



THE INTERNATIONAL INSTITUTE FOR THE STUDY OF EXTREMELY QUESTIONABLE CREATURES

Teacher's Notes

Episode One: The Curious Case of the Frozen Frog

Case File: #0018

Episode length: Approximately 19½ minutes

Recommended levels: Years 3–6

Adaptable for: Years 1–2 with teacher support

Main investigation: The Wood Frog

Additional creatures: Trapdoor Spider and Drop Bear

Institute classification: REAL



EPISODE OVERVIEW

Reports have reached the International Institute for the Study of Extremely Questionable Creatures about a frog that can apparently freeze during winter.

Its heart stops beating.

It stops breathing.

Ice forms inside its body.

Then, when the weather warms, the frog thaws and hops away.

Senior Field Researcher Tom Bramble and the Institute team investigate whether this extraordinary animal could possibly be real. With help from expert Dr George, they examine the remarkable survival abilities of the Wood Frog.

Meanwhile, Mia Sullivan investigates mysterious holes in the Institute garden, while Field Researcher Coops attempts to gather photographic evidence of a legendary Drop Bear.

The episode encourages students to question surprising claims, listen for evidence and remain curious about the natural world.

LEARNING INTENTIONS

Students will:

- learn how Wood Frogs survive extremely cold conditions
- explore how animal features and behaviours assist survival
- distinguish between a claim, evidence and a conclusion
- practise listening for important scientific information
- ask questions and make predictions
- recognise that something can sound unbelievable and still be scientifically possible
- communicate their ideas through speaking, writing, drawing or investigation.

SUCCESS CRITERIA

Students can:

- identify the main claim being investigated
- explain at least two ways the Wood Frog survives winter
- describe the difference between a prediction and a conclusion
- recall evidence presented by the expert
- classify the Wood Frog as REAL
- develop a question that could be investigated scientifically.

BEFORE LISTENING

Introduce the mystery

Read the following report to the class:

A frog is caught outside in the middle of winter.
The temperature continues to fall.
Its heart stops beating.
It stops breathing.
Ice begins to form inside its body.

Ask students:

What do you think happens next?

- A. The frog dies.
- B. The frog remains frozen forever.
- C. The frog slowly thaws and hops away.
- D. There is no such creature.

Students can record their prediction on the **Real or Not? Worksheet** before listening.

Emphasise that they do not need to know the correct answer yet. Scientists often begin an investigation with a prediction based on the information available.

Prior-knowledge questions

Discuss:

- What do frogs usually do during cold weather?
- What normally happens to water when it freezes?
- Why might freezing be dangerous for an animal?
- Do all animals survive winter in the same way?
- What is the difference between a fact and a claim?
- Can something sound impossible but still be real?

Create a class chart with three headings:

What we think we know

What we want to know

What we discovered

Complete the first two columns before listening. Return to the final column after the episode.

KEY QUESTION

Can a frog freeze, stop breathing, experience no heartbeat and later return to normal?

Encourage students to listen for:

- the name of the frog
- where it lives
- what happens to its heart and breathing
- where ice forms
- how its body protects its cells

- what happens when the weather becomes warmer
- the evidence used to classify the creature.

DURING-LISTENING GUIDE

The episode may be paused at the following points for discussion.

Pause 1: The initial report

After the freezing-frog claim is introduced, ask:

- Which part of the report sounds most unbelievable?
- What evidence would convince you that the claim is true?
- Who might be a suitable expert to investigate this report?

Pause 2: The expert evidence

After Dr George begins explaining the Wood Frog's survival abilities, ask students to record three facts they hear.

Possible headings:

Claim	Evidence from the Episode
The frog freezes during winter.	
Its heart stops beating.	
It can survive and thaw.	

Pause 3: The garden investigation

When Mia investigates the mysterious holes, ask:

- What observations does Mia make?
- Why should an investigator observe before reaching a conclusion?
- What evidence suggests that the creature is a Trapdoor Spider?
- How is this smaller investigation similar to the Wood Frog investigation?

Pause 4: Before the classification

Pause before the final result is announced.

Ask students to vote:

- REAL
- LEGENDARY
- INSTITUTE ORIGINAL
- NOT YET DETERMINED

Students should support their choice with one piece of evidence from the episode.

CREATURE CASE FILE: WOOD FROG

Common name

Wood Frog

Scientific name

Rana sylvatica

Institute status

REAL



Habitat

Wood Frogs are found in cold regions of North America. They live in woodland environments and spend much of their time on the forest floor.

The extraordinary claim

During winter, a Wood Frog can partially freeze. Its heart stops beating, it stops breathing and ice can form within parts of its body.

When temperatures rise, the frog thaws and becomes active again.

How does it survive?

The Wood Frog's body produces large amounts of protective substances, including glucose. These substances help protect its cells while much of the water outside the cells freezes.

The frog enters a state in which its normal activity is dramatically reduced. Its heart and breathing temporarily stop.

When the temperature rises, the frog gradually thaws. Its heart begins beating again, breathing resumes and the frog can continue its normal activities.

Important clarification

The frog does not simply become an ordinary block of solid ice. Its body has special biological processes that help protect its most important cells and organs from damage.

Why is it remarkable?

For most animals, freezing would cause severe injury or death. The Wood Frog has evolved a survival strategy that allows it to endure winter conditions that would be impossible for many other frogs.

SUB-INVESTIGATION: TRAPDOOR SPIDER

Mia is sent to investigate insects disappearing from the Institute garden. Small holes are discovered in the soil. With expert guidance, Mia carefully observes the area and identifies a hidden burrow belonging to a Trapdoor Spider.

Key facts

- Trapdoor Spiders build burrows in soil.
- Some species create a camouflaged entrance or “door”.
- The spider waits inside the burrow.
- It detects movement nearby.
- It quickly emerges to capture passing prey.
- The hidden burrow helps protect the spider and assists it in hunting.

Discussion connection

Ask students to compare the Wood Frog and Trapdoor Spider.

Both animals have survival adaptations, but they use them differently:

- The Wood Frog’s adaptation helps it survive extreme cold.
- The Trapdoor Spider’s burrow helps it hide, remain protected and catch food.

LEGENDARY CREATURE CHECK: DROP BEAR

Field Researcher Coops attempts to collect photographic evidence of a Drop Bear. Unfortunately, a possum gets in the way at exactly the wrong moment.

Use this section to discuss the quality of evidence.

Ask:

- Does a blurry or obstructed photograph prove that a Drop Bear exists?
- What else could have caused the reported sighting?
- What evidence would investigators need?
- Why should scientists examine alternative explanations?
- Can a photograph be genuine but still fail to prove a claim?

The Drop Bear should remain classified as **LEGENDARY** unless reliable evidence is produced.

KEY VOCABULARY

Adaptation

A feature or behaviour that helps a living thing survive in its environment.

Camouflage

Colours, patterns or shapes that help a living thing blend into its surroundings.

Cell

A tiny structural unit from which living things are made.

Classification

The process of placing something into a group based on its characteristics or available evidence.

Conclusion

A decision reached after examining information and evidence.

Evidence

Information, observations or results used to support or challenge an idea.

Expert

A person with specialised knowledge or experience in a particular area.

Freeze

To change from a liquid state to a solid state because of low temperature.

Glucose

A type of sugar used by living things. In Wood Frogs, high glucose levels help protect cells during freezing conditions.

Habitat

The natural environment in which a living thing lives.

Hibernation

A period during which an animal becomes much less active and uses less energy.

Hypothesis

A possible explanation that can be investigated or tested.

Observation

Information collected by carefully watching, listening, measuring or examining.

Prediction

A statement about what someone thinks will happen, based on the information available.

Thaw

To become unfrozen as the temperature rises.

COMPREHENSION QUESTIONS

Remembering

1. What creature is the main subject of the episode?
2. What is the Wood Frog's scientific name?
3. What happens to the frog's heartbeat during freezing?
4. What happens to its breathing?
5. Which substance helps protect the frog's cells?
6. What creature is Mia investigating in the garden?
7. Why does Coops fail to obtain clear Drop Bear evidence?
8. What final classification does the Institute give the Wood Frog?

Understanding

9. Why would freezing normally be dangerous for an animal?
10. How does glucose help the Wood Frog survive?
11. Why does the Trapdoor Spider build a hidden burrow?
12. Why is an expert useful during an investigation?
13. Why should researchers avoid making a conclusion too early?
14. What makes the Wood Frog difficult to believe even though it is real?

Thinking more deeply

15. Is "I saw it" enough evidence to prove that a creature exists? Explain.
16. Which piece of Wood Frog evidence did you find most convincing?
17. What further questions would you ask Dr George?
18. How are the Wood Frog and Trapdoor Spider suited to their environments?
19. What might happen to a Wood Frog if winter temperatures changed significantly?
20. Why is curiosity important in science?

ANSWER GUIDE

1. The Wood Frog.
2. *Rana sylvatica*.
3. Its heart temporarily stops beating.
4. It temporarily stops breathing.
5. Glucose.
6. A Trapdoor Spider.
7. A possum blocks or interferes with the photograph.
8. REAL.

Questions 9–20 allow for varied responses. Strong answers should refer to information or evidence from the episode.

For Question 15, students should recognise that an eyewitness account may begin an investigation, but stronger evidence is usually needed to reach a reliable conclusion.

CLAIM, EVIDENCE AND CONCLUSION

Use the investigation to introduce three important scientific-literacy concepts.

Claim

A statement that something is true.

Example:

A frog can freeze during winter and later thaw.

Evidence

Information that supports or challenges the claim.

Examples from the investigation:

- Wood Frogs have been observed surviving freezing conditions.
- Their heartbeat and breathing temporarily stop.
- Their bodies produce protective substances.
- They thaw when temperatures rise.
- Experts can explain the biological processes involved.

Conclusion

The decision reached after considering the evidence.

Institute conclusion:

The frozen-frog report is extraordinary, but it is supported by evidence. The Wood Frog is classified as **REAL**.

CLASSROOM ACTIVITIES

Activity 1: Real or Not?

Time: 10 - 15 minutes

Before listening, students record whether they think the freezing frog is real or not.

After listening, they revisit their prediction and complete:

- My original prediction was...
- The most convincing evidence was...
- My final classification is...
- I changed/did not change my mind because...

Emphasise that changing an opinion after receiving new evidence is an important part of scientific thinking.

Activity 2: Design a Wood Frog Survival Diagram

Time: 20 - 30 minutes

Students draw a labelled Wood Frog showing what happens during freezing.

Possible labels include:

- heart temporarily stops
- breathing temporarily stops
- glucose protects cells
- ice forms around some cells
- frog remains inactive
- temperature rises
- frog thaws
- heart and breathing resume.

Students may present the process as a diagram, comic strip or sequence of panels.

Activity 3: Freeze and Thaw Investigation

Time: One lesson plus observation time

Place equal amounts of water in suitable transparent containers.

Students predict:

- which will freeze first
- whether the water level or shape will change
- what will happen during thawing.

Students observe and record:

- appearance before freezing
- appearance after freezing
- changes during thawing.

Safety

This is a teacher-supervised investigation. Students should not touch extremely cold surfaces, taste investigation materials or attempt to freeze living things.

Important scientific distinction

Make it clear that freezing plain water is not the same as freezing a Wood Frog. The frog has specialised biological protections that a container of water does not have.

Activity 4: Build a Trapdoor Spider Model

Time: 30 - 45 minutes

Using recycled materials, students create a model showing:

- an underground burrow
- a camouflaged entrance
- the spider's hiding place
- where prey might travel
- how the spider detects movement.

Students explain how each part helps the spider survive.

Activity 5: Evidence Ranking

Give students different possible pieces of creature evidence:

- an anonymous report
- a blurry photograph
- footprints

- a clear video
- a scientist's observation
- repeated observations by independent researchers
- a physical specimen
- a funny story told by Coops.

Students rank the evidence from least reliable to most reliable.

Discuss why different evidence may have different strengths and why several pieces of evidence are often better than one.

Activity 6: Write an Institute Case Report

Students invent or research a creature and complete:

Creature name:

Reported location:

Extraordinary claim:

Initial prediction:

Observations:

Expert evidence:

Alternative explanation:

Final classification:

Reason for classification:

Possible classifications:

- REAL
- LEGENDARY
- INSTITUTE ORIGINAL
- NOT YET DETERMINED

Activity 7: Interview an Expert

In pairs, one student plays an Institute researcher and the other plays a wildlife expert.

The researcher should ask:

- What is this creature?
- Where does it live?
- What extraordinary ability does it have?
- What evidence supports the claim?
- How does the ability help it survive?
- What do people often misunderstand about it?

Students can perform or record their interview as a short podcast segment.

WRITING ACTIVITIES

Scientific explanation

Write a paragraph explaining how the Wood Frog survives winter.

Suggested structure:

1. Introduce the animal.
2. Explain what happens when temperatures fall.
3. Describe how its body is protected.
4. Explain what happens when the temperature rises.
5. Finish with a concluding sentence.

Creative writing

Write a diary entry from the perspective of a Wood Frog.

Possible opening:

The temperature dropped again last night. Most animals would be worried, but I knew exactly what my body was about to do ...

Students should combine imagination with facts from the episode.

Persuasive writing

Respond to:

The Wood Frog is the most remarkable frog in the world.

Students provide at least three reasons and support each reason with evidence.

Newspaper report

Write a report with the headline:

FROZEN FROG RETURNS TO LIFE!

Include:

- what was reported
- where it happened
- witness comments

- expert explanation
- the Institute's conclusion.

JUNIOR RESEARCHER FIELD ASSIGNMENT

Investigate a local survival strategy

Students safely observe an animal in their garden, schoolyard or local environment.

They may observe:

- a bird
- an insect
- a spider web
- a snail
- an ant trail
- a lizard
- another familiar creature.

Record:

1. What creature did you observe?
2. Where was it?
3. What was it doing?
4. What body feature or behaviour may help it survive?
5. What question would you like to ask an expert?

Field safety

- Observe without touching or disturbing the animal.
- Do not reach into holes, burrows, webs or vegetation.
- Keep a safe distance.
- Work with an adult where appropriate.
- Leave the habitat as you found it.

The Institute's rule is

Observe. Question. Imagine. Investigate.

CROSS-CURRICULUM IDEAS

Science

Explore:

- the needs of living things
- habitats
- animal adaptations
- seasonal change
- survival in extreme environments
- asking investigable questions
- making predictions
- collecting observations
- using evidence to form conclusions.

The Australian Curriculum: Science includes learning about living things, their environments, structural adaptations and behaviours that assist survival.

English

Students can:

- listen for key information
- identify main ideas and supporting details
- participate in group discussions
- ask relevant questions
- create explanations, reports and imaginative texts
- perform or record an expert interview
- adapt scientific information for different audiences.

The Australian Curriculum: English integrates listening, reading, viewing, speaking, writing and creating across its strands.

Media literacy

Students can examine:

- whether a source is trustworthy
- the difference between entertainment and evidence
- how photographs may be misleading
- how sound effects and character voices shape a podcast
- why extraordinary claims require convincing evidence.

Visual arts

Students can:

- design an Institute case-file cover
- illustrate the freeze-and-thaw process
- create a creature-classification stamp
- build a Trapdoor Spider burrow model.

Drama

Students can:

- recreate an Institute morning briefing
- perform an expert interview
- act out the freezing and thawing process
- present competing arguments about whether a creature is real.

DIFFERENTIATION

Support

- Provide picture-based vocabulary cards.
- Allow students to draw rather than write responses.
- Pause the episode after each important fact.
- Complete a class evidence chart together.
- Provide sentence starters.
- Pair students for listening and discussion.

Suggested sentence starters:

- I predict that ...
- I heard that ...
- The evidence shows ...
- I changed my mind because ...
- The frog survives by ...
- My final classification is ...

Extension

Students can:

- investigate another freeze-tolerant animal
- compare hibernation with freeze tolerance
- research how different frog species survive winter
- examine how antifreeze substances are used by living things
- create a complete podcast investigation
- evaluate the reliability of several fictional evidence sources
- investigate how changing climates could affect cold-adapted animals.

ASSESSMENT OPPORTUNITIES

Teachers may assess students through:

- **completed Real or Not? Worksheets**
- participation in discussions
- labelled scientific diagrams
- written explanations
- claim-evidence-conclusion charts
- field observations
- expert-interview performances
- original creature case files.

EXIT TICKET

Before leaving the lesson, students complete:

1. One fact I discovered:
2. One thing that surprised me:
3. One piece of evidence that convinced me:
4. One question I still have:
5. My final classification:

REAL / LEGENDARY / INSTITUTE ORIGINAL / NOT YET DETERMINED

TEACHER SUMMARY

The central scientific idea in this episode is that living things can possess extraordinary adaptations that help them survive in particular environments.

The Wood Frog's abilities sound impossible, but the investigation demonstrates why surprising claims should not be automatically accepted or rejected. Instead, students are encouraged to ask questions, consult knowledgeable sources and examine the available evidence.

The most important message is:

**Something sounding unbelievable does not make it false.
But a good investigator still asks for evidence.**

INSTITUTE CLOSING MESSAGE

Congratulations, Junior Researchers.

You have examined the report, listened to the expert evidence and reached a scientifically supported conclusion.

Case File #0018: The Curious Case of the Frozen Frog

Classification: REAL

The file may now be stamped, closed and returned to the Creature Archives.
Until the next investigation:

Observe. Question. Imagine. Investigate.