

Mammals in extreme temperatures

Cold experiment

Since animals like walruses, polar bears, and seals live in very cold arctic climates, they have developed special physical adaptations that allow them to stay warm. One of these adaptations is their ability to store fat in their bodies in a special form called blubber. Blubber is a structural adaptation that helps insulate these animals from the cold water and ice of the arctic.



In this activity you will see how blubber protects mammals from the cold by making your own “blubber” layer out of Crisco shortening or lard. Be prepared to get messy!

Hypothesis: Which hand will stay warmer, your bare hand or the one covered in “blubber”?

Materials

- Large bowl of ice water
- Crisco shortening or lard
- Saran wrap

Directions

1. Fill a large bowl (large enough for your hand) with ice water
2. Dunk your hand into the ice water to feel how cold it is (try holding it there for at least 30 seconds)
3. Take your hand out of the water and dry it off.
4. Saran wrap your hand to prevent the shortening from sticking to it
5. Apply a thick layer of shortening to your Saran wrapped hand (you may want to ask someone to help with this)
6. Put a second layer of Saran wrap over the layer of shortening (again, you may want someone to do this for you)
7. Dunk your wrapped hand into the ice water and see if you notice a difference in how cold it feels (try holding it there for at least 30 seconds)
8. Clean up!!! Make sure to avoid touching anything with your greasy hand until you have thrown away the Saran wrap and washed up really well with soap and water

Heat experiment

If you have a furry pet, like a dog or cat, you have probably noticed that they tend to shed more (lose more hair) as it gets hotter outside. This is because in hot climates like Texas, many animals lose layers of fur to keep cool in the summer heat and regrow their coats in the winter as it gets colder out. In this experiment, you will pretend to be a furry animal, putting on lots of layers of clothes (fur) to stay warm, then removing them (shedding) to cool down.



Directions

1. Put on as many layers of clothing as you can (pretend like it is 0 degrees outside and you are bundling up to survive a blizzard)! Don't forget your heavy coat!
2. Go outside in the heat of the day and observe your body temperature
3. Take off layers of extra clothing as the heat makes you uncomfortable and observe how much cooler you feel without all of those heavy layers on.

Questions

What differences did you notice when you put your bare hand in the ice water compared to when you put your "blubbered" hand into the ice water? Which felt colder?

When you did the "heat experiment" how many layers did you manage to put on?

Which felt more comfortable when you went outside, wearing lots of layers, or just wearing a t-shirt and shorts?

Why don't animals in Texas have blubber?

How are fur and blubber similar? How are they different?

What adaptations do animals in Texas have to stay cool?