

## Polar Opposites

### OBJECTIVES

The student will be able to understand the effects of introducing geographically non-native species to a new environment.

**National Geography Standards:** 14, 16

### MATERIALS

- Atlas; Arctic and Antarctic maps
- Computer with Internet access if available
- Writing and drawing materials including color markers or pencils

### BACKGROUND

More than 100 years ago, Eugene Schifffelin, an eccentric New Yorker who loved Shakespeare, was struck by an idea—he wanted to introduce every bird mentioned in Shakespearean plays to the United States. In 1890 he released 60 European starlings (*Sturnus vulgaris*) to New York City’s Central Park (because starlings were mentioned in the play *Henry IV*). Now an estimated 200 million starlings can be found everywhere across North America. From New York to California and Canada to Mexico, these non-native birds take away food and shelter from species native to the United States such as woodpeckers (family Picidae) and cardinals (family Cardinalidae). Non-native species can be plants, animals, and other organisms. Introducing non-native species, whether intentionally or accidentally, is one of the greatest threats to biodiversity.

Sometimes a species is so common, such as starlings, that most people may not know it was ever non-native. And misinformation can be confusing. For instance, two species found in polar regions, penguins and polar bears, are often pictured together in cartoons, movies, greeting cards, souvenirs, and so on. However, penguins and polar bears live on opposite sides of the world. Penguin species are found on every continent in the Southern Hemisphere. In addition, penguins generally live on islands and remote continental regions that are free of land predators, where their inability to fly is not detrimental to their survival. To the north, polar bears are found throughout the circumpolar Arctic.



Penguins do not fly. To avoid predation, penguins generally live where there are few land predators.

### ACTION

1. First, ask students to use the atlas or other maps to locate the Arctic and the Antarctic. Compare and contrast the two regions. The Arctic is primarily a mass of snow and ice. Antarctica is a continent—a landmass covered with ice and snow.
2. Divide students into two groups: Polar Bears and Penguins.
3. Begin a class discussion with these questions: What would happen if someone today wanted to introduce penguins to the Arctic environment? The Penguin group will investigate this. What if someone introduced polar bears to areas of the Antarctic? This is what the Polar Bear group will look into.
4. Using maps of the Arctic, the Penguin group should select an area in which they would like to introduce penguins. What food sources are available for penguins? What wildlife will they compete with for resources? What new predators will they face? Overall, what would be the impact on the Arctic ecosystem if penguins were able to survive there?
5. Using maps of the Antarctic, the Polar Bear group should select an area in which they would like to introduce polar bears. What food sources are available for polar bears? What animals will they compete with for resources? What new threats will they face? Overall, what might be the impact on the Antarctic ecosystem if polar bears were able to survive there?
6. Have the two groups present their findings using posters or oral reporting methods. Lead a class discussion about students’ findings. Is it ever a good idea to introduce animals to an ecosystem in which they are not native?



How would the Arctic ecosystem change if penguins were introduced to it?



Polar bears (*Ursus maritimus*) are not found in the Antarctic region, but what would happen if they were brought there?

### Saving My Wild

Are non-native species present in the state in which the students live? If so, which ones? Geographically, where did the species originate? What threats do these non-native species have on the state’s ecosystems? What steps, if any, are being taken to eliminate these invading species? For extra credit students could learn what species are invasive to their region and discuss ways of removing those invasive species.

### Online Sources

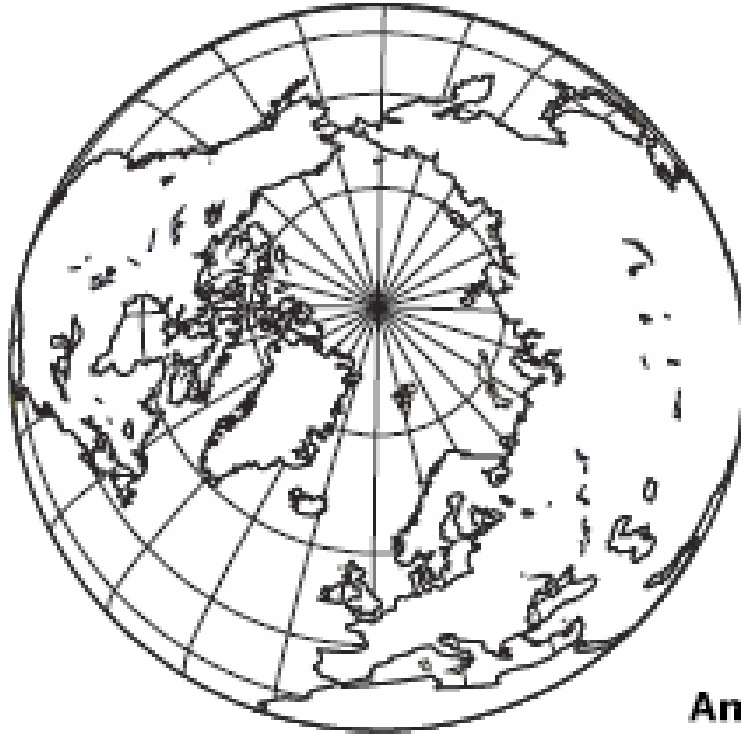
**National Geographic News. “Bioinvasion: From Old World to New”**  
[news.nationalgeographic.com/news/2001/01/bioinvasion\\_2001-01-23.html](http://news.nationalgeographic.com/news/2001/01/bioinvasion_2001-01-23.html)

**National Geographic News. “Bioinvasion: Fighting the Invaders”**  
[news.nationalgeographic.com/news/2001/02/0206\\_bioinvasion3.html](http://news.nationalgeographic.com/news/2001/02/0206_bioinvasion3.html)

**National Agricultural Library**  
[www.invasivespecies.gov](http://www.invasivespecies.gov)

**Environmental Literacy Council**  
[www.enviroliteracy.org/article.php/40.html](http://www.enviroliteracy.org/article.php/40.html)

### Arctic Map



### Antarctic Map

