

Curricular Outcome: Living things have features and behaviours that help them survive in their environment.

Core Concepts:

Students investigate how:

There are ways to distinguish living from non-living things

Structural features of living things and how these help animals survive in their environment.

Behavioural adaptations (such as migration) and how these allow animals to survive in their environment.

Keywords and Connections: Animals, plants, structural features, behavioural adaptations, migration, hibernation, survival

Big Questions: How can we tell a difference between living and non-living things? How do the features and adaptations of animals help them survive?

Learning Goals:

Students should understand:

Living things have certain requirements: energy (food), air, to grow over time, and respond to their environment (i.e. moving to where food is; or a plant leaning towards the light).

In order for living things to meet their requirements, they have structural (physical) features and in many cases, behavioural adaptations.

By analyzing an animal's adaptations (both physical and behavioural) we can learn a lot about how the animal lived.

Materials Needed:

Adaptation cards (at the end of this document).

Floor / desk space for students to organize adaptation cards.

Introduction:

As you have probably learned by now, living things have specific characteristics that distinguish them from non-living things. But, how do living things meet their needs, and

how can these adaptations allow a living thing to survive over time? Here at the Beringia centre, one of the main topics we're focused on is the idea of extinction versus survival during the ice age. This was a very long period of change through time, and animals had to make adjustments to their lifestyle as the world around them changed.

While this change caused certain animals, such as the Woolly Mammoth, to **migrate** (or move a far distance), certain animals had unique ways to deal with the heating and cooling of the Earth throughout the ice age. The **Arctic Ground Squirrel**, a common critter seen in the Yukon today, is one of the longest-surviving ice age animals. Believe it or not, scientists have discovered remains of ground squirrels going back over 2 million years ago! With their small size, it's hard to imagine they could withstand the cold conditions of the ice age. Arctic ground squirrels have some amazing behaviours, as well as features, that allowed them to continue surviving through the ice age.

(Important for activity): Arctic ground squirrels have a variety of **adaptations**, or features, which allowed them to survive. Some of these adaptations are **physical**, which has to do with the features of their **bodies**. **Behavioural** adaptations, on the other hand, are things an animal does (how it behaves) to help itself survive, such as hunting methods or movement patterns.

Introduction Question: What physical and behavioural adaptations allowed arctic ground squirrels to survive the ice age, while many larger animals did not?

Mini Lesson

1. To begin, read through and discuss the above **introduction** to your students. Please ensure you include and emphasize the last paragraph, as it is fundamental for getting them started on the activity.
2. Organize your class into groups of 3 or 4 (this can also be done individually, if you prefer). At the bottom of this document, there is a resource page with cards to be cut out, which students will be organizing.
3. Instruct students to work together in their group to discuss and sort through the different adaptations. *Essentially, they will be deciding whether each adaptation on their printed cards is behavioural or physical* based on classroom learning and the introduction to this activity. Allow students to work on this for about 5-8 minutes, but this is dependent on your class. Feel free to add or subtract more time.
4. Once all groups have concluded, or you decide enough time has passed, have students bring their attention back up to the front. You can go through the answers one category at a time.

KEY:**Physical adaptations:**

- **TEETH:** Like all rodents, arctic ground squirrels have teeth that continuously grow. To help keep their teeth at a good length, they use them a lot to gnaw at dirt / roots, to cut grass, and to open seeds, to name a few. These activities help them trim their teeth, much like a beaver chewing wood!
- **CLAWS:** The claws of the arctic ground squirrel are very long relative to its body size. Because ground squirrels rely on burrowing underground so much, having these claws is very important if they want to build their tunnels and nests underground.
- **BODY SHAPE:** Ground squirrels have cylindrical-like bodies, which allow them to move throughout their tunnels with ease.
- **SHORT EXTREMITIES:** Ties into “body shape” – Arctic Ground Squirrels have developed proportionally shorter limbs and ears. This helps them to survive the Ice Age cold by retaining more heat.

- Behavioural Adaptations:

- **HIBERNATION:** Arctic Ground Squirrels are the only known vertebrate that can survive while their body temperatures drop below 0 degrees Celsius. During their prolonged hibernation period, they drop their body temperatures to around -2.9 degrees Celsius!
- **GATHERING GRASS:** These critters can be found picking, chewing, and carrying grass. Not only do they use this grass for food – they use it to build their homes (nests) as well. These nests preserve these grasses as well and provide scientists with an idea of what plants were around during the Ice Age.
- **DIGGING HOLES:** In order to construct their homes, arctic ground squirrels need to dig deep underground to build nests, food storage rooms, and even “bathrooms”! Digging is key to their survival.

Printable cards on the next page. Please print these out and cut them before the activity.



TEETH



CLAWS



BODY SHAPE



DIGGING HOLES



HIBERNATION



SHORT
EXTREMITIES



GATHERING
GRASS