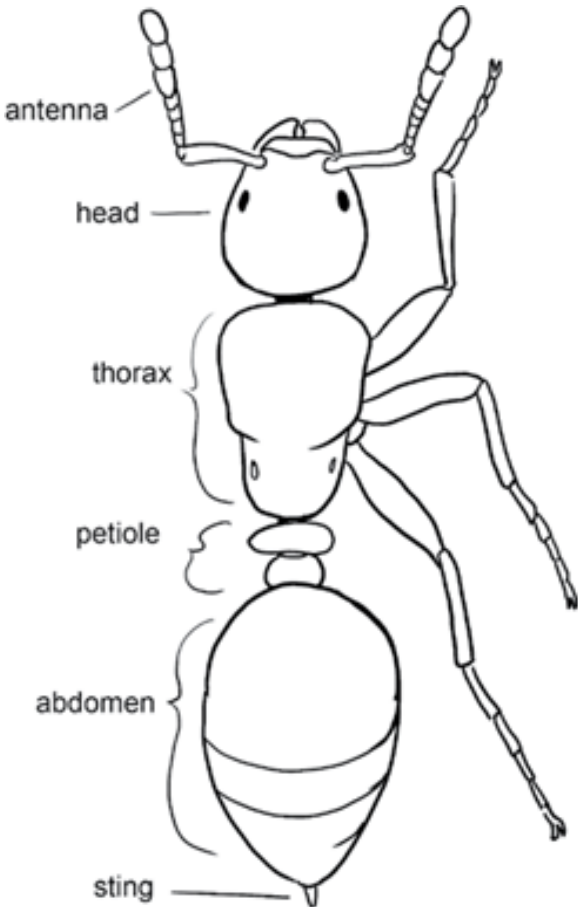
Features of fire ants

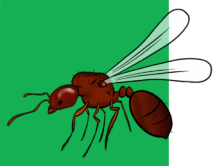
Discuss and label the structural features of fire ants using the illustrations on the **What do fire ants look like?** resource sheet.

Discuss how fire ants are different from many native Australian ants and the ants they have seen in their school. The following differences may be observed by students:

- Two petiole
- Colour
- Size



Fire ants can't swim... so how did they get here?



Fire ants can spread naturally through flight, and by assisted spread such as movement of infested materials.

Fire ant nests can have a single queen or multiple queens. A new queen can fly up to a kilometre from her original nest and will lay up to 20 eggs initially.

Eggs hatch in 7-10 days and become adults after 9-15 days. A queen can increase laying capacity up to 800 eggs per day after the initial hatching.

Fire ants are easily concealed in a range of materials such as soil and mulch and can rapidly spread throughout the world with our help.

It is believed that fire ants living in the soil stuck on the bottom of a shipping container got a free a ride from Argentina into Port Botany.

See **NSW DPI Red imported fire ants – Frequently Asked Questions** for more details.

Resources for research and learning:

Ants generally:

- **askabiologist.asu.edu** - this website provides detailed information on the anatomy, life cycles and features of ants.

Fire ants:

- **NSW DPI red imported fire ants** - contains information about fire ants in NSW including current situation updates, media releases, general information and brochures.
- **Antweb.org** - is the world's largest database of images, records and natural history information on ants.
- **QLD DPI fire ants** – contains information about fire ants and the eradication program in QLD.

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Learning experience 5:
Design your investigation

Collaboratively explore options to lure fire ants and develop a plan for your science investigation:

Introduce/revise the science investigation process and fair testing.

What is a fair test?

A fair test is one where the results are only due to one factor (variable). Fair testing aims to find relationships between factors (variables). In a fair test, one variable is changed while other variables are kept the same. Any differences are said to be the result of the changed variable.

Cows: What will we change?

Moo: What will we measure?

Softly: What will we keep the same?

Use the **ABC Splash Fair Test** interactive tool to introduce or reinforce fair testing.

You may choose to use the **Science Investigation: plan and report template** to guide your students through the investigation process.

Question and predict

Remind students that their task is to design an investigation to find out if there are fire ants in your school.

Collaboratively f**orm a question** about fire ants in your school which you can answer through your investigation. This may be as simple as asking "are there fire ants in our school?" or you and your class may come up with a better question!

Discuss your question and ask students **what they think will happen.** Do you think there are fire ants in our school? Students should provide explanations for their answer.

Question whether it is a good or bad result if fire ants are found at the school. Reinforce that the best outcome from the investigation would be to not find any fire ants in the school. **Discuss** the problems that fire ants could cause if they were found in your school.

Ideally students will decide that they need to lure ants and fire ants to an area to investigate whether fire ants are present – but you may need to guide them with targeted questioning.

Discuss and record the information required to determine how to lure ants. These could include:

- Food sources – what do ants and fire ants eat?
- Environment – where are you most likely to find ants and fire ants?
- Time – what part of the day are ants and fire ants likely to be out looking for food?
- Time period – how long will the lures be left out before you collect your results?
- Weather – in what sort of weather are you most likely to find ants and fire ants?

Method and fair testing

Decide w**hat materials will be needed to lure ants** and **when and where you are going to place your lures**. Remember that for your investigation to be a fair test you will need to change one thing and keep everything else the same. That means you may choose to use:

- different food sources and keep the location, date, length of time and time of day the same. Options for your food sources could be:
  - » sweets such as lollies, sugar solutions or fruit juice
  - » proteins such as meat, cheese or milk
  - » carbohydrates such as crackers, cooked rice or pasta

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- different areas or environments and keep the food sources, date, length of time and time of day the same. Options for your different environments could be:
  - » grass
  - » concrete
  - » garden bed
  - » bare ground
- different times of day and keep the food sources, date and length of time the same. Options for your different times of day could be:
  - » in the morning
  - » in the middle of the day
  - » in the afternoon
- different periods of time prior to collecting your results and keep the location, food sources, date, and time of day the same. Options for your different periods of time could be:
  - » 30 minutes
  - » one hour
  - » two hours

Discuss **what you are going to measure**. The primary outcome of this investigation is to check your school for fire ants however it is not expected that you will find fire ants. In order for students to evaluate their investigation, data should be collected and measured from each of the lures.

Decide what you are going to measure and how you are going to record your measurements. For example, you may measure:

- different types of ants at your lures
- total numbers of ants at your lures

Don't forget to record your students learning and activities as you do them to keep your KWL chart updated.

Equipment

Once you have decided on your investigation method, list the equipment you need for your investigation.

Photos are a very effective method to record your results.

Photos will allow you to accurately count the numbers and types of ants at your lures without anyone getting stung!

Results

Discuss how to collect your results.

When collecting results you should consider:

- Where are you collecting from? Placing your lure on a piece of paper or plate is an easy way to identify the area you are collecting results from.
- How are you going to record your data? Will students count or estimate the number of ants or types of ants at the lures or draw diagrams or illustrations of the lure and ants?

There is a fire ant detection form included in the science investigation template to assist students to identify fire ants amongst the ants at your lures.

Your results need to reflect the data that the class decided to measure and whether you believe there were fire ants present at your lures.

Example experiment:
School of Ants Science Project

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Learning experience 6:
Investigate ants in your school

Investigate ants in your school by luring them to an area, making observations, collecting and analysing results.

Undertake your investigation

Review your investigation method and outline the roles and responsibilities of students while the investigation is being undertaken.

Organise your equipment and ensure you have all the materials required.

Demonstrate how and where the lures will be placed. To ensure that the investigation results are collected at the appropriate time and to reduce potential disturbance to the ants assign a group of students to the set-up and results collection from each lure. Ask groups of students to move off and setup the lures.

While waiting to collect results revise the following:

- safety procedures
- the collection method (how, what, where)
- how to use the fire ants detection form in the **science investigation template LINK**
- what to do if students suspect they have found fire ants at their lure.

What if you think you have found fire ants

- Move away from the area and barricade the location to keep others away
- Report fire ants by calling 1800 680 244 or the **NSW DPI report a pest or disease online form**.
- If stung remove ants quickly, wash the area with soap and water and apply ice to relieve swelling and pain.

Collect and present your results

Present and discuss each group's results. Collate these results and determine whether fire ants were present at any of the lures and which lures had the largest number of ants or species of ants. Record your group and/or class results using graphs, tables or diagrams.

Discuss your results

Discuss your investigation results by considering the following questions:

- What do the results tell you?
- Did you find fire ants in your school?
- How many and what types of ants did you find in your school?
- Which lure/s attracted the most ants?
- How could you improve your investigation?
- What new questions do you have which you could investigate in the future?

Form your conclusion

Form your conclusion by answering the following questions?

- What did you find out about the question you investigated?
- Was the outcome the same or different to your prediction? Why do you think this is?

Make sure you celebrate if you haven't found any fire ants. This is a great thing and it is important students understand how they have helped by checking their school!

INVESTIGATE: Fire ants

Learning experience 7:
Communicate your results and learning

Collaboratively design and prepare a way to inform your school and community about fire ants and communicate the results of your investigation.

Discuss why it is important to tell other people about fire ants. Explain that by informing others we can all work to keep them out of NSW. Discuss and list the types of things which other people should know about fire ants. This list should include:

- What fire ants are
- What fire ants and their nests look like
- Why fire ants are a pest and how they can affect our ecosystems, production systems and human society
- Where fire ants are currently found
- How fire ants move around and how to reduce the spread of fire ants
- What to do if you find fire ants

You also want to inform others that you have carried out an investigation in your school to check for fire ants and the results of your investigation.

Ask students to think of ways that as a class or group, you can tell other people about fire ants and your investigation. Examples of communication products include:

- Brochures, pamphlets or booklets
- Billboards or posters
- Magazine or newspaper story
- Postcards
- Blogs
- Presentations
- Displays
- Radio commentary
- Stickers
- Songs or jingles
- Games
- Short video
- Film documentary or news article

Collaboratively **design** and create a communication product about your results and learning.

When selecting, designing and creating your communication product think about:

- The resources available to you
- Your target audience (your school and local community)
- The purpose of the text (to inform others)
- Creativity and audience engagement

Share your communication product with your school and community to help us raise awareness and understanding of red imported fire ants and biosecurity threats.

Remember not finding fire ants is a great thing so make sure you include that message in your communication! Check the judging criteria in the competition guide to help you create an amazing communication product for your competition entry!

"You will be surprised at how effective students can be with their communication projects. Most community members will be more interested in reading a kids poster than a high quality poster. Don't underestimate what can be achieved"

Australian Marine Environment Protection Assoc.

Learning experience 8:
Careers in biosecurity and agriculture

Students extend their knowledge of careers in agriculture and related industries through discussion, research and peer presentations.

Watch the video red imported fire ant detected in NSW and brainstorm the diversity of careers that were involved in the outbreak, eradication and surveillance processes including those listed below.

- Entomologist – scientists who study insects. Entomologists were involved in identifying the fire ants and providing expertise on their life cycle, distribution, physiology, behaviour, ecology and population dynamics.
- Biosecurity officers – help with pest animal, plant, disease and insect control. Provide advice, assistance and coordination of control programs and are trained in emergency management. Biosecurity officers complete inspections for fire ants, provide information on the invasive pest and implement eradication and surveillance programs.
- Dog trainers – specialised dog trainers train the QLD DPI's team of fire ant detection dogs. Some of these dogs were loaned to NSW DPI to complete the eradication program and provide continual help to the surveillance programs.
- Dog handlers – Biosecurity staff are often trained as dog handlers in order to work as the single handler of a detection dog. During the Botany Bay outbreak, the detection dogs were joined by their QLD handlers to ensure they would work to the best of their ability. Detection dogs are being used more frequently in biosecurity as they can detect insects, animals, soil microbes and weeds.
- Journalists – a person who writes news stories for newspapers, radio, television, and websites. Journalists made sure that the general public was informed about the fire ants outbreak and eradication and surveillance programs.
- Information, Communication and Technology (ICT) specialists – develop programs and technologies to help with eradication and surveillance processes of the fire ant outbreak and other biosecurity threats. Such examples were the development of the Biosecurity Information Management System (BIS) which tracks surveillance teams to minimise data entry time and directly inform all team members of surveillance areas and findings. BIS had a significant impact on fire ant eradication and surveillance.
- Volunteers – individuals and volunteer groups helped undertake surveillance and monitoring activities to ensure the fire ants have been eradicated.

Discuss the ways people in different careers worked together to eradicate fire ants and keep our ecosystems and way of life safe.

Activities:

Complete one of the following activities using the careers listed in your discussion.

Two truths, one lie

1. Distribute cards with a single job or occupation name written on them, see above list for career examples. Tell students not to show their card to anyone else.
2. Invite students to form pairs and tell each other two things that are true about their particular job and one thing that is not true.
3. Give students one or two minutes thinking time to note their three 'facts'. They may want to refer to workbooks, posters or other information readily available in the classroom.
4. Each student then introduces their partner to the class, repeating the three 'facts'. The class decides which 'fact' is not true.

Role on the wall

Draw an outline of a body on a large piece of paper and attach it to a wall. Give the body a job name using one of the biosecurity careers listed above and divide it into five roughly equal parts:

- head and shoulders – sayings
- chest and heart – interests
- hands and torso – objects used
- hips to knees – objects taken to work
- lower legs and feet – possible workplaces.

1. Give each student five sticky notes.
2. Invite students to write down five things about this person. They may want to refer to workbooks, posters or other information readily available in the classroom. Ask students to note:
   - a common thing this person might say to others at work
   - what this person might be most interested in
   - objects this person might use at work each day
   - objects this person might take to work each day
   - places where this person might work.
3. After students post their notes in the appropriate section of the outline, read them to the class and ask for comments.

Activities sourced from **myfuture.edu.au**.

Learning experience 9: *Evaluate learning*

Discuss and evaluate learning.

Shared learning - KWL chart

Collaboratively **review** your fire ants KWL chart. **Discuss** the questions students had about fire ants throughout the learning sequence. Have the questions been answered? Make sure all students questions are answered and understood.

WORKSHEET

Interactions in our school

INVESTIGATE: Fire ants

It lives in:

It gets energy from:

The living thing is:

It gives energy/ protection to:

It's protected by:

WORKSHEET

Interactions in our school

INVESTIGATE: Fire ants

It lives in:

It gets energy from:

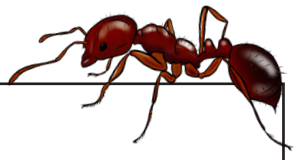
The living thing is:

It gives energy/ protection to:

It's protected by:

WORKSHEET:
KLW

INVESTIGATE: fire ants



K WHAT WE KNOW:

W WHAT WE WANT TO KNOW:

L WHAT WE LEARNED:

WORKSHEET

Ant observations

INVESTIGATE: fire ants

Name: _____ Date: _____ Time: _____

Weather observation:

Temperature: _____

Description (eg. sunny, raining, windy):

_____

_____

Instructions:

Move around the school with your teacher and choose 2 different places where you can see ants. For each place answer the following questions:

- Describe the environment where you saw the ants. Is it a grassy or concrete area? Is it in the shade or in the sun? Is it near anything in particular such as a tree or garden bed?
- Describe the ants you saw. Were they the same type of ants or was there more than one type of ant? What did they look like?
- Describe what the ants were doing. What were they interested in? Where do they seem to be moving to? How were they moving (in a line together or scavenging individually)?

Environment 1:

_____

_____

Ants I saw:

_____

_____

_____

What the ants were doing:

_____

_____

_____

_____

Environment 2:

_____

_____

Ants I saw:

_____

_____

_____

What the ants were doing:

_____

_____

_____

_____

Ants in our school:

We have seen _____ different types of ants.

We saw the most ants in _____ and near _____

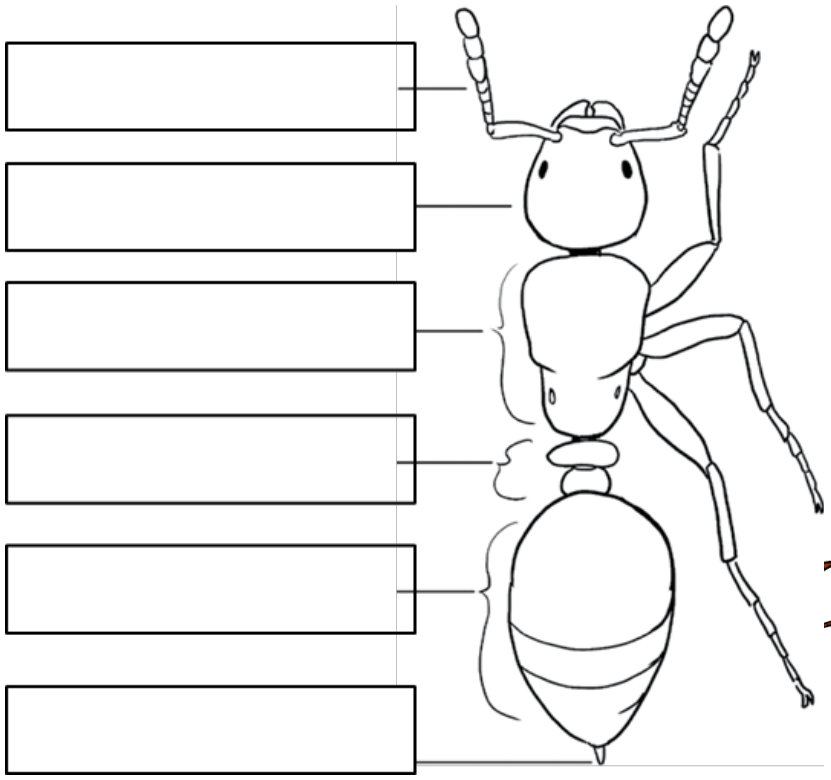
They seem to like these things/areas: _____

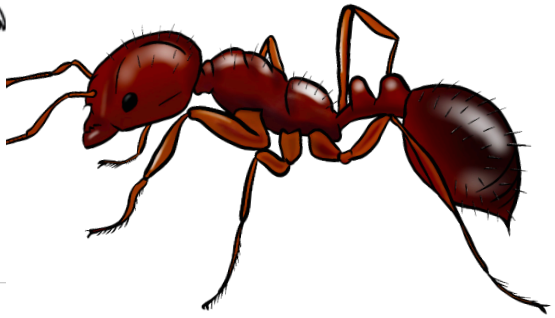
Something interesting I observed/learned was: _____

_____

INVESTIGATE: Fire ants

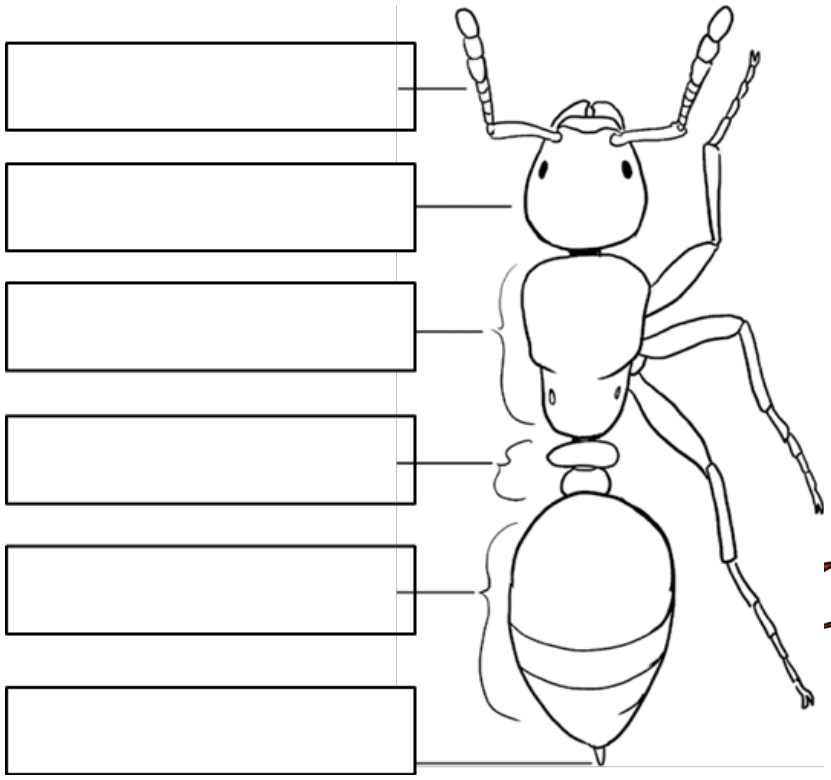
Name: _____

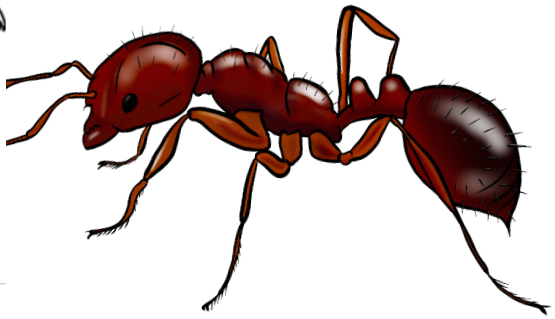




INVESTIGATE: Fire ants

Name: _____





WORKSHEET

All about fire ants

Habitat and diet

Where would you find a fire ant nest?

What does a fire ant nest look like?

What do fire ants prefer to eat?

When are fire ants most liekly to hunt for food?

Description

What is the scientific name for fire ants?

What colour are fire ants?

How long are fire ants?

How is their length compared to other ants?

How can you tell fire ants apart from other ants?

Biosecurity

Where did fire ants originally come from?

How do fire ants move around?

Name a type of material fire ants can move in:

Identify on way fire ants could impact our lifestyle in Australia

What do you do if you think you've found fire ants?

Stings

How do fire ants behave when disturbed?

Why are fire ants dangerous?

What kind of animals can fire ants harm?

What should you do if you're stung by fire ants?

SCIENCE INVESTIGATION:
Plan & Report Template

INVESTIGATE: fire ants

Name: _____

Introduction

What are we going to investigate?

What does a fire ant nest look like?

Prediction

What do we think will happen? Explain why?

Method

What are we going to do?

Method: Fair test

We are going to change:	We are going to measure:	We will keep these the same:

How will it be fair?

SCIENCE INVESTIGATION:
Plan & Report Template

INVESTIGATE: fire ants

Equipment

What equipment is needed?

Results

Use the following fire ant detection form to check if the ants you saw were fire ants.

- What colour are the ants?
  - Bi-coloured (2 colours) red and black
    - Are all the ants the same size?
      - No. They are all different sizes
        - How long are the ants?
          - Between 2-6mm long
            - Have you seen an ant mound with a visible entrance?
              - No
                - There is a chance the ants you have found may be fire ants please move away from the area and inform a teacher or supervisor.
              - Yes
                - Fantastic! These ants are highly unlikely to be fire ants.
          - Longer than 6mm or shorter than 2mm
      - Yes
  - All one colour

SCIENCE INVESTIGATION:
Plan & Report Template

INVESTIGATE: fire ants

Results

What happened? Describe your observations and record your results

SCIENCE INVESTIGATION:
Plan & Report Template

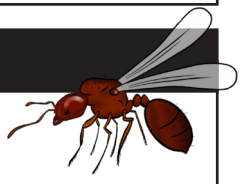
INVESTIGATE: fire ants

Discussion

What do the results tell you? Are there any relationships, patterns or trends in the results? Explain.

How could you improve this investigation? For example fairness, accuracy.

Conclusion



What did you find out about the problem you investigated? Was the outcome different from your prediction? Explain.