

Designing a Habitat in the Classroom for Animals and Plants to Co-exist

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Students will be designing...

This design challenge will give children the opportunity to empathize and use their knowledge and experience to design a classroom habitat where all their classroom plants and animals can best coexist. Plants and animals are a natural topic of study in kindergarten, and the Next Generation Science Standards has “Interdependent Relationships in Ecosystems: Animals, Plants and their Environment” as one of three core science topics covered during the year (i.e. 1. “Motion and Stability: Forces and Interactions”, 2. “Interdependent Relationships in Ecosystems: Animals, Plants and their Environment,” and 3. “Weather and Climate”). “Engineering Design” is a fourth standard that will be covered during the K-2 school years, timing as determined by school districts.

After empathizing with the animals, plants and humans, students will have time to work independently and to collaborate in small teams to brainstorm and then prototype a co-existing habitat. During this process, students will practice listening and speaking skills. Teams will share their final prototype with the class (now resident animal/plant experts) for feedback. The class will vote on which habitat prototype to build for the classroom.

During the course of the year or possibly during one specific unit, children will learn about various plants and animals (e.g., elodea, gold fish, snails, night crawlers and earth worms, chicks, pill and sow bugs, tad poles, ferns, etc.). Students will focus on basic needs of plants and animals—food, water, light, and shelter.

Through engaging in this challenge, students will learn...

- To use observations to describe patterns of what and animals (including humans) need to survive. (NGSS K-LS1-1)
- To use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. (NGSS K-ESS3-1)
- To ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. (NGSS K-2-ETS1-1)
- To develop a simple sketch, drawing or physical model to illustrate how the shape of an object shapes to function as needed to solve a given problem. (NGSS K-2-ETS1-2)

- To analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. (NGSS K-2-ETS1-3)

Lessons

We feel that most kindergarten lessons are best kept under 30 minutes. Most of the following lessons are longer so may be spread over multiple sessions or days.

Lesson 1 (to be done with each animal/plant)

The first lesson, a research and learning lesson, will need to be done for each animal or plant in your unit. The lesson for each animal or plant will likely take 30-60 minutes. This means if you are introducing 4 animals and 3 plants, you will have 7 different Lesson 1s – each lasting 30-60 minutes.

Lesson 2

The second lesson will be a 30-minute-or-less review of what we learned about the various animals and plants we are studying. The class will brainstorm a summary of the similarities and differences in needs of the different plants and animals being studied. This is where the teacher will present the challenge: How might we design a classroom habitat for all of our plants and animals to coexist?

Lesson 3

The third lesson will be a 45-to-60-minute session. First children will work independently to sketch a first draft design. In kindergarten, “sketch” can mean anything from drawing with pencils and crayons to using manipulatives and other materials to represent their ideas. Next, children will work in small teams (ideally with an adult to support, scaffold, and differentiate) to make a 3D model of their prototype habitat. The focus is on process not product, and practicing collaboration skills with peers.

Lesson 4

The fourth lesson will be a 30-to-60-minute “share” where teams will share and describe and explain their prototypes. The teacher will scribe. Class will vote on a prototype.

After Lesson 4, we recommend you do a final lesson with the students in your classroom. In the final lesson students will build the actual habitat with adult support.

Because the nature of this final lesson is dependent on the prototype and resources available to classrooms, we have chosen not to write the specifics of this lesson. We do

believe that having students build the final habitat (even if this means a small task) is an important part of completing the design thinking process.