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Best Lesson

Grade Level: 4th Grade

Title of Lesson: The Ant Farm

Unit Title: Food Energy and Ecosystems

Performance Standard(s) Covered: S4L2. Students will identify factors that affect the survival or extinction of organisms such as adaptation, variation of behaviors (hibernation), and external features (camouflage and protection).

a. Identify external features of organisms that allow them to survive or reproduce better than organisms that do not have these features (for example: camouflage, use of hibernation, protection, etc.).

Essential Question: How can adaptations affect survival in ecosystems.

Objective: After the experiment, the students should be able to explain what adaptations are and how they improve life in an ecosystem.

Key Words and Terms: Ecosystem, habitat, adaptation

Learning Activity

Abstract (limit 100 characters):

Over a two day period, students will observe an ant farm. They will observe the ants' behavior and their tunneling through the sand and deduce from their behaviors what adaptations help them survive in their

Materials Needed:

Ant Farm habitat kit (Can be purchased at Hobby Lobby),

Ants (ants are to be ordered online or can be taken from any nearby ant pile. Be careful not to mix ants from different ant piles because they will fight each other),

Ant diagram (can be printed from the computer)

Safety Concerns: It is best to set the experiment up before class. Once obtaining the ants for the habitat, do Not attempt to place the ants inside the habitat while in class. The opening for the ants

is very narrow and the ants are very active and can be very aggressive. Once free, your ants will try to escape and they do bite and sting. This is why it is best to set up the experiment before class and away from kids. Make sure the ants are safely secured and all compartments are closed shut to prevent any escapees.

Procedure:

Day One

1. It is very important that you go over some rules before you begin the lesson. For example, because these animals are very fragile and the habitat is sensitive to movement and heat, I told the students that no one is aloud to touch or handle the ant farm except for me and the teacher. They must stay in their seats at All times and if they cannot cooperate with me and their group members than they will not get to participate in this lesson.
2. A good way to begin this lesson is to first asses their knowledge of the key terms. Together, me and my students came up with a simple definition of each. Ask if any students have seen an ant farm or know what an ant farm is. Afterwards, go over the specifics of the ant farm and how it works. I asked the students what made up the ecosystem (ants, sand, plastic farms) and then what made up the habitat (sand, plastic farms).
3. Next pull out the ant diagram and go over the main parts of ant structure (i.e. mandibles, legs, claws, etc.). These parts will later be described as adaptations.
4. Next have the kids to begin making observations. I had them make a T chart so that they could organize their ideas. The topics, observation/adaptations were on the left side and details on that topic were on the right side.
5. Next begin facilitation of the discussion. Make references of how the ants are moving around in the environment. For example, are they only climbing on the ground or are they climbing on the walls and up the plastic houses and windmills located inside the habitat? How are they able to climb so high. Are their legs long or short. Are they working together or are they competing with one another. On the first day, the ants will spend more time getting use to their environment rather than tunneling through the sand. Therefore, you should use this time to get your students use to ant behavior and the ant habitat.

Day Two

1. On the second day of observation the ants will have began building extravagant tunnels through the sand. (I received the ants on a monday and I taught this experiment on tuesday and thursday, thus enough time had passed for the ants to begin their tunneling adventure by the next observation).
2. Have your students make new observations. By this time, the students should clearly see the ants working on their tunnels and clear and multiple tunnels should be evident throughout the ant farm. Tell the students to observe the tunnels. Ask the students how the

tunnels were formed using the ant diagram. During the lesson, the students observed that sand was forming at the top half of the ant farm compartment. I asked them to explain how this could have happen. I asked them if it were me who did this or was it magic? Asking ridiculous questions like this guided the students reasoning skills. After, closer observation of the ants the students replied that the ants were using the mandibles to pick up the sand and carry it to the top of the habitat. We described their mandibles as an adaptation.

3. I asked the students how the ants were able to make it up the steep tunnels. The students said that the ants use their legs and their claws at the end of their feet to climb up the steep hills and tunnels. We were also able to identify that as an adaptation. A few of the students found that the ants that were dead or had died in the habitat had been buried into the sand. I asked them how they were able to accomplish this feat. They told me that they used their legs and mandibles together for grabbing and digging to bury the ants into the sand. We labeled this another adaptation. We observed also that the ants worked together to move the sand and that they were not fighting amongst themselves. We discovered that by working together and sharing duties, more work could be accomplished in one day.
4. Next, I asked the students about the characteristics of a worm (no legs or feet and small mouth parts). I asked the students if a worm could grab sand and bring it to the top of the habitat as well as these ants could and the students replied no. I also asks the students if worms could bury other worms into the said as well as these ants could and the students replied no. Then I asked them why. The students replied that it was because they lacked the lacked the claws and mandibles that ants have. Thus, eventually we all agreed that ants are better adapted to living in habitat such as this rather than worms.

Notes and Tips:

Make sure to strategically order the ants so that they arrive in enough time during the week for the students to see the ants before and after they begin tunneling through the sand (Monday or Tuesday preferably Monday). It takes about 24-48 hours for the ants to get use to their new habitat, which they must do before they begin tunneling, and It takes 3 to 4 days for the ants to completely tunnel through the sand. It takes 5 to 6 weeks for the ants to be delivered. I ordered the ants the week before so I paid \$3 extra to receive the ants on Monday. Also, make sure to read and follow the directions on the ant farm closely before bringing it to the classroom.

It is better to do this lesson in small groups so that everyone can get a chance to see the ants up close. If you have magnifying glasses available, you may want to consider using them for the students who trouble seeing the ants up close. However, the ants are big enough for you to see them if you are close enough to them

This lesson went very well. It was the first time the students were able to work with live animals so they were really curious and all of them wanted to participate. However, often times the students were very excited so it is important to make sure that the students stay focused on the appropriate topics and the discussion at hand.

If I could do this lesson again, I would try to bring some extra books for the habitat to sit on or a sturdy table because often times, the table shook and the ant farm was in danger of falling down. Also, some of the students had a hard time making and using the T charts for their observations. Thus, I would try to simplify this by asking them to simply write a topic and make bullet point underneath for their observations.

References:

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