NATIONAL GEOGRAPHIC

RESOURCE LIBRARY
ACTIVITY : 50 MINS

Lion Crittercam

Students use a Crittercam video and simulation game to learn about technologies scientists use to study the health and behavior of big cat populations. Then they explore how scientific research and technology can help conserve big cat populations.

GRADES

3 - 5

SUBJECTS

Biology, Ecology, Geography, Physical Geography

CONTENTS

5 PDFs, 3 Links

OVERVIEW

Students use a Crittercam video and simulation game to learn about technologies scientists use to study the health and behavior of big cat populations. Then they explore how scientific research and technology can help conserve big cat populations.

For the complete activity with media resources, visit:
http://www.nationalgeographic.org/activity/lion-crittercam/

Program

NATIONAL GEOGRAPHIC | BIG CATS INITIATIVE

DIRECTIONS

1. Activate students' prior knowledge about big cats and their behavior in the wild.

Set the stage for the activity by activating students' prior knowledge about big cats. Discuss with students what they think of when they hear of "big cats." Ask: *What are some types of big cats that you can think of?* Elicit from students that big cats include lions, tigers, leopards, cheetahs, and other large predatory cats. Tell students to think about what the behavior of a big cat is like. One at a time, write the following questions on the board and ask students to briefly write what they know about each question:

- *How do big cats find food and hunt?*
- *How do they protect themselves?*
- *What is their family structure like?*
- *What factors threaten their survival?*

Summarize students' responses in a bulleted list. Discuss students' responses. Explain to students that it is okay if they can't answer all of the questions. In fact, big cat scientists don't even know the answers to all of the questions. That's why scientists are always doing research, asking new questions, and developing new technologies. Explain that these are questions big cat scientists try to answer so they can better understand the health and behavior of big cats in the wild. The answers to these questions can be used by scientists to conserve big cats, like African lions, whose wild populations are increasingly threatened. Explain that during this activity, students will learn about tools and technologies big cat scientists use to learn about and conserve big cats.

2. Introduce technologies and how they are used to study wild animal populations.

In preparation for watching a video, pre-teach the vocabulary. Write the following terms on the board: *radio collar, VHF radio,* and *Crittercam*. Ask: *Do you know what these types of technologies are? What are they are used for?* Record student answers on the board and then clarify any misconceptions. Provide students with the following information:

- *Radio collars* are devices that transmit radio signals. They help identify the location and track the movement of animals they are attached to.
- *VHF radios* are devices that receive radio signals emitted from radio collars, so that the radio-collared animal can be located and tracked.
- *Crittercams* are research tools designed specially for wild animals. A crittercam can be attached to the body of a wild animal. It combines video and audio recording of the animal within its natural environment. Crittercams can collect environmental data, including the depth, temperature, and acceleration of the animal relative to its environment.

Display the Laikipia Predator Project Lion Tracking Map web page. Explain that the map shows the results of radio tracking data for lions in Kenya. Select one of the lions (colored squares) and animate its tracking information. Ask: *What is the track (colored line) showing?* Show students the date and distance information on the website and elicit from them that the track is showing where and how far the lion is traveling on different days. Explain that this is an example of how radio collars and VHF radios are used to track lion populations.

3. Have students preview a concept map to prepare to watch a video.

Distribute the Video Concept Map worksheet and read aloud the directions. Discuss each component of the concept map with students. Ask: *What is the topic of the video and concept map?* (Using scientific questions and technology to study lion behavior and conservation) Explain that the circles on the concept map ask questions that are essential to understanding the main topic. Explain that scientists are a lot like detectives. Ask: *What kinds of questions do detectives ask when trying to solve a mystery?* Elicit from students that the questions detectives ask are the same basic questions asked on the concept map: Who? What? Where? Why? How? These are the same questions that scientists ask when doing research. Explain that the Who, What, and Where questions will be easier to answer than the How and Why questions. Tell students to think about these questions as they view the video you are about to show.

4. View and discuss the "Midnight Marauding Lions" video and create a concept map.

Show students the video "Midnight Marauding Lions." After watching the video, refer back to student responses for the lion behavior questions in Step 1. Ask: *Which of the lion behavior questions did the Crittercam video footage help to answer? How were your ideas about lion behavior similar to or different from what you observed in the video?* Elicit from students that all of the questions were addressed in the video. The Crittercam footage provided information about how lions hunt together at night, and how they live in groups that protect one another and help care for their cubs. Help students compare and contrast their original ideas about lion behavior to those presented in the video. Give students time to complete their concept maps. If needed, replay key segments of the video or allow them to work in pairs. Then arrange students in small groups and give them a few minutes to discuss their concept maps. Tell students to identify any similarities and differences between their individual concept maps. Then use the Video Concept Map Answer Key to discuss students'

concept maps, and review each question one at a time: Who, What, Where, Why, and How. Clarify the correct answers and elaborate as needed. Elicit from students that this questioning method is like the scientific method that scientists and other researchers use to carry out their investigations.

5. Have students play the National Geographic Crittercam: African Adventure game.

Explain to students that they will now take on the role of a big cat scientist studying lion populations in Africa. They will do this by playing the National Geographic Crittercam: African Adventure game. During the game, students will be using radio collar signals and Crittercam videos to learn more about African lions. Arrange students in small groups, depending upon the number of computers available. Tell them that after completing the game they will need to answer the questions in the Crittercam African Adventure Game Question worksheet. Read aloud the questions so students know what to pay attention to while they play. Tell students that they must read through the "How to Play" section before starting the game. Encourage them to use the game's locator map to help them navigate and find the lions. Allow students time to play the game and answer the questions. Some students may not have time to finish collecting all nine Crittercam video segments, but they should be able to answer the questions. Use the Crittercam African Adventure Game Question Answer Key to lead a class discussion about the game and how it relates to the scientific process: questioning, researching, using technology, overcoming challenges, collecting different types of information, using trial and error, analyzing results, and drawing conclusions.

6. Have students discuss the role that science and technology play in studying and conserving big cats.

Remind students that scientific research is a lot like detective work. Science is a process that starts with a question (Who? What? Where? Why? How?) and requires a variety of strategies and technologies to answer that question. Have students review their worksheets. Ask: *What has the scientists' research and technology (Crittercam video footage and radio collar tracking) taught them about big cat health and behavior?* Elicit from students that the information collected from giving lions physical exams, observing Crittercam footage, and tracking where lions go has helped scientists learn about the health, behavior, and conservation of big cat populations, especially lions in Africa. This information is essential to knowing how we can protect and conserve big cat populations. Ask: *Can you think of other*

ways the Crittercam technology could be used for scientific research? Elicit from students that the Crittercam could, and is, used to study many other species in a range of habitats, and the video footage is teaching researchers new information every day.

TipTeacher Tip

Refer to Big Cats Background Information for additional background information.

Modification

In Step 5, if only one computer is available, play the Lion Crittercam Simulation Game together as a class and ask volunteers to take turns controlling the jeep.

Informal Assessment

Use the provided answer key to assess students' comprehension of the video and interactive game.

Extending the Learning

Have students access the National Geographic website to view other Crittercam footage and to learn more about conserving big cats through the Big Cats Initiative.

OBJECTIVES

Subjects & Disciplines

Biology

- Ecology

Geography

- Physical Geography

Learning Objectives

Students will:

- describe the methods and technology scientists use to study big cats in the wild
- discuss the role science and technology play in studying and conserving big cats

Teaching Approach

- Learning-for-use

Teaching Methods

- Discussions
- Information organization
- Multimedia instruction

Skills Summary

This activity targets the following skills:

- 21st Century Themes
  - Global Awareness
- Critical Thinking Skills
  - Analyzing
  - Understanding
- Geographic Skills
  - Asking Geographic Questions
  - Organizing Geographic Information

National Standards, Principles, and Practices

NATIONAL COUNCIL FOR SOCIAL STUDIES CURRICULUM STANDARDS

• **Theme 3:**
People, Places, and Environments

NATIONAL SCIENCE EDUCATION STANDARDS

• **(5-8) Standard A-2:**
Understandings about scientific inquiry

• **(5-8) Standard C-4:**
Populations and ecosystems
• **(5-8) Standard E-2:**
Understandings about science and technology
• **(5-8) Standard F-2:**
Populations, resources, and environments
• **(K–4) Standard A-2:**
Understanding about scientific inquiry
• **(K-4) Standard C-1:**
The characteristics of organisms
• **(K-4) Standard C-3:**
Organisms and environments
• **(K-4) Standard E-2:**
Understanding about science and technology
• **(K-4) Standard F-5:**
Science and technology in local challenges

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Paper
- Pencils

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per small group, Projector, Speakers
- Plug-Ins: Flash

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction

OTHER NOTES

Before starting the activity, familiarize yourself with the Lion Crittercam Simulation Game and the Laikipia Predator Project's Interactive Lion Tracking Map.

BACKGROUND & VOCABULARY

Background Information

Ongoing scientific research and the development of new technologies like Crittercam are essential in addressing the problem of declining wild populations of big cats. Scientific inquiry, research, and technology help scientists better understand the health and behavior of big cat populations. This information is then used in addressing big cat conservation, particularly that of Africa's lions.

Prior Knowledge

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Recommended Prior Activities

- None

Vocabulary

Term	Part of Speech	Definition
Big Cats Initiative	*noun*	National Geographic Society program that supports on-the-ground conservation projects, education, economic incentive efforts, and a global public-awareness campaign to protect big cats and their habitats.
conservation	*noun*	management of a natural resource to prevent exploitation, destruction, or neglect.
Crittercam	*noun*	camera designed to be worn on a wild animal, providing a "critter-eye view" of the animal's environment.
lion	*noun*	large cat native to sub-Saharan Africa and Gir Forest National Park, India.

Term	Part of Speech	Definition
radio collar	*noun*	a band put around the neck of an animal that uses radio signals to track the animal's movement.
technology	*noun*	the science of using tools and complex machines to make human life easier or more profitable.
VHF	*adjective, noun*	(Very High Frequency) radio frequency between 30 and 300 MHz.

For Further Exploration

Audio & Video

- National Public Radio: Making 'Living with Lions' Practical in Kenya

Websites

- National Geographic Education: Crittercam Education
- National Geographic Animals: African Lion
- IUCN: Red List of Threatened Species—Panthera leo
- National Geographic: Big Cats Initiative