

Life on Earth

Bat Lesson Sequencing Suggestions

Overview

This series of lessons focuses on bats, bat traits, and inventions inspired by physical and behavioral traits of bats with the ultimate goal of students designing (on paper) their own bat-inspired invention.

The lessons are centered around 1-LS1-1; see teacher keys for more details.

1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Prerequisite Knowledge (if incorporating echolocation elements)

Lessons on sound (and that sound travels), and lessons that light is needed to see are helpful to get the most out of this series of lessons. However, echolocation elements could also be removed or minimized.

1. Kickoff Discussion

File: "2. or 3. Bat and Bat-Invention Presentation" + "4. ...Teacher's Key"

- Ask students "Can bats (or other animals or even plants) inspire inventions that can help people?" Or "Can scientists and engineers use bats as a model for new inventions?"
- Guide the students in this discussion - you might want to write down some of their ideas and questions!

2. Lesson 1: General Overview of Bats and Echolocation

File: "2. or 3. Bat and Bat-Invention Presentation" + "4. ...Teacher's Key"

- "Lesson One" in the "Bat Presentation Powerpoint" has a general overview of bats and we recommend using your own materials and lessons in addition for this overview if possible!
- Echolocation description and videos links are at the end of "Lesson One"

3. Echolocation activity

Files: "5. Echolocation Activity Teacher Instructions" + "6. Echolocation Take-Home Instructions"

- This simple activity uses materials found around any household and shows students how sound can be used to detect if an object is in front of you. (For sanitary reasons this is best done as an at-home activity during COVID).

Suggestion -> read *Nightsong* by Ari Berk [Link to book and ELA materials on website](#)

- In *Nightsong* a young bat goes out into the night on his own for the first time and must learn to navigate (using echolocation).
- Help your students make the explicit connection between the "night song" and echolocation.

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Bat Lesson Sequencing Suggestions (Cont)

4. Lesson 2: Echolocation-Inspired Inventions

File: "2. or 3. Bat and Bat-Invention Presentation" + "4. ... Teacher's Key"

- "Lesson Two" in the "Bat Presentation Powerpoint" discusses and links to videos about echolocation-inspired devices that help people with limited sight navigate their environment.

5. Lesson 3: Other Bat-Inspired Inventions

File: "2. or 3. Bat and Bat-Invention Presentation" + "4. ... Teacher's Key"

- "Lesson 3" in the "Bat Presentation Powerpoint" discusses the fact that bats have unique wings, compares them to bird wings, and introduces small flying machines inspired by bats!
- The "Bat vs. Bird Wing" student sheet can be done before, after, or during this activity.

6. Student Sheet: "Bat vs. Bird Wings"

Files: "7. Student Sheet Bat Vs. Bird Wing" + "8.... Teacher's Key"

- Students compare and contrast structures of different organisms; what is similar and different between bat and bird wings?
- This comparison can be done before, after, or during Lesson 3.

7. Student Sheet: "Bat vs. Bat Bot"

Files: "9. Student Sheet Bat Vs. BatBot" + "10.... Teacher's Key"

- Students compare and contrast a real bat with a bat-inspired robot!

Suggestion -> read *Stellaluna* [Link to book and ELA materials on website](#)

- In *Stellaluna*, a baby bat is attacked by an owl and ends up growing up in a bird's nest. Throughout the story, many differences between bats and birds are described.
- *Stellaluna* can be read before or after Lesson 3.

8. Lesson 4: "You Design an Invention Inspired by Bats"

File: "2. or 3. Bat and Bat-Invention Presentation" + "4. ... Teacher's Key"

- This lesson is a review about bats to prepare students to come up with their own bat-inspired invention
- Use of other materials (books, videos etc.) is encouraged for the bat review.

9. Student Sheet: "Bat-Inspired Invention"

Files: "11. Student Sheet Bat-Inspired Invention" + "12.... Teacher's Key"

- Students design and describe an invention inspired by a bat!
- This is an "on-paper" invention but teachers with time and resources can have students make a 3-D model or prototype of their invention with craft materials.

Don't forget to introduce students to real bat scientists - Dr. Kristen Lear and Dr. Susan Tsang! (see end of "Bat and Bat-Invention Presentation")