Design a Habitat

Unit: Henry as Innovator
Topic: Research, design, and habitats

Thoreau Quotation

"Not only the Indian, but many indigenous insects, birds, and quadrupeds, welcomed the apple tree to these shores. The tent caterpillar saddled her eggs on the very first twig that was formed, and it has since shared her affections with the wild cherry; and the canker-worm also in a measure abandoned the elm to feed on it. As it grew apace, the bluebird, robin, cherry-bird, kingbird, and many more came with haste and built their nests and warbled in its boughs, and so became orchard-birds, and multiplied more than ever."

—"Wild Apples", *The Writings of Henry D. Thoreau* (1906)

Background

In the above quote, the apple tree is home to many different animals. Where an animal lives is called their habitat. Habitat includes the climate and weather (temperatures, wind, precipitation, length of days, etc.), plants, soils, water, other animals that live in or nearby, and anything else the animal needs to live. Henry David Thoreau was a naturalist and walked for hours or more each day, observing animals and their habitats. While Henry studied the habitat that was already there, this lesson allows the students to develop a habitat for an animal. Today, because humans continue to grow in numbers, many of the natural habitats are being changed by humans. Designing and building habitat on purpose is one way to overcome habitat loss.

Objectives

1. Research the habitat of an animal.
2. Design a habitat that will attract or be comfortable for an animal.

Method

Students will research an animal's habitat and then design and build the habitat.

Time Required

3 hours – weeks (depending on the extent of the habitat created)

Materials

- Computer for researching animal habitat needs
- Paper, pens/pencils for drawing out their design and listing materials needed

- Habitat materials, dependent upon the animal chosen

Procedure
1. Engage the students by asking all the different things an animal needs to live (food, shelter, water, light). Describe to them that this is habitat. How does this compare to what our human habitat is?
2. Explain that they are going to design a habitat for an animal (bees, a specific species of butterfly, general pollinator habitat, or a specific bird are good for outside options; turtle, fish, or rodent are good for inside options). Depending on your class, you may want to ask them for input or have an animal already picked out for them.
3. Once an animal has been picked, develop teams and have each team to research all the different needs of the animal.
   a. How much water do they need?
   b. What kind of plants, trees, or shrubs, if any? How many plants?
   c. What food do they eat?
   d. Do they need a place to hide?
   e. What kind of home do they need? Should you provide the home or will the animal make it themselves but you need to make sure they have the materials to build their home?
   f. How much sunlight do they need?
   g. Have them also consider human interactions with the habitat such as if too many people walk by a habitat designed for birds, will the birds be too scared to use it?
   h. If you're creating an inside habitat, does the animal need something to occupy them (i.e., a hamster needing a wheel).
4. Once research is complete, students should draw their design, include a list of materials needed, and explain why they chose the different elements of the habitat. Have each team present their design to the class. The class could vote on the best design for the habitat. Or maybe there are different aspects from each design that they want to incorporate into the final design.
5. Now that they've researched and a winning design has been picked (or collaboratively created), it's time to build the habitat. Because there are so many options for this lesson, you will determine the best way to build the habitat. If building the full habitat is not feasible, then you may choose to build a prototype.

Reflect and Explain
- What was one (or more) part of the habitat that they did not know their animal needed? Have each student write their answer down and then share it (or have them pass them in and write the answers on the board).
- Now that they know the needs of the animal to survive, are there things they can do to help keep that animal's local habitat intact? (picking up litter, not disturbing animals, planting habitat in their yard or on their balcony, leaving rocks and other shelter in place so they don't disturb the animals)

Extensions

1. Once they've built their habitat, have them observe the animal in it. If it is an outside habitat, did it attract the animal you wanted? Were other animals also attracted to the habitat? For inside habitats, is the animal acting as you expected it to in the habitat provided?
2. Have them research how tolerant their animal is to disturbed habitats and report on the impacts of disturbed habitat in the population of the animal.
3. Some species are become endangered because of the disappearance of their habitat. You could have them research different such species and decide if they wanted to engage in an action or service project on behalf of one of those animals.
4. Give the students rotating responsibilities to maintain the habitat and/or provide for the animal.

Vocabulary

habitat – the place or type of place where a plant or animal naturally or normally lives or grows.

Additional Resources

https://www.nwf.org/Garden-For-Wildlife/About/Native-Plants.aspx - guide to native plants

https://www.nwf.org/Butterfly-Heroes/Getting-Started/Learning-to-Garden.aspx - Monarch butterfly garden

http://www.nwf.org/Garden-For-Wildlife.aspx - gardening for wildlife

The Lorax by Dr. Seuss offers a great, fictional demonstration of the connection between living things and their habitats and what can happen when habitats are destroyed or eliminated.

Common Core Standards

English Language Anchor Standards (all grades)

- CCSS.ELA-LITERACY.CCRA.W.7
  Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
- CCSS.ELA-LITERACY.CCRA.W.8
  Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
- CCSS.ELA-LITERACY.CCRA.SL.1
  Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

- CCSS.ELA-LITERACY.CCRA.SL.2
  Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.CCRA.SL.3
  Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.
- CCSS.ELA-LITERACY.CCRA.SL.4
  Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
- CCSS.ELA-LITERACY.CCRA.SL.5
  Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
- CCSS.ELA-LITERACY.CCRA.SL.6
  Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.
- CCSS.ELA-LITERACY.CCRA.L.1
  Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.CCRA.L.6
  Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

Math Practice Standards (all grades)
- CCSS.MATH.PRACTICE.MP1 Make sense of problems and persevere in solving them.
- CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively.
- CCSS.MATH.PRACTICE.MP3 Construct viable arguments and critique the reasoning of others.
- CCSS.MATH.PRACTICE.MP5 Use appropriate tools strategically.
- CCSS.MATH.PRACTICE.MP6 Attend to precision.