

LCM- Adaptations
Emily Roseberry
Hopson Middle School
Barrow, AK

This lesson is designed to be completed within 2 days.

Grade Level Range: 7-9

Standards:

AK State Science Content Standard: A-14

AK State Science Process Standard: B-1, B-5, B-6

Language Arts Standard: D1, D4

Cultural Standard: E2

(Day 1)

Science Concept: Living things have special adaptations for survival.

Vocabulary: Adaptations, Habitat, Consumer, Producer, Decomposer

Gear Up:

Generate a THC (What do you THINK, HOW can we find out, and What do we CONCLUDE) with students on adaptations of several animals and their diet classification (producer, consumer, decomposer).

Process skill: Inferring, communication

Explore:

Students will participate in an adaptation activity found in the Holt Textbook. Students will create and design a 3-D organism with selected adaptations. Students will choose 3 classification systems: mode of transportation (example: slithers, walks, runs, hops), diet (producer, herbivore, omnivore, carnivore, scavenger, or decomposer), and adaptation (example: red eyes, big ears, uses echolocation, has an armor). They will then use their creativity to design an organism based on the three selections.

Materials for Explore:

- Construction paper
- Scissors
- Glue
- Stapler

Process skill: predicting, inferring,

Generalize:

Students will present organisms and share what adaptations they have, how those adaptations allow the organism to survive and what kind of organism it is (producer, consumer), where it lives, and what it does. During this process, the teacher will clarify with students the terms adaptations, consumer, producer, habitat, and niche.

Questions: 1) How is a consumer different from a producer? 2) What is the difference between a habitat and a niche?

Process skill: communication, observations, classifying, concluding

Experiment: (Day 2)

Gear Up: Generate a concept map on the adaptations of the polar bear and especially focus on the color of the fur (white) and the color of the skin (black) and the reasons for the adaptations.

Students will participate in tundra adaptation experiments found in the AK Tundra and Wildlife Curriculum from the AK Department Fish and Game pg. 117-122. Students will work pairs. Each group of students will work on the following experiment: Color and Heat Loss. Science Cards related to the activity will guide students through the scientific method while conducting the experiments. Science Cards are provided in the curriculum borrowed.

Materials for Experiment:

- 2 tin cans, one painted white, one painted black
- 2 thermometers
- hot water

Question:

Which do you think would be a warmer coat – a black one or a white one?

Hypothesis (State your answer as a hypothesis that you could test):

Procedure:

1. Fill each can with hot water.
2. Measure and record the beginning temperature of the water in each can. Use the table provided.
3. Place both cans in a dark or shaded place. Wait 15 minutes.
4. Record the final temperature of the water.
5. Repeat the experiment 2 more times.
6. Find the average temperature lost.

Analysis:

	Experiment 1		Experiment 2		Experiment 3	
	White Can	Black Can	White Can	Black Can	White Can	Black Can
Start Temperature						
End Temperature						
Loss of Temperature						
Average Loss of Temperature						

Conclusion: Students will answer questions in their science journals.

Based on this experiment, can you accept or reject your hypothesis? Would a black or white coat be warmer? Why?

Based on the results of this experiment, what color coat do you think tundra animals would have in order to survive? Why?

Process skills: Observation, classifying, predicting, hypothesizing, concluding

Interpret:

Students will graph their trial results as well as the averaged result and share with the class how the results lined up with their hypothesis.

Process skills: Graphing, communicating, concluding, inferring.

Extension:

Students can design new experiments to determine how arctic animals adapt to their cold environment.

Assessment Scoring Guide:

Students will answer the following questions in their science journals:

Think carefully about the insects, plants and animals of the arctic tundra. Are the majority of them the color you predicted? Why? Provide 3 supportive details.

Why do you think many tundra insects are darker than insects that live in warmer environments? Provide 3 supportive details.

Why do you think many of the birds and mammals that live in the tundra regions year-round are white? Provide 3 supportive details.

Score:	1 Emergency!	2 Need Improvement.	3 Very Good.	4 Excellent,
Inferences about organisms	Student answered assessment questions but provided 0 supportive details.	Student answered assessment questions and provided 1 supportive detail.	Student answered assessment questions and provided 2 supportive details.	Student answered assessment questions and provided 3 supportive details.
Inferences about environment	Student answered assessment questions but provided 0 supportive details.	Student answered assessment questions and provided 1 supportive detail.	Student answered assessment questions and provided 2 supportive details.	Student answered assessment questions and provided 3 supportive details.
Inferences about year round animals	Student answered assessment questions but provided 0 supportive details.	Student answered assessment questions and provided 1 supportive detail.	Student answered assessment questions and provided 2 supportive details.	Student answered assessment questions and provided 3 supportive details.