Southern Life Digital Breakout

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Summary

Students will explore the history, climate, and ecosystem of Antarctica as they access various documents and real scientific data collected by researchers during field experiences along the West Antarctic Peninsula. Significant events in Antarctic Exploration, Research, Technology, and Policy will be discussed and relevant concepts and principles relevant to climate and polar literacy standards will be assessed via a completed worksheet. In addition to historical and policy information, students will also explore data from Palmer Station’s LTER (Long Term Ecological Research) Program. Information obtained during their exploration will assist students in completing a student worksheet while also “opening locks” using a Digital Breakout format. Students may work in pairs to complete the Digital Breakout and the Southern Life Activity Worksheet.

*[TAGS: LTER, Digital Breakout, Antarctica.]*

Key Concepts

* Antarctic Exploration and Policy
* Antarctic Food Web and Ecology
* Impacts of Climate Change on Population Dynamics

Objectives

Include clear, measurable statements of what students will be able to do, such as:

* Develop and use multi-tiered learning levels to solve and “open locks” for the Southern Life Digital Breakout.
* Apply knowledge gained during the Digital Breakout to identify the advantages and disadvantages of conducting research in Antarctica.
* Use graphing skills to analyze and interpret data collected using gliders and marine mammal tags.
* Collaborate with a partner to examine biotic and abiotic variables and parameters (including climate change) that impact the ecology in the West Antarctic Peninsula.

Materials

* The following materials are provided to assist the successful completion of the Digital Breakout and Activity Worksheet:
	+ Website link to Southern Life Digital Breakout Activity
	+ Southern Life Digital Breakout KEY
	+ Resource links for background and additional information
	+ Student Southern Life Activity Sheet
	+ Southern Life Activity Sheet KEY

Procedure

**Recommendations**:

Use this activity as a review session for concepts relevant to Energy Transfer through an Ecosystem or Environmental Impacts to Ecosystems. It is also recommended that the teacher work through the Digital Breakout to become familiar with the content presented in the activity.

1. Provide students will a link to the Southern Life Digital Breakout Activity: <https://sites.google.com/view/southern-life>
2. Allow students to work in pairs as they complete the Digital Breakout and the Southern Life Activity Worksheet.
3. Assess student performance based on their accurate completion of the Activity Worksheet and Digital Breakout.

Assessment

* **Formative assessments**—Digital Breakout activities encourage students to use different cognitive patterns than normally used in academia.
* **Summative assessments**—Student knowledge will be assessed using the Southern Life Activity Worksheet. The worksheet addresses Climate and Polar Literacy Standards and Science Standards for the transfer of energy through an ecosystem; aquatic food webs; exploration; and sea ice morphology.

Additional Resources (**Resources for Southern Life Digital Breakout Activity)**

<http://snotes.com/snotes/ss.php?snoteId=5970d369043775.13370439> (Snotes link)

<http://puzzlemaker.discoveryeducation.com/code/BuildWordSearch.asp> (Word Search link)

<http://www.coolantarctica.com/Antarctica%20fact%20file/History/exploration-history.php> (History of Antarctic Exploration)

<http://lrs.ed.uiuc.edu/students/downey/project/penguins.html> (Info of number and types of Antarctic penguins)

<https://www.nsf.gov/geo/opp/support/palmerst.jsp> (Date for Palmer Station)

<https://www.usap.gov/videoclipsandmaps/palwebcam.cfm> (Palmer Station Info)

<http://www.ats.aq/documents/ATCM32/op/atcm32_op022_e.pdf> (Antarctic Treaty info)

<http://coseenow.net/converge/how-gliders-work-a-look-inside-the-blue-hen/> (Converge Page, including “How Gliders Work” info)

<http://news.nationalgeographic.com/news/2013/08/130817-antarctica-krill-whales-ecology-climate-science/> (NatGeo article on vital role of krill to Antarctic Food Web)

Extensions or adaptations

List any adaptations to the lesson that will make it more accessible to a wider audience, or any extensions that will move the lesson beyond initial understanding or experience.