Exhibit Design
Virtual Classroom Extension

Grade Levels

Grades 4-8

Objectives

These activities are designed to start your at-home students in recognizing themselves as scientists and in thinking critically about problem-solving. The goal is to teach concepts through discovery and to encourage using scientific thought processes. Feel free to adapt the lessons provided to better suit your students' abilities. Take these ideas, make them your own, and your students will have a greater chance of success.

Background Information

This activity can be used with your at-home students after viewing the Exhibit Design: Rhinos Facebook Live stream from 4/9/2020.

How does knowledge of the behavior and needs of an animal influence the design of its zoo habitat?

Procedures

1. Begin this lesson by telling your at-home students they have been tasked with designing a new animal habitat at the Zoo. They will be investigating the elements that go into designing a world-class habitat. They will be paying special attention to the behavior and needs of the animal(s) that will live in this new habitat.
2. Using Cleveland Metroparks Zoo's Online Resource Library (http://resourcelibrary.clemetzoo.com), allow at-home students to choose an animal for which they will design a new habitat. They can choose an animal already at the Zoo or another animal if they prefer. Exploring the animal fact sheets and the animal videos in the Online Resource Library, at-home students should learn all they can about the natural behaviors and needs of their chosen animal.
3. As individuals, or together, take notes on what is learned. Take note of behavioral observations made while watching the videos as those behaviors are important to consider when designing a habitat. While exploring the animal fact sheets and/or other outside resources, also take note of any needs the animal might have. Consider its diet, space use, if it lives in a group or is solitary, preferred climate, shelter, etc. A good zoo animal habitat must meet the animals' needs.

4. Continue with the above discussion and encourage at-home students to imagine what a habitat might need to include in order to suit the animal they selected. Allow a wide variety of ideas and encourage conversation to refine the details of their ideas.
5. Share the following information with your at-home students:
    a. Zoo habitats are costly and involved endeavors. (African Elephant Crossing, for example, cost $25 million, involved many people, and ten years to design and build.) Lots of time and expertise goes into determining what is needed to provide the best care for the animals. A lot of care also goes into determining how to provide the best experience for the public. Architects work with animal care staff, horticulturists, water quality specialists, facility maintenance workers, educators and guest services staff to design the best habitat and guest experience possible. Each element is given tremendous consideration. Considerations continue once the animals are live in the habitat, as there are always lessons to be learned about how the habitat functions, given that individual animals all have their own unique personalities.
6. Encourage your at-home students think about what other considerations might need to be made in their habitat design. By this point they should already have the animal behaviors and needs accounted for, but what needs might people have at this habitat? What do the guests want or need when visiting? What might the animal care or veterinary teams need in this space to provide proper care to the animals? What changes or additions might the students want to make to their design to accommodate these human needs? Allow a wide variety of ideas and encourage conversation to refine the details of their ideas.
7. Have your at-home students work to develop a graphic representation of their designed habitat. Remind them that, like all designers, they need to be able to give reasons for why elements were added to the design. Option: incorporate spatial math concepts into this lesson by having them pay attention to scale when creating their drawings or models.
8. Monitor their work as they continue to research and develop their drawings and models. Make sure to help them continue their discussion on what they learned from their animal behavior videos, what they already might know about the animal and habitat design and what they may have discovered through their own research.
9. Conclude the lesson by looking back at the original research question. What did the information collected tell at-home students about their chosen animal, and how did it help them to approach their design? How does information like this affect the decisions made by habitat designers?

Standards

Next Generation Science Standards
Engineering Design 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem