

Formative Assessment #2

Concept(s) Assessed

Living things have needs met by their environment; adaptations provide an advantage in meeting those needs.

Time

45 minutes

Materials

Whole Class

Class clock with a second hand

Per Group (groups of 3)

1 Large sheet of white construction paper

1 Envelope with 100 white and 100 grey construction paper “dots” (see advance preparation)

Optional: 1 Minute timers or good view of the clock.

Individual

Arctic Hare Packet

Advance preparation

1. Gather materials.
2. Punch out 100 white and 100 grey punchouts and place in an envelope for each group.

Procedure:

1. Explain that students will be completing a performance task called *Arctic Hunt*. Tell them they will both individually and in groups to complete the task.
2. Distribute the *Arctic Hare* packet to each student. Ask them to individually read the first page and make a prediction.
3. Distribute the group materials to each group. Explain that the white construction paper represents your environment in which there a snowy owl and arctic hares. Both are hungry.
4. Explain that in this task students will rotate roles so that everyone has a chance to be: a snowy owl that will be hunting, a timekeeper, and a collector who will represent the owl's nest.
5. Ask the groups to decide who will be the nest, who will be the owl, and who will be the timekeeper for the first hunt.
6. Explain the rules for the hunt in which the owls are trying to catch as many hares as they can in 1 minute.

- a. The owl will hunt and place what he/she catches into the nest. Each owl may only catch one hare at a time.
 - b. The time-keeper will keep a close eye on the time for exactly 1 minute.
 - c. The nest will hold whatever the owl catches.
7. Give each group their envelope of the Arctic Hares. Ask the “owls” to look away as the collector spreads the “hares” on the white paper.
 8. Tell students you will give the first “go”, and then they will continue the rounds. Say go.
 9. When the groups have completed 3 rounds on hunting and recorded their numbers in their chart ask them to place the hares in the envelope and place it on the white paper. Ask students to now work independently to finish the rest of their packet. As they work, collect the materials.
 10. Collect the packets when students have finished.
 11. To extend this assessment/ lesson in the computer lab see:

http://nature.ca/ukaliq/030act/013_spt_e.cfm

Name _____

The Arctic Hare

Pretend that you wake up one morning to find that you are about a foot tall. You step outside and find yourself knee-deep in arctic snow. Your house is a den, and when you go to take a sip of water from the nearby lake, you see your reflection. You realize that you and your family have been transformed into a herd of rabbit-like animals called arctic hares. You are all covered in fur, but you notice that your six older siblings are shades of grey but you and your younger brothers are completely white.

You are all hungry for grasses. You look up and see a snowy owl sitting in a tree watching you. You remember from your science class that the owl is also hungry...

Before you begin this investigation, think about...

Question 1: Will you survive? Will your older siblings survive? Will your younger brothers survive?

Question 2: What will you need in order to survive?

Prediction

1. Using your understanding of basic needs and adaptations, predict who in your family will survive..

I predict that I will (circle one) **survive/not survive** because

I predict that my older brothers will (circle one) **survive/not survive** because

Conducting Your Investigation

Directions: You will investigate what happens when a hare is out of its den and in the snow without somewhere to hide.

Procedure

1. Remember that the hunt is 1 minute. The owl will pick up as many hares (pieces of paper), one at a time, that he/she can in one minute. The owl must pick up one hare and put it into the nest before he/she can hunt another hare.
2. The time-keeper should call time at 1 minute.
3. Once you finish...
 - ✓ The nest sorts the hares.
 - ✓ The timekeeper and the owl count the hares that were hunted.
 - ✓ Everyone records the data for hunt #1 on his/her own recording sheet.
4. Get ready for the next round. Trade jobs that that everyone has a new role. Spread out all of the hares again and begin the hunt. Repeat steps 1-3 above.
5. Get ready for last hunt. Trade jobs so that everyone has a new role. Spread out all of the hares again and begin the hunt. Repeat steps 1-3 above.

Results

Recording Sheet (Do this with your team)

	Number of white hares	Number of grey hares
Hunt #1		
Hunt #2		
Hunt #3		
Total		

Use this workspace *if you need extra room* to add the numbers from your 3 hunts to find the total.

Organizing and Explaining Your Results.

(Please work independently to complete the rest of this packet.)

Effect of Fur Color on Survival

Use this bar graph to record your data from the three hunts. Color in the bars to represent the **total** number white hares and the total number of grey hares from your team's hunts.

145		
135		
125		
115		
105		
95		
85		
75		
65		
55		
45		
35		
25		
15		
5		
	Grey Hares	White Hares

Reasoning:

Did the results of your investigation support your prediction about your survival ? Yes ____ No ____

Did the results of your investigation support your prediction about your siblings' survival? Yes ____ No ____

How does the color of the arctic hare's fur affect its ability to meet its needs in order to survive in the arctic? Make sure you use your data to explain your answer.

What do you think might happen if the snow melted and the temperatures got warmer? Explain.

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Expected Student Responses for a High Level Response

Prediction

Using your understanding of basic needs and adaptations, predict who in your family will survive.

I predict that I will (circle one) **survive/not survive** because

Survive because I am white and the snow is white and so I should blend in and be harder for the owl to see.

I predict that my older brothers will (circle one) **survive/not survive** because

Not survive because they are darker than I am and they will stand out and be easier for the owl to see

Results

Recording Sheet

	Number of white hares	Number of grey hares
Hunt #1		
Hunt #2		
Hunt #3		
Total		

Totals should be within a reasonable range and the total from the 3 hunts should be mathematically correct.

Organizing and Explaining Your Results.

Effect of Fur Color on Survival

Use this bar graph to record your data from the three hunts. Color in the bars to represent the **total** number white hares and the total number of grey hares from your team's hunts.

145		
135		
125		
115		
105		
95		
85		
75		
65		
55		
45		
35		
25		
15		
5		
	Grey Hares	White Hares

Data from the previous page should be plotted correctly (correct number, with the correct color) and the bar should be colored to that number.

Reasoning:

Did the results of your investigation support your prediction about your survival ? Yes ____ No ____

Did the results of your investigation support your prediction about your siblings' survival? Yes ____ No ____

Answers should relate to the student's predictions

How does the color of the arctic hare's fur affect its ability to meet its needs in order to survive in the arctic? Make sure you use your data to explain your answer.

The white fur helps the Arctic Fox to blend with the white snow so that the owl can't see it as easily. The fox's fur is an adaptation that helps the fox survive because it is less likely to be eaten. My data supports this idea because only _____(uses correct number from the bar graph) white hares were eaten compared to _____(uses correct number from the bar graph) grey hares that were eaten during the same hunts.

What do you think might happen if the snow melted and the temperatures got warmer? Explain.

If the snow melts the white fur is no longer helpful. The hares with the grey fur would be harder to see in dirt/mountains/land and they wouldn't be eaten as often.