



new bedford  
whaling museum

ART. HISTORY. SCIENCE. CULTURE.

# Blubber: Keeping Warm with Arctic Animals

## **This lesson includes three sections:**

**1**

### **INVESTIGATE** (15 min.)

Click through the following slide deck to learn more about blubber, which is a unique adaptation of some animals in the Arctic.

**2**

### **INQUIRE** (15 min.)

Analyze images from the New Bedford Whaling Museum to investigate the protective properties of blubber and formulate questions.

**3**

### **IMAGINE** (30 min.)

Follow the steps in the Activity Guide to experience how blubber protects living creatures from cold water.

INVESTIGATE

# Can you name these animals?



Which ones might have a layer of blubber to help them stay warm in cold water?



The circled animals have blubber:

1. polar bear
2. wolverine
3. Arctic fox
4. Arctic hare
5. lemming
6. caribou
7. musk ox
8. **walrus**
9. **fur seal**
10. otter
11. **bowhead whale**
12. **narwhal**
13. ptarmigan
14. snowy owl
15. eider duck
16. eider duck
17. razorbill
18. seagull



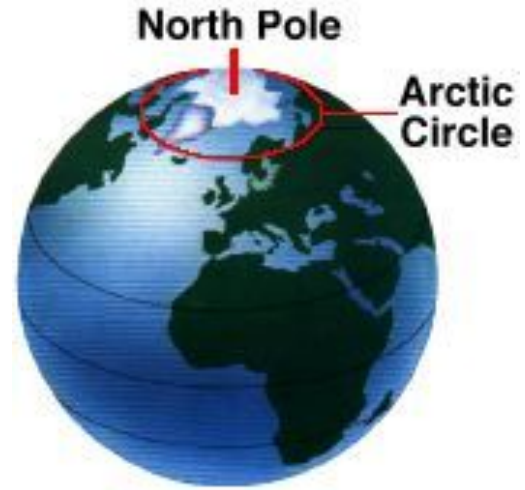
1. Eisbär — 2. Vielfuß — 3. Blaufuchs — 4. Schneehase — 5. Lemming — 6. Rentier — 7. Moschusochs — 8. Walroß — 9. Seebär — 10. Seeotter — 11. Gronlandswal — 12. Narwal — 13. Schneehuhn — 14. Schneeeule — 15. Eiderente, Männchen. 16. Weibchen. — 17. Torsalk. — 18. Polarnöwe.

# Where is the Arctic?

MIGRATE:  
to move from one  
area to another  
seasonally

ADAPTATION:  
a feature that helps  
animals live in their  
environment

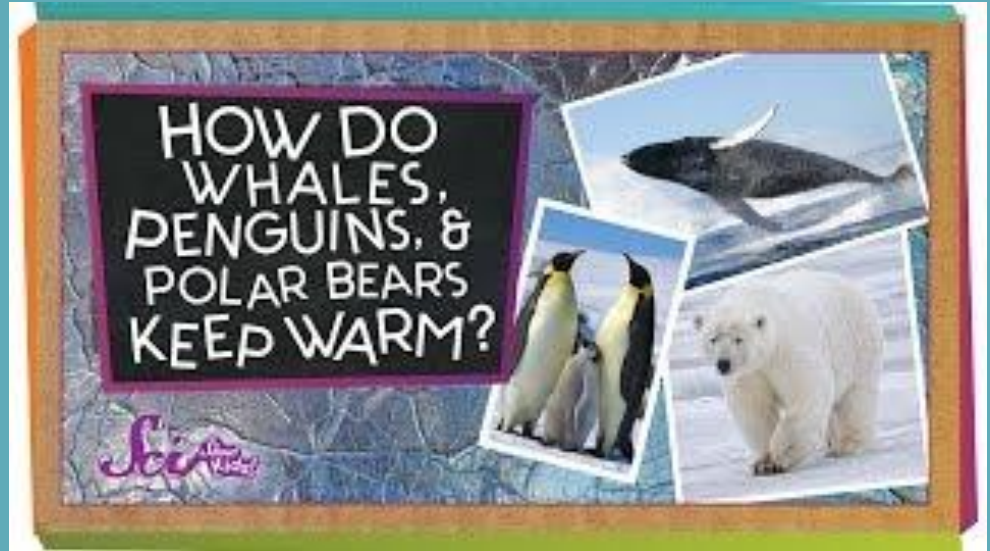
Many of these animals live in the Arctic, where it is very cold. In 1991, the temperature dipped to almost  $-94^{\circ}\text{F}$ ! While some of the animals **migrate**, some Arctic animals have blubber, an **adaptation** that helps them survive in the cold.



# What is blubber?

**Blubber** is an insulating layer of fat (adipose tissue) that some marine and Arctic animals have under their skin. Blubber is a special adaptation that helps them survive in their environments.

Watch the video to learn more.



# What are the three ways that blubber helps the animals?

1

The fat keeps them **warm** in colder waters.

2

The fat stores **energy** that the animal can use when they can't find food.

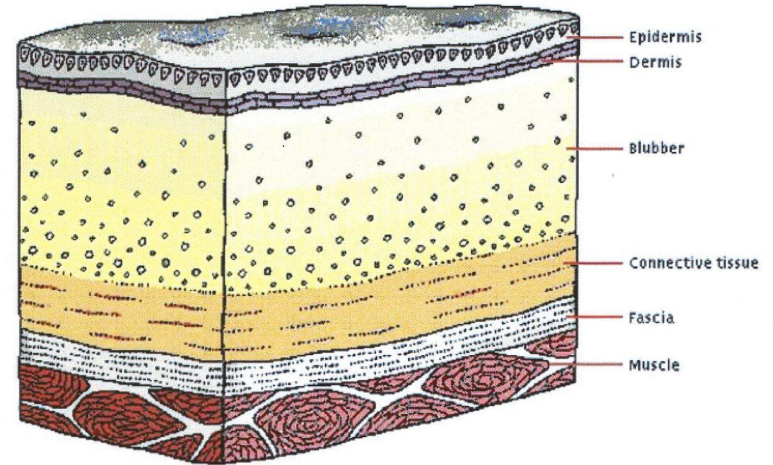
3

The fat helps them **float**, which is called buoyancy.



# Where is the blubber?

- ★ Blubber is a layer between the animals' skin and their muscle.
- ★ Go grab a ruler! Blubber can be just millimeters thick in newborns but then grow to be up to 19 inches thick!
- ★ Animals that live in colder climates have a thicker layer of blubber than animals that live in warmer climates.



Can you  
put the  
whales in  
order  
from  
thinnest  
to  
thickest  
blubber?

Humpbacks travel from cold to warm waters. Their blubber is about 5 inches thick.

The bowhead whale lives in sub-zero polar waters. So their blubber can be 19 inches thick.

The minke lives in warm waters. Their layer of blubber is about 3 inches thick.

## Fill in the blanks ...

- Whales are \_\_\_\_\_ blooded like humans.
- Whales don't have blubber on their \_\_\_\_\_.
- Bowhead whale blubber can be \_\_\_\_\_ inches thick!
- Whales' blubber traps heat like a \_\_\_\_\_.
- Polar bears also have \_\_\_\_\_ to help them keep warm.

HOW DO  
WHALES,  
PENGUINS, &  
POLAR BEARS  
KEEP WARM?

Sea  
Animals



Rewatch  
this  
video to  
check  
your  
answers!

INQUIRE



# Time to question!

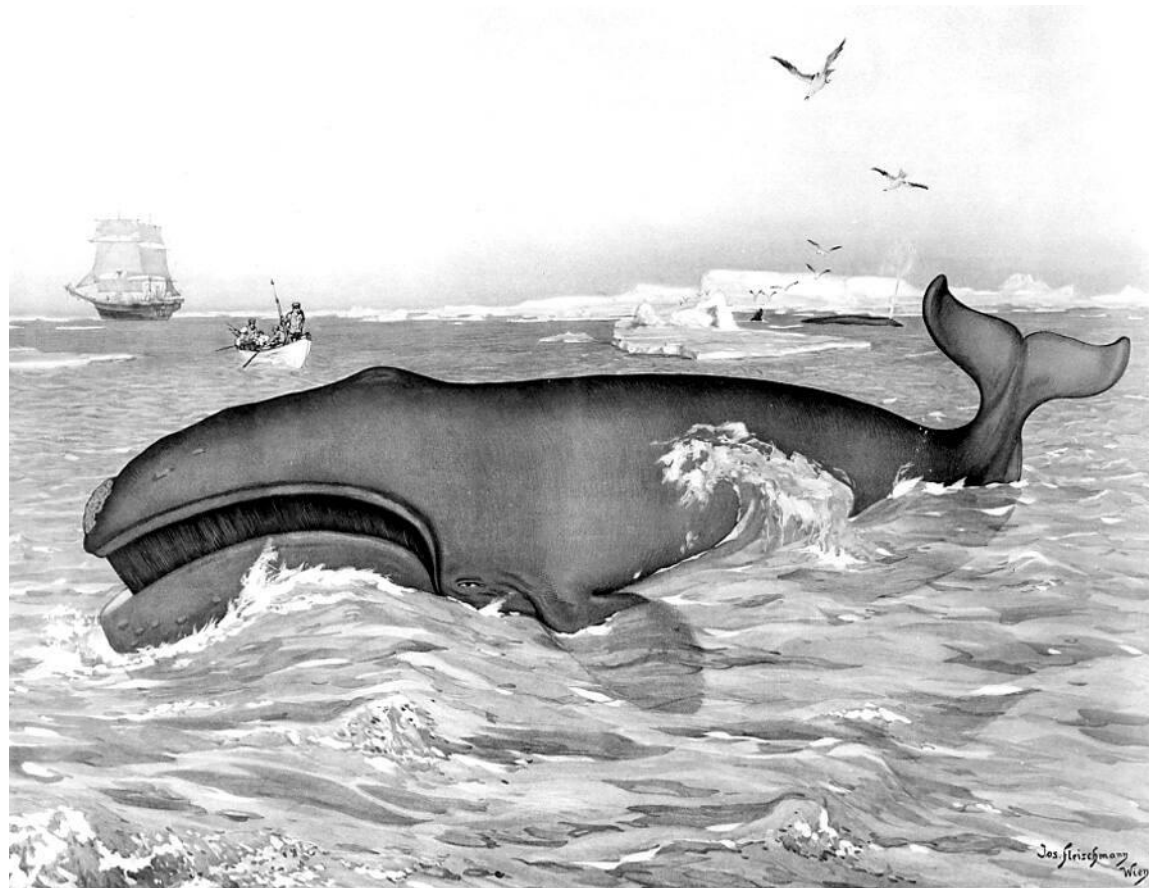
Take a look at the next two images. What do you know about blubber? What questions do you still have? What more would you like to learn about how Arctic animals survive in the cold?

## BLUBBER REFLECTIONS

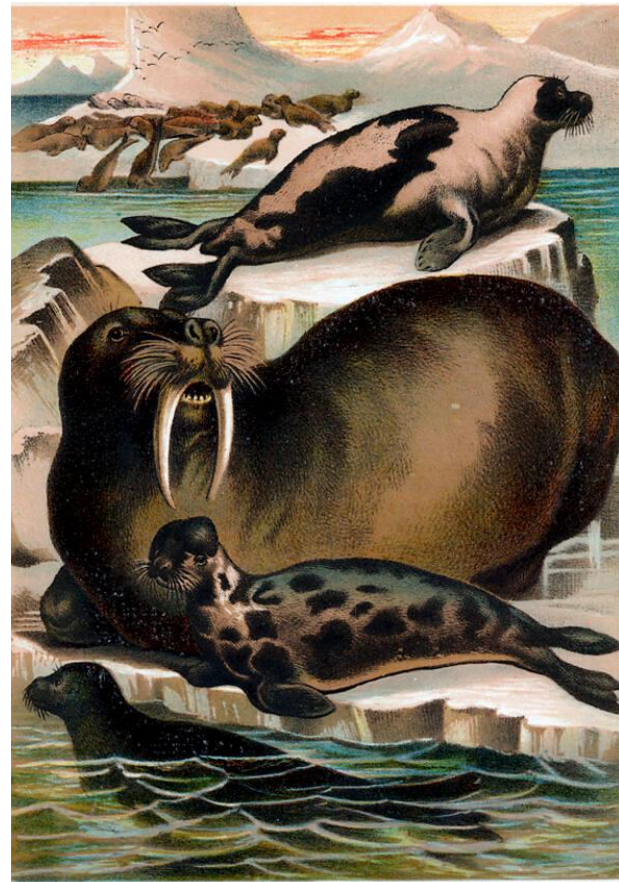
**Directions:** Take a good look at the images. Add one question or thought to each bubble. What's on your mind?

NAME: \_\_\_\_\_



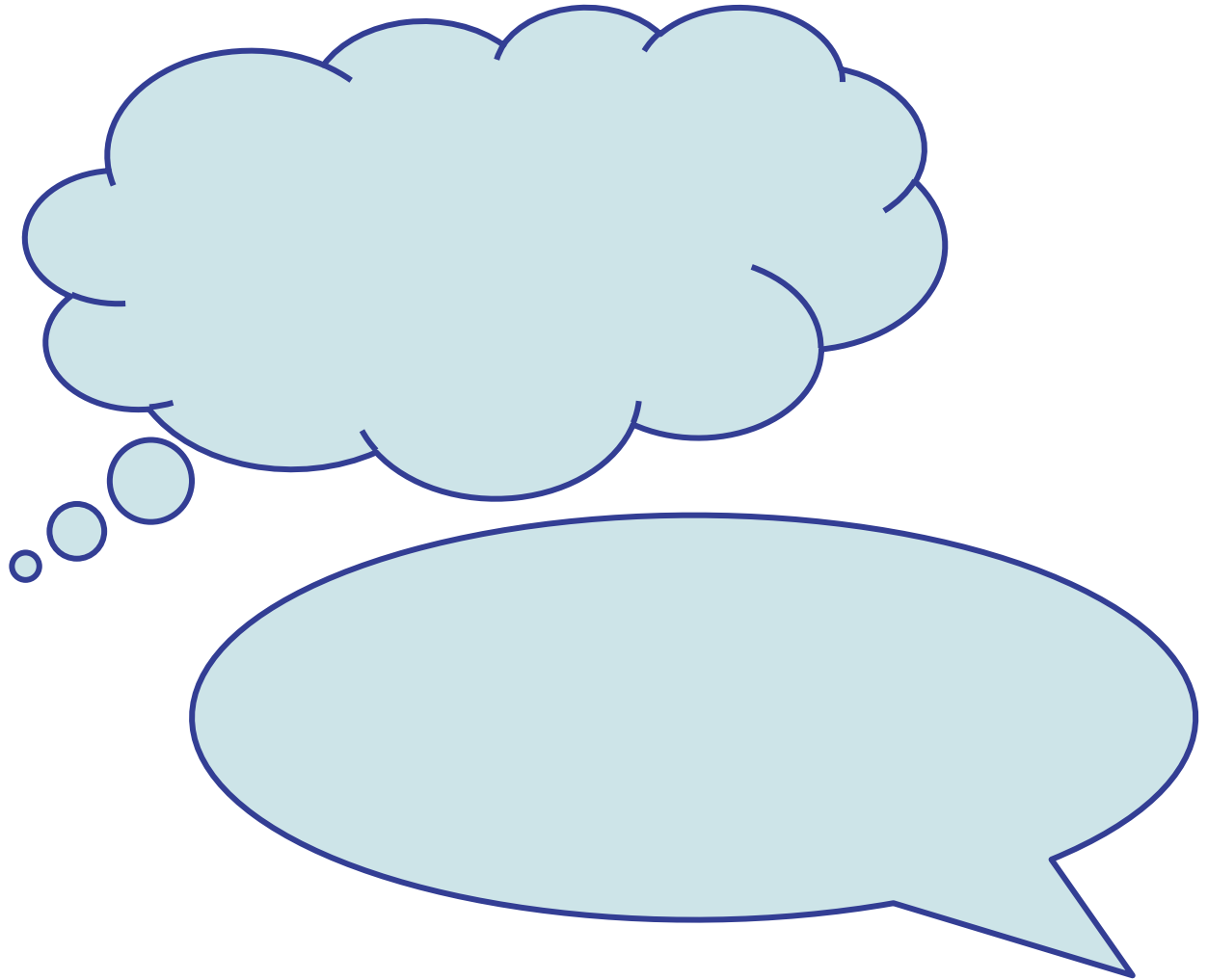


Bowhead Whale



Walrus and Seals

What  
questions  
do  
you  
have  
about  
blubber?



IMAGINE

# Time to create!

Ready to create an experiment to see what it is like to have blubber? Follow the steps in the Activity Guide to work as a class and take turns to see how “blubber” can protect you from cold water temperatures.

## Activity Guide: Blubber Gloves

### Your Challenge

It's time for an experiment! Humans and whales are both warm blooded, but only whales have blubber. Do you want to see how blubber forms an insulating layer from the cold? You will use bags and cooking shortening to create a layer of “fat.” You will test what it feels like to put your hand in icy cold water with and without the protective layer. Are you ready?

### Time to Create

#### Materials

- 2 sealable bags
- spoon/spatula
- shortening
- duct tape
- bucket
- cold water
- ice
- OPT: thermometer
- OPT: timer

### STEP 1: PREPARATION

1. Scoop about 2 cups of shortening into a sealable bag. Seal the bag closed, and then smooch the shortening to line the inside of the bag.
2. Turn a second sealable bag inside out. Open the shortening-lined bag and push the second bag into it. Push the edges of the sealable bags together to close them. Tape the edges with duct tape so that no shortening can escape. Use your hand to distribute the shortening evenly between the two bags. You've made a “blubber glove.”
3. Fill a bucket full of cold water and ice.

**Optional:** Use a thermometer to measure the temperature of the water before and after you add ice. Use a timer to time how long you can keep your hand in the water (not too long!)

### STEP 2: EXPERIMENTATION

1. Take turns and place your bare hand in the cold water. What does it feel like? How long can you stand the cold?
2. Let your hand warm up (or use your other hand) and place it inside the baggie “glove” so that it acts like a mitten. Now put your hand -- while inside the bag -- in the bucket of ice water. How does it feel different? How long can your hand stay in the cold water with the blubber glove?
3. Discuss how this experiment relates to an animal's layer of blubber.





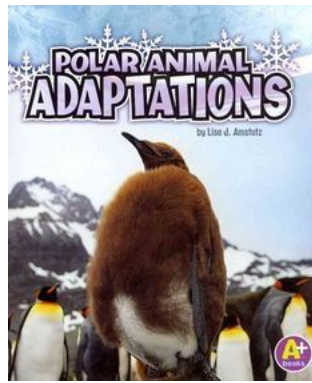
# Additional resources

**Nat Geo Wild!**: Narwhals: The Unicorns of the Sea (video)

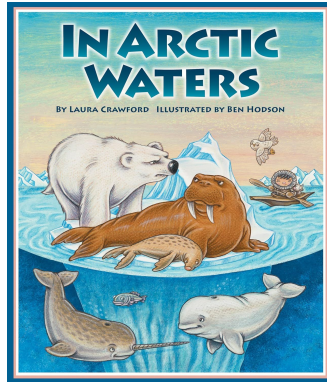
**National Geographic**: Blubber (Encyclopedic Entry)

**National Park Service**: Wildlife of the Arctic

**WWF**: Bowhead Whale Habitat and Migration



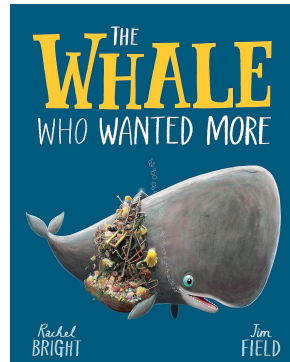
***Polar Animal Adaptations***  
by Lisa J. Amstutz



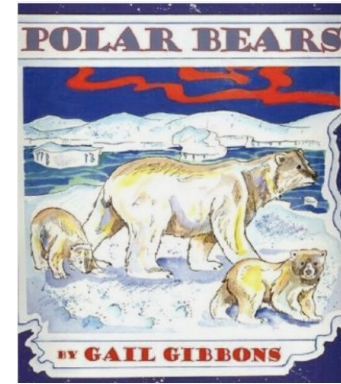
***In Arctic Waters***  
by Laura Crawford



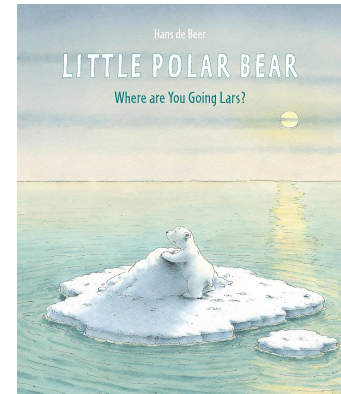
***The Magic School Bus  
Presents: Polar Animals***  
by Cynthia O'Brien



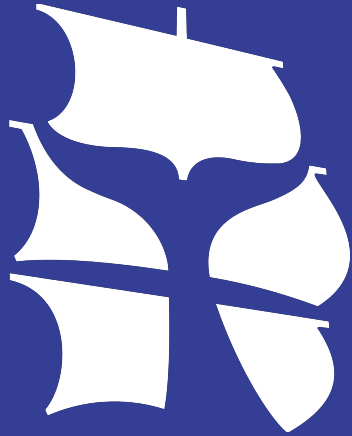
***The Whale Who  
Wanted More***  
by Rachel Bright



***Polar Bears***  
by Gail Gibbons



***The Little Polar Bear***  
by Hans de Beer



For more  
classroom activities,  
visit the  
New Bedford Whaling  
Museum website:

[www.whalingmuseum.org](http://www.whalingmuseum.org)

# Media citations

Slides 4 & 5 image: New Bedford Whaling Museum, [Arktische Fauna](#)

Slides 7 & 12 video: *How do Whales, Penguins, and Polar Bears Keep Warm?*  
From [SciShowKids](#); [https://www.youtube.com/watch?v=TwfKcX\\_8fbA](https://www.youtube.com/watch?v=TwfKcX_8fbA)

Slide 9 image: New Bedford Whaling Museum, Blubber Illustration

Slides 15 images: New Bedford Whaling Museum, [Bowhead Whale](#), [Walrus and Seals](#)

Slide 19 video: New Bedford Whaling Museum, [Blubber Glove](#)