BLUBBER GLOVES

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BLUBBER GLOVES

*Insulation from freezing water, just like seals and whales*

The animals of the Arctic and Antarctic circles spend their lives surviving subfreezing air temperatures and frigid water. Their secret is blubber, a thick layer of body fat that comprises up to 50% of some marine mammals. Is there any way for humans to replicate this cold-weather adaptation? With the Blubber Glove experiment, you’ll test a blubber substitute on a small scale and see what it’s like to take a dip in cold water without turning into a human popsicle.

**Materials**
- Two large zipper lock bags (your hand should be able to fit inside)
- Shortening
- Spoon
- Duct tape
- Water
- Ice (crushed/cubes)
- Bucket

**EXPERIMENT**
1. Since we can’t afford to send you to the polar regions, you have to recreate a typical Arctic or Antarctic circle scenario. So make an ice bath! Fill a one or two gallon bucket half full with cold water. Add a bunch (scientific measurement) of ice. This ice bath will be a great representation of the near-freezing waters of the polar regions.
2. Since you aren’t a seal, walrus, or whale, you don’t have blubber. You need to find a suitable blubber substitute.
3. Fill a zipper lock bag (make sure the bag is big enough to fit your whole hand inside) with three or four heaping spoonfuls of shortening. Seriously... get at it!
4. Put your hand inside a second zipper lock bag of the same size and push it into the shortening-filled zipper lock bag.
5. Spread the shortening around the zipper lock bags until the inner bag is mostly covered.
6. Fold the top of the inner zipper lock bag over the top of the outer zipper lock bag, keeping the shortening between the two. Duct tape the fold in place so that the shortening may never escape (just like blubber, because whales can’t use a treadmill).
7. Now you have a blubber-filled glove, ready to test the frigid waters of the bucket in your kitchen. Stick your hand in the glove and dip your blubber-gloved hand into the icy water. Crazy… your hand doesn’t get cold in the water!
8. Try comparing a hand inside the Blubber Glove to a hand stuck in the water without the glove. What do you experience? It’s probably a little chilly!

Try using other materials in the same fashion to find out which insulator works best. Try:
• Butter
• Margarine
• Cotton balls
• Starch peanuts
• Dirt or sand
...pretty much anything that you can fit between two zipper lock bag

HOW DOES IT WORK?
Uses for shortening: making cookies, frying chicken, melting chocolate, insulating a Blubber Glove?!! How does a cooking ingredient double as a perfect insulator? Easy. Shortening is a fat, just like blubber, and is great for thermoregulation. That means fat keeps heat in and cold out. Fats work well as insulators because of their high density and low thermal conductivity relative to water.
Despite being submerged in incredibly cold water, fats can maintain a constant temperature. Blubber, in particular, requires very little blood supply, allowing more blood to be circulated to skin surfaces that are more directly exposed to the frigid temperatures. Using the Blubber Glove, your hand isn't directly exposed to the water, so the fat takes the full brunt of the cold.
BLUBBER GLOVE

HERE IS WHAT YOU NEED

SHORTENING
2 PLASTIC BAGS
SPOON
STRONG TAPE
BOWL
ICE
WATER
THE REASON FOR THIS EXPERIMENT IS TO SHOW HOW SOME SEA ANIMALS CAN WITHSTAND COLD TEMPERATURES

1. SCoop approximately 2 cups of shortening into the plastic bag.

2. PUT THE SECOND PLASTIC BAG INSIDE THE FIRST
Work the shortening into a thin layer in between the 2 bags.

This is what it will look like when you are finished.
4. Fold the top edge of the inner plastic bag over.

5. Use a piece of tape to create a seal between the two bags.
NOW PUT ON YOUR BLUBBER GLOVE AND SEE HOW LONG YOU CAN KEEP IT IN THE WATER