Lesson Plan: Building to Solve a Problem
Grades and Subjects
Grade K Science and ELA
Topic
Animal Habitat and Problem & Solution

Conceptual Understanding

- Most narratives have a problem and solution.
- Organisms live in areas where their needs for air, water, nutrients, and shelter are met.

Primary Standards/Indicators

Science

K.L.2A.6 Obtain and communicate information about the needs of organisms to explain why they live in particular areas.

Secondary Standards/Indicators
ELA

RL. 8.1 With guidance and support, read or listen closely to:
a. describe characters and their actions;
b. compare characters' experiences to those of the reader;
c. describe setting;
d. identify the problem and solution;
and e. identify the cause of an event.

Note - This lesson also covers many Science and Engineering indicators

Academic Language
Vocabulary

- Habitat
- organism
- Design
- Engineering
- Physical environment
- shelter

Language Function and Objective

- Explain problem and solution in text.
- Synthesize information about animal habitats in order to create a home design that can solve or alleviate the problem of animals not being comfortable in regular houses.
- Infer the needs of certain animals to explain why their home needs certain features.

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Assessment Plan

- Pre-Assessment-
    - Students will complete an anticipation guide that covers questions on problem and solution, design solution and animal habitats. These will be agree or disagree questions that will provide insight into current levels of understanding. This will not count as a grade.
- Post-Assessment-
    - Students will refer back to the anticipation guide. They will complete the "after" portion at this time to see how their answers have changed.
- Criteria for Mastery-
    - Student is able to successfully identify the difference between problem and solution.
    - Student can design a "home" structure for a specific animal based upon the animals ideal habitat or shelter.

Materials

- Anticipation guide
- Anchor chart paper
- *No Place Like Home* by Ronojoy Ghosh
- Cardboard
- Tape
- Glue
- Construction paper, popsicles sticks, balloons, string, gauze, etc.

Teacher Preparation

This lesson will serve as a review of problem and solution but will also push students to think of real life scenarios where solution oriented thinking is required. The lesson can be used as an introduction to animal habitats or as reinforcement of the content.

This lesson could be divided into several, with one lesson focusing on ELA and the next several devoted to planning and construction of the animal home. It may also be beneficial to have students read about a few specific animals and their habitats to build background knowledge for their design. Further, students could work in groups to develop several homes to create an animal neighborhood. It is particularly helpful to have materials set and ready to go in order to make this lesson run smoothly.

Meat of Lesson

- **Hook**
    1. Think of a time you were somewhere and you really just wanted to be at home. What made you feel that way? Why is "home" such a good place to be?
        a. Teacher records answer on board or chart paper.
        b. Next, students turn and talk to share answers. The instructor may call on a few students to share their examples.

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c. The instructor should highlight the **why** for each example. Usually organisms prefer being where all their need are met (air, food, water, shelter, etc).

2. Today we will read *No Place Like Home.* This is a story about a grumpy Polar Bear. There is a problem that he must overcome in order to find happiness.
   a. Read text to students.
   b. Discuss book (See discussion guide for questions)
3. Students will then complete a brief activity to check their understanding of problem and solution using the problem/solution cards.
   Read the following statements and have students hold up either their Problem Card or their Solution Card. Remind students to hold the cards at their chest and face towards you, so you can see what they understand.
   Is this a animal habitat PROBLEM or SOLUTION:
   New York City is too hot for a polar bear. (P) example
   The Polar Bear moves to the North Pole. (S) example
   Chimpanzees do not have tree branches to swing on. (P)
   Cheetahs do not have a large grassy area to run around. (P)
   Turtles hide in their shell for protection. (S)
   Lions have run out of prey to hunt. (P)
   Elephants find a waterhole to bathe, play, and drink. (S)
   Community members build tall structures so Ospreys can nest near the Wadmalaw River. (S)
   Periwinkle snails are being eaten by blue crabs. (P)

4. <u>Introduction to lesson:</u> Just like the Polar Bear in our book, animals have a preferred home. This home is their ideal habitat. In the book, the polar bear was living in a home in a city. His home was not comfortable to him because it was not design to be like his habitat. Imagine an animal is choosing to move in YOUR neighborhood. How might your design the house to that they are comfortable and feel “at home”? You need to improve solutions, so from the front your structure may kind of look like a normal house, but with special features.

- **<u>Brainstorm</u>**
  1. First, students should brainstorm a list of possible animals that have unique habitats. This can be done independently, then share out to find a partner with either the same animal or one that may have similar needs.
  2. Encourage students to do animals that they either have background knowledge about or can quickly research (display books/have book bin accessible) some possible problems with those animals living a typical house. Teacher should circulate to hear students discussing problems and possible design solutions.
  3. Next, they should sketch their solution design on the anticipation guide brainstorm. Once this is complete they may gather materials.

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- **Prototype**
    1. Students will work individually, but may want to sit near others to share ideas and knowledge about animals. Each student will receive cardboard, scissors and tape. They will use these materials to build their design.
    2. After they've done this, they may add decorations to their structure. They may cut, paste, draw, etc.
        i. Students that struggle with this should be encouraged to talk with others who are having success designing their structure or have lots of ideas for adaptations to a typical house. At this point the teacher should try to step back and allow students to problem solve.
    3. Once students have put the home together, they should review their work. Does the house have special features for their animal? Does the object solve the problem (making sure the animal would be comfortable if it move in?)
        i. Instructor should be asking these questions of groups. If anyone finishes early, ask them how they can further improve their home to have special features that cater to the animal? (ie. a polar bear may have a lap pool that instead of being heated is set to frozen?)
- **Share**
    1. Each student should write the problem and solution for their animal habitat home. Students then show off their designs. Ask them to talk about the animal they chose and how their design solves the problem of making sure the animal would feel "at home". (Can be done as a whole class or in table groups).
    2. Instructor asks for feedback- What went well? What made this challenging?
- **Synthesize**
    1. Bring students back together for a final discussion. During this conversation, students will discuss the process of making. *See discussion guide for questions.*
    2. Finally, have students complete the anticipation guide.

Supports for Student Learning
Accommodations

- **ELs**- Provide labels and written directions for each of the steps. The instructor can also use props to further help students understand major concepts and instructions. Due to the visual and hands-on nature of this lesson, there is little written work but it may be necessary to provide word sort or story in another language depending on student's present level.
- **Grade Level adaptations**- Stencils can be provided to scaffold for those that need more support. Definitions can be introduced and practiced ahead of time. Those that need help explaining their building can develop a script.
- **Advanced students**- Those students who are able to grasp these concepts quickly will be asked to incorporate Little Bits into their building. This can serve as a review on the electricity unit and add a level of complexity.
- **Additional supports**- As needed.

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Discussion Guides

- Hook- While or after reading, can ask students these questions:
  - How can being uncomfortable cause you to be grumpy?
  - Why didn't the polar bear feel at home in his house?
  - What type of houses did the polar bear try out? Why didn't they work for him?
  - When the solution to the problem was found, how did the polar bear change?
  - Who was in charge of find the solution to Polar Bears grumpiness?
- Synthesis- Ask students:
  - What went well and what was difficult about making the animal habitat home design? *(Allow them to share their answers and see if any talk about how they adapted their invention.)*
  - Were you like the polar bear at all today? Why or why not? *(Stress the idea of problem and solution and no giving up in order to find an improvement)*
  - How do our inventions relate to things to the habitats of animals?
  - What limitations might our houses have? Why might the animals still not feel at home even though our houses were designed for them?

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