



Name \_\_\_\_\_

Date \_\_\_\_\_

## CREATE YOUR OWN ECTOTHERM

It's time to get creative and build your own unique ectotherm! Draw your creature in the space below, on another piece of paper, or craft a 3D model using your choice of materials. Your creature can be based on a real animal or completely imaginary, but they should have adaptations to help it survive in a cold weather environment. For ideas on adaptations, see the examples on Page 2, or conduct research on your own. Be sure to include your creature's habitat and label the physical, behavioral, or physiological adaptations it has.

### GUIDING QUESTIONS

- What **habitat** does the animal live in (arctic, boreal forest, wetland pond, alpine, tundra, cold desert)?
- What happens to this species when it gets **cold outside**, either during the winter or nighttime?
- How does the animal use **external sources of heat** and/or **behaviors** to maintain their body temperature?
- What **other adaptations** does this animal have to survive through the winter or in a cold climate?

### DRAW YOUR ECTOTHERM

## ECTOTHERM COLD WEATHER ADAPTATIONS

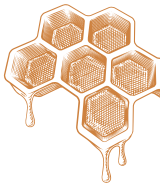
### BEHAVIORAL

#### Kleptothermy



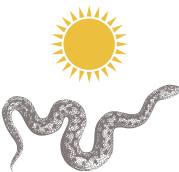
Honey bees, and many other animals, “huddle” together when the temperature drops in order to sustain each other's body temperature. Honeybees will form a cluster and buzz, creating warmth for the Queen.

#### Caching



Many animals store extra food so they have enough energy to last the winter when many food sources are scarce. Honeybees, for example, rely on food storage, because there is no flower nectar available in the winter.

#### Basking



Some animals, like snakes and turtles, will bask in order to soak up the sun's thermal energy and increase their body temperature. Basking is when animals lay or sit still in a sunny place, usually on a dark surface, such as a rock or log. Go outdoors or sit by a window and try it!

#### Dormancy



Dormancy is when animals, such as snakes and turtles, go into a state of sluggishness or inactivity during winter. Some animals will remain completely inactive throughout the entire winter, while others will emerge every once in a while if temperatures increase.

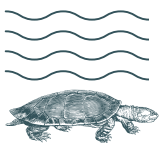
#### Migration



Migration is when an animal physically moves from one environment to another. Monarch butterflies, for example, do this to escape cold temperatures and move where food sources, breeding habitat, and other resources are more available even in winter months.

### PHYSIOLOGICAL

#### Changes in Metabolism



Aquatic turtles will often go dormant at the bottom of a pond, because water insulates better than air. The cold water slows the turtles' metabolic rate down, which allows them to conserve energy and not require as much oxygen.

#### Antifreeze



Wood frogs have a special physiological adaptation: they can become partially frozen and thaw again in the spring. As temperatures drop, they begin to produce a special anti-freeze in their blood, made out of glucose, glycogen and urea, that protects their cells and vital organs.