Science Assessment Lesson Plan
By: Erin Delger
Lesson Plan Template
Date: _____

Grade: 2

Subject: Science

Materials:

- Graphic of a bee pollinating a flower (Figure A; below)
- Students' science journals
- Bee picture template (Figure B; below)
- Flower template (Figure C; below)
- Student experiment checklists (Figure D, E, F; below)
- Pencils
- Tape
- Pipe cleaners
- Cotton balls
- Q tips
- Cheetos
- Paper cupcake liners

Technology Needed:

- Computer
- Projector

Instructional Strategies:

- ☐ Direct instruction
- ☐ Guided practice
- ☐ Socratic Seminar
- ☐ Learning Centers
- ☐ Lecture
- ☐ Technology integration
- ☐ Other (list)
- ☐ Peer teaching/collaboration/ cooperative learning
- ☐ Visuals/Graphic organizers
- ☐ PBL
- ☐ Discussion/Debate
- ☐ Modeling

Guided Practices and Concrete Application:

- ☐ Large group activity
- ☐ Independent activity
- ☐ Pairing/collaboration
- ☐ Simulations/Scenarios
- ☐ Other (list)
- ☐ Hands-on
- ☐ Technology integration
- ☐ Imitation/Repeat/Mimic

Explain:

Standard(s)

2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

Objective(s)

By the end of the lesson, students will be able to model how a bee helps pollinate flowers by performing a pollination experiment with pipe cleaners, cotton balls, Q tips, and Cheeto dust; after, they will write a description or draw a diagram in their science journals to portray how the bee pollinates a flower.

"I can model how a bee pollinates flowers by using a cotton ball, Q tip, or pipe cleaner. I can write about or draw a diagram to show bee pollination."

Bloom's Taxonomy Cognitive Level: Applying

Differentiation

Below Proficiency: I will give the child a visual of the bee pollinating the flower (Figure A; below). The students can use this figure as a reference during the experiments and formative assessments. During the experiment, I would provide these students with a step by step checklist (Figure D, E, F; below) to help keep them on track with what they need to do next. A checklist has been made for each station. In their science journals, the students will have the opportunity to choose how they want to depict the process of bee pollination. They can write about it or draw a diagram. For those that are tactile sensitive, I will place them at one of the stations and give them a pencil to use to transfer the pollen; this way they do not have to touch the cheeto dust, cotton balls, Q tips, or pipe cleaners.

Above Proficiency: The students will have the opportunity to choose how they want to depict how bee pollination occurs. They can write about it or draw a diagram. If the students quickly finish this, I may prompt them to write about or draw a diagram showing how other animals may cause pollination.

Approaching/Emerging Proficiency: The students will get to choose how they want to represent the process of bee pollination. They can draw a diagram or write about their experiment and how it transfers to bee pollination.

Modalities/Learning Preferences:

- **Bodily/Kinesthetic Intelligence:** The students will be able to work hands on with pipe cleaners, cotton balls, and Q tips to simulate how a bee pollinates a flower.
- **Spatial/Visual Intelligence:** The video at the beginning of the lesson, the checklists, and bee pollination diagram, will provide the students with a visual representation of the pollination process.
- **Naturalistic Intelligence:** Students will be experimenting with concepts that happen in nature and

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	that provide them with natural elements such as flowers and fruits. • **Interpersonal Intelligence:** Students will be able to collaborate with their group members as they experiment with the concept of bee pollination. • **Intrapersonal Intelligence:** The science journals will provide the students with an opportunity to work independently and to express their own understanding of the concept.

Classroom Management- (grouping(s), movement/transitions, etc.)
• Grouping
  • For the experiment, students will be broken up into groups of three. I will divide them up by numbering them one, two, and three. Once all students have received a number, they will go their correlating station.
• Transitions
  • "One, two, three eyes on me."
  • "Come back to me in three, two, and one."
  • "Hands on top, everybody stop."
  • Once the students have provided me with their undivided attention, they will be allowed to quietly move to their stations or to their desks depending upon what part of the lesson they are on.
• Movement
  • Students will move from their desk to their station. While at this station, they should remain with their group and in their area. When the experiment is over, the students will quietly move back to their desks.
• Using Materials
  • The students will be using several materials for the experiment in their lesson. They are expected to be responsible with the materials; this includes not eating the Cheeto dust or placing other materials into their mouths. If the students are unable to handle the materials correctly, they will be asked to return to their desk.
	Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)
	• Direct Instruction
	  • Students are expected to have their eyes on the speaker.
	  • Students are expected to have their bodies still.
	  • Students are required to use a voice level 0 when others are talking.
	  • Students are required to raise their hand if they have a question.
	• Partner Discussion
	  • Students are required to take turns.
	  • Students are expected to use a voice level 1.
	  • Students are required to be active listeners by facing the speaker and using a voice level 0.
	• Group Work (Experiment)
	  • Students are expected to stay at their station.
	  • Students are required to be on task.
	  • Students are required to use a voice level 2.
	  • Students are expected to use the materials appropriately.
	• Using Materials
	  • Students are required to keep all materials out of their mouths.
	  • Students are required to not throw, break, or stomp on the materials.
	If the students can not adhere to these expectations, they will be asked to practice them until they can get them right, or they may be asked to take a break and return to their desks.

Minutes	Procedures
15 minutes	**Set-up/Prep:** 1. Print off checklists, bee templates, flower templates, and graphic of bee pollination. 2. Cut out the flower templates, bee templates, and graphic of bee pollination. 3. Set out pipe cleaners at one station, Q tips at another, and cotton balls at the final station. 4. Set out four flower templates and four cupcake liners at each station. 5. Place the cupcake liners in the center of the flower templates. 6. Scrape Cheeto dust into two of the cupcake liners at each of the stations. Remember to leave two of the cupcake liners empty. 7. Write prompt on the board.
4 minutes	**Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)** 1. Start the pollination video at 2:25 linked here: https://youtu.be/txv2k7OoY7U?t=145 2. "Turn to a partner and share what you already know about pollination. When I call you back, I want you to tell me what your friend said; this way I know that we are all being good listeners. Remember to use a voice level one when you are sharing and to be active listeners. You may begin." a. Allow approximately 30 seconds for the students to turn and talk with their partner. Go around and check in with a few groups to get a better understanding of what they know about the concept of pollination. 3. "Come back to me in three, two, and one." a. Allow time for the students to have their eyes on you and to have a voice level 0. 4. "I am going to pick two people from two different groups to share what their partner knows about pollination." a. Select two students to explain their partner's understanding of pollination. 5. "Great work! From what I heard, you know that pollination is something that happens to flowers. You already know so much about pollination, but we can always learn more! Today we are going to talk about how bees help pollinate flowers.

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	Let's look at our learning goal for today; it says, "I can model how a bee pollinates flowers by using a cotton ball, Q tip, or pipe cleaner. I can write about or draw a diagram to show bee pollination." Let's keep our goal in mind when we are going through today's lesson."
6 minutes to explain 4 minutes for journal entry 5 minutes to explain 2-3 minutes for journal entry	**Explain: (concepts, procedures, vocabulary, etc.)** 1. "I want to turn your attention to the image I have displayed on the board." a. Display Figure A which is the steps to bee pollination. 2. "This diagram shows us the steps that a bee takes to pollinate a flower. First the bee lands on a flower and drinks the nectar from the flower. When it does this, it bumps its furry body against the stamen of the flower. That is this tall part here." a. Point to the stamen on the bee pollination diagram. 3. "The bee's body is now covered with pollen because the hair on its body catches the pollen and makes it stick. Raise your hand if you have ever heard of pollen." a. Allow time for the students to respond. 4. "What is pollen?" a. Allow time for a student to answer. 5. "Yes. It is a yellow or orange powder that the male part of the flower, the stamen, makes. To me, it looks like the bumble bee rolled around in some Cheeto dust! When we watched the video and when we look at this graph, we notice that bees help move this pollen. What are some of the ways that a bee can move pollen?" a. Allow time for the students to respond. 6. "The bee uses its head, antennas, body, and legs to move pollen. I want everyone to take out their science journals." a. Allow time for the students to take out science journals. 7. "Turn to a new page and place the header "Pollination by Bees" at the top of your new page." a. Allow time for the students to create a header. 8. "Now that we have our header at the top of our page, write the sub title "How Bees Carry Pollen" right underneath our header." a. Allow students time to write the sub title. 9. "Under our sub title "How Bees Carry Pollen", I want you to show me your understanding of how bees use their bodies to carry pollen. You can either write about or draw a diagram of how a bee uses its body to carry pollen. You could even do both if you would like. If you think drawing would be best for you, but you do not know how to draw a bee, you can use one of these bee templates." a. Show the students Figure B which is the bee template. 10. "We will tape the template in your notebook later on. Maybe you want to label the parts of a bee that carry pollen; maybe you want to write about the bee's body parts and how they carry pollen. You choose which every way that you feel comfortable. I just want to be able to see that you are understanding how a bee carries pollen from flower to flower. You will have about four minutes to do your journal check in and then we will continue. If you do not finish in those four minutes, there will be time later on. Remember when we are doing independent work, we should be using a voice level 0 and should be doing the task that I have asked you to do. You may begin." a. Allow students approximately four minutes to portray their understanding of how a bee uses parts of its body to carry pollen. 11. "Now that we have talked about how a bee can carry this pollen, we will talk about what happens when this pollen moves to a new flower. Remember, the pollen sticks to the head, legs, antenna, body, and wings of a bee. When the bee moves to another flower, some of those little bits of pollen fall off. When this happens, there is a special process that occurs; this process is called pollination. Some of you may already know what pollination is but we can always review. Pollination is a process where pollen moves from flower to flower and this causes the plant to make seeds. These seeds can turn into more flowers or fruits! Bees are animals that can help flowers become pollinated. When I say go, I want you to turn and talk with your neighbor about why pollen is important. Remember to be active listeners and use a voice level one when it is your turn to talk. Let's have the tallest group member share first but everyone needs to share. You may go." a. Allow approximately 30 seconds for the students to discuss why pollination is important. When they are discussing, walk around and check in with a few of the groups to make sure they are comprehending the content. 12. "What were some of you answers your group came up with to the question "why is pollination important? Please raise your hand." a. Select a few students to answer. 13. "Great answers! Now that we know how bees carry pollen with their bodies and what pollination is, we are going to do a pollination experiment. Scientists, I want you to pretend that you are bees for the day. You will get to experiment with carrying pollen. I have three stations. You will be placed at only one station. If you look at this station, you will be able to see that there are four flowers and each flower has a cupcake liner in the middle. Two of the cupcake liners have Cheeto dust in the middle. This is our pollen. What is pollen again?" a. Allow time for the students to respond. 14. "Yes! It is a yellow powder that male parts of the flower make. Two of the cupcake liners are empty. You will take your special bee body part and dip it into the Cheeto dust. Once you have done this, you will move to the flower that has not been pollinated and you will tap your bee body part to knock some of your pollen off and onto the flower. When we do this, we have just completed a very special process. Raise your hand if you remember what this process is called."

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	a. Allow time for the students to raise their hands and have one student answer. 15. "Yes! It is called pollination. Like I said, each group gets a certain bee body part. The cotton balls are like the bee's body and head. The pipe cleaners are like the bee's legs, and the Q tip is like the bee's antennas. Station one is cotton balls, station two is pipe cleaner, and station three is Q tip." a. Point to the stations as you say them. 16. "After you have pollinated the flower, you may use your science journal to write or draw about what happened. Then I will give you more instructions. We must remember our expectations. First, we will not be eating the Cheeto dust or putting any of the tools in our mouths. If I see this happen, I will take them away and you will not get to do the experiment. Second, we must be using a voice level 2. We can talk about what is happening with our friends, but we must keep it down. Finally, we must be on task. When I say this, that means no wandering around; you are at your spot doing your work. I will divide you by numbering you one, two, or three. Please do not move until everyone has a number." a. Number students off one, two, or three. 17. "You may now move to your station." a. Allow the students approximately four minutes to perform the experiment. Walk around and make sure the students are using the materials correctly. Prompt students with questions like the ones below: a. Why do you think the pollen is sticking to the bee's (body, legs, or antenna)? b. Do you think this part of the bee's body can hold a lot of pollen? Why? c. If you were a bee, do you think it would be easy to get the pollen off? Why? d. Do you think there are other ways pollen can be moved? 18. "You have two minutes." 19. "You have one minute. You need to start finishing up." 20. "Hands on top, everybody stop. I should see everyone's hands on their heads and all eyes looking at me." a. Allow time for the students to respond by placing their hands on their head and by having their eyes on you. 21. "Please quietly walk back to your desks. If we cannot do this quietly and with walking feet, we will keep practicing until we get it right." a. Allow time for the students to transition. 22. "Now that we had the chance to pretend we are bees and experiment with carrying pollen, we need to record it in our journals. Please create a new subtitle that says "Experiment Reflection". I wrote this on the board for you. When you have done this, place your pencil in your journals, so I know you are done." a. Allow time for the students to create a new subtitle. 23. "An experiment reflection is where we think about what happened during our experiment. Using what we talked about during the lesson and what you found out during your experiment, I want you to answer our prompt. It says, "How can bees pollinate a flower?" You can either write about how the bee pollinates flowers, or you can draw a diagram with the steps of how a bee pollinates flowers. If you draw a diagram, you must label some of the parts, so I can understand. You will have about two to three minutes to explain what you know about bees and how they help pollinate flowers. Remember, this is an activity that should be done on your own, so we must be using a voice level 0 and must remain in our own seats. You may begin." a. Allow students time to reflect on the lesson. b. If a student is a high flyer and finishes early, I will prompt them with a question that requires some more critical thinking. My question would be: "what other animals help with flower pollination and how do you think they help?"
5 minutes	**Explore: (independent, concreate practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)** 1. The students will split into three groups. Each group will go to one of the stations. The first station uses cotton balls to represent the bee's body and head. The second station uses pipe cleaners to represent the bee's legs. The third station uses Q tips to represent the bee's antennas. Along with cotton balls, pipe cleaners, or Q tips, there will be four flower templates and four cupcake liners. The cupcake liners sit at the center of the flower. In two of the four cupcake liners there will be Cheeto dust. This is the flower's pollen. The students will be required to use the bee body part (cotton ball, pipe cleaner, Q tip) that is at their station and attempt to transfer pollen from the pollinated flower to the non-pollinated flower. They do this by dunking their bee body part (cotton ball, pipe cleaner, Q tip) into the pollen (Cheeto dust). Then they move the bee body part over to the non-pollinated flower. When they move it to the non-pollinated flower, they must tap the bee body part to release some of the pollen.    Some of the ideas from my lesson were derived from the following sites: http://imbloghoppin.blogspot.com/2013/11/activities-likelinky-party.html https://www.weareteachers.com/hands-on-science-using-nature-works/

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	http://msbarbarasblog.blogspot.com/2013/04/beesa-preschool-study.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed:+blogspot/oEDfg+(For+the+Children)&m=1 https://www.teacherspayteachers.com/Product/Butterfly-Life-Cycle-Complete-Science-Unit-1808862 https://www.teacherspayteachers.com/Product/FREE-Pollination-Demonstration-1837566
4 minutes	**Review (wrap up and transition to next activity):** 1. "Today, we talked about how bees help pollinate flowers. Let's look back to our learning goal; it says, "I can model how a bee pollinates flowers by using a cotton ball, Q tip, or pipe cleaner. I can write about or draw a diagram to show bee pollination." What were some of the bee body parts that helped carry pollen?" a. Allow time for the students to answer. 2. "What happens when a bee moves pollen to a flower that has not been pollinated?" a. Allow time for the students to answer. 3. "Right! This can create new seeds which gives us more flowers or fruit. Why do you think we need to know about how bees help pollinate flowers?" a. Allow time for the students to respond. 4. "Yes! So we can take care of bees, so we can continue to have beautiful flowers and delicious fruit, or to help us have a great garden! Are there other animals that can help move pollen?" a. Allow time for the students to respond. 5. "You are correct. There are other animals that help move pollen. Tomorrow, we will talk about the other animals that can help pollinate flowers. Right now, I want you to quietly put away your science materials and get ready for our next activity."

Formative Assessment: (linked to objectives, during learning)

- **Progress monitoring throughout lesson (how can you document your student's learning?)**

Throughout the lesson, the students will be asked to document their understanding in their science journals. They have the option of representing their understanding by writing or by using a diagram. The first time the students are required to document in their journals is when I prompt them to portray their understanding of how a bee carries pollen. The students can draw a picture of a bee and label the parts that carry pollen, they can use the template that I have provided and label it, or they can write about the bee body parts that carry pollen. The students have the ability to portray their understanding in whatever way they feel comfortable. The other portion of the formative assessment is at the end of the experiment. Once again, I have them document their understanding in their science journal. I give them the prompt "how can bees pollinate a flower?" They can answer this question any way that suits them and their learning style. The science journal provides me, the teacher, with an understanding of how well the students are obtaining the information that connects with today's objective.

The formative assessment is differentiated by allowing them to choose how they want to represent their understanding in their journals. I also provide the students with a template if they want to draw a bee in their journal but do not know how. For the high flyers that finish early, I will prompt them with the question: "what other animals help with flower pollination and how do you think they help?"

Summative Assessment (linked back to objectives, END of learning)

After talking about how bees and other animals help flowers in the pollination process, the students will be given a short paper pencil test that allows me to assess their learning in connection with the standard we have been discussing. This end of the unit test allows me to observe how well the students understood the content that was presented throughout the entire pollination unit. The test is composed of questions about how animals help transfer pollen from flower to flower or disperse seeds and why pollination is important. Figure G, H, and I listed below is the summative assessment I would give to my students.

Reflection (What went well? What did the students learn? How do you know? What changes would you make?):

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Figure A: Bee pollination

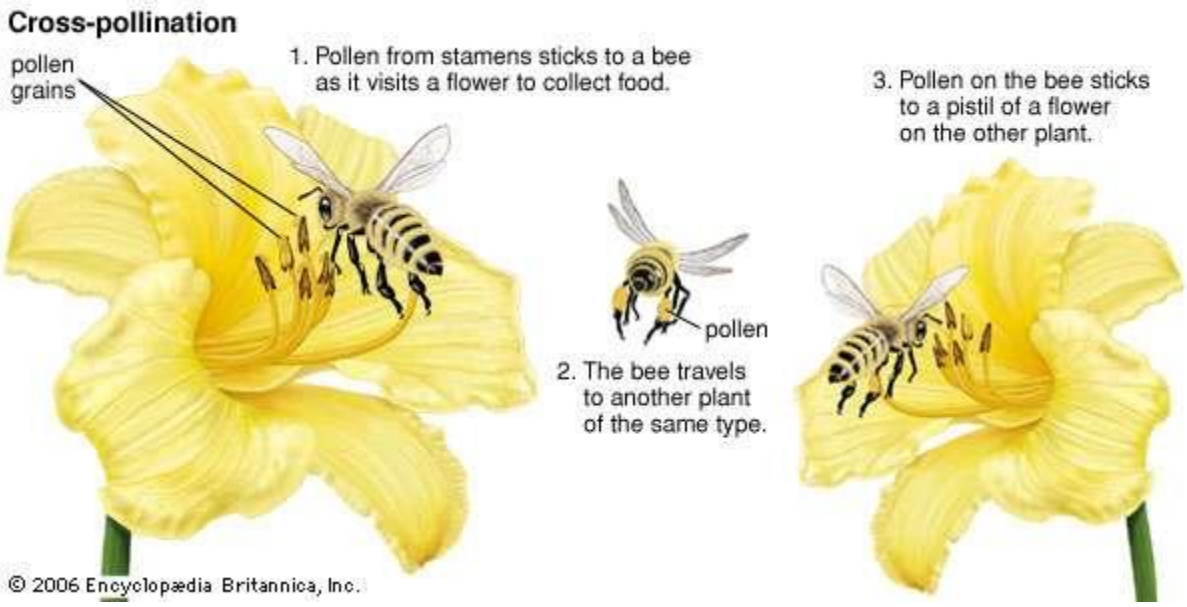

Figure B: Bee Picture Template

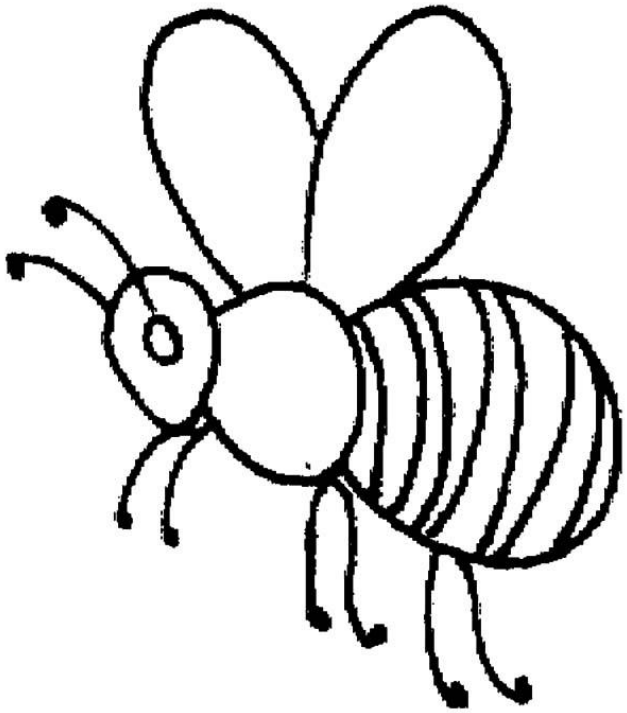

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Figure C: Flower Template

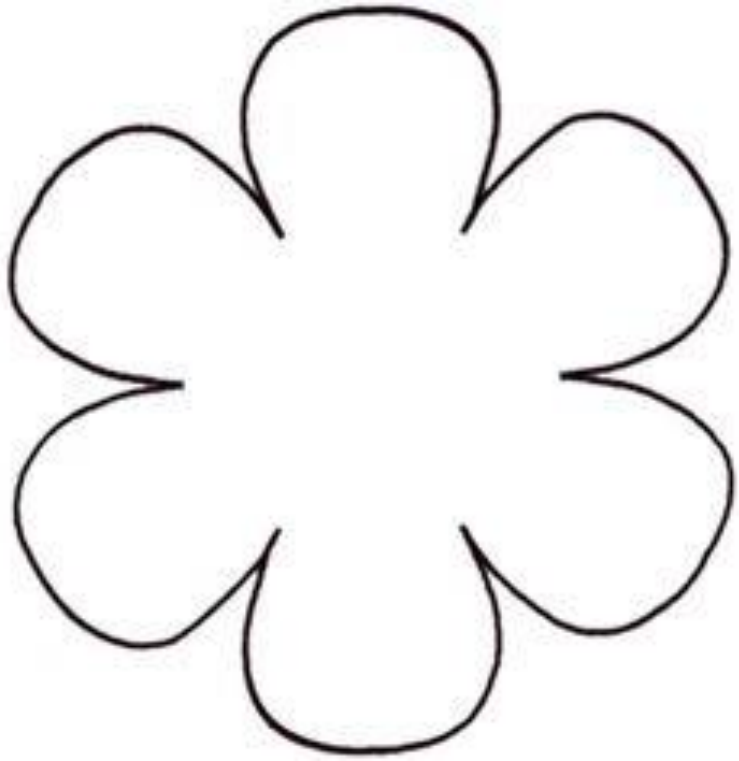

Figure D: Student Checklist

Bee Pollination Experiment Checklist (Cotton Ball Station)

Directions: Put a ✓ next to the step that you have done.

_____ Step 1: Grab the cotton ball.

_____ Step 2: Place cotton ball in Cheeto dust.

_____ Step 3: Take Cheeto covered cotton ball and move it to other flower.

_____ Step 4: Tap the cotton ball until Cheeto dust falls onto flower.

_____ Step 5: Set cotton ball down.

_____ Step 6: In your science journal, write about or draw a picture to show how the Cheeto dust (pollen) was moved from one flower to the other flower.

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Figure E: Student Checklist

Bee Pollination Experiment Checklist (Pipe Cleaner Station)

Directions: Put a ✓ next to the step that you have done.

_____ Step 1: Grab the pipe cleaner.

_____ Step 2: Place pipe cleaner in Cheeto dust.

_____ Step 3: Take Cheeto covered pipe cleaner and move it to other flower.

_____ Step 4: Tap the pipe cleaner until Cheeto dust falls onto flower.

_____ Step 5: Set pipe cleaner down.

_____ Step 6: In your science journal, write about or draw a picture to show how the Cheeto dust (pollen) was moved from one flower to the other flower.

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Figure F: Student Checklist

Bee Pollination Experiment Checklist (Q tip Station)

Directions: Put a ✓ next to the step that you have done.

_____ Step 1: Grab the Q tip.

_____ Step 2: Place Q tip in Cheeto dust.

_____ Step 3: Take Cheeto covered Q tip and move it to other flower.

_____ Step 4: Tap the Q tip until Cheeto dust falls onto flower.

_____ Step 5: Set Q tip down.

_____ Step 6: In your science journal, write about or draw a picture to show how the Cheeto dust (pollen) was moved from one flower to the other flower.

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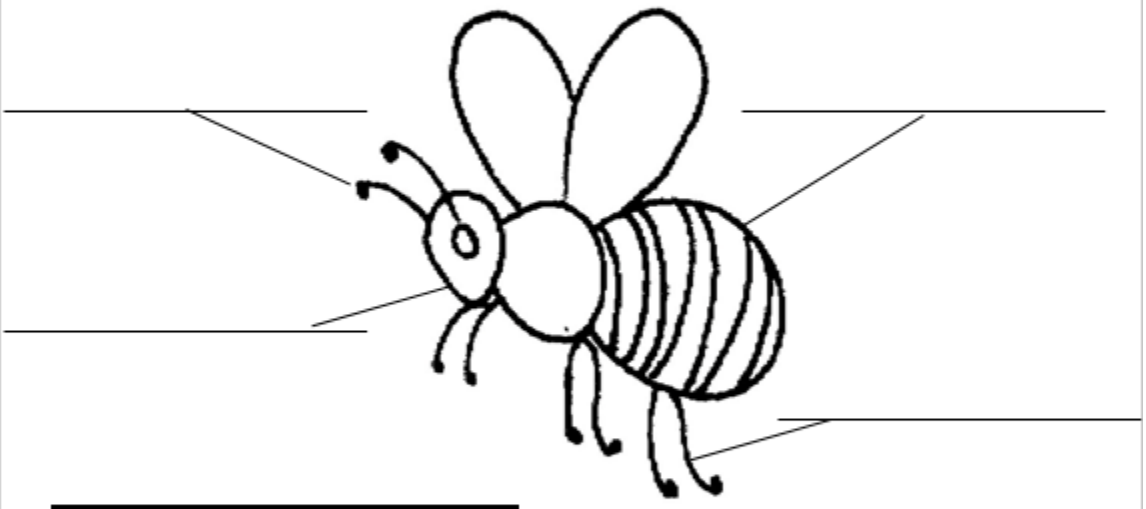
Figure G: Page 1 of Pollination Summative Assessment

Name: _____

How Animals Help Pollinate Plants

2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

Directions: Write the name of the bee body parts that carry pollen. There are four spaces for you to fill in. Use the word bank for help.



Word Bank	
Antenna	Body
Head	Legs

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Figure H: Page 2 of Pollination Summative Assessment

How Animals Help Pollinate Plants

Directions: Circle the pictures that answer the question. There may be **more than one** answer.

What helps spread seeds and helps pollinate flowers?

Directions: Choose an animal that helps move pollen from flower to flower. Describe how this animal moves the pollen. Write in complete sentences.

_____

_____

_____

_____

_____

_____

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Figure I: Page 3 of Pollination Summative Assessment

How Animals Help Pollinate Plants

Directions: Read the two questions below. If the answer is true, circle true. If the answer is false, circle false.

1. Pollen is the yellow powder found on plants.

   True **False**

2. Pollination is when the pollen from one flower moves to another flower.

   True **False**

Directions: Write your answer to the question. Use complete sentences.

What happens after a flower has been pollinated?

_____

_____

_____