

“Of Feathers, Fats, and Freezing”

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Lexile Level: 1370 | 896 Words



- 1 Chickadees living near Fairbanks, in interior Alaska, experience -30 degrees to -40 degrees F on a regular basis, with temperatures sometimes plunging to -60 degrees F or colder. Birds have a body temperature of about 104 degrees F. This means that sometimes there is well over a 100 degree difference between a chickadee's body and the air temperature only an inch away.
- 2 What do you do when you go out in the cold? Throw on a big, warm coat? Like all birds, chickadees have feathers, so in a sense, they wear little down parkas all the time. The colder the temperature, the more they fluff their feathers by sticking them out, away from their bodies. Feathers are the perfect insulation, trapping air between them and acting as a barrier between the cold outdoor weather and the birds' bodies.
- 3 Chickadees can fluff their feathers out to an inch thick—wider than their own bodies—to protect themselves against the cold. At extreme temperatures, they look like round, feathery balls. Their feathers provide such good insulation that chickadees don't become covered with frost. The only places where chickadees lose heat are around their beaks and eyes, which become frosty at extremely cold temperatures.

- 4 But chickadees don't have feathers on their legs or feet, so how do they keep their tiny toes warm? They don't. Without any feathered insulation, heat would quickly be lost and much energy wasted in attempting to keep their toes as warm as the rest of the body. So they allow their feet to cool to just above freezing. They do this by exchanging heat between the blood vessels in their legs. Warm blood flowing into the legs is cooled by cold blood returning from the toes. Then, when this blood returns to the main part of the body, it is warmed up again as it passes the warm blood entering the legs. This way, the rest of the chickadee doesn't get cold by having cold blood returning to the body from its legs.
- 5 But even such energy efficiency by itself is not enough to survive the frigid winter days. In the same way that we must burn more fuel in the winter to keep our houses warm, chickadees also need more fuel to stay warm. And what sort of fuel do chickadees burn? Food. The colder the weather, the more food they need. As the days shorten, the temperature drops, and since chickadees forage only during daylight hours, they have the least amount of time to eat during the season when they need the most fuel. During the shortest days, chickadees have only about 6 hours of daylight to forage for food. As soon as there is enough light to see by, they spend all of their time finding and eating as much food as possible until the light fades.
- 6 Chickadees begin preparing for winter while the green leaves of summer are still on the trees. They stash away bugs, seeds, or fat from dead animals, tucking these morsels into crevices in tree bark. After most of the other birds have flown south to warmer climes, chickadees return to their caches. They also seek out wintering insects between the cracks in the tree bark and feast at bird feeders stocked with fatty treats like sunflower seeds, peanut butter, suet, or mealworms. The higher the fat content the better, since calories—the units of energy in food—are concentrated in fats.
- 7 To a chickadee, body fat is a fuel. Since they don't have crops in which they can store food to eat later, they must eat enough each day to survive the long, 18-hour night. By feasting on fatty foods, chickadees can increase their body weight by about 8 to 10 percent—which would be like a 100-pound kid gaining 8 to 10 pounds in one day. The amount of food these birds must eat depends on what kind of food is available and how active they are. Chickadees living near well-stocked bird feeders can survive much easier than those living far from humans. Increasing their

body fat during the day is like stoking the fire before going to bed. Throughout the night chickadees burn their recently accumulated fat, and by the next morning, none is left.

- 8 Even with their feathered insulation and daily storing away of fat, chickadees must still conserve as much energy as possible at night. They do not roost together in flocks as some birds do but spend the night alone. As darkness falls they cram themselves into little hollows in the trees. Once settled, they lower their body temperature, just as we lower the thermostat in our houses to save energy at night. For humans, becoming hypothermic (having a lowered body temperature) like this would be deadly, but chickadees use hypothermia to their advantage. By lowering their body temperature, or "thermostat", by nearly 20 degrees F, their fat reserves, or "fuel" supplies, last longer, enabling them to withstand the cold until it's light enough to forage again.
- 9 Although fragile in many ways, the tiny black-capped chickadee shows how tough it really is by surviving the bitterly cold winters of northern North America. The next time you see a chickadee visiting your bird feeder, just think, could you survive out there?

Standard RI.6.8**I can trace and evaluate the argument and specific claims in a text.****1**

DOK 1

Which phrase from the article supports the claim that “*Feathers are the perfect insulation*”?

- A. “. . . acting as a barrier between the cold outdoor weather . . .”
- B. “. . . look like round, feathery balls . . .”
- C. “. . . lose heat are around their beaks . . .”
- D. “. . . cool to just above freezing . . .”

2

DOK 1

What claim is the author making in paragraph 7?

- A. Chickadees save food to eat later.
- B. Chickadees use all their fuel at once
- C. Chickadees use fat to fuel their body.
- D. Chickadees body weight changes every day.

3

DOK 2

Match the claim to the paragraph that **best** supports it.

Claims:

Chickadees use their feather to keep warm.

Chickadees eat more food during the winter.

Chickadees live where the weather is very cold.

Chickadees use their warm blood to keep their feet from freezing.

Paragraph	Claim
1	
3	
4	
5	

4

DOK 2

Part 1

How do the seasons affect the chickadees ability to find food?

- A. Chickadees prefer food that is easy to find.
- B. Chickadees store food away to eat in winter.
- C. Chickadees only search for food for 6 hours a day.
- D. Chickadees eat as much as possible in the summer.

Part 2

Which **two** pieces of evidence supports your answer in Part 1?

- A. "...they have the least amount of time to eat during the season when they need the most fuel."
- B. "...eating as much food as possible until the light fades."
- C. "They stash away bugs, seeds, or fat from dead animals, ..."
- D. "...chickadees return to their caches."
- E. "...feast at bird feeders stocked with fatty treats..."

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DOK 3

In the article "Of Feathers, Fat, and Freezing", the author makes several claims about chickadees. In a 3 to 5 sentence paragraph, analyze how the author uses textual evidence to support a claim.
