**Daily Pacing Guide: Introduction to the Polar Regions**

 This pacing guide should be used in conjunction with the PowerPoint “Introduction to the Polar Regions”. Supplemental material that is paired with this lesson is included below. Not all information from the PowerPoint is included in this guide, as it is meant to support, not replace, the PowerPoint-guided lesson.

*Introducing the Polar Regions*

* Class Discussion
	+ In groups, have the students discuss the polar regions for 7-10 minutes. Have each group write their answers on a large (legal) size piece of paper to turn in. Keep these papers, as students will revisit this activity on the last day of the curriculum. Students should discuss the following prompts:
		- List 2+ facts that you know about the Arctic.
		- List 2+ facts that you know about the Antarctic.
		- In what ways are the Arctic and Antarctic similar to each other? In what ways are they different?
		- Are there any specific questions you have about these regions?
	+ Ask each group to share something that they discussed with the rest of the class. This is an opportunity to tell them they are correct or incorrect with their “facts”. Assure students that we will cover some of the information they presented and so much more.
* Video: “The Arctic vs. The Antarctic”
	+ This short 4-minute video introduces students to the differences between the Arctic and Antarctic. Give students an opportunity to ask questions or make comments about the video.
* Bathymetric Map
	+ This is a common world map. We don’t really get to see what the Arctic and Antarctic actually look like.
	+ Ask students where the Arctic Ocean is located.
		- Top of map; northern hemisphere.
	+ Ask students where Antarctica is located.
		- Bottom of the map; southern hemisphere.
* Integrated Question
	+ Give students a few minutes to talk and determine their answer.
	+ Ask if they agree or disagree with each other’s answers. Why or why not?
	+ ANSWER: The Antarctic (on the left) is a frozen continent, while the Arctic (right) is a frozen ocean.

*The Arctic*

* Satellite Image
	+ This is an image from NASA of the frozen Arctic Ocean.
* Integrated Question
	+ Give students a few minutes to talk, look back in their notes, and determine their answer.
	+ Ask if they agree or disagree with each other’s answers. Why or why not?
	+ ANSWER: The High and Low Arctic sub-regions are defined by the flora that inhabit each area.*The High Arctic is home to plants like mosses and grasses. The Low Arctic is home to hardier plants like shrubs and willows.*
* The Arctic Ocean
	+ Make sure to stress that it is a frozen ocean surrounded by land.
* Geopolitical Status of the Arctic
	+ Race to drill in the Arctic
		- “Russia and China vie to beat the US in the trillion-dollar race to control the Arctic” by Clay Dillow for CNBC: [*https://www.cnbc.com/2018/02/06/russia-and-china-battle-us-in-race-to-control-arctic.html*](https://www.cnbc.com/2018/02/06/russia-and-china-battle-us-in-race-to-control-arctic.html)
			* Russia, China, US, Finland, Canada, and other arctic nations are interested
			* Up to $35 trillion worth of oil and natural gas (20% to 25% of the world’s untouched fossil fuels)
			* Also minable minerals (gold, silver, diamonds, copper, titanium, graphite, uranium, and other rare elements)
			* Warming ocean temperatures will melt the sea ice and open up “new sea lanes” 🡪 will allow more ships and larger ships
			* Not good for the environment
				+ Can anyone think of why?

*The Antarctic*

* Satellite Image
	+ This is an image from NASA of Antarctica.
	+ Point out East Antarctica, West Antarctica, the Transantarctic Mountains, and the Antarctic Peninsula.
	+ Facts from Emslie, Steven. *Lecture I Introduction to Antarctica* PowerPoint Presentation, slide 4.
		- coldest, windiest and most remote place on Earth
		- mean annual temperature at -50° C (-18° C in Arctic)
		- coldest recorded temperature on Earth at -89° C, or -129° F
			* New study shows that the coldest temperatures on Earth can reach −94 ± 4 °C (about −138 °F)
				+ Read more here: <https://doi.org/10.1029/2018GL078133>
* Antarctica Compared to the US Image
	+ Continental US for size comparison
	+ Roughly the size of US and Mexico combined
* The Southern Ocean
	+ The only place on earth where wind can move completely around the world without ever touching land.
* South Pole Image
	+ The flags in this image represent the countries that signed the original Antarctic Treaty.
		- From left to right: United Kingdom, Norway, United States, Great Britain, France, and Japan
* Antarctic Flora
	+ The only 2 vascular (flowering) plants can be found on the Antarctic Peninsula.
* Integrated Question
	+ Give students a few minutes to talk and determine their answer.
	+ Ask if they agree or disagree with each other’s answers. Why or why not?
	+ ANSWER: There are no terrestrial mammals, only marine mammals. This is due to the harsh environment. These are just some of the marine mammals that you might be able to find in Antarctica. We will be learning all about these animals later in the week/month (depending on how your lesson schedule is designed)

*Activity*

* Worksheet: “Introduction to the Polar Regions”
	+ There are 2 maps, 1 of the Arctic and 1 of the Antarctic, that students should label. Using colored writing utensils might make it easier to separate everything. Don’t forget to answer the questions on the last page. Internet, books, notes, etc. can be used to complete this assignment.

*Exit Ticket*

* Have students complete and turn in before they leave.