

Cameras in Disguise: Design Challenge

YEAR 5
DESIGN AND TECHNOLOGIES



QGC

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This partnership aims to engage and inspire people with the wonder of science, and increase the participation and performance of students in STEM-related subjects and careers — creating a highly capable workforce for the future.

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ELABORATE - EXPLAIN

Cameras in Disguise: Design Challenge

Teacher Resource

In this activity, students design a camouflaged camera that can be used to record footage of a native Australian animal. Students must consider both the behaviour of the animal and the conditions of the environment in which the animal lives to make their designed solution.

Students gain inspiration from wildlife documentaries to complete the design challenge. People who work in this setting often disguise cameras to record footage of animals that may be scared away by the presence of humans and/or large camera rigs. Cameras disguised as rocks, eggs, snowballs and logs have been used to record footage of animals, as have cameras that are designed to look like the animals that are being filmed!



A camera disguised in a nesting box.

Curriculum Links

Design and Technologies

YEAR 5

Design and Technologies Knowledge and Understanding

Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use (ACTDEK023)

Design and Technologies Processes and Production Skills

Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve intended designed solutions (ACTDEP024)

Generate, develop and communicate design ideas and processes for audiences using appropriate technical terms and graphical representation techniques (ACTDEP025)

Select appropriate materials, components, tools, equipment and techniques and apply safe procedures to make designed solutions (ACTDEP026)

Mathematics

YEAR 5

Statistics and Probability

Pose questions and collect categorical or numerical data by observation or survey (ACMSP118)

Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies (ACMSP119)

General Capabilities

Literacy

Comprehend texts through listening, reading and viewing
Composing texts through speaking, writing and creating

Numeracy

Interpreting statistical information

Information and Communication Technology

Investigating with ICT

Creating with ICT

Critical and Creative Thinking

Inquiring – identifying, exploring and organising information and ideas

Generating ideas, possibilities and actions

Reflecting on thinking and processes

Analysing, synthesising and evaluating reasoning and procedures

Personal and Social Capability

Social management

Cameras in Disguise: Design Challenge

Student Activity

Task:

You are a wildlife documentary maker, preparing to film a new documentary about native Australian animals. Some of the animals you need to film are very shy. They tend to hide if they sense humans in their environment, and they will not come out of their hiding places until the humans have left.

In order to make your film, you need to design a camouflaged camera that can be used to record footage of some of these animals. Your camouflaged camera should remain undetected by the animals. You will also need to consider both the behaviour of the animal and the conditions of the environment in which the animal lives to make your designed solution.

You must:

- **Investigate** how other documentary makers capture footage of animals. You will also need to research the behaviour of your chosen animal and the environmental conditions of the habitat.
- **Design** a camouflaged camera that can be used to record footage of the animal. Consider how the characteristics of the animal and the environmental conditions of the habitat will influence your design.
- **Create** a model of the camouflaged camera.
- **Test** the model. You could position the camouflaged camera in your school, and then record how many people stop to look at or inspect the device.
- **Refine** the camouflaged camera to improve on the original design.
- **Collaborate** in teams of two or three.
- **Evaluate** your design. You may also be required to evaluate social interactions and your ability to work effectively in a team.



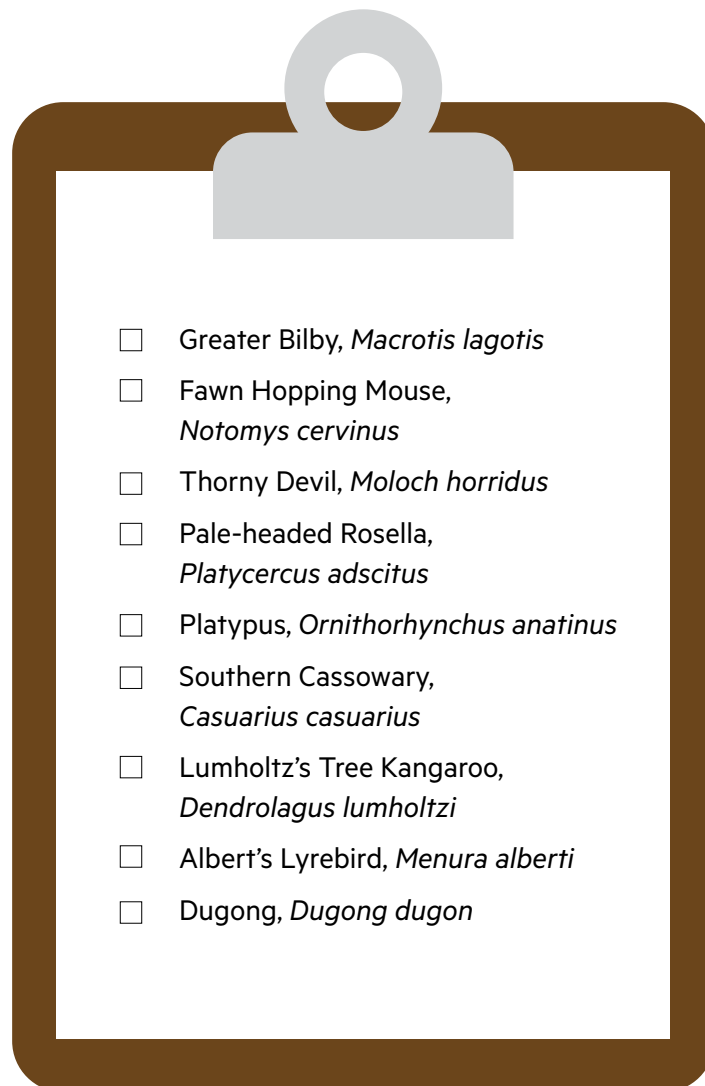
Investigate

Wildlife documentary makers use a variety of techniques to capture footage of animals. Investigate some of the camouflaged cameras documentary makers use in their productions:

- [Polar Bear: Spy on the Ice](#)
- [Dolphins: Spy in the Pod](#)
- [Trek: Spy on the Wildebeest](#)

Compare the features and components of these cameras.

You have short-listed the following animals to film. Select one animal to film first. You will design a camouflaged camera specifically for this animal.



- Greater Bilby, *Macrotis lagotis*
- Fawn Hopping Mouse, *Notomys cervinus*
- Thorny Devil, *Moloch horridus*
- Pale-headed Rosella, *Platycercus adscitus*
- Platypus, *Ornithorhynchus anatinus*
- Southern Cassowary, *Casuarius casuarius*
- Lumholtz's Tree Kangaroo, *Dendrolagus lumholtzi*
- Albert's Lyrebird, *Menura alberti*
- Dugong, *Dugong dugon*

Research the behaviour of your chosen animal. Record any important information below.

Research the environmental conditions of the habitat in which the animal lives. Record any important information below.

Design

Draw a labelled diagram of the camouflaged camera design. Include reasons for your design and selection of materials.

A large, empty rectangular box with a thin black border, intended for a student to draw a camouflaged camera design. The box is oriented vertically and occupies most of the page's width and height.

Create and Test

Create and then test the camouflaged camera. Place your camera in the school grounds during lunchtime. Record how many people see or interact with the camera. You may also like to record this data in a graph.

| | |
|-----------------|--|
| Location | |
| Duration | |

| Time | Number of times camera seen/ interacted with |
|-------------|---|
| | |
| | |
| | |
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| | |
| | |
| | |

Record further observations in the PMI Chart below.

| Plus | Minus | Interesting |
|-------------|--------------|--------------------|
| | | |

Refine

Recommend future changes that could improve the effectiveness of the camouflaged camera.

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| |
|--|

Evaluate

Reflect on your actions with your team or class after you have completed the design challenge. You might like to think about the following questions to assist in your reflection.

- What scientific knowledge helped you make decisions about your designed solution?
- What aspects of your designed solution are you very satisfied with and why?
- What were the main challenges you experienced during the design process?
How did you overcome these challenges?
- What have you learnt about science and the design process from this activity?
- How could you apply this knowledge and understanding to your learning in other contexts?
- What more would we like to know about camouflage?