POLAR TREC
Learning Resources

Details

Completion Time: About one period

Permission: Download and Share

What makes an effective scientist? Interviews with Arctic Scientists

Overview

We want students to develop the habits, traits, and qualities of effective scientists. What better way for them to learn what these traits are than by hearing from actual scientists? In this lesson, students watch video interviews with four Arctic scientists from the University of Alaska, notice what types of work scientists do on a daily basis, and make inferences about the qualities and traits that are most important for effective scientists to develop. This lesson was created by Alicia Gillean, a PolarTREC teacher who participated in a study of Arctic Ground Squirrel circadian rhythms at Toolik Field Station in 2013.

Objectives

- Students will identify some of the daily work of polar scientists.
- Students will identify qualities and traits of effective scientists.

Lesson Preparation

Prepare the technology (projector and computer with Internet access) needed to show the video "Interviews with Arctic Scientists" (http://www.youtube.com/watch?v=eOoqEK8e_08)

Background Knowledge:
This lesson works well at the beginning of the school year with little background knowledge needed. However, some students appreciate insight into the work the scientists in the video are conducting before they view the video interviews. This can be accomplished by giving students the opportunity to peruse the blog of Team Squirrel's work (http://www.polartrec.com/expeditions/arctic-ground-squirrel-studies) or by beginning the lesson with this short introductory video: (http://www.youtube.com/watch?v=CR6B_z3AF60).

Materials

- Paper or science notebooks for students
- Pen or pencil for each student
- Projector
- Computer with Internet access
- Video: http://www.youtube.com/watch?v=eOoqEK8e_08

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Procedure

- Post guiding statement: Although scientists study a variety of topics and research in a variety of ways, most effective scientists share common traits, qualities, and habits.
- Draw students' attention to the guiding statement and explain that since they are developing as scientists, they are going to explore this idea today.
- Post and share two guiding questions:
    - What types of work do scientists do?
    - What habits/qualities are important for scientists?
- Tell students that the best way to learn about the work scientists do and what qualities make effective scientists is to hear from actual scientists. Today, they will have that opportunity by watching video interviews with four polar scientists from the University of Alaska. All four scientists currently study Arctic ground squirrels.
- Tell students that as they watch the interviews, they should keep the guiding statement and questions in mind. To help them organize their thinking and observations, they will create a four-column chart in their science notebooks or on a piece of paper. Post an example chart and allow time for students to copy the four column headings: Do, Qualities/Traits, Notice, Wonder (see "Viewing Organizer" attachment).
- Explain the four columns to students:
    - *Do:* What types of things do the scientists do in their day to day work? (example: gathering data, writing reports, trapping squirrels, etc.)
    - *Qualities/Traits:* Based on what the scientists say, what qualities/traits seem to be important for effective scientists? (example: organized, curious, risk-taker, etc.)
    - *Notice:* This is the place to jot down anything interesting that you notice/observe while watching the interviews. This might relate to being a scientist or the work the scientists are doing. (example: I noticed that all of the scientists have a Master's degree or higher)
    - *Wonder:* What questions do you have as you listen to the scientists? Again, this might relate to being a scientist, the work of the scientists, life in the Arctic, etc.
- Play the video (http://www.youtube.com/watch?v=eOoqEK8e_08), pausing often to allow students to record their thoughts, discuss in small groups, and to have whole class conversations.
- After the video, lead students in a debriefing conversation. A few possible conversation starters:
    - Circle the quality/trait that you think is most important for scientists to develop. Why do you think so?
    - What did you notice about the types of work scientists do on a day to day basis?
    - What sticks with you from the video?
    - Circle the most intriguing question you recorded. How might you go about finding the answer to your question?
    - How can you apply your learning today to your goal of developing as scientist?

Extension

- Students can continue to add to their "do"/"qualities" chart and look for answers to their

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lingering questions on the PolarTREC blog that relates to the work of the scientists interviewed. (http://www.polartrec.com/expeditions/arctic-ground-squirrel-studies).
- If students asked questions in the "wonder" column of their charts that can't be answered with the blog above, you might allow them to research using other sources and share their learning with each other.
- The process described in this lesson can be repeated with a video of interviews with ocean scientists (from a NOAA Teacher at sea cruise in 2012), located here: http://www.youtube.com/watch?v=pHBHCWNLYzM
- Teacher can lead a discussion about the similarities and differences between science in the Arctic and science at sea.
- Students could explore books/articles about scientists with the same guiding questions in mind. A few suggested books are listed in the "resources" section of this lesson plan.

Resources

Resources listed in lesson plan:

http://www.polartrec.com/expeditions/arctic-ground-squirrel-studies
Alicia Gillean's PolarTREC blog about her work with scientists studying Arctic ground squirrels. Created summer 2013.

http://www.youtube.com/watch?v=CR6B_z3AF60
Introductory video to Team Squirrel's work at Toolik Field Station in 2013. Video by Alicia Gillean, June 2013.

http://www.youtube.com/watch?v=eOoqEK8e_08
Video interviews with Arctic scientists from the University of Alaska. Video by Alicia Gillean, June 2013.

http://www.youtube.com/watch?v=pHBHCWNLYzM
Video interviews with NOAA marine scientists. Video by Alicia Gillean, summer 2012.

Additional resources not listed in lesson plan:

Picture books about scientists:

Lourie, Peter. Whaling season: A Year in the Life of an Arctic Whaling Scientist. Boston: Houghton Mifflin Books for Children, 2009.

McDonnell, Patrick. Me...Jane. New York: Little, Brown, 2011.

Nivola, Claire A. Life in the ocean: The story of oceanographer Sylvia Earle. New York: Farrar Straus Giroux, 2012

http://toolik.alaska.edu/
The scientists mention Toolik Field Station. This is where they conduct much of their research.

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This is the website for the field station.

http://teacheratsea.wordpress.com/category/alicia-gillean/
Alicia Gillean's NOAA Teacher at Sea blog. Created summer 2013. Could be relevant if the video interviews with Ocean scientists listed in the "extension ideas" section is used.

Assessment
The objectives of this lesson are assessed informally through class discussion. More formal assessments can be made by studying student do/qualities charts. Students might also respond to two questions as an exit slip:
1. Describe some of the daily work of polar scientists.
2. In two or three sentences, explain what you feel are the most important qualities/traits for scientists to develop and why you think so.

Credits
This lesson was created by Alicia Gillean from Jenks Public Schools. She can be contacted at alicia.gillean@jenksps.org

Learning Resources

National Science Education Standards (NSES)

Content Standards, Grades K-4

Content Standard A: Science As Inquiry
a. Abilities necessary to do scientific inquiry
b. Understandings about scientific inquiry

Content Standard G: History and Nature of Science
a. Science as a human endeavor

Content Standards, Grades 5-8

Content Standard A: Science As Inquiry
a. Abilities necessary to do scientific inquiry
b. Understandings about scientific inquiry

Content Standard G: History and Nature of Science
a. Science as a human endeavor
b. Nature of science

Content Standards, Grades 9-12

Content Standard A: Science As Inquiry
a. Abilities necessary to do scientific inquiry
b. Understandings about scientific inquiry

Content Standard G: History and Nature of Science
a. Science as a human endeavor
b. Nature of scientific knowledge

Do?	Qualities/ Habits	Notice	Wonder