

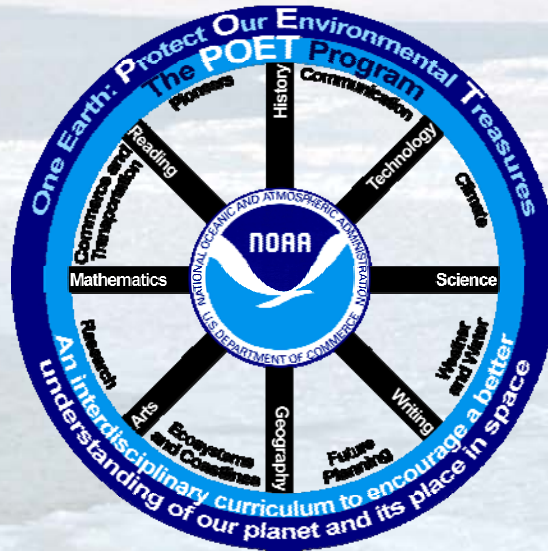
Arctic Sea Ice

Category

History, Technology,
Mathematics, Science,
Art

Real World Connection

Future Planning,
Coastal Areas,
Climate, Research



Materials

Calculator, Scissors,
Heavy Duty Stapler

Maps of Arctic Sea
Ice Extent –
1979 to Present
(Included)

Paper Cutter
(Optional)

Problem Question

How has the area of Arctic sea ice changed over recent years?

Prior Knowledge What I Know

Based on your prior knowledge, answer the problem question to the best of your ability.

Conclusion What I Learned

Answer the problem question after completing the activity. Include an example in your answer.

Background

In the early 1600's, Henry Hudson, an English explorer, sailed north and west toward the North Pole from Europe on four different occasions. Hudson sailed under flags of different countries, whoever would finance his adventure, looking for a short-cut from Europe to the riches of the Orient. Each time he was defeated by the cold and seemingly endless expanses of ice.

On his last trip, Hudson sailed deep into what is now the United States and Canada without success. Hudson's crew wanted to return home to Europe. When Hudson refused, the crew mutinied. The angry sailors put Hudson, his teenage son, and the sailors loyal to him into a small boat with no supplies. Clearly meant to die in the frigid wilderness, Hudson and his fellow passengers were never seen again.



Although, Henry Hudson failed to find a northwest passage to the Far East from Europe, he succeeded in exploring vast areas of the North Atlantic and, therefore, played a major role by setting the stage for colonizing North America. Hudson established friendly trade with the Indians, helped to establish New Amsterdam (New York) and explored the river that bears his name. Sadly, records of his voyages, including his original notes, were scattered after his untimely death.

The Arctic sea ice prevailed!

Procedure - Part 1

Graph the area (extent) of Arctic sea ice (measured in millions of square miles) over time from 1979 to 2007. Use the series of small images of the Arctic sea ice extent on the pages at the end of this activity, where you will find total sea ice extent information.

1. On the X-axis of Figure 10-1, starting with 1975, number each year up to 2007. Label the x-axis.
2. On the Y-axis of Figure 10-1, starting with 4.0, number to 8.0, counting by two-tenths.(4.2, 4.4, 4.6, etc.). Label the y-axis.
3. Use the series of small images of the Arctic sea ice extent on the pages at the end of this activity, to find the data that you need, plot the points (extent in millions of square miles for each year). Each image represents a different year.
4. Draw a line of "best fit" through the plotted points in your graph.
5. Write a title for your graph in the area provided.

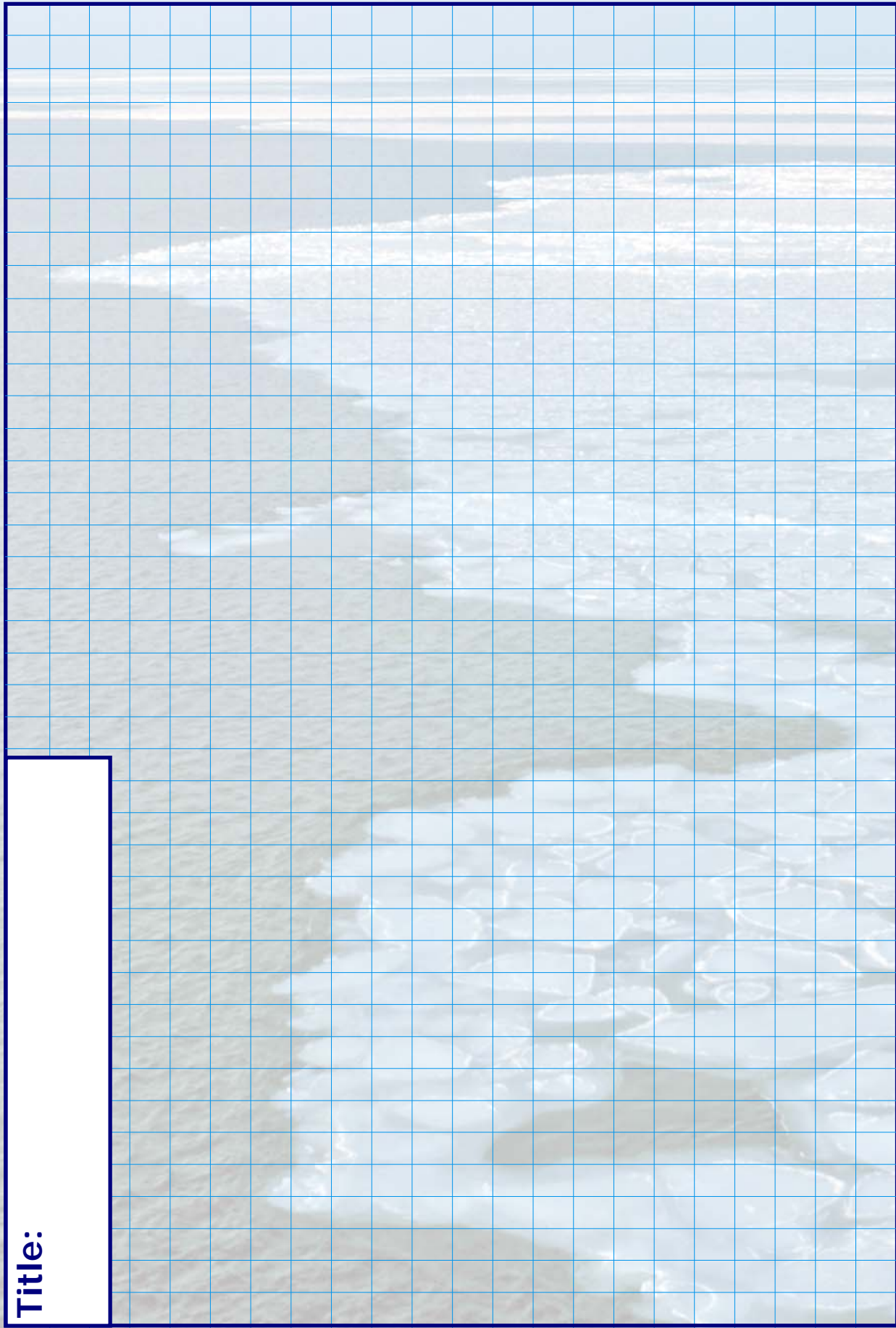


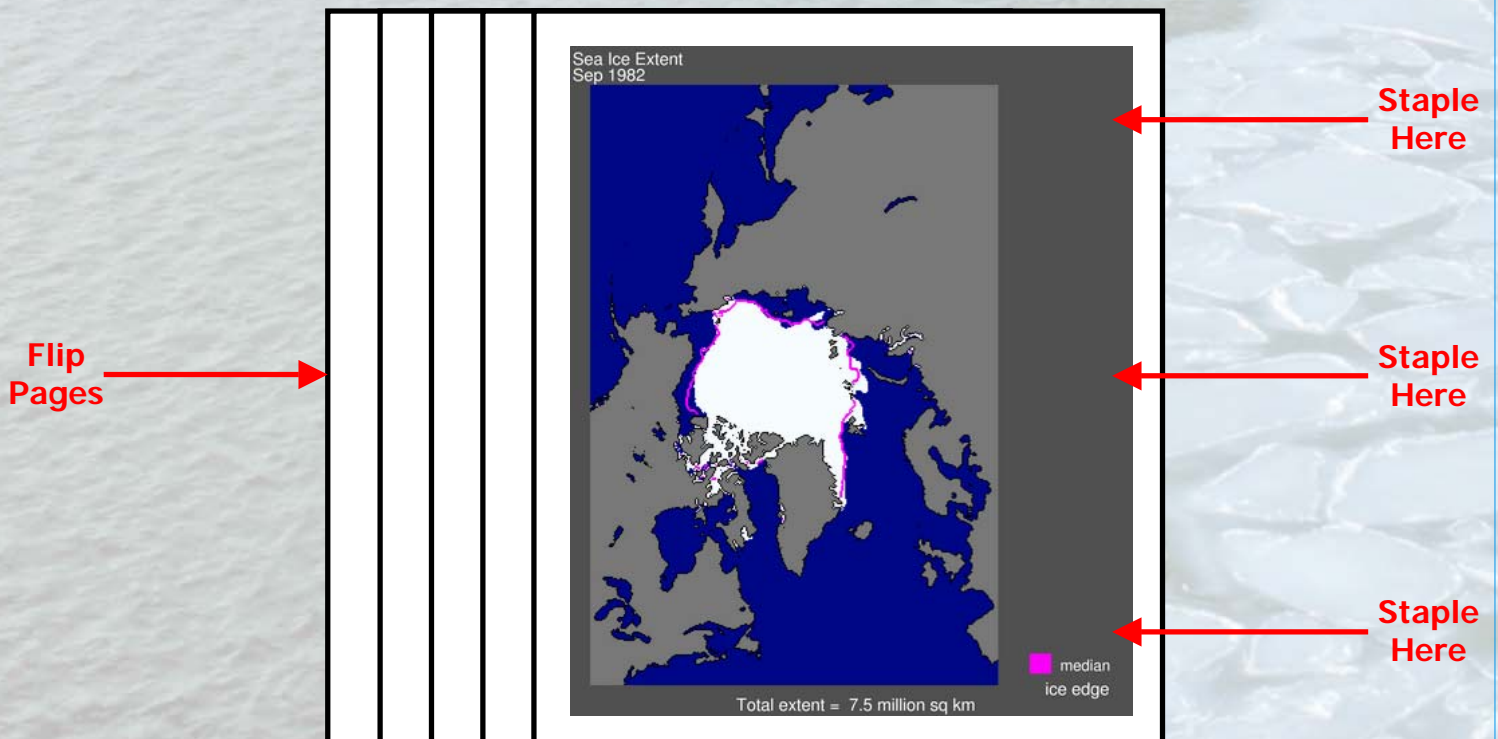
Figure 10-1. Blank graph for labeling the X-axis, labeling the Y-axis, plotting sea ice extent data, drawing a curve, and titling the figure.

Procedure - Part 2

Make a "flip" book, an animation to simulate the sea ice change between 1979 and 2007. Use the images on the next pages to create your book.

1. Cut-out each individual image. Be sure to **cut each image the same size**.
2. Chronologically, assemble the images into the pages of your book, with the most recent image on the **bottom**.
3. Holding the pages so that the side that will open is facing downward, gently tap the pages on a table so that all of the pages are evenly aligned on the side that will be flipped. The other sides need not be so carefully aligned.
4. Staple the side opposite the flip side together with two or three staples. Note that there is a dark colored blank to place the staples. Be careful to keep the pages on the side that you will flip as even as possible. If the pages become uneven after stapling, then carefully trim with a paper cutter. (Use a paper cutter under the supervision of an adult or ask an adult to do it for you.)
5. Flip the pages several times to "loosen-up" your flip book. If pages stick together, carefully separate them and flip several more times.

Voila!



Questions – Parts 1 and 2

1. Between what two years is the greatest decrease in Arctic sea ice?

For the Arctic sea ice extent between the years 1979 and 2007, answer the following questions.

2. Calculate the mean.

3. Find the median.

4. What is the mode?

5. Why is the data collected in September for each year?

6. Extend your "line of best fit" to predict the extent of Arctic sea in 2015, if the current trend continues.

7. In what year might Henry Hudson sail, unobstructed by Arctic sea ice, to the Orient from Europe if the current trend continues? (Arctic sea ice disappears)

8. Why should we be concerned about Arctic sea ice melt?

