



MOM & ME: A POLAR BEAR SURVIVAL STORY

5TH-8TH GRADE

Created by Emily Miller

TRANSFER GOALS:		ESSENTIAL QUESTIONS:
Students will be able to independently use their learning to... <ul style="list-style-type: none"> Analyze cause and effect relationships to develop sequenced predictions about natural phenomena Gather information from a source to complete a task 		How is sea ice related to polar bear populations?
STANDARDS:	MATERIALS:	OBJECTIVES:
Next Generation Science Standards: MS-LS2-1 Common Core State Standards Connections: ELA/Literacy - RI.5.1,2,3,5,7,9 RST.6-8.1 RST.6-8.7	For Activity 1: <ul style="list-style-type: none"> <i>All About Polar Bears</i> Powerpoint Copies of <i>Mom and Me: A Polar Bear Crossword Puzzle</i> Computers with Internet access (or copies of mini-posters) Pencils and erasers For Activity 2: <ul style="list-style-type: none"> Copies of Graph A (<i>Break-up Dates 1979-2020</i>) Copies of Graph B (<i>Lone Female Body Mass, 1980-2020</i>) Copies of <i>Polar Bear Ecoregions Map</i> (optional) 	Students will know... <ul style="list-style-type: none"> Why sea ice plays an important role in polar bear population health Students will be skilled at... Collecting information from a provided source to complete a task Accurately Interpreting data from a graph Students will understand that... <ul style="list-style-type: none"> Polar bear populations and sea ice formation have a cause and effect relationship Climate change is changing sea ice formation
DESCRIPTION:	VOCABULARY:	
Through independent research, group work, and class discussion about the natural history of a polar bear, students will recognize the connection between polar bear survival and sea ice. This lesson contains several activities.	*Review Polar Bear Crossword Puzzle	
	DURATION:	
	This lesson contains several activities <ul style="list-style-type: none"> PowerPoint: 15 minutes Activities 1 and 2: Two 50-minute class periods 	

Activity 1:

- Have students watch the *All About Polar Bears* PowerPoint appropriate to their grade level for an engaging introduction to the polar bear world. (<https://polarbearsinternational.org/education-center/teaching-and-learning-materials/>).
- Give each student a copy of *Mom and Me: A Polar Bear Crossword Puzzle*. Have students explore the Polar Bears International website. The Polar Bear Facts and FAQ page is a good place to start (<https://polarbearsinternational.org/polar-bear-facts/>), (<https://polarbearsinternational.org/faq/>).



Activity 2:

- Look at Graph A: *Break-Up Dates 1979-2020*. As a group, ask students to make observations and share what they notice in Graph A.

♦ For this section, we suggest having students independently at first and then transition to a pair and share to answer the questions below. You may also choose to finish with a class discussion.

* With younger students that have not had experience interpreting graphs, this might be a good opportunity to work in a class discussion style.

1. In 1980, estimate when did the ice begin to break up? (Answer: June 30)
2. In 2005, when did the ice begin to break up? (Answer: June 18th)
3. Is the ice breaking up sooner or later each year? (Answer: Sooner)
4. What do you think may be causing the ice to break up earlier each year?
5. List several ways this earlier ice break-up negatively affects polar bears.

(Answers:)

- Polar bears hunt ringed seals from the sea ice. Earlier break-up means less hunting time.
- Less hunting time means bears cannot gain the weight they need for their winter fast.
- Weight gain for females is essential because they are hunting both for themselves and their cubs.
- Earlier ice break-up means bears are losing their habitat and coming ashore earlier, potentially creating a human/wildlife conflict.

- Look at Graph B: *Female Polar Bear Body Mass, 1980-2020*. This graph shows a steady decline in average female polar bear body mass and weight. We suggest having students work in small groups to answer the questions below for this section. You may then choose to finish with a class discussion.

* With younger students that have not had experience interpreting graphs, this might be a good opportunity to work in a class discussion style.

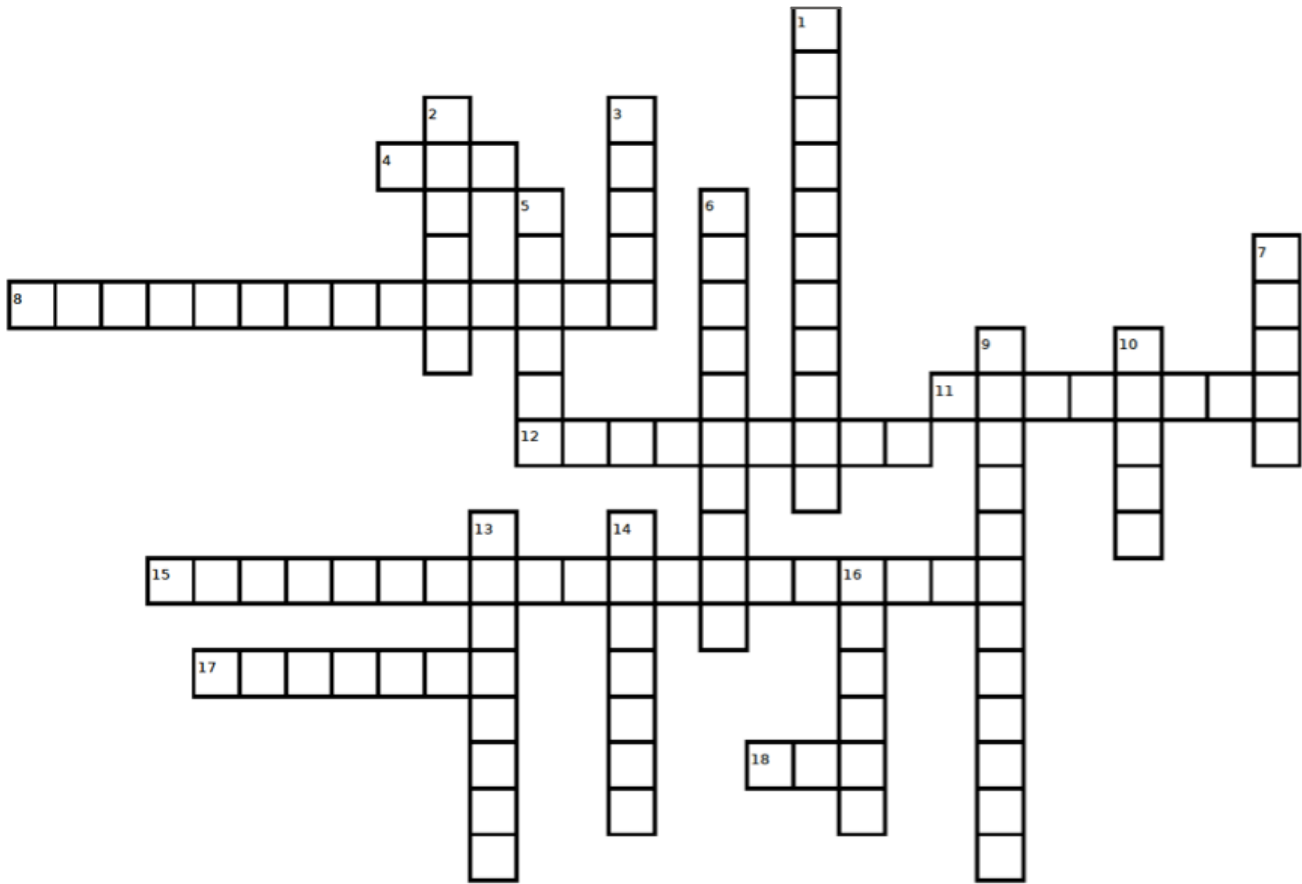
1. What was the average weight of a female polar bear in 1980? (Answer: 300kg)
2. What was the average weight of a female polar bear in 2005? (Answer: 225kg)
3. How much lighter were polar bears in 2005 than in 1980? (Answer: 75kg)
4. What negative effect does lighter body mass have on a polar bear? (Answer:)

EXTENSION:	ADAPTATION:
<ul style="list-style-type: none"> • Providing time for immediate climate action may ease anxiety, or stress about climate change and its effects on polar bears and humans. Something as quick as turning the lights off in the classroom for an hour can empower students in feeling like they have input in their classroom community. You can also offer other solutions like planting a classroom window garden or working together to clean up the schoolyard. • For more involved solutions, see the <i>Energy Island</i> lesson in the “Paws Up for Polar Bears” 5th grade unit: https://polarbearsinternational.org/education-center/units-lessons/paws-up-for-polar-bears-unit-plan/ • Provide opportunities for students to reply to PBI’s Mom and Me “Flips” at https://flipgrid.com/polarbearsint 	<ul style="list-style-type: none"> • If students are new at interpreting graphs, this lesson could be used or paired with another lesson to introduce graph reading skills • This lesson can be done as a class discussion with abbreviated questions for younger students.
REFERENCES	
<ul style="list-style-type: none"> • <i>All about Polar Bears</i> PowerPoint: https://polarbearsinternational.org/education-center/teaching-and-learning-materials/ • Polar Bears International Website FAQ: https://polarbearsinternational.org/faq/ • Youtube Video “When will polar bear populations collapse: The answer is up to us”: https://youtu.be/I7Z1H4pUfIQ • <i>Explore Our Solutions</i> Handout: https://downloads.ctfassets.net/i04syw39w9p/2PLxXi79wLqP7moFT7ehZX/c3b1835c442282908b560f71566854a6/YouthSolutionsPiece_2022.pdf • Flat Nanuk Handout: https://assets.ctfassets.net/i04syw39w9p/6lLAgZp2rCtf2Y1JrkKOZ9/4da353882b96cabaf31b269987d06935/flat_nanuk.pdf 	



POLAR BEAR CROSSWORD PUZZLE

Using the clues below, write the answers directly into the crossword puzzle boxes.



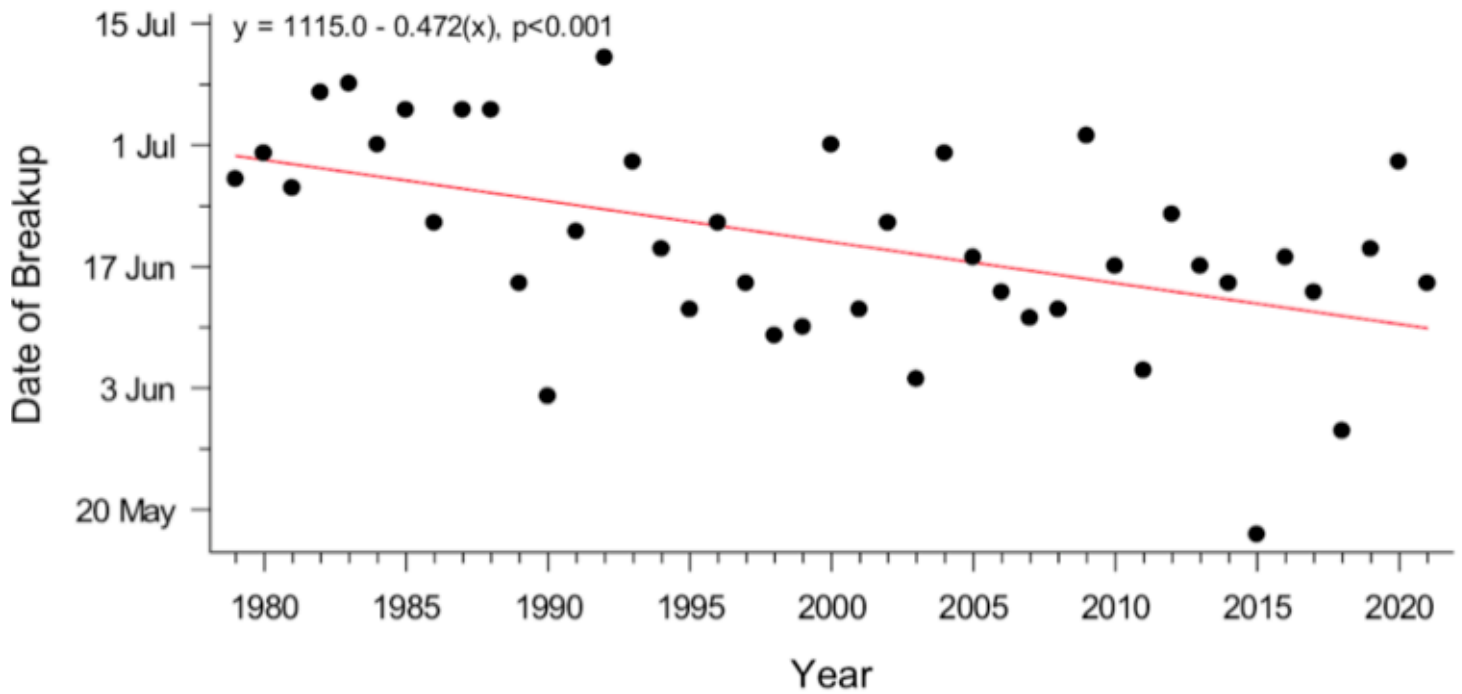
DOWN:

1. Polar bears' favorite food (two words).
2. The number of months a polar bear cub nurses.
3. Openings in the sea ice.
5. The polar bear's only enemy.
6. The mother bear does not do this for the entire time she is in the den (three words).
7. Number of months a female polar bear stays in the den to give birth.
9. A snow cave where cubs are born cubs (two words).
10. The color of a polar bear's skin.
13. The number of different bear populations in the Arctic.
14. Polar bears do not have this but they eat it.
18. Polar bears live an average of 15-18 years old, but biologists have tagged bears around this age.

ACROSS:

4. Number of cubs a polar bear mom typically has.
8. The Latin species name for "polar bear" (two words).
11. Small bumps that keep polar bears from slipping on ice.
12. What polar bears are called after they leave their mothers between the age of 2 to 2½ years old.
15. Used in reproduction to time the birth of cubs during the most favorable conditions for survival (two words).
16. A flat sheet of ice floating in the sea (two words).
18. Polar bears need a thick layer of this to keep warm and survive when food is scarce.

GRAPH A: BREAK-UP DATES PER YEAR



GRAPH B: FEMALE POLAR BEAR BODY MASS

