STEAM *(Science, Technology, Engineering, Art & Math)* **Lessons Based on 'A Whale's Tale'**

***Where* in the World is Antarctica?**

STEAM Lessons (geared to elementary students)

SCIENCE	**TECHNOLOGY**	ENGINEERING	**ART**	MATHEMATICS
• Careers • Measurement • Research • Technology use	• Display/presentation • Input data • Printing • Word processing	• New technologies • Technology use • Use tools with precision	• Graphics • Layout • Technology use • Visual displays	• Distance • Online tools for measurement
GEOGRAPHY	LANGUAGE ARTS			
• Actual location • Environment, habitat • Physical differences	• Comprehension • Main idea • Speaking/listening • Supporting details			

Modify unit lesson pieces to meet content area/grade level requirements. You may find additional standards (including state level) that apply to the activities, feel free to add them to your documentation.

***Where* in the World is Antarctica?** T*echnology* focus through the manipulation of several computer application programs and on line resources to build *geography* concepts and understanding. V*isual arts* focus with the layout of graphic elements. Activities can be done individually, in pairs or triads depending on technology available and student expertise/objectives.

Materials	• Access to A Whale's Tale Film (http://bluesteam.org/video/)	• Computers and internet access • Printer
High order questions:	• How is technology being used by the scientists? • Why do you think the scientist who wrote the narrative had the whales explain what was happening to them? • What are graphics? • How do scientists use computers?	• Why do you think the scientists share information learned about different places and the animals that live there? • How do you think the scientists felt when they tagged Wyatt and Wendy? • Why do you feel that way? (literature components, summarizing and supporting) • What is a computer application? • How does this group of scientists use photographs and video to support their research?
Engage	**Set focus for video viewing** (to meet content requirements), Watch ***A Whale's Tale: Wyatt's Antarctic Adventure with the Scientists*** – available at http://bluesteam.org/video/ • Discussion, use a circle map or other graphic organizer in discussion after viewing the video • **Technology Focus**: What types of technology do scientists use? Why do them require those tools?, How do they use them?	

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- **Geography Focus**: What did you learn about the place featured in this video? How would you describe it? How would you get there from here?
- **Visual Art Focus** = Why should you plan the layout of your document?, How can the elements of art and principles of design help you create an aesthetically pleasing document?, How did the scientists use art skills in their research?

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<tr><td>Explore</td><td>

Scientists use technology to collect and analyze data. Computer literacy is a required skill.

A Whale's Tale Computer Projects (worksheet attached at end of lesson)

Part 1 Word or word processing application

- Copy, paste and make corrections to passage
- Add required elements

Part 2 Word or word processing application

- Change margins and orientation
- Add vocabulary and insert definitions
- Use spell/grammar check
- Insert shape
- Erase directions

Part 3 Word or word processing application

- Create or copy table
- Insert clip art
- Complete additional elements
- Print

Part 4 PowerPoint or presentation application

- Create a title page, add 4 more pages
- Change layout to blank on slides 2 & 4
- Using shapes create either a whale or a penguin on page
- On page 2 use a numbered (bullet) list type out 5 things you know about your topic (whale/penguin)
- Add a whale or penguin to page 4
- Run slide show
- Change the backgrounds or design of your presentation
- Create a slide anyway you want but stay on topic

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A Whale's Tale Computer Projects (continued)

Part 5 PowerPoint or presentation application

- Locate and open Microsoft PowerPoint
- Create a title page, add 4 more pages
- Research a career in science
- Include a description of the job
- Educational requirements for the job
- At least 3 types of technology you would be required to use
- Create a visually appealing document, adding clip art or shapes, changing background etc. – student choice
- Save as your presentation
- Share your presentation

Part 6 Application choice

- Choose your application and input the following information:
- Answer the following questions:
  - What are the names of at least 3 stations in Antarctica? (use a map)
  - What is the distance between Washington D.C. and Antarctica? (in both kilometers and miles)
  - What is the distance between your home and the South Pole? (in both kilometers and miles)
  - If you were going to Antarctica what means of transportation would you take and how long would it take you to get there?
  - What would you want to research if you were going to Antarctica and why did you choose that topic?
- Share and discuss group choices

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	• Save as and share your presentation	
Explain	• Model processes and skills as needed for the group • Encourage further research in areas of student interest • Help with technical issues as needed (individually or group)	

Elaborate	• Share PPT presentations with class
	• Discussion based on student presentations
	  ○ What is the benefit of PowerPoint for research presentations?
	  ○ What did you think was the most interesting thing you learned about Antarctica?
	  ○ Do you think it is important to protect the habitat of Antarctica? Why or Why not?	

Evaluate	• Students reflect on personal and group learning.
	  ○ What was observed?
	  ○ What conclusions can you make?
	  ○ What did you learn about Antarctica?
	  ○ What did you learn about scientists?
	  ○ Plan next steps for future learning.	

Extend	• Read **A Whale's Tale - Wyatt's Antarctic Adventure: Tagged by Scientists** (narrative available at http://bluesteam.org/books/)
	• Read **Color Wyatt the Humpback Whale and his Antarctic Friends** (coloring book available at http://bluesteam.org/books/)
	• Conduct additional research about scientific careers and/or the use of technology.
	• Word list/crossword puzzles (available at http://bluesteam.org/activities/)
	• Complete other art/craft projects
	• Read literature about Antarctica
	• Research marine life, habitat and/or geography.
	• Complete other integrated units in the series (available at http://bluesteam.org/resources/):
	  ○ *Who Lives in Antarctica?*
	  ○ *What is Buoyancy?*
	  ○ *When Should I Care for the Earth?*
	  ○ *Why is This Whale Talking?*
	  ○ *How Can I Build That?*	

Geography Essential Elements and Standards	**Language Arts - Common Core Standards**
National Geographic Education Source of Standards **Geography Essential Elements and Standards** • WST – The World in Spatial Terms • PR – Place and Regions • PS – Physical Systems • HS – Human Systems • ES – Environment & Society • UG – The Uses of Geography **Geographic Skills** 1. Asking Geographic Questions 2. Acquiring Geographic Information 3. Organizing Geographic Information 4. Analyzing Geographic Information 5. Answering Geographic Questions	**Kindergarten** **Comprehension and Collaboration:** CCSS.ELA-Literacy.SL.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups. CCSS.ELA-Literacy.SL.K.2 Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
	1st Grade **Comprehension and Collaboration:** CCSS.ELA-Literacy.SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. CCSS.ELA-Literacy.SL.1.2 Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
ISTE Standards – Students (*International Society for* ***Technology*** *in Education*) 1. **Creativity and innovation** - Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. 2. **Communication and collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. 3. **Research and information fluency** - Students apply digital tools to gather, evaluate, and use information. 4. **Critical thinking, problem solving, and decision making -** Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. 5. **Digital citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. 6. **Technology operations and concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.	**2nd Grade** **Comprehension and Collaboration:** CCSS.ELA-Literacy.SL.2.1 Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. CCSS.ELA-Literacy.SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
	3rd Grade **Comprehension and Collaboration:** CCSS.ELA-Literacy.SL.3.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly. CCSS.ELA-Literacy.SL.3.2 Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
National Core Arts Standards **Artistic Processes** **Creating** - Conceiving and developing new artistic ideas and work. **Presenting -** Interpreting and sharing artistic work. **Producing -** Realizing and presenting artistic ideas and work. **Connecting -** Relating artistic ideas and work with personal meaning and external context.	**4th Grade** **Comprehension and Collaboration:** CCSS.ELA-Literacy.SL.4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
	5th Grade **Comprehension and Collaboration:** CCSS.ELA-Literacy.SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly. CCSS.ELA-Literacy.SL.5.2 Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

Part 1: Word Processing

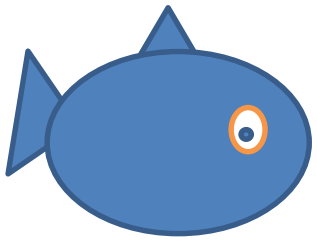
Student directions for ***Technology Projects*** *- Using a word processing application copy the following passage and make the necessary corrections to Part 1.*
(note: there are mistakes in this passage that require corrections)

We are learning about Antarctica using the Internet to find information and facts about where it is located and why it is important to us.
The scientist who wrote this storeie working hard anddoing her best at all times. She studied very hard in school and worked extra hard in math and science so she could follow her dreams.
The movie we watch used photographs and video clips taken by a team of sceintsits the reasosn the video was created was to chare information about antarcica, whales and about how some sceinstists do research .
Here are thee(or more) things I learned or found very interesting in the video.

- *Change these bullets to numbers & type in at least 3 things*
- *Erase this text*

Part 2:

- *Change the margins of your documents to .75 all the way around.*
- *Change the orientation to landscape.*
- *Type vocabulary word(s)*
  - ***Glacier***
  - ***Migrate***
  - ***Binoculars***
  - ***Zodiac***
  - ***Scientist***
  - ***Oceanographer***



- *Use an online dictionary to find the definition of the word(s)above (use copy and paste tools)*
- *Use Spell & Grammar Check*
- *Insert a shape of your choice*
- *Erase the blue italicized text*

Part 3:

1. Watch ***A Whales Tale*** for this time focusing on details
2. **Insert** the following table

   3 columns by 6 rows

   Type in the following information

	In the movie	Not in the movie
Two whales		
Penguins		
Polar bears		
Scientists		
Tourists		

3. **Insert** Clip Art whale
4. **Complete as many of the following as you can in the time remaining**
   - Put the date somewhere on your document
   - Add a title to your document using **Word Art**
   - Put page numbers in the footer
   - Using shapes create your own version of a humpback whale
   - Find and include at least 3 facts about Antarctica you did not know previously
   - Present your evidence by citing the source (copyright and ethical standards)
5. ***Print document (when possible)**

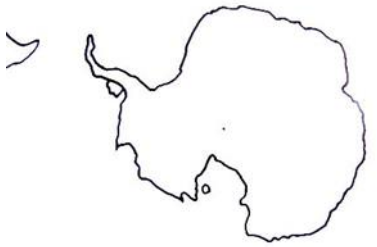
Part 4: PowerPoint or another presentation application

1. Locate and open Microsoft PowerPoint
2. Create a title page (whales or penguins as a topic)
3. Add 4 more pages
4. Change layout to blank on slides 2 & 4
5. Using shapes create either a whale or a penguin on page
6. On page 2 use a numbered (bullet) list type out 5 things you know about your topic (whale/penguin)
7. Add a whale or penguin to page 4

8. Run slide show
9. Change the backgrounds or design of your presentation
10. Create a slide anyway you want but stay on topic
11. Save as your presentation
12. Share your presentation

Part 5:

- Locate and open Microsoft PowerPoint
- Create a title page
- Add 4 more pages
- **Copy and insert the following graphic of Antarctica on page**
- **Use the insert tab to add text boxes and label the location of the following**
    - **South America**
    - **Southern Ocean**
    - **Atlantic Ocean**
    - **Pacific Ocean**
    - **Indian Ocean**
    - **South Pole**



- Research a career in science
    - Include a description of the job
    - Educational requirements for the job
    - At least 3 types of technology you would be required to use
- Create a visually appealing document, adding clip art or shapes, changing background etc. – student choice
- Save as your presentation
- Share your presentation

Part 6 (Word, PowerPoint, Publisher or other application of choice):

- Choose your application and input the following information in a visually appealing manner.
- Answer the following questions:

- What are the names of at least 3 stations in Antarctica? (use a map)
- What is the distance between Washington D.C. and Antarctica? (in both kilometers and miles)
- What is the distance between your home and the South Pole? (in both kilometers and miles)
- If you were going to Antarctica what means of transportation would you take and how long would it take you to get there?
- What would you want to research if you were going to Antarctica and why did you choose that topic?

- Share and discuss group results