Raising Clouded Leopards

Lesson Plan

Author

Allison Duarte

Smithsonian

STEAM Readers

Science ▪ Technology ▪ Engineering ▪ Arts ▪ Mathematics

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References to digital components are included for educators who purchased the full kit: *Smithsonian Readers: STEAM: Grade 3*. Please disregard digital component references if this lesson was purchased in a different product configuration.

Answer Key: *Raising Clouded Leopards*

page 10—Finding Facts

Responses will vary. Examples:

Habitat: Some clouded leopards live in rainforests, heading, 10; Threats: People cut down trees where clouded leopards live, image, 13; Breeding programs: Joint breeding programs have produced more than 70 cubs, caption, 20; Zoo exhibits: Tall objects are put in clouded leopard exhibits for them to climb, sidebar heading, 25

page 11—Saving Clouded Leopards

Answers may vary. Examples:

1. Clouded leopards growl, hiss, and chuff; they can open their jaws 100 degrees; and their back paws rotate.
2. Their habitats have been destroyed, and they are hunted.

3. Conservation groups work to create preserves and pass laws to protect clouded leopards. Zoos have created breeding programs to increase their numbers and learn more about them.
4. People can spread the word about clouded leopards and raise money to support breeding programs.

Posters will vary, but should include clearly stated information about clouded leopards and how to help them.

page 17—*Raising Clouded Leopards* Quiz

1. D
2. D
3. C
4. B
5. Answers will vary. Example: a. Breeding programs have increased the number of clouded leopards in zoos; b. The image of a cub drinking milk on page 21 helped me find the answer.

Raising Clouded Leopards

Materials

- *Raising Clouded Leopards* books
- copies of student activity sheets (pages 9–19)
- chart paper
- **STEAM Challenge materials include but are not limited to the following:**
  - ✓ aluminum foil
  - ✓ cardboard pieces
  - ✓ clear or masking tape
  - ✓ markers
  - ✓ moss
  - ✓ pipe cleaners
  - ✓ plastic wrap
  - ✓ scissors
  - ✓ shallow, square cardboard boxes, medium size (1 per team)
  - ✓ sticks and twigs (various sizes)
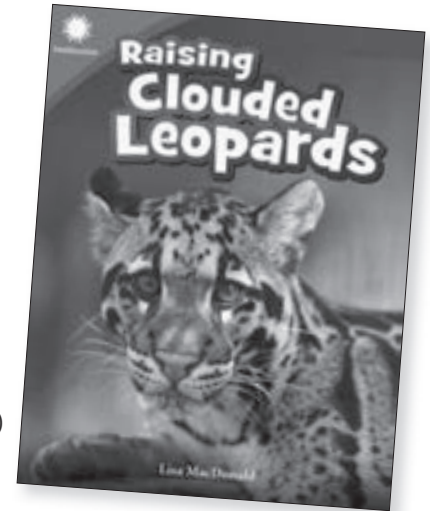
Learning Objectives

- **Reading:** Use text features and search tools to locate information relevant to a given topic efficiently.
- **Writing:** With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.
- **Speaking and Listening:** Engage effectively in a range of collaborative discussions with diverse partners on grade-appropriate topics and texts, building on and expressing ideas clearly.
- **Engineering:** Define an engineering problem, design and evaluate solutions, and optimize a design based on test results.

Phenomena

Clouded leopard populations have declined.

Lesson Timeline

Day 1	Day 2	Day 3	Day 4	Day 5–10
Introductory and **Before Reading Activities** (page 4)	**During Reading Activities** (page 5)		**After Reading Activities** (page 5)	**STEAM Challenge** and **Assessments** (pages 6–8)
Define the STEAM Challenge, and practice using text features.	Research clouded leopards, use text features to locate and gather information, and brainstorm design solutions.		Plan and create an informational poster about saving clouded leopards.	Design, build, test, improve, reflect on, and share an exhibit model for clouded leopards. Complete the assessments.

Raising Clouded Leopards (cont.)

STEAM Vocabulary

adapt	breed	conservation
prey	solitary	traits

Introductory Activity

Define the Problem

1. Ask students to turn and talk with partners about what their favorite animals look like, where they live, and what fun facts they know about them. Then, ask partners to talk about how they would feel if their favorite animal went extinct. Tell students there are scientists, engineers, and other professionals who work hard to help animals that are in trouble or are at risk of extinction.

2. Distribute the *Raising Clouded Leopards* books to students. Reveal the STEAM Challenge by reading aloud pages 28 and 29 of the book.

   ◗ Display the Interactiv-eBook for a more digitally enhanced introduction to the challenge.

3. Distribute *Make a Plan* (page 9) to students. Have students summarize the challenge. Summaries should include constraints and criteria. Provide the following sentence frame to help students summarize: *Make an _____ for clouded leopards that _____.*

   Note: You may wish to distribute all student activity sheets as one packet. They will be used throughout the STEAM Challenge.

Before Reading

1. Write the vocabulary words on the board and explain the meaning of each word. Show students pictures related to the words or use the words in sentences that provide context for the meanings of these words. Use the following pages in the book for images and sentences or choose your own:

   ◗ *adapt* (page 10)   ◗ *prey* (page 10)
   ◗ *breed* (page 14)   ◗ *solitary* (page 8)
   ◗ *conservation* (page 14)   ◗ *traits* (page 6)

2. Write the following related words and phrases on the board: *type*, *victim*, *cubs*, *alone*, *protection*, and *get used to*. Ask students to match the related word or phrase with the correct vocabulary word.

   ◗ Challenge **above-level learners** to suggest additional related words for each vocabulary word.

3. Tell students that text features are important parts of a text, which help readers locate information, build understanding of the topic, and determine importance. Write the following text features on the board: *headings*, *bold words*, *sidebars*, *images*, *captions*, and *table of contents*. Define each text feature and have students preview the text and use those text features to make predictions for each section of the book.

Raising Clouded Leopards (cont.)

During Reading

Research and Brainstorm

1. Distribute the *Raising Clouded Leopards* books to students. Read pages 4–9 together. Pause periodically to identify and discuss the purpose of text features. For example, point out that the sidebar on page 9 explains how scientists use cameras to capture animal activity. Explain how the image, caption, and heading in the sidebar help readers locate information about cameras if they wanted to find it again later.

- Display the Interactiv-eBook for a more digitally enhanced reading experience. You may wish to have students annotate the PDFs as you read.

- Play the audio recording as students follow to model fluent reading. This may be done in small groups or at a listening station. The recording will help **English language learners** practice fluency and aid in comprehension.

2. Have partners read the rest of the book. Ask them to discuss the text features and how the features support the text after reading each page.

3. Distribute *Finding Facts* (page 10) to students. Explain that rather than re-reading the book to find information, they will use text features to help them locate facts quickly.

- Provide **below-level learners** with page numbers to help them find helpful text features for each topic (*Habitat: page 14–15, Threats: pages 12–13, Breeding programs: pages 20–21, Zoo exhibits: pages 18–19*).

4. Have students record their ideas for designs on their *Make a Plan* activity sheets.

After Reading

1. Write the vocabulary words on the board and review their definitions.

2. Have students use vocabulary words in meaningful sentences. Use the following sentence stems or create your own.

- Clouded leopards *adapt* to _____. (a variety of habitats)

- Zoos *breed* clouded leopards to help _____. (increase the number of clouded leopards)

- *Conservation* groups help _____. (protect wildlife)

- Clouded leopards _____ their *prey* from trees. (hunt)

- Most wild cats are *solitary* and don't often _____. (stay in large groups)

- _____ is an example of a *trait* that helps clouded leopards survive. (a long tail)

3. Explain that when a species is threatened, people often come together to help save the species. Ask students to identify the different groups working together to save clouded leopards.

4. Distribute *Saving Clouded Leopards* (page 11) to students. Explain that conservationists help animals by raising awareness. Ask students to plan and create informational posters about clouded leopards. Have them work independently to plan their posters. Then, have students create their posters on separate sheets of paper.

- Challenge **above-level learners** to include at least two statistics about clouded leopards on their posters. Encourage them to conduct more research if needed.

Raising Clouded Leopards(cont.)

Prep

◗ Review all designs prior to building.

◗ Prepare all materials for STEAM Challenge.

STEAM Challenge

Design and Build

I. Discuss the following question as a class to connect the reading to the STEAM Challenge:

◗ *What do zoo staff think about when designing an exhibit for clouded leopards?* Guide students to the idea that zoo staff think about meeting animals' needs, reducing stress, and making an exhibit resembling the animals' natural habitat. Have students locate features of a clouded leopard's habitat in the text to inform their own designs.

2. Distribute previously completed activity sheets. Review the STEAM Challenge on pages 28 and 29. List the materials on the board and show students the cardboard boxes they will use to make models.

3. Ask students to independently sketch and label two designs on their *Make a Plan* activity sheets.

4. Organize students into teams. Distribute one copy of *Collaborative Design* (page 12) to each team. Ask teams to have each member share their designs. Then, have groups choose, sketch, and label a team design. (Team designs must be submitted for approval before building.)

◗ Challenge **above-level learners** by adding constraints or criteria (e.g., the model must have certain dimensions, it must include a research lab for scientists).

5. Explain to students that when they build their models, they must follow their design plans. Reassure them that they will have an opportunity to change and improve their designs after they present them. Review classroom expectations for working with materials. Give teams time to build models.

◗ You may choose to digitally record students' processes to share at a later date with students and parents.

6. Distribute *Think about It* (page 13) to students. Explain that reflection is an important part of the engineering design process. Read aloud questions 1 and 2 on the activity sheets and have students write their responses. Ask volunteers to share.

Raising Clouded Leopards (cont.)

Prep

- ◗ Review all redesigns before students build.
- ◗ Prepare all materials for the STEAM Challenge.

STEAM Challenge

Test and Improve

1. Discuss the following questions as a class to connect the reading to the STEAM Challenge:

   - ◗ *Why is a successful exhibit design important for breeding programs?* Point out that zoo staff design habitats for animals to keep them safe and comfortable. Discuss with students that successful breeding programs have created stress-free habitats for clouded leopards to live and breed.

   - ◗ *Who is responsible for saving clouded leopards?* Guide students to the idea that one group is not responsible; that scientists, engineers, conservationists, and government officials are some of the groups of people that must work together to help save clouded leopards.

2. Gather teams to share the models they built. Explain that teams will offer feedback after each presentation. Use *Friendly Feedback* (page 14) to review best practices for giving feedback.

3. Distribute *Assess Habitat Models* (page 15) to students and ask them to record their scores for each team. Allow time for teams to display their models and explain each feature they included. A successful habitat design will have features that make the animal feel safe, resemble their natural habitat, allow scientists to see and monitor the animals, and contain separate living spaces for four animals. Ask volunteers to give friendly feedback.

4. Allow time for teams to brainstorm ways to improve designs based on feedback. Refer them back to their *Collaborative Design* activity sheets. Ask students to sketch their improved designs and explain any changes. Have them submit improved designs for approval before building.

   - ◗ Challenge **above-level learners** and successful teams with additional constraints or criteria for the second design (e.g., improve the design without additional materials, include an area for clouded leopard cubs).

5. Have teams gather materials to improve their designs. Then, have them share models again.

6. Have students answer questions 3 and 4 on their *Think about It* activity sheets.

Raising Clouded Leopards(cont.)

STEAM Challenge

Reflect and Share

1. Provide each team with a sheet of chart paper and markers. Instruct students to sketch a large tree with several branches. On each branch, ask students to write a quality their teams exhibited during the STEAM Challenge. Post the chart paper around the classroom, and allow time for students to view each team's reflection poster.

2. Have students answer question 5 on their *Think about It* activity sheets.

3. Distribute *Engineering Design Process* (page 16) and review how students used each step to complete the challenge. Have them annotate the infographics with details specific to this challenge.

4. Read "Career Advice" on page 32 of the book. Ask students to brainstorm other tips for a career protecting animals.

Assessment Activities

1. Have students complete the short posttest, *Raising Clouded Leopards Quiz* (page 17), to assess the lesson's objectives.

2. Students may complete the Interactiv-eBook activities in the Digital Resources for assessment purposes.

3. Have students complete *Teamwork Rubric* (page 18) and *Engineering Design Process Checklist* (page 19) to reflect on and evaluate their work and collaboration skills.

4. Have students complete the Read and Respond questions from the book. Possible answers to the questions can be found in the Digital Resources (leopards_reproducibles.pdf).
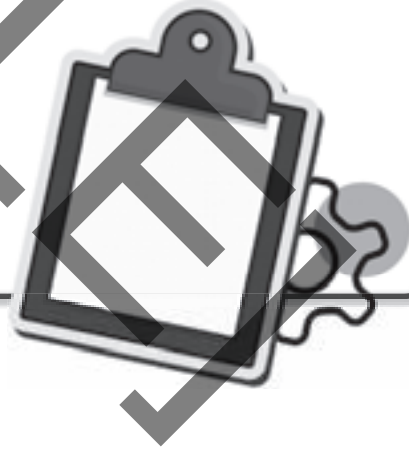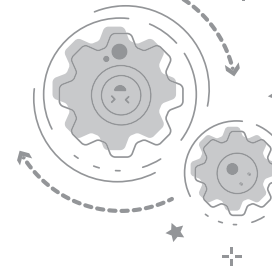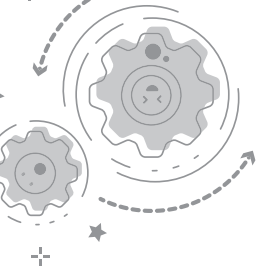
Make a Plan

Directions: Summarize the challenge. Brainstorm ideas and sketch two designs. Circle your favorite.

Challenge: _____
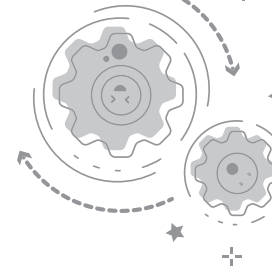
_____

Brainstorm

Design 1

Design 2

Finding Facts

Directions: Write a fact about each topic using text features in the book. Write the text features that helped you and their page numbers.

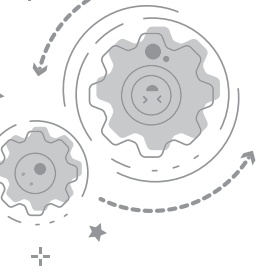| Topic	Fact	Text Feature (page)
Habitat		
Threats		
Breeding programs		
Zoo exhibits		

Name: _____ Date: _____

Saving Clouded Leopards

Directions: Plan an informational poster about clouded leopards.

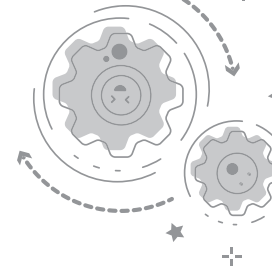| **1.** What are some interesting facts about clouded leopards?	**3.** What is being done to help them?
2. Why are they in trouble?	**4.** How can people help?

Collaborative Design

Directions: Sketch your team's design in the first box. Sketch your team's improved design in the second box. Label each design with materials needed and the purpose of each part.

Design 1

Design 2

Think about It

1. It was (hard/easy) to create one team design because _____

_____

_____

2. I helped my team by _____

_____

_____

3. Our design (failed/passed) the test because _____

_____

To improve our design, we _____

_____

4. Our improved design (worked/did not work). I know this because _____

_____

_____

5. During the challenge, I learned _____

_____

I liked _____

It was hard when _____
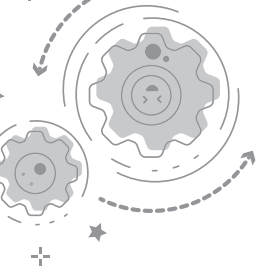
Friendly Feedback

Directions: Feedback can help people improve their work. Use these sentence stems to give feedback to your peers.

Clarify

Can you explain _____ ?

Why did you choose to _____ ?

How did you _____ ?

Warm Feedback

I like _____ because _____ .

It is interesting that _____ .

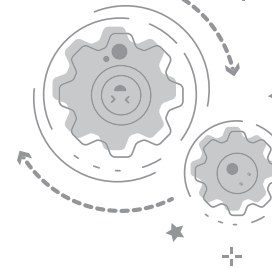_____ is a good idea because _____ .

Cool Feedback

Have you thought about _____ ?

I wonder if _____ .
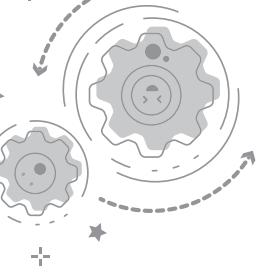
You might want to try _____ .

Assess Habitat Models

Directions: Rate your team and other teams on four areas.

3 = Yes   2 = Somewhat   1 = No

Teams					
Animals will feel safe and secure.					
It looks like the natural habitat.					
Animals can be seen by people.					
All four animals have their own spaces.					

What will you change or add to your exhibit?

_____

_____

How will this improve your exhibit?

_____

_____

Engineering Design Process

Define the Problem

Reflect and Share

Research and Brainstorm

Test and Improve

Design and Build

SAMPLE
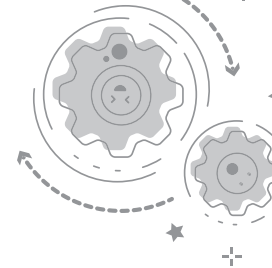
Name: _____ Date: _____

Raising Clouded Leopards Quiz

Directions: Read each question. Choose the best answer. Fill in the bubble for the answer you have chosen. Answer the last questions in complete sentences.

1. Which text feature would help you locate information about clouded leopard cubs?

(A) heading on page 26
(B) image on page 19
(C) caption on page 10
(D) image on page 23

3. Which text feature provides a reader with definitions of bold words?

(A) index
(B) headings
(C) glossary
(D) table of contents

2. Which text feature would help you locate information about where clouded leopards live?

(A) caption on page 9
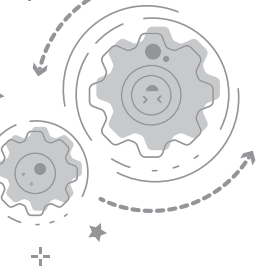(B) bold word on page 6
(C) heading on page 12
(D) map on page 15

4. Animals brought to zoos from the wild _____ to living in a new habitat.

(A) prey
(B) adapt
(C) nurse
(D) solitary

5. Use text features to locate the answers to the following questions.

a. How do breeding programs help save clouded leopards?

_____

_____

_____

b. Which text feature(s) helped you find the answer?

_____

_____

Teamwork Rubric

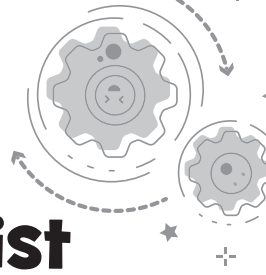**Directions:** Think about how you worked in your team. Score each item on a scale of 1 to 4.

4 = Always   3 = Often   2 = Sometimes   1 = Never

I listened to people on my team.	4	3	2	1
I helped people on my team.	4	3	2	1
I shared ideas with people on my team.	4	3	2	1
We made choices as a team.	4	3	2	1
Total				

Comments: _____

_____

_____

_____

_____

_____

_____

Name: _____ Date: _____

Engineering Design Process Checklist

Directions: Check the boxes to show that you completed each step.

Define the Problem

❏ I understood and explained the problem in my own words.

Research and Brainstorm

❏ I used research to help me brainstorm solutions.

Design and Build

❏ I planned and made a model.

❏ I thought like a mathematician.

Test and Improve

❏ I used criteria to evaluate designs.

❏ I improved designs based on test results.

❏ I thought like a mathematician.

Reflect and Share

❏ I shared my results and reflected on my work.

STEAM CHALLENGE

Define the Problem

Your local zoo is starting a breeding program to help save the clouded leopard. You have been asked to design the new exhibit. How will you use what you have learned to make a zoo habitat for these animals?

Constraints: The exhibit must be able to house 4 clouded leopards at one time.

Criteria: A successful design will look like their natural habitat, make the animals feel safe, and allow scientists and visitors to observe them.

Research and Brainstorm

Look for information in the book about the life and behavior of clouded leopards. Do clouded leopards live in groups or alone? Do they need separate spaces? What do the animals like to do? How will the scientists watch the animals in your model?

Design and Build

Sketch your design of the exhibit. What purpose will each part serve? What materials will work best? Build the model.
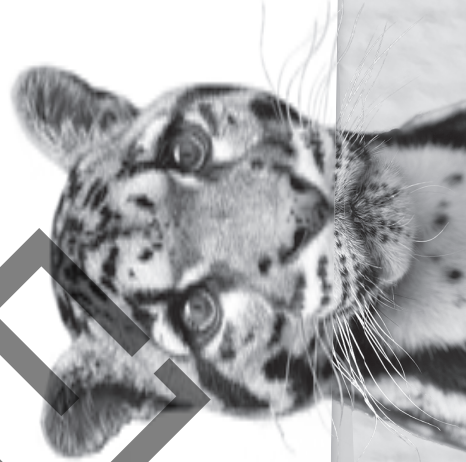
Test and Improve

Your classmates will act as the zoo's scientists. Show and explain your model exhibit to the group. Ask for ways to improve the design. How will you use this information to make changes? Modify your design and present it again.

Reflect and Share

Do you think scientists share their work? What are some benefits of sharing ideas in science and engineering? How did you learn from others during this challenge?

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