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Name: Teacher Version Date: _____ Class/Period: _____**Lesson 3: How do behaviors impact survival?****Purpose**

Species constantly engage in a variety of behaviors or activities that help increase their chance of survival. For example, a bird may build a nest or a coyote might communicate to other coyotes through howling. In this activity, you are going to explore the plasticity of behaviors – the ability of an organism to change or modify its behaviors based on the external conditions. Specifically, you will examine your own behaviors, but then consider how your behaviors would be similar or different from other species. You will then consider how the plasticity of an organism’s behaviors impacts its chance of survival within an urban environment.

Procedure for Structure #1

1. Determine which partner will be the *Describer* and which partner will be the *Builder*.
2. The *Describer* should receive the envelope with the two cards with pictures of the structures. Do **NOT** show the pictures to your partner.
3. The *Builder* will receive the bag of gumdrops.
4. When your teacher tells you to start, the *Describer* will take the card with Structure #1 out of the envelope without showing your partner. You will describe the structure pictured on the card so that your partner can build it. Your goal is to have the *Builder* construct the structure as accurately and quickly as possible. Both partners can talk and use gesture. The *Describer* can look at what the *Builder* is creating.
5. Use a stopwatch or timer to measure how long it took to build the structure.
6. After you have finished building the structure, record the time it took to build the structure, the accuracy of the structure and any strategies that you used to help your partner below.

Data Collection: Structure #1

Time	Accuracy of Structure	Building Strategies
~1-2 minutes	Accurate	<p><i>Students could use a variety of behaviors such as -</i></p> <p><i>Describer – Use words to describe the position of the different gumdrops. Gesturing where to place the gumdrops. Giving the Builder feedback if a gumdrop is placed in the correct or incorrect position.</i></p> <p><i>Builder – Listen to the description. Asking the Describer to look and check if it is correct.</i></p>

Procedure for Structure #2

1. Similar to the last activity, the *Describer* will describe the structure (without showing the picture) and the *Builder* will construct it. You should have the same roles as you did for Structure #1.
2. This time the *Builder* and *Describer* cannot look at each other. The *Describer* should turn around so their back is facing the *Builder*. You can both still talk, but you will not be able to use gesture, because you cannot look at each other or at the structure that is being built.
3. After you have finished building the structure, record the time it took to build the structure, the accuracy of the structure and any strategies that you used to help your partner below.

Data Collection: Structure #2

Time	Accuracy of Structure	Building Strategies
~2-4 minutes	<i>Accuracy will vary.</i>	<p><i>Students could use a variety of behaviors such as -</i></p> <p><i>Describer – Use words to describe the position of the different gumdrops – more detailed and slower than previous description. Cannot use hand gestures. May ask the Builder if the directions make sense or if they have any questions.</i></p> <p><i>Builder – Listen to the description. Asking the Describer to repeat parts or ask questions if some thing did not make sense. May describe back to the Describer what they have built.</i></p>

Conclusions

1. Did you use or rely on different strategies when building Structure #2 where you could not look at each other compared to building Structure #1? Why do you think your behavior either did or did not change?

They are a variety of possible student responses here. For Structure #2 when the Describer could not use gesture or observe the structure, they may have found that the Describer needed to include more detail and go at a slower pace. They also might have found that the Builder talked much more for Structure #2. The Builder may have asked questions or described back to the Describer what they built. Since the Builder can no longer rely on the Describer seeing what they have built and determining if it is correct, the Builder needs to describe the structure to get feedback on whether or not it is correct.

2. Human activity in urban areas tends to be greatest in daylight. One common behavioral modification urban animals make in response to human activity is that they change the time of day when they complete an activity and in some cases become strictly nocturnal. This could change their behavior because sight is limited (like when you and your partner could no longer see each other). Think about one behavior of a species (e.g. feeding, building a nest or den, reproduction, etc.). How might that behavior change if the organism had to complete it at night instead of during the day? Why?

Students responses will vary. It is more important that they are thinking through the idea of modifying behaviors then if the actual behavior is accurate for a species.

Some examples could be – Feeding could include the idea that an organism could become more of a forager instead of a predator. Before a species may have hunted during the daylight. At night, they may not be able to see prey; instead, they may shift to foraging in human trash. Building of a habitat could include an example such as building a nest. If a pair of birds is building a nest at night, they may need to communicate with each other differently since sight is limited.

3. Some species have greater behavioral plasticity. Behavioral plasticity means that an organism is able to respond to its environment in different ways. How important do you think behavioral plasticity is to the chances of a species surviving in an urban environment? Why?

Behavioral plasticity is essential in an urban environment, because the urban environment is constantly changing. Species need to be able to modify their behaviors to survive in the new conditions. If they are unable to change their behaviors, they will either die or need to move to a new area.