Lotusland

(To be taught after the Lotusland class presentation, on the morning of the field trip.)

Lesson Concept  Plants have adaptations for seed dispersal, which include interactions with animals.

Link  In the previous lesson, students learned about the various adaptations that seeds employ to disperse in their environment. In this lesson, students will investigate and apply the concepts of adaptation and ecological interdependence in a diverse botanical garden. In the next lesson, students will begin a new sub concept to learn about the cycling of matter that takes place in these interactions by studying the links of a food chain.

Time  Approximately four hours

Materials  Whole Class
Computer and internet to display Lotusland website

Individual
Picture card for “Snowball” activity (see evaluation)

Advance preparation  1. Contact Lotusland to schedule a docent presentation and class tour. Explain the focus (lesson concept) to the docents so that they may discuss these concepts with the students.

2. Decide how many rounds of snowballs (see evaluation) you want to do and duplicate picture cards so that there is enough space for students to write on the paper for each round that is conducted. For example, if you want students to toss and write four times, they will need a larger picture than if you want them to toss and write twice.

Procedure:

Engage  (10-15 minutes) Living things are inter-related and have adaptations to survive in their environment.

1. Display pictures of the Lotusland garden from the website www.lotusland.org (e.g., the caterpillar on the leaf in the Butterfly Garden).

2. In a think-pair ask students to discuss the some of the following questions:
   • What are some biotic and abiotic components of this ecosystem?
   • How do these components interact with each other?
• What adaptations do you notice? How do those adaptations help meet the organism’s needs?
• Do you see any seeds? If so how do you think they disperse? Do animals help?
• Based on what you have learned in this unit, how do you think the animals and plants might interact with each other?

3. Ask a couple of partners to share part of their conversations. Explain that today they will explore Lotusland to observe the things they have been discussing: plant and animal adaptation, and interdependence of biotic and abiotic factors.

Explore/Explain/Extend (3 hours) Lotusland is a diverse botanical garden where it is possible to observe many forms of seed dispersal and the interdependence of plants and animals.

4. Focus on the key concepts of the lesson as you explore the garden.

Evaluate (20 minutes)

5. When you have returned from the field trip, ask students to reflect on the information they learned and the observations they made during the Lotusland tour.

6. Explain that students will have an opportunity to share what they learned using the “Snowball” strategy: Tell students that they will be given a piece of paper with an illustration of an animal in its ecosystem, and will be asked to share their knowledge about what they have learned so far by writing a descriptive sentence or “caption” for the picture.

7. After they write their caption, they will wad up the paper and toss it in the air simultaneously. Another student will find the paper, add another detail to the caption, and sign their name. Tell them it is necessary to sign their name before every toss so they can figure out who wrote on their “snowball,” and so the teacher can see what ideas they shared.

8. Remind them that if another student has already chosen a certain sentence frame, they may not use it again and must pick a different one.

9. Set the behavior expectations for the activity: walk safely, choose a “snowball” near you rather than racing across the room for a specific person’s “snowball,” throw snowballs UP in the air rather than towards people, etc.

10. Display the following sentence starters, and tell students they may choose any sentence frame to start their sentence:

“The plant depends on an animal to ____________________________.”
“The animal depends on a plant to ____________________________.”
“An adaptation the plant has is ____________________________.”
“An adaptation the animal has is ____________________________.”

11. Distribute the picture card to each student and ask each to write his or her name on the back of the paper. Give students time to write their caption using the
sentence starter of their choice. Then instruct them to wad up their “snowball” and wait for the count of three to toss it up into the air.

12. Students pick up a different “snowball,” write a response, **sign their name on their partner's paper**, toss, and collect again.

13. Continue for as many rounds as you planned in advance preparation.

14. Collect all “snowballs” when done and review for student understanding.
Pictures for Snowballs

- Image of a bee
- Image of a plant
- Image of a hummingbird
- Image of a purple flower
<table>
<thead>
<tr>
<th><img src="image1.jpg" alt="Image" /></th>
<th><img src="image2.jpg" alt="Image" /></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.jpg" alt="Image" /></td>
<td><img src="image4.jpg" alt="Image" /></td>
</tr>
</tbody>
</table>