Edu.Cat

STEM Challenge

LEVEL 2A

Teacher Guide



TenLives

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About Ten Lives

Ten Lives is a leader in cat management and operates Tasmania's largest cat shelter taking into our care all lost, stray, unwanted, wild and feral cats. Ten Lives receives no government funding and relies on funds generated from our own operations and the support of the general community through donations and bequests.

Operating for over seventy years Ten Lives has cared for tens of thousands of cats and kittens. In kitten season we have on average one cat or kitten coming into our care every 30 minutes during our 7 day a week operation.

By changing the way we collectively care for cats, we are benefiting not only cats but also members of our community and the environment.

Ten Lives has an independent board and has a professional and dedicated team that ensure Ten Lives is a sustainable organisation for the long term.

Ten Lives objectives are:

- To promote and improve the welfare of cats and kittens.
- To promote responsible cat ownership and humane animal welfare principles.
- To shift public attitude towards the welfare of their cats in order to reduce the number of stray, abandoned, lost, unwanted or feral cats.
- To provide education throughout schools and the general public to create positive outcomes for cats, the environment and communities.
- To reduce unnecessary euthanasia of cats and kittens.

Ten Lives promotes responsible cat ownership and all cats adopted are microchipped, de-sexed, vaccinated and have received all necessary veterinary care.

Ten Lives plays a leading role in cat management and works with all levels of government, community groups, education and research institutions, conservation groups and business.

Ten Lives believes that education is key to creating long term social change in the way we care for our cats, the community and our environment.

Ten Lives

About Edu.Cat

Edu.Cat is an Australian-first STEM education program focusing on issues surrounding cat welfare, cat management and the positive and negative impact cats have on individuals, communities and wildlife. The subject matter of the program (cats) is tangible and appealing to students whilst the presentations and STEM Challenges and additional work book activities engage students in areas of Science, Technologies, Engineering and Maths, inspiring students in these professional fields and empowering them to make positive choices in cat ownership.

Edu.Cat,developed in Tasmania by Ten Lives is available to all schools. The program includes complete Australian Curriculum – linked suggested unit plans for Kinder to Yr 6 students in 4 levels. 1A, 1B, 2A, 2B: 1A = K/P; 1B = Yr 1/2; 2A = Yr 3 /4; 2 B = Yrs 5 /6. However, any level might be presented due to the needs and background knowledge of students. As students' progress through the program, they engage in new and exciting inquiry-based learning and STEM Challenges to build on information they have learnt in previous years.

Ten Lives provides teachers with all supporting resources: Teacher Guides, Students Books, STEM Challenges and additional activities linked to the Australian Curriculum and the Early Years Learning Framework.

All **Edu.Cat** curriculum-linked presentations are tailored to specific year levels and to the needs of individual schools which is highly desirable for teachers, as well as being fantastic for students.

Enquiries can be made for kittens to attend **Edu.Cat** sessions as an additional component to the program, subject to availability.

Ten Lives also offers schools the opportunity to book a behind the scenes tour of Ten Lives, Tasmania's largest cat shelter.

Edu.Cat paves the way for students to:

- **inquire**
- **problem solve**
- **design**
- **create**
- **evaluate**
- **work as a team**
- **innovate**
- **be inspired**
- **participate in cooperative learning**
- **engage in STEM**



Ten Lives Edu.Cat STEM Challenge

Kinder to Year 6

The Big Question: What is responsible cat ownership? (Welfare, Environment and Community)

Background Information: Foundations of STEM (Science, Technologies, Engineering, Maths)

STEM education is a term used to refer collectively to the teaching of the disciplines within its umbrella - Science, Technologies, Engineering and Mathematics.

Today's students need to acquire core subject knowledge as well as the skills of collaboration, critical thinking, creativity and problem solving - and STEM education has a crucial role in achieving this.

International research shows that building STEM capacity across the population is critical in helping to support innovation and productivity regardless of occupation or industry. Consistent with this research, industry surveys show that STEM literacy is increasingly becoming part of the core capabilities that Australian employers need. (National STEM School Education Strategy 2016 - 2026)

STEM education is an interdisciplinary approach to learning where rigorous academic concepts are coupled with real-world lessons as students apply Science, Technologies, Engineering, and Mathematics in contexts that make connections between school, community and work... (Tsupros, N., R. Kohler, and J. Hallinen, 2009)

Edu.Cat is committed to contributing to the way in which Tasmanian students experience STEM fields. The Edu.Cat program paves the way for students to collaborate, inquire and problem solve within their school community, whilst preparing them for future endeavours.

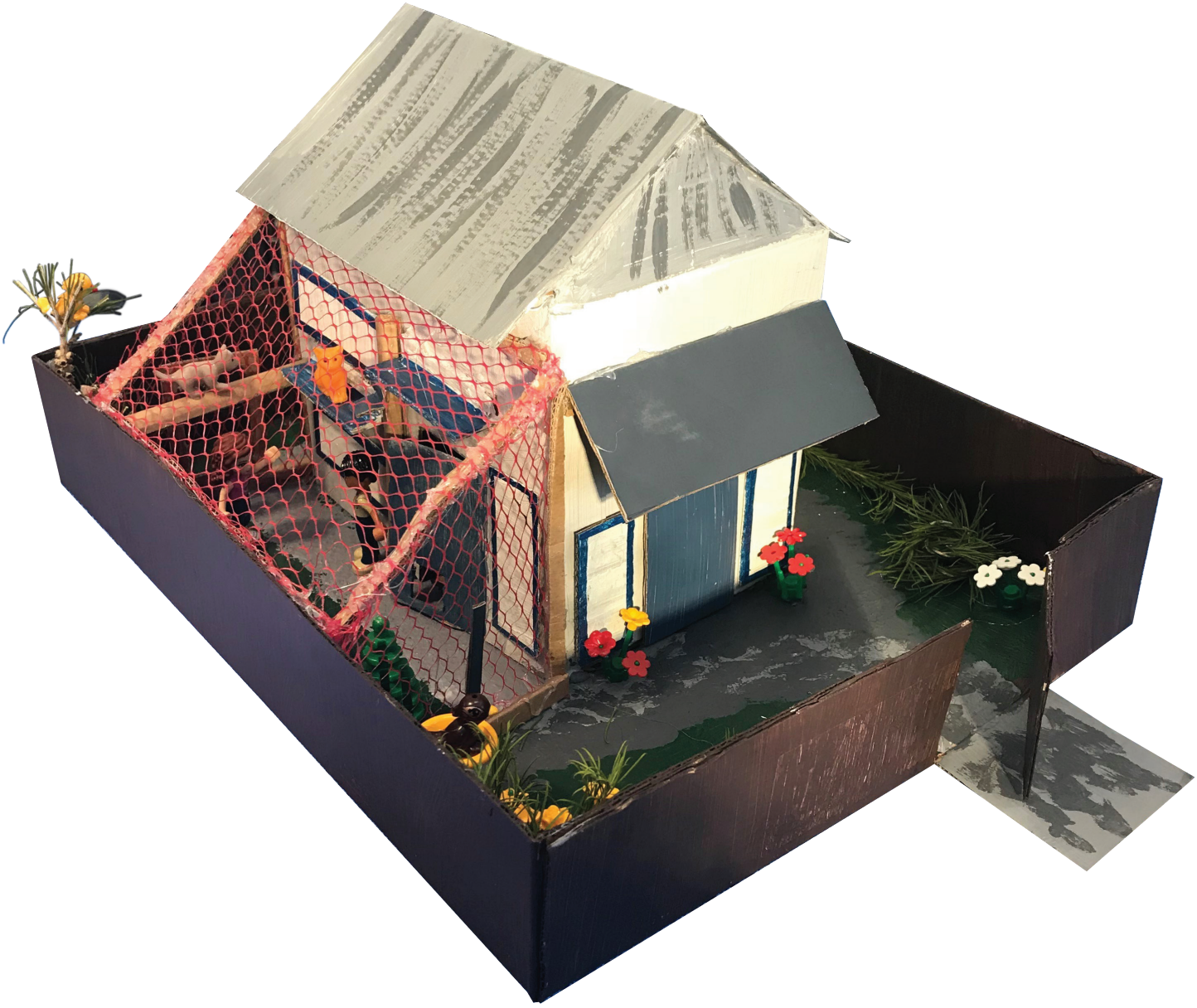
Level 2A STEM Challenge Overview

	Guiding Questions	Resources Required	Learning Intentions
Activity 1	• Who contributes to the design of playgrounds e.g. designers, engineers, builders, environmental scientists, community members (and those who will use it) e.g. cat owners.	• Examples of a design plan and template for a cat containment playground. (A design plan has an inquiry question, research, planning, making, testing and modifying). • Resource list of websites, videos, books for research on a cat's need in containment playgrounds.	• Students recall the differences between living and non-living things. • In teams, students write and design a plan for a cat containment playground with living and non-living features.
Activity 2	• How can research and scientific knowledge assist with the planning of a cat containment playground? • Knowledge of land use, natural and man-made materials, climate, cat's and cat owner's needs are all relevant to planning an effective cat containment playground.	• 1cm grid paper provided in student workbook, pencils. • Sample images/videos of natural and human-made cat enclosures. Include features such as jumps, runs, scratching poles, a connection direct to the house, on grass, inside playgrounds (jumps fixed to walls or under tables).	• In teams, students create a design, to scale, of the cat containment playground and where it fits in the area it will be, labelling living and non-living features.
Activity 3	• How can working as a team create a better outcome when designing a cat playground? Recall back to activity 1 and 2 and all the skills needed to complete this challenge.	• Everyday materials for models, e.g. shoe boxes, crepe paper, coloured cardboard, pipe cleaners, modelling clay, etc. • Glue, tape, paints etc. • Students bring in recycled materials from home.	• In teams, students construct a model of the cat containment playground.

Success Criteria - Evidence of work

- An accurate design plan template which clearly incorporates peer feedback in a different colour or in written statements.
- An accurate diagram of the design to scale in relation to the overall area where the cat containment playground will be, with at least 4 living and 4 non-living features clearly and accurately labelled.
- An accurate model of the proposed cat containment playground with all living and non-living features clearly shown.

Level 2A STEM Challenge:
Cat Containment Playground Design



Level 2A STEM Challenge Part 1
Cat Containment Playground

STEM Challenge Part 1 of 3

Learning intentions for STEM Challenge Part 1

Students recall the differences between living and non-living things. In teams, students work collaboratively to research, brainstorm and design a plan for a cat containment playground ensuring there are both living and non-living features for the cat. They will list the elements needed for a cat containment playground.

Success Criteria

- An accurate design plan for their team which clearly incorporates peer feedback in a different colour or in written statements.
- Accurate list of elements for a cat playground will be written up.

Knowledge and Understanding - Australian Curriculum

Science		
Science Understanding **Sub Strand: Biological Sciences** **AC9S4U01** Explain the roles and interactions of consumers, producers and decomposers within a habitat and how food chains represent feeding relationships. **Sub Strand: Biological Sciences** **AC9S3U01** Compare characteristics of living and non-living things and examine the differences between the life cycles of plants and animals.	**Science as a Human Endeavour** **Sub Strand: Nature and development of Science** **AC9S4H01** Examine how people use data to develop scientific explanations. **Sub Strand: Use and influence of Science** **AC9S4H02** Consider how people use scientific explanations to meet a need or solve a problem. **Sub Strand: Nature and development of Science** **AC9S3H01** Examine hoe people use data to develop scientific explanations. **Sub Strand: Use and influence of Science** **AC9S3H02** Consider how people use scientific explanations to meet a need or solve a problem.	**Science Inquiry Skills** **Sub Strand; Processing, modelling and analysing** **AC9S3I04** Construct and use representations, including tables, simple column graphs and visual or physical models, to organize data and information, show simple relationships and identify patterns. **Sub Strand: Processing, modelling and analysing** **AC9S4I04** Construct and use representations, including tables, simple column graphs and visual or physical models, to organize data and information, show simple relationships and identify patterns.

Maths	
Space **AC9M3SP01** Make, compare and classify objects, identifying key features and explaining why these features make them suited to their uses.	**Measurement** **AC9M3M01** Identify which metric units are used to measure every day items: use measurements of familiar items and known units to make estimates. **AC9M4M01** Interpret unmarked and partial units when measuring and comparing attributes of length, mass, capacity, duration and temperature, using scaled and digital instruments and appropriate units.

Technologies	
Knowledge and Understanding **Yr 3/ 4** **AC9TDE4K01** **Sub Strand: Technologies and society** Examine design and technologies occupations and factors including sustainability that impact on the design of products, services and environments to meet community needs. **AC9TDE4K02** Describe how forces and the properties of materials affect function in a product or system.	**Processes and Production Skills** **Yr 3/4** **AC9TDEP01** **Sub Strand: Investigating and defining** Explore needs or opportunities for designing, and test materials, components, tools, equipment and processes needed to create designed solutions. **AC9TDEP02** **Sub Strand: Generating and Designing** Generate and communicate design ideas and decisions using appropriate attributions, technical terms and graphical representation techniques, including using digital tools.

General Capabilities	
Personal & Social Capability: Expanding students' capacity to question, solve problems, explore and display curiosity. Students use their scientific knowledge to make informed choices about issues that impact their lives such as environmental change, and consider the application of science to meet a range of personal and social needs.	**Critical and Creative Thinking:** Creative thinking enables the development of ideas that are new to the individual, and this is intrinsic to the development of scientific understanding. Scientific inquiry promotes critical and creative thinking by encouraging flexibility and open-mindedness as students speculate about their observations of the world and the ability to use and design new processes to achieve this. Students' conceptual understanding becomes more sophisticated as they actively acquire an increasingly scientific view of their world and the ability to examine it from new perspectives.
Literacy: By learning the literacy of science, students understand that language varies according to context and they increase their ability to use language flexibly. Scientific vocabulary is often technical and includes specific terms for concepts and features of the world, as well as terms that encapsulate an entire process in a single word, such as 'photosynthesis'. Language is therefore essential in providing the link between the concept itself and student understanding and for assessing whether the student has understood the concept.	**Numeracy:** Many elements of numeracy are evident in the Australian Curriculum: Science, particularly in Science Inquiry Skills. These include practical measurement and the collection, representation and interpretation of data from investigations.

Ethical Understanding: They explore what integrity means in science, and explore and apply ethical guidelines in their investigations. They consider the implications of their investigations on others, the environment and living organisms.

They use scientific information to evaluate claims and to inform ethical decisions about a range of social and environmental issues, including the treatment of animals.

Resources

- Student workbook - design process steps and supporting information (copy per student)
- Short ABC video
  Kid Architects and Sustainable Design
  http://education.abc.net.au/home#!/media/1829037/

STEM teaching and learning activities

- Discuss and review what was found out from the ***Ten Lives Cat Centre*** incursion.
- Students recall the importance of cat enclosures.
- Compare and contrast outdoor cat playgrounds with living features and without from a sample of photos and videos. (in workbook)
- Discuss with class who would contribute to the design of the cat containment playgrounds?
- Watch this short ABC video Kid Architects and Sustainable Design to spark discussion. Encourage discussion that it is not just architects that are needed to design a building or cat playground.
- In teams, students complete the steps outlined in the workbook.
- Teams must get feedback from another team on their ideas before going to the next stage and record their feedback in the Design Plan in workbook.
- Note to students, research is started next session. Now, students can brainstorm a range of sources, people they know, books, internet and fact sheets etc.

Vocabulary list

Aesthetics - factors that contribute to the appearance of an object.

Architecture - the design of built environments, buildings or playgrounds.

Factor - one of the elements (things) that contribute to a result.

Sustainable - the ability of the object or building to last a long time.

Key inquiry questions

Who contributes to the design of cat playgrounds e.g. designers, engineers, builders, environmental scientists, cat owners and cats.

Who could you ask to find out more about cat playgrounds?

What factors are considered when building a new structure outdoors or indoors?

Support materials

Student Design Plan in workbook

Level 2A STEM Challenge Part 2
Cat Containment Playground

STEM Challenge Part 2 of 3

Learning intentions for STEM Challenge Part 2

In teams, students create an accurate design to scale of the cat containment playground and understand how it relates to the cats' size, number of cats and the larger area in which it sits e.g. the backyard. The design will show they know living and non-living things as they need to be labelled.

Success Criteria

- An accurate diagram of the team design to scale in relation to the overall area where the cat containment playground will be, with at least 4 living and 4 non-living features clearly and accurately labelled in different colours.

Knowledge and Understanding - Australian Curriculum

Science		
Science Understanding **Sub Strand: Biological Sciences** **AC9S3U01** Compare characteristics of living and non-living things and examine the differences between the life cycles of plants and animals. **Sub Strand: Biological Sciences** **AC9S4U01** Explain the roles and interactions of consumers, producers and decomposers within a habitat and how food chains represent feeding relationships.	**Science as a Human Endeavour** **Sub Strand: Nature and development of Science** **AC9S4H01** Examine how people use data to develop scientific explanations.	**Science Inquiry Skills** **Sub Strand: Processing, modelling and analysing** **AC9S3I04** Construct and use representations, including tables, simple column graphs and visual or physical models, to organize data and information, show simple relationships and identify patterns. **Sub Strand: Processing, modelling and analysing** **AC9S4I04** Construct and use representations, including tables, simple column graphs and visual or physical models, to organize data and information, show simple relationships and identify patterns.

Maths	
Number **AC9M3N02** Recognise and represent unit fractions including ½, 1/3, ¼, 1/ 5 and 1/ 10 and their multiples in different ways; combine fractions with the same denominator to complete the whole. **AC9M4N03** Find equivalent representations of fractions using related denominators and make connections between fractions and decimal notation.	**Measurement** **AC9M3M01** Identify which metric units are used to measure everyday items; use measurements of familiar items and known units to make estimates. **AC9M4M01** Interpret unmarked and partial units when measuring and comparing attributes of length, mass, capacity, duration and temperature, using scaled and digital instruments and appropriate units.

Technologies	
Knowledge and Understanding **Yr 3/4** **Sub Strand: Technologies and society** **AC9TDE4K01** Examine design and technologies occupations and factors including sustainability that impact on the design of products, services and environments to meet community needs. **Sub Strand: Technologies context: Engineering principles and systems; materials and technologies specialisations.** **AC9TDE4K02** Describe how forces and the properties of materials affect function in a product or system.	**Processes and Production Skills** **Yr 3 /4** **Sub Strand: Investigating and defining** **AC9TDE4P01** Explore needs or opportunities for designing, and test materials, components, tools, equipment and processes needed to create designed solutions. **Sub Strand: Generating and designing** **AC9TDE4P02** Generate and communicate design ideas and decisions using appropriate attributions, technical terms and graphical representation techniques, including using digital tools. **Sub Strand: Producing and implementing** **AC9TDE4P03** Select and use materials, components, tools, equipment and techniques to safely make designed solutions.
General Capabilities	
Personal & Social Capability: Expanding students' capacity to question, solve problems, explore and display curiosity. Students use their scientific knowledge to make informed choices about issues that impact their lives such as environmental change, and consider the application of science to meet a range of personal and social needs.	**Critical and Creative Thinking:** Creative thinking enables the development of ideas that are new to the individual, and this is intrinsic to the development of scientific understanding. Scientific inquiry promotes critical and creative thinking by encouraging flexibility and open-mindedness as students speculate about their observations of the world and the ability to use and design new processes to achieve this. Students' conceptual understanding becomes more sophisticated as they actively acquire an increasingly scientific view of their world and the ability to examine it from new perspectives.
Literacy: By learning the literacy of science, students understand that language varies according to context and they increase their ability to use language flexibly. Scientific vocabulary is often technical and includes specific terms for concepts and features of the world, as well as terms that encapsulate an entire process in a single word, such as 'photosynthesis'. Language is therefore essential in providing the link between the concept itself and student understanding and for assessing whether the student has understood the concept.	**Numeracy:** Many elements of numeracy are evident in the Australian Curriculum: Science, particularly in Science Inquiry Skills. These include practical measurement and the collection, representation and interpretation of data from investigations.
Ethical Understanding: They explore what integrity means in science, and explore and apply ethical guidelines in their investigations. They consider the implications of their investigations on others, the environment and living organisms. They use scientific information to evaluate claims and to inform ethical decisions about a range of social and environmental issues, including the treatment of animals.	

Resources

- 1cm grid paper (in workbook), pencils.
- Sample images and/or videos of cat playgrounds with living and non-living features.
- Short ABC video Draw a Floorplan of your Home

http://education.abc.net.au/home#!/media/103220/drawing-a-floor-plan

STEM teaching and learning activities

- Students recall their design completed in the last session.
- Last session we discussed who contributed to the design. This session we will discuss how knowledge and research can assist our designs.
- Discuss how scientific knowledge is needed to design an effective cat playground.
  - Land use - what else is sharing the space? Is there a low area which fills with water?
  - Natural and man-made materials - is there a natural feature that can be incorporated?
  - Climate - are temperatures very hot or cold and does it rain a lot?
  - Cat owner's needs - do you need access to change food and water or does the grass need mowing in the containment area or do you need to see it from inside?
- Watch this short ABC video Draw a Floorplan of your Home to understand how their layout will look and why it is used and what symbols they could use to show different features.
- In teams students conduct research to answer any more questions they may have.
- In teams, students complete a diagram to scale using the 1cm grid paper in the overall area the playground will be. (CREATE stage in Workbook) Students include dimensions and features which should be labelled. Students can seek feedback and redevelop their diagram.

Vocabulary list

Floorplan - a diagram to scale to show the structure of a built area from the birds' eye view.

Land use - how an area of land is used, built on or natural as both are used in different ways.

Climate - the average temperature and rainfall of a specific area in each season.

Key inquiry questions

How can research and scientific knowledge assist with the planning of a cat playground?

How do you know the needs of the cat and cat owner are met?

How can you show the doorway, roof and play features in your diagram?

Support materials

Student workbook per student.

Level 2A STEM Challenge Part 3
Cat Containment Playground

STEM Challenge Part 3 of 3

Learning intentions for STEM Challenge Part 3

In teams, students cooperatively construct a model of their designed cat containment playground. Students are able to communicate their thinking on choices they made of the living and non-living feature in their cat playground.

Success Criteria

- An accurate model of the proposed cat containment playground with all living and non- living features clearly shown.
- Students will be able to describe and justify their decisions to an audience.

Knowledge and Understanding - Australian Curriculum

<table>
<tr><th colspan="3">Science</th></tr>
<tr>
<td>Science Understanding
Sub Strand: Biological Sciences
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Compare characteristics of living and non-living things and examine the life cycles of plants and animals.
Sub Strand: Biological Sciences
AC9S4U01
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<td>Science as a Human Endeavour
Sub Strand: Nature and development of science
AC9S4H01
Examine how people use data to develop scientific explanations.</td>
<td>Science Inquiry Skills
Sub Strand: Communicating
AC9S3I06
Write and create texts to communicate findings and ideas for identified purposes and audiences, using scientific vocabulary and digital tools as appropriate.
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AC9S4I06
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</tr>
<tr><th colspan="3">Maths</th></tr>
<tr>
<td colspan="3">Measurement
AC9M3M01
Identify which metric units are used to measure everyday items; use measurements of familiar items and known units to make estimates.
AC9M4M01
Interpret unmarked and partial units when measuring and comparing attributes of length, mass, capacity, duration and temperature, using scaled and digital instruments and appropriate units.
AC9M3M05
(Only use this link if you want students to explain why they used certain shapes in corners etc).
Identify angles as measures of turn and compare angles with right angles in everyday situations.</td>
</tr>
</table>

Technologies	
Knowledge and Understanding **Yr 3 /4** **Sub Strand: Technologies and society** **AC9TDE4K01** Examine design and technologies occupations and factors including sustainability that impact on the design of products, services and environments to meet community needs. **AC9TDE4K02** **Sub Strand: Technologies context: Engineering principles and systems; Materials and technologies specialisations.** Describe how forces and the properties of materials affect function in a product or system.	**Processes and Production Skills** **Yr 3 /4** **Sub Strand:** **AC9TDE4P01** **Sub Strand: Investigating and defining** Explore needs or opportunities for designing, and test materials, components, tools, equipment and processes needed to create designed solutions. **Sub Strand: Evaluating** **AC9TDE4P04** Use given or co-developed design criteria including sustainability to evaluate design ideas and solutions.
General Capabilities	
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Resources

- Everyday materials for models e.g. shoe boxes, crepe paper, coloured cardboard, pipe cleaners, modelling clay, etc.
- Glue, tape, paints etc.
- Students to bring in reused materials from home.

STEM teaching and learning activities

- Team Skills Discussion – Students recall back to activity 1 and 2 and all the skills needed to complete this challenge.
  - Explain that scientists with different backgrounds and skills, work together to develop science knowledge.
  - Discuss the different knowledge each person in their team brings to the group and how it added to tacking the challenge.
- Students refer to their diagram completed in the last session.
- In teams, students construct a model of their playground using everyday materials.
- The model must clearly represent living and non-living features.

Vocabulary list

Team Roles/Skills:

Ideas generator – Suggests many different ideas.

Evaluator – Checking in with the required task to see if the project is on track. If off track that is okay, they will let everyone know and provide feedback.

Problem solver – Ask questions such as 1. What if we....? 2. Maybe we can....? 3. I wonder if we change this, move that...it would...?

Details person – Often the one finishing the task. Asks questions like 1. Will it work? 2. What materials do we need? 3. Where can we get those materials? 4. Is there a simpler way?

Key inquiry questions

How can working as a team create a better outcome when designing a cat playground?

What different knowledge did you bring to the group?

What different roles did you take in the group?

How did the outcome change from working together? Was it better or different?

Support materials

Student Workbooks

Top 9 reasons to contain your cat

1. Lost cats

Cats roam much further than their owners think.

Cats that are not contained can become lost.

Sadly, only 5% of the thousands of cats and kittens taken to animal shelters in Tasmania each year are microchipped and reclaimed by their owners.



Photo: Kingborough Council

Solo the cat

- Travelled 4km
- Visited 16 different back yards
- Crossed 3 roads
- Explored bushland

Tasmanian Lost Pet Register receives lots of calls about lost cats every day.

Some cats wander and find themselves a new home. People who find a cat may keep it, rather than try to find the cat's owner.



Jetzt/ 123RF Stock

2. Cats and cars

Cats hit by cars often have major injuries, resulting in expensive vet treatment. Some may be so injured they cannot be saved.

Some cats hit by cars become lost as well as injured.

3. Cats and other cats



ysevich / 123RF Stock

Cats are territorial animals and will fight to claim areas that belong to other cats. This can cause stress and fighting which may result in injury.

The most common injury from cats fighting is called a cat bite abscess. Cats have long, sharp, pointy teeth. When a cat bites another cat, bacteria from its teeth enter deep under the cat's skin. Since it is only a small hole, it quickly closes over, but the bacteria continue to grow until there is a large wound full of puss. Cat bite abscesses require vet treatment.



don57/123RF

Bite wound opened to remove infection from a cat bite abcess.

If your cat interacts or fights with a sick cat, infectious diseases like cat flu and other more serious diseases like feline aids and feline leukaemia can spread to your cat. Vaccinations cannot prevent all diseases.

4. Cats, dogs, possums and snakes don't get along

Dog attacks can seriously injure or kill cats.

Cats can be bounced off fences into a dog's yard, especially by large dogs jumping against fences.

Possums have very sharp claws and can cause serious wounds and even kill cats.

All snakes in Tasmania are poisonous and a slithering snake will be very interesting for a cat to try to catch. Snake bites require urgent vet treatment and may result in death.



Clarence Valley Council

Cat attacked by a dog receiving oxygen at a vet hospital.

5. Cats and people in your neighbourhood



forestpath /123RF Stock

Some people do not like cats going onto their property. They may not like cats defecating (pooing) in their garden, marking areas as their territory by urinating (weeing), harassing or fighting their cat, harassing or killing their pets or killing wildlife. This can cause problems between neighbours and may put the cat at risk of being taken to a shelter, dumped far from home or hurt in some way.

If your family do not like the neighbour's cat entering your property, discuss it with the cat's owner, as they may not know what the cat is doing. If this is unsuccessful your local council may be able to offer advice or assist.

If you find a lost or stray cat your family could: call the owner if the cat has an identification tag, make found posters/ pamphlets and deliver to local houses and shops, contact Lost Pet Register, advertise on social media, or take it to a vet or animal shelter to check if the cat has a microchip.

6. Cats and wildlife don't get along

A cat's instinct is to hunt, and they are extremely good at it. Even well-fed pet cats will hunt.



Some people think that their cat does not hunt or only catches a few birds, mammals or reptiles a year. However, research tells us that cats only bring home a third of what they catch. In other words, if your cat brings home an animal it has killed, it has killed or injured another two animals that it did not bring home. If that animal has babies that depend on it for food and warmth, they will die too.

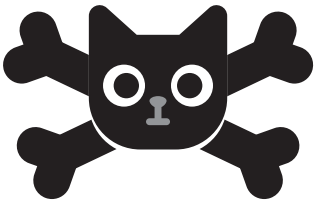
Cats stalking and hunting wild animals stop the animals from eating. The wild animals are too busy hiding from the cats, so they have less time to eat.

Containing cats reduces the spread of the disease toxoplasmosis, which is spread by contaminated poo from infected cats. Toxoplasmosis can harm wildlife, farm animals (like sheep) and even some people.

Containing your cat from dusk till dawn helps to protect some nocturnal wildlife. It does not protect animals, such as lizards, or birds that are active during the day.

Cats and other factors such as habitat loss have a large impact on wildlife, driving some species to become endangered or at worst extinct.

7. Cats and poison



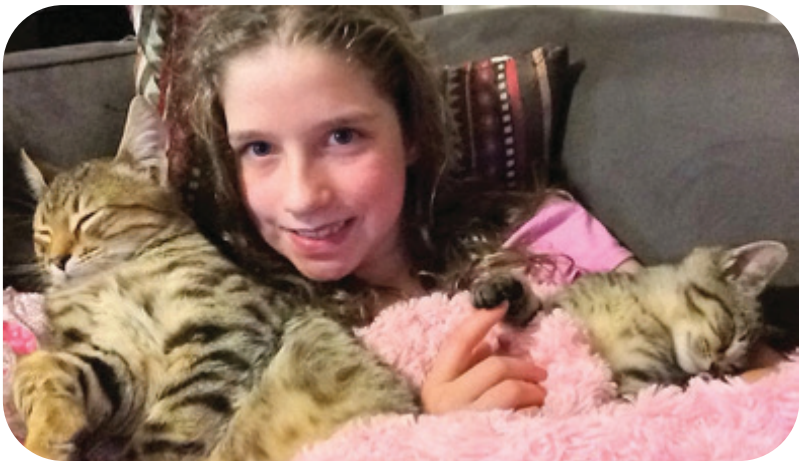
Outdoor cats can get poisoned by chemicals we use for cleaning the house, cleaning the car, or in the garden. Rotting rubbish, spoiled foods and some plants are toxic to cats. Many types of human foods and medicines, as well as dog medicines are toxic to cats. Any poisoning can kill a cat or be extremely expensive to treat. Not all cats will survive even when given vet treatment.

8. Saves you $$$$$$

Parasites like fleas, ticks, paralysis ticks and worms can make cats very sick or even die, they can make people sick too. Contained cats are at less risk of getting fleas and ticks if they do not have other animals entering their enclosure but this depends on the environment surrounding the enclosure.

Containing your cat(s) will save you money in the long run. Vet treatment for injuries and poisonings can cost thousands of dollars, which can be a lot more expensive than setting up a containment area (enclosure) for your cat.

9. Saves you a broken heart



Rose Bray / Ten Lives

Cats play a very important role in our lives. They are our friends and one of the family, and they bring a lot of joy and love into our hearts. Losing a pet is devastating, yet in so many cases it may have been prevented by containing your cat.

The Challenge

In teams, students design and build a model of a cat containment playground with living and non-living features.

Working as a team can be a challenge. Here are some different roles people take in teams.

Ideas generator - Suggests many different ideas.

Evaluator - Checks in with the task to see if the project is on track. If off track, that is OK: they will let everyone know and provide feedback.

Problem solver - Asks questions such as: What if we....? Maybe we can....? I wonder if we change this, move that... would it...?

Details person - Often the one finishing the task. Asks questions like: Will it work? What materials do we need? Where can we get those materials? Is there a simpler way?

How do you like to work in a team?

What do you think you are good at?

Factors to consider when designing a cat containment playground

Needs of the animal

- [ ] Feel safe, or able to reach a space where they feel safe at all times
- [ ] Able to move freely from inside home to outside enclosure
- [ ] Able to choose to be with owners or not
- [ ] Age of kitten/cat
- [ ] Is the cat young, busy and active or old and inactive
- [ ] Number of cats
- [ ] Shelter from the weather (sun, heat, wind and rain)
- [ ] Food and water
- [ ] Sleeping space
- [ ] Private resting areas to be alone
- [ ] Toilet area

Needs of the owner

- [ ] Easy access for cleaning, repairs and feeding
- [ ] Clear view of cat or access to the cat's private hidey-holes
- [ ] Looks nice
- [ ] Not too expensive

Compare and contrast

Compare two cat enclosures, and write down the living and non-living things in each one.

- What features do they have in common?
- How are they different?

Inside only

Living things	Non-living things
Example: cat grass	Example: scratching post

Inside and outside

Living things	Non-living things
Example: tree	Example: scratching post

The engineering design process





ASK:
Define the problem

Questions our team is wondering...

1. _____

_____

_____

2. _____

_____

_____

3. _____

_____

_____

IMAGINE:
Brainstorm possible solutions...

Here are some ideas to help...

Types of cat-containment playgrounds

Cat playgrounds can be Do It Yourself (DIY) and cheap using recycled materials. They will cost more when using new materials, pre-made kits or are professionally built. There is something available for all budgets and all skill levels. The money you save on vet bills can pay for a cat enclosure many times over.

Indoor only

Many people will choose to keep their cat as an indoor-only cat. This means the cat cannot go outside at any time unless the owner takes it for walks outside on a harness and lead. Other people will spend time with their cat outside in an enclosed yard under strict supervision.

Keeping cats indoors certainly keeps them safe from the dangers outside, but there are also dangers indoors. You can cat-proof and kitten-proof your home – see page 20.

Indoor cats must be provided with activities to stimulate their mind and body. This will help keep them well and happy.



Michael / Ten Lives

Indoor, with access to outdoor containment area

This can be great for cats, as it provides more space to explore and the option to go back indoors whenever they like if it gets too hot, cold, wet or windy. Cats feel safe, as they do not feel trapped or vulnerable.

Access to the outdoor enclosure is via an opening in a door, window or wall. It can lead directly into the enclosure or into a sky walk that leads into the enclosure.



Ten Lives

Translucent roofing sheets attached to existing fence surrounding the property



Happy Cat Enclosure

Cat net enclosing a side area of a home using the existing house and fence.



Noel Hunt / Ten Lives

Metal kit enclosure with access to house by a sky walk tunnel and cat door in a window.

Placed into an outside containment area

This option is a free-standing enclosure not attached to the home in any way. The cat needs to be carried to and placed inside the enclosure, then carried back and placed inside the home. The disadvantage is the cat has no choice but to stay in the enclosure until its owner chooses to move it. This can be very stressful for some cats, as they can feel trapped and vulnerable. The enclosure must be carefully designed to make sure a cat doesn't get exposed to bad weather.

Small enclosures can restrict a cat's ability to exercise. If the enclosure is small, your cat will need extra exercise, such as going for walks on a harness or active play time.



Menna / Ten Lives

Using an existing enclosed garden area.

Materials used to make enclosures

Outdoor enclosures can be made from many different materials, but the most common are:

- cat netting
- wire mesh
- wood
- translucent roofing sheets (laserlite / alsynite)
- Oscillot

Many different types of enclosure designs are on the internet. They can be stand alone, linked to the house via sky walks; several standalone enclosures can be linked together to create more space. They can be as simple as enclosing an area off like a deck, or under a deck, with wire mesh or cat netting. The size, style and materials are only limited by your budget and imagination.



Rose Bray / Ten Lives

Sectioned-off area of a yard using star pickets, metal angled brackets, wooden posts, stainless steel wire and cat netting. The enclosed area is attached to the existing deck, with access to the remainder of the yard.



Happy Cat Enclosures

Side of house enclosure using metal posts cat netting and snake proof netting.



Pawelchrzaszcz/123RF

Cat netting is designed for cat enclosures and is very different to bird netting, which is not safe for cat enclosures and should not be used.

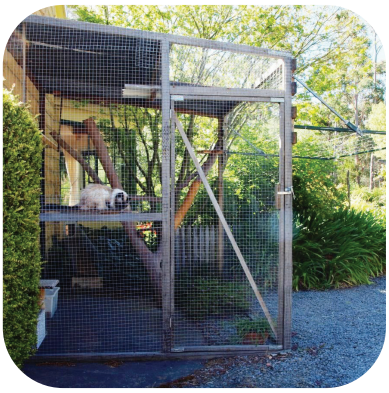


Oscillot Cat Containment Systems



Ten Lives

Translucent roofing sheets



Pauline /Ten Lives

Home made cat enclosure using wire mesh sheets

PLAN:
Think, sketch and label

Draw a sketch of your design. Work as a team.

What is the tallest item in your enclosure? _____

What is the widest item in your enclosure? _____

Using complete sentences, describe the living and non-living features of your cat containment playground.

Here are some more ideas to think about...

Key ingredients for happy, contained cats

The following help to keep all contained cats happy wherever they are.

Minds matter

Cats are highly intelligent animals with strong natural instincts and are incredibly skilled hunters. A cat's play is based on hunting instinct - they need toys to stalk, chase and pounce on.

Cats can get bored with the same toys - swap them often.

Make eating fun

Sometimes contained cats are not as active as outdoor roaming cats, so they do not need the same amount of food. It is important to keep an eye on their weight and adjust the amount of food to avoid obesity, or increase their activity. One way to help your cat is to put some of their food in a food puzzle. These are sold at pet shops or you can make your own from cardboard cylinders. Make a game of meal times and teach your cat how to get the food out and to find the hiding spots.

It is essential to provide fresh clean water every day. Avoid (do not use) plastic water and food bowls. Plastic can change how the water and food tastes, which many cats do not like.

In summertime, it is always tricky to keep flies, ants and wasps out of food. If ants are a problem, put the food bowl in a large shallow dish of water to stop the ants reaching the food.

Get physical

Dog owners take their dogs for walks daily to keep them fit and prevent boredom. Cats, especially contained cats need people to play games with them every day to keep them fit and prevent boredom. Cats prefer short bursts of active play, so keep an eye out for when your cat starts to lose interest and end the play session; you can play again later.

You can train a cat to do tricks, and many love fetching toys to bring back to their owner. Cats love playing hide and seek with cat friends and human owners too. When training your cat, always reward the behaviour you want and ignore the behaviour you don't want. Never punish your cat in any way for any reason. There are some great cat training sites on the internet to help you, but please make sure the sites use positive reinforcement.



Rose Bray/Ten Lives

Cats like their greens

All cats love to eat grass, so it is important to provide all contained cats with a cat salad bar with plenty of cat grass, cat nip and spider plants.

Flowering plants can attract bees and some cats are allergic to bees.

Please ensure all plants and flowers in the home and the contained area are not toxic to cats.

Search for this on the web
http://goodcats.com/toxicplants.html

Note: All parts of Christmas lilies are extremely toxic to cats.



jetzt/ 123RF Stock

Toilets

Litter trays need to be kept clean and changed either daily or more often, depending on the type of tray system. If you have more than one cat, you will need more than one tray e.g. in multi cat households you need one tray per cat plus one extra tray. Ensure the litter tray is large enough for the cat to scratch and dig in.

Cats with access to, or contained in an outdoor enclosure, will require an area to toilet. This may be a litter tray, sand box or garden area. Even though the tray or sand box is outside, it will still need to be cleaned.



belchonock/123RF



Magryt/123RF

Sightseeing



Joel / Ten Lives

All contained cats need a nice spot to sit and watch the world go by and/or drift off to sleep.

Cats in outdoor enclosures require safe and comfortable resting places. They need:

- sunny spots
- shady spots to escape the heat of the sun
- a covered area to escape the cold, rain and wind
- safety zones where they can retreat from the public eye to make them feel safe.

Get your claws into it



sonelly / 123RF Stock

Cats need areas to scratch and shed their claws, and to scent mark with their feet and face. These areas do not just need to be vertical, they can be horizontal as well.

In outdoor contained areas, either put in logs or branches from cat-safe trees (like gum trees), or a scratching post you bought.

Cats need enough space in their contained area to move freely and naturally. Make sure your contained area is large enough for the number of cats you have.

Cats like to jump and climb. They feel safe when up high, so provide platforms for them to climb up to.

Cats like to hide and stalk. Cat-safe plants, shrubs and ground cover will allow cats to use this normal behaviour.

Safety zone

Ensure there are no dangerous areas that a cat could possibly hurt themselves, for example no sharp places, and no areas where a cat may become entangled.



Rose Bray / Ten Lives

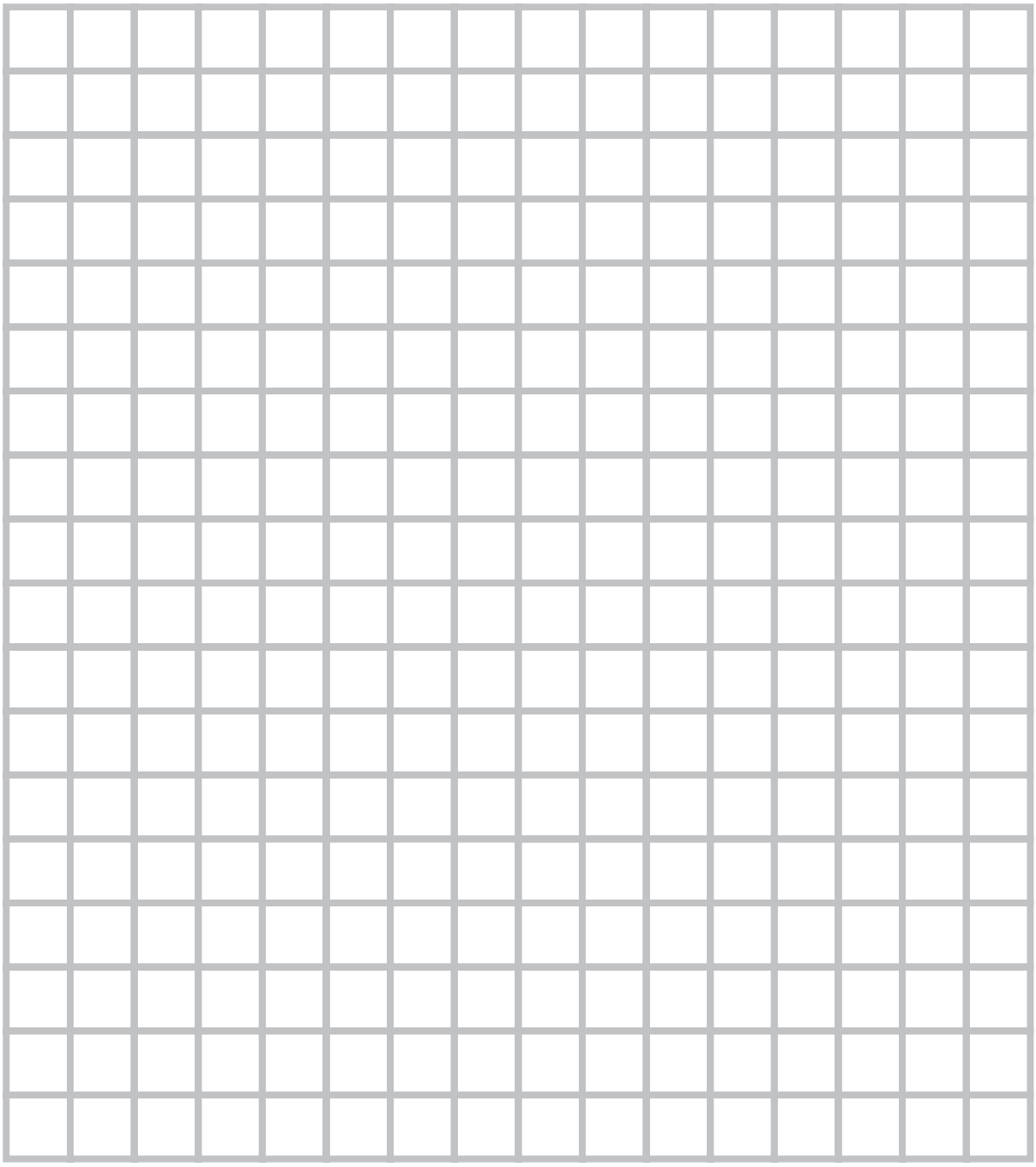
IMPROVE:
Adjust your design to make it better

Meet with another team to present your sketch and listen to their feedback. Then swap.

Using complete sentences, explain what changes you will make to your design based on the feedback. Sketch ideas.

CREATE:
Make a model

1. Using 1cm grid paper, draw a floor plan of your cat containment playground design.
2. Create a model of your cat containment playground.
3. Present to class or school community.
4. Reflect and celebrate.



Keeping kittens and cats safe

PET SAFETY STARTS WITH YOU!

Like babies and toddlers, cats and kittens have no concept of danger and easily get themselves into all sorts of trouble.

Home safety

Falls from high places can cause serious injury. Ensure kittens do not have climbing access to curtains, bookcases, wardrobes etc.

Cats can get caught or strangled in looped curtain and blind cords. Make sure curtains are folded up high out of their way, and cords are either split/cut at the loop or folded and pegged up high, out of their reach.

Kittens will often chew electrical cords, which puts them at risk of electric shock. Please make sure kittens are well supervised near any electrical cords. Provide them with cat specific chew toys when teething to help soothe sore gums.

Toilets, spas, pools, baths filled with water, dishwashers and washing machines are all drowning hazards for kittens and cats. Always keep toilet lids down and the door shut, and put up signs to remind others living in the house and visitors. Always empty baths immediately after use, and keep spa covers firmly in place when not in use. Please keep the doors to washing machines and dishwashers closed at all times and check when using that no one has snuck in.

Dryers, fridges and ovens can be fatal if curious cats and kittens sneak into these while the doors are open.

Reclining chairs and some gym equipment are also dangerous for cats and kittens, as they can become caught in the mechanism and seriously injured.



aetb/123RF

At risk of electrocution



ivanov_ark

At risk of drowning



belchonock/123RF

At risk of suffocation

THESE ITEMS ARE NOT CAT TOYS

Cat-proof your house by preventing cats having access to these things:

- String, yarn, ribbon and dental floss
- Paper clips
- Pins and needles
- Rubber bands and hair ties
- Plastic bags, especially drycleaner bags (a cat could suffocate inside)
- Anything else your cat might chew, including electrical cords



andreykuzmin / 123RF Stock

Cat toys with long cords or dangly bits are for supervised play only and must be stored in a cat-proof cupboard when you aren't around to control the stick. They are not good for unsupervised play, as the pointy ends can cause damage to your cat or kitten's eyes, mouth and body. The string on dangly toys, wool, and other toys with long, stringy parts are dangerous, as they can cause strangling or choking.

Wool may look innocent enough, but because cats have backward facing barbs on their tongues, they can easily swallow wool which can block their intestines. This can be life threatening.



Ten Lives

When not in use, put dangly toys like this away in a cupboard that cats/ kittens cannot open and get into.



viki2win/123RF

Tinsel, fake 'icicles', Christmas lights and most of the fun stuff on Christmas trees are dangerous to cats. Cellophane grass used to line Easter baskets is also dangerous.

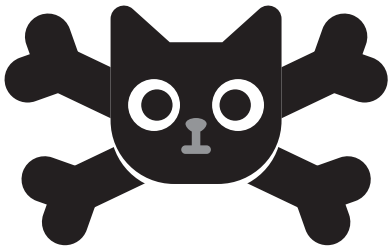


belchonock/123RF

Cats can choke on rubber bands and hair elastics/ties.

Other choking risks: small eyes and noses on soft toys can be swallowed or inhaled. Plastic bits can break apart, leaving sharp edges (which can cut tummies on the inside). If toys need faces, either use non-toxic paints, non-toxic permanent marker pens or sturdy embroidery. Stuffing can be made of cotton, kapok, polyester fibres, plastic, foam beads etc. These materials can be dangerous to cats and kittens if swallowed or eaten. Beads are a choking hazard and polyester fibres, cotton and kapok can block your pet's intestines. Keep a close eye on the seams of toys, and once they start to give way, replace the toy.

Check all toys for wear and tear daily. If a toy is broken, bin it!



POISONS

Please cat-proof your house by preventing kittens and cats having access to these things:

- All prescription and non-prescription medication and illicit drugs
- All household detergents and cleaning products
- All chemicals and gardening products
- All flea products and medications that are used for dogs
- All pesticides - pyrethrum is very toxic to cats

Never give cats any over-the-counter medicine unless advised to do so by your vet, and never give or use dog products on cats.

People food can be toxic to cats

Many items commonly found on kitchen shelves, pantries and benches can harm your cat. Protect your cat from serious food-related illness by keeping food items where it can't get to them and by keeping pantry and cupboard doors closed.

If it isn't commercial cat food, then it's not good for cats and can be dangerous for cats to eat.

Plants that are toxic to cats

Many common garden plants and shrubs, house plants and cut flowers are toxic to cats. For example, all parts of lilies and daffodils (flowers, leaves, steams, stamen and pollen), cyclamens and azaleas are extremely toxic to cats and have caused tragic deaths. Aloe vera, which is good for people, is toxic for cats.

If you have house plants and cut flowers in your house, please check if they are toxic to cats. The Pet Poison Helpline website has a long list of toxic plants and other toxic substances around the home: http://www.petpoisonhelpline.com/poisons/

If your cat eats or comes into contact with any toxic plant or other substance, you will need to take it to the vet urgently. We recommend that you take part of the toxic plant/substance with you. This will help your vet identify the poison and treat your cat.



jetzt/ 123RF Stock

If your cat is poisoned, please call your vet immediately.

POISON SAFETY AT HOME FOR CATS

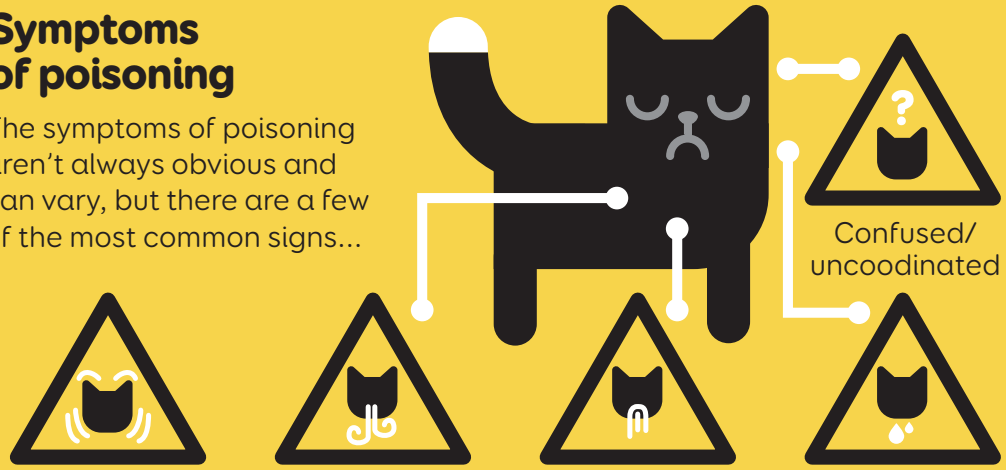
Common cat poisons



Dog flea treatments | Human Medicine | Antifreeze | Household chemicals | Lillies | Human Foods

Symptoms of poisoning

The symptoms of poisoning aren't always obvious and can vary, but there are a few of the most common signs...



Confused/ uncoodinated

Fitting/ seizures

Difficulty breathing

Vomiting

Drooling

What should I do if I think my cat has been poisoned?

DO:



Take them to the vet immediately



Show your vet labels or samples of the suspected poison, if known



Keep other pets away from source

DO NOT:



Try to make your cat vomit or feed them salt water



Wait for the symptoms to stop or assume they will go away

Panic



Prevention is better than a visit to the vets!

Remember, keep poisonous substances out of cats' reach - ideally stored in a sealed container or closed cupboard or shed.

This list and advice is not exhaustive.
For further advice please consult your vet
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Cat Language



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What you can do to help?

- Cats can live up to 21 years, so owning a cat is a long-term commitment.
- As a general rule treat kittens for fleas straight away and treat for worms from 2 weeks of age. Talk to your local veterinarian about which products are safe to use on kittens younger than 8 weeks of age. All other pets need to be treated as well.
- Vaccinations protect pets from a range of diseases which can be life threatening. Kittens should have their first vaccination between 6 - 8 weeks of age.
- Desexing male and female kittens can be done from 8 - 10 weeks of age.
- Provide your cat or kitten with a collar, id tag and microchip, even if they live indoors.
- Think about keeping your cat or kitten in an enclosure or indoors: this keeps them safe from being lost, injured, killed or abused. It will also keep your neighbours happy and protect the wildlife.
- Encourage people you know to make good choices for the care of their cat/s, their community and the environment.
- Where possible kittens should remain with their mother until 8 - 10 weeks of age. This gives them the best opportunity to develop physically and socially.
- Encourage owners of unwanted cats and kittens to surrender them to a reputable shelter instead of giving them away.
- Anyone can sell or give away a cat or kitten but legally it must be at least 8 weeks old, microchipped, desexed, wormed and vaccinated. Cats sold between registered breeders and genuine show cats are exempt.
- Do not take free or cheap kittens unless they are already desexed, microchipped and vaccinated.
- Never dump or abandon a cat or kitten (it is against the law).
- Call your local animal shelter for help on how to care for your cat/kitten or how to find a new home for your cat/kitten if you can no longer care for them.
- If you are eligible, National Desexing Network may help by reducing desexing fees. For more information go to www.ndn.org.au or phone: 1300 368 992

Vocabulary list

Containment	Preventing something from roaming free or leaving a defined area
Territory	An area that an animal uses and defends to keep others out
Defecating	To poo, or pass solid waste from the body
Supervise	To be in charge of (someone or something), or to watch and direct (someone or something)
Parasite	An animal or plant that lives in or on another animal or plant and gets food or protection from it.
Privacy	Being away from public attention, or being away from others
Toxic	Poisonous
Poisonous	Causing sickness or death by entering or touching the body
Enclosure	An area that is surrounded by a barrier



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