

WINTER WEATHER ADAPTATIONS - ECOLOGY RESEARCH PROJECT



6th, 7th, 8th Grade

Print-and-go
ECOLOGY PROJECT
where students
learn about **WINTER**
ADAPTATIONS
through a research
and presentation
project.

SCROLL
to take a look inside!



NO PREP



HOW THIS PROJECT WILL HELP YOU



- Highly structured and ready to use
- Supports scientific reasoning and evidence-based explanations
- Easily differentiable for varying grade levels and abilities
- Builds research, literacy, and presentation skills
- Clear rubric for consistent assessment

Winter Warriors: Exploring How Animals Beat the Cold Cold-Weather Adaptations Research Project

Introduction: Adaptations to Survive the Cold

Animals that inhabit polar or high-altitude regions face extreme cold time they have evolved **adaptations**—traits that improve their chance of survival in winter conditions. Scientists describe three main strategies for surviving winter: **hibernation** and **resistance/tolerance**. Animals that stay in cold climates reduce heat loss, fluff their fur or feathers to trap insulating air, hibernate, or develop thick coats or layers of fat. Many species also have **small** and **change colour** to white for better insulation and camouflage. Some animals even show how life persists even in the harshest winters.

Project Overview

In this project you will explore how a specific animal survives in a cold climate.

1. **Choose an animal** that inhabits a cold climate.
2. **Research** multiple adaptations for your animal:
 - **Structural adaptations** – identify at least **two physical** adaptations (e.g., thick fur, blubber, hollow hair, small appendage, etc.) that help the animal survive in cold conditions.
 - **Behavioral adaptations** – identify at least **two** behaviors (e.g., hibernation, food caching) that help the animal survive in cold conditions.
3. **Take notes** using the research outline provided. Use credible sources (National Park Service, NOAA, National Geographic, etc.) to find key facts and how the adaptation helps your animal survive.
4. **Create a short presentation** (7-9 slides) to teach the class about your animal's adaptations. Your slides should include the following at a minimum:
 - **Slide 1 – Title Page:** animal name, your name, and a subtitle/tagline.
 - **Slide 2 – Introduction Slide:** Introduce your animal and its habitat.
 - **Slide 3&4 – Structural Adaptations:** summarize how each works and why it helps survival.
 - **Slide 5&6 – Behavioral Adaptations:** summarize how each works and why it helps survival.
 - **Slide 7 – Reference slide** with references in APA format (<https://www.easybib.com/>) to create your references.
5. **Cite your sources** on a reference slide at the end of your presentation when summarising information.
6. **Present your project** to the class, explaining why your animal is a winter survival expert!

Grading Rubric – /20 points				
Criteria	4 – Exceeds Expectations	3 – Meets Expectations	2 – Approaching Expectations	1 – Beginning
Introduction Slide(s)	Clearly identifies animal and habitat region; describes winter conditions, general description is accurate and includes size, diet, predators; sources are cited properly.	Provides animal, habitat, and general description; minor details missing or unclear; sources noted.	Provides some information; missing winter conditions or general description; unclear citations.	Introduction slide is incomplete or inaccurate; sources missing or incorrect.
Research Quality & Note-Taking	Uses 3+ credible sources; notes are thorough, organized, and paraphrased; all facts cited correctly.	Uses 2+ credible sources; notes cover key points with some paraphrasing; most facts cited.	Uses 1-2 sources; notes are incomplete or copied; citations missing or incorrect.	Uses fewer than 2 sources; notes are minimal; no citations provided.
Structural Adaptations Explanation (2)	Clearly identifies two structural adaptations; provides accurate, detailed descriptions and explains how each function and aids survival; includes specific data/evidence.	Identifies two adaptations and describes them with some detail; explains how they help survival.	Identifies only one adaptation or gives limited description/unclear explanation for both.	Adaptations are incorrect or poorly described; no connection to survival.
Behavioral Adaptations Explanation (2)	Accurately describes two behaviours and when/why they occur; clearly explains how each improves survival; includes specific data/evidence.	Describes two behaviours and relates them to survival.	Describes only one behaviour or gives incomplete/unclear explanations for both.	Behaviours are incorrect or not explained; no survival connection.
Presentation Organisation & Visuals	Slides follow the template; well-organized with clear headings and concise bullet points (12-14 words each); visuals enhance understanding; sources cited.	Slides are organized and include required elements; visuals are relevant.	Slides missing one or more required elements; visuals not clearly related; text may be too dense or too short.	Slides are poorly organized; missing several required elements; little or no visual support.
Professionalism & Mechanics	Presentation is polished; grammar/spelling are correct; presenter speaks clearly, maintains eye contact and answers questions thoughtfully.	Presentation shows care; minor errors in grammar/spelling; presenter reads mostly from slides.	Presentation shows limited preparation; multiple grammar/spelling errors; presenter reads entirely from slides or is hard to hear.	Presentation appears unprepared; numerous errors; little engagement with audience.

- Bring your completed research outline and a printed copy of your slides
- Be prepared to present your project on the assigned date.
- Speak clearly and talk to the class (don't just read your notes) and explain why your animal is a winter survival expert!



Student-friendly project instructions

What you get inside



Guided research and note-taking pages



Exemplar presentation



Detailed and easy to use grading rubric



Printable student checklist

The collage displays three key components of the project materials:

- Grading Rubric - /20 points**: A table with criteria and performance levels.
- Winter Warriors Survival Project Checklist**: A detailed checklist for students to follow.
- Exemplar Presentation Slide**: A sample slide for a structural adaptation.

Criteria	4 - Exceeds Expectations	3 - Meets Expectations	2 - Approaching Expectations	1 - Needs Improvement
Introduction Slide	Identifies animal's habitat region; provides general description; general description is accurate; includes size, diet, predators; sources are cited properly.	Provides animal, habitat, and general description; minor details missing or unclear; sources noted.	Provides some information; missing winter conditions or general description; unclear citations.	Introduction slide is incomplete or inaccurate; sources missing or incorrect.
Research Quality Note-Taking	Uses 3+ credible sources; notes are thorough, organized, and paraphrased; all facts cited correctly.	Uses 2+ credible sources; notes cover key points with some paraphrasing; most facts cited.	Uses 1-2 sources; notes are incomplete or copied; citations missing or incorrect.	Uses fewer than 2 sources; notes are minimal; no citations provided.
Structural Adaptations Explanation (2)	Clearly identifies two structural adaptations; provides accurate, detailed description; explains how it functions and survival; includes data/evidence.	Identifies two adaptations and describes them with detail; explains.	Identifies only one adaptation or gives limited description/unclear explanation for both.	Adaptations are incorrect or poorly described; no connection to survival.
Behavioral Adaptations Explanation (2)	Accurately describes behaviors; when/why they clearly explain improves survival; includes specific data/evidence.			
Presentation Organisation & Visuals	Slides follow template; with clear concise text; 14 word enhancement sources.			
Professionalism & Mechanics	Present grammar correct; clear content; no questions.			

Winter Warriors Survival Project Checklist
Use this checklist to make sure you complete all the requirements for top marks.

Research & Planning

- ☐ Choose your animal and note its winter habitat region.
- ☐ Find at least two credible sources (websites, books, interviews) about your animal's winter adaptations.
- ☐ Take detailed notes on:
 - ☐ Habitat & climate: where it lives in winter and how cold it gets.
 - ☐ General description: size, diet and predators; note other notable details.
 - ☐ Structural adaptations: two adaptations that help it survive the cold (or three if assigned).
 - ☐ Behavioral adaptations: two adaptations that help it survive the cold (or 3 if assigned).
 - ☐ Evidence: examples showing why each adaptation is beneficial.
- ☐ Record full citation details for each source (author, date, title, URL).

Presentation Slides

- ☐ Title slide with the animal's name, your name, class, and date.
- ☐ Introduction slide(s) summarizing:
 - ☐ Animal & habitat region for winter.
 - ☐ Habitat & climate: where it lives in winter and how cold it gets.
 - ☐ General description: size, diet, predators, and other key details.
 - ☐ The sources.
- ☐ Structural adaptation slides:
 - ☐ For each adaptation, include three concise bullet points:
 - Description and details of the structure (≤14 words).
 - How it works to protect the animal from cold (≤14 words).
 - Why it is beneficial in winter, with evidence (≤14 words).
 - ☐ Include a third structural adaptation slide.
- ☐ Behavioral adaptation slides:
 - ☐ For each adaptation, include three concise bullet points:
 - Description and details of the behavior (≤14 words).
 - How it works to protect the animal from cold (≤14 words).
 - Why it is beneficial in winter, with evidence (≤14 words).
 - ☐ If assigned, include a third behavioral adaptation slide.
- ☐ References slide in APA style listing all your sources.

Finishing Touches

- ☐ Slides are neat, well-organized, and use large font (12–14 words per bullet).
- ☐ Each slide includes at least one relevant image or diagram.
- ☐ Grammar and spelling are checked and corrected.
- ☐ Practice your oral presentation: speak clearly, use your own words, and be ready to answer questions.

2. Structural Adaptations
For each structural adaptation, record the details below.

Structural Adaptation 1: (e.g., thick fur, blubber, hollow hair, small ears)

- Description and details of structure:
- How does it work? What does this feature do to protect the animal from cold?
- Explain why this adaptation is beneficial in winter. Provide evidence from sources (e.g., "fur traps air to insulate and resist winds up to 110 km/h").

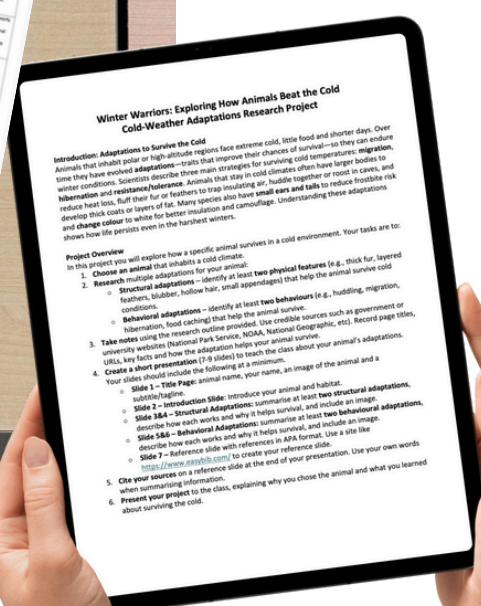
Source(s):

Structural Adaptation 2: (e.g., thick fur, blubber, hollow hair, small ears)

- Description and details of structure:
- How does it work? What does this feature do to protect the animal from cold?
- Explain why this adaptation is beneficial in winter. Provide evidence from sources (e.g., "fur traps air to insulate and resist winds up to 110 km/h").

Source(s):

- Understanding of structural and behavioral adaptations
- Clear written and oral communication
- Presentation and organization skills



Your Project

All steps are clearly outlined and easy to follow

Exemplar presentation for student reference

Guided student research pages

Easy to use grading rubric

Winter Warriors: Exploring How Animals Beat the Cold Cold-Weather Adaptations Research Project

Introduction: Adaptations to Survive the Cold

Animals that inhabit polar or high-altitude regions face extreme cold, little food and shorter days. Over time they have evolved **adaptations**—traits that improve their chances of survival—so they can endure winter conditions. Scientists describe three main strategies for surviving cold temperatures: **migration**, **hibernation** and **resistance/tolerance**. Animals that stay in cold climates often have larger bodies to reduce heat loss, fluff their fur or feathers to trap insulating air, huddle together or roost in caves, and develop thick coats or layers of fat. Many species also have **small ears and tails** to reduce frostbite risk and **change colour** to white for better insulation and camouflage. Understanding these adaptations shows how life persists even in the harshest winters.

Project Overview

In this project you will explore how a specific animal survives in a cold environment. Your tasks are to:

1. **Choose an animal** that inhabits a cold climate.
2. **Research** multiple adaptations for your animal:
 - o **Structural adaptations** – identify at least **two physical features** (e.g., thick fur, layers of feathers, blubber, hollow hair, small appendages) that help the animal survive cold conditions.
 - o **Behavioral adaptations** – identify at least **two behaviours** (e.g., huddling, migration, hibernation, food caching) that help the animal survive.
3. **Take notes** using the research outline provided. Use credible sources such as government university websites (National Park Service, NOAA, National Geographic, etc). Record page URLs, key facts and how the adaptation helps your animal survive.
4. **Create a short presentation** (7-9 slides) to teach the class about your animal's adaptations. Your slides should include the following at a minimum.
 - o **Slide 1 – Title Page:** animal name, your name, an image of the animal and a subtitle/tagline.
 - o **Slide 2 – Introduction Slide:** Introduce your animal and habitat.
 - o **Slide 3&4 – Structural Adaptations:** summarise at least **two structural adaptations** describe how each works and why it helps survival, and include an image.
 - o **Slide 5&6 – Behavioral Adaptations:** summarise at least **two behavioural adaptations** describe how each works and why it helps survival, and include an image.
 - o **Slide 7 – Reference slide** with references in APA format. Use a site like <https://www.easybib.com/> to create your reference slide.
5. **Cite your sources** on a reference slide at the end of your presentation. Use your own words when summarising information.
6. **Present your project** to the class, explaining why you chose the animal and what you learned about surviving the cold.

Emperor Penguin: Surviving Antarctica



Emperor Penguin

Animal & Habitat:
• Emperor penguins are the largest of the 18 penguin species and can weigh up to about 40 kg.
• They live only in Antarctica, forming breeding colonies near the coastline that can range from a few hundred to more than 20,000 pairs.
Habitat & Climate:
• Their breeding sites experience winter temperatures ranging from -40 °F to 32 °F (-40 °C to 0 °C), with wind-chill factors dropping to -60 °F (-46 °C) and winds that can reach 124 mph (200 km/h).

Emperor Penguin

General Description:
• Adult emperor penguins stand 3' 4" to 4'

Emperor Penguin: Surviving Antarctica



2. Structural Adaptations

For each structural adaptation, record the details below.

Structural Adaptation 1: (e.g., thick fur, blubber, hollow hair, small ears)

- Description and details of structure:

- How does it work? What does this feature do to protect the animal from cold?

- Explain why this adaptation is beneficial in winter. Provide evidence from sources (e.g., "fur traps air to insulate and resist winds up to 110 km/h").

Source(s): _____

Structural Adaptation 2: (e.g., thick fur, blubber, hollow hair, small ears)

- Description and details of structure:

- How does it work? What does this feature do to

- Explain why this adaptation is beneficial in winter. Provide evidence from sources (e.g., "fur traps air to insulate and resist winds up to 110 km/h").

Source(s): _____

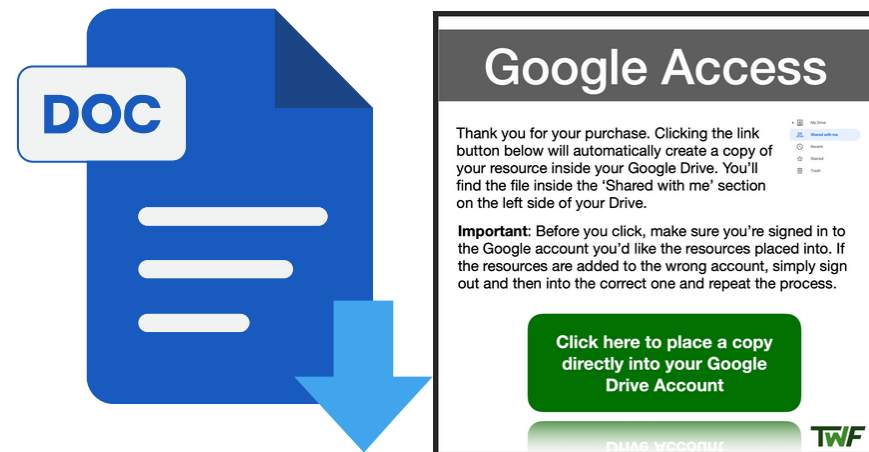
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At School or at Home

Print & Digital



Word, Google, and
PDF versions



Fully digital and editable
- can be done in class
or through distance
education/homeschool



Ways to Use this Resource



Ecology Adaptations -
Structure and Behavior



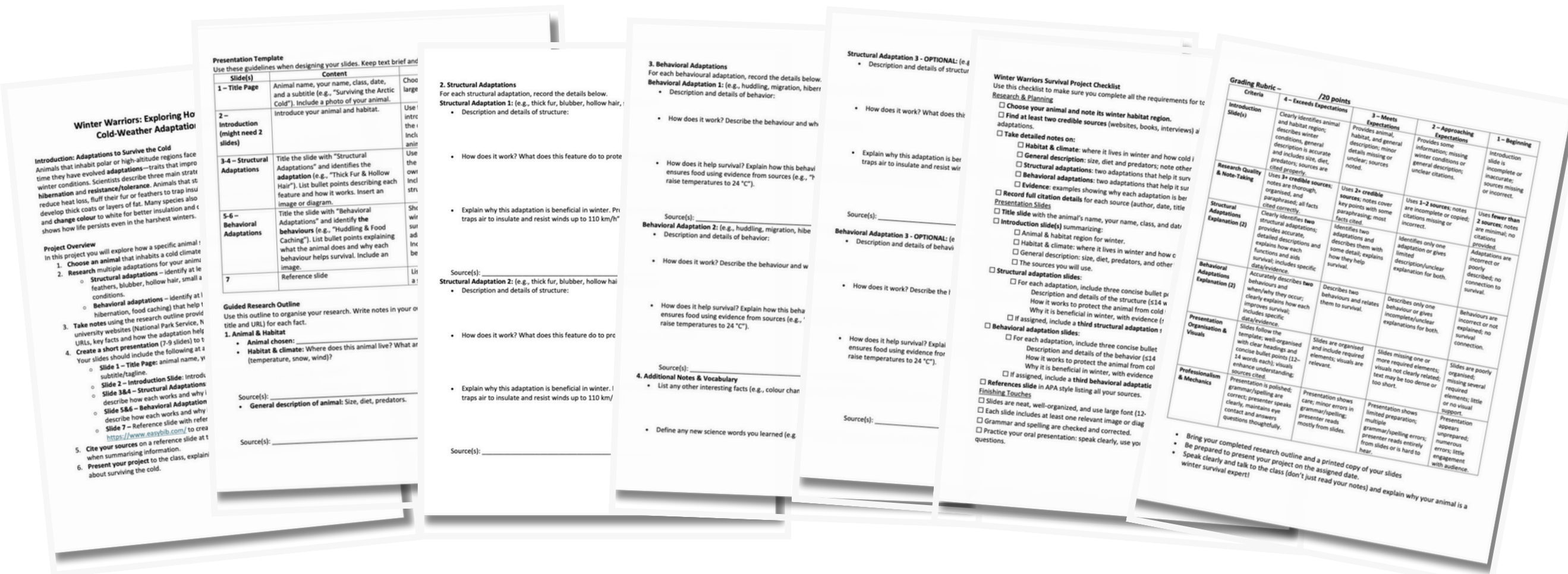
Reinforce key ideas



Winter Weather Project



Formative or Summative
Assessment



As a special bonus, I want to send you a few resources that you can use in your classroom tomorrow. Completely free and geared towards what you teach!



Just



and then choose what you teach!

thanks
**for your interest
in this resource!**



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