

Date: _____

Your Name: _____

Name(s) of Partner(s): _____



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

Released Science Inquiry Task

Bees and Pollinators

2013

Grade 4

Inquiry Booklet

Science

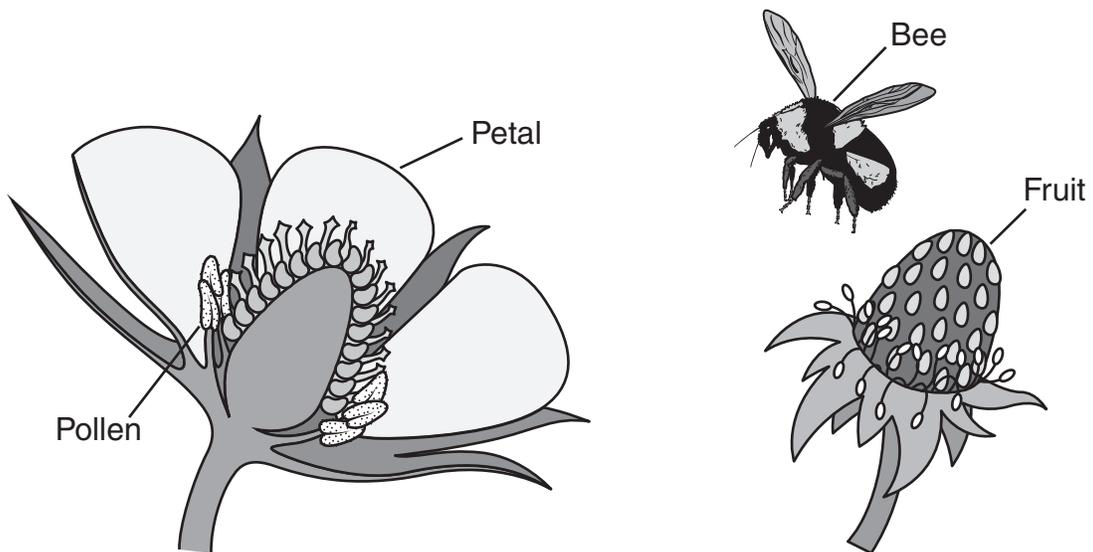
Directions:

You will read a story about students in a science class. You and a partner will do the same investigation as the class in the story.

Word Bank

Median	the middle value in a list of ordered measurements Example: The median for 2 cm, 4 cm, and 5 cm is 4 cm.
Model	a testable idea used to learn about the natural world
Pollen	a yellow-orange powder made by a flowering plant that helps the plant produce seeds and fruit
Pollinate	to move pollen from one plant to another of the same kind
Pollinator	an animal that carries pollen from one flower to another
Texture	the feel or look of something

Strawberry Plant



Pollinating Strawberry Plants

A science class is learning about plants. The students decide they want to plant strawberry plants in pots in the school classroom and watch them grow. Their teacher also takes a few strawberry plants from the classroom to the community garden.

The students care for the strawberry plants in the classroom. After a couple of months, the class is confused and a little discouraged that their plants have plenty of leaves and flowers but no berries.



Meanwhile, one of the students in the class visits the community garden. She discovers that many of the strawberry plants in the garden have flowers, and some even have berries.

The student reports her findings back to the class. The teacher suggests the class go as a group to visit the community garden so they can see the strawberry plants for themselves. Everyone agrees that the strawberry plants in the garden are doing well and have berries; however, the classroom strawberry plants look different.



The students decide they want to find out why the two sets of strawberry plants look so different. They wonder, “What was the same for both sets of plants? Air, light, soil, and water. What was different? One set was grown inside while the other was grown outside.”

The class researches and finds out that flowering plants need to be pollinated to make a fruit or a seed. They learn bees are one of the primary pollinators and that bees have a certain texture on their legs and body that allows them to pick up, carry, and drop off pollen. They realize the community garden has bees pollinating the strawberry plants, but the plants in the classroom have no bees.

The students know that they cannot bring bees into the classroom, so they research how they can pollinate their strawberry flowers without bees.

In this investigation, you will be using a model to investigate materials that might help pollinate a flowering plant. Scientists use models to learn about the natural world. The models that scientists use can help them make predictions, understand how something works, and share their ideas. The models used in this investigation are pollinating sticks with three different textures on the ends.

Research Question:

On a bee, which texture works best to pollinate a flowering plant?

Making a Prediction—What Do You Think?

Make a prediction **on your own** about the research question below.

Research Question:
On a bee, which texture works best to pollinate a flowering plant?

Use information from the story about the science class and what you know about the characteristics of textures to make your prediction.

Explain your prediction.

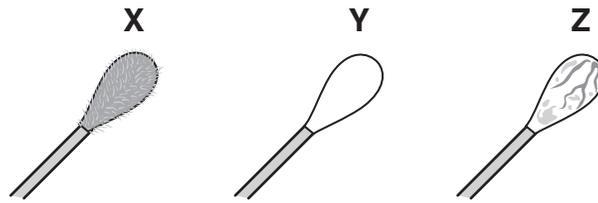
I predict _____

because _____

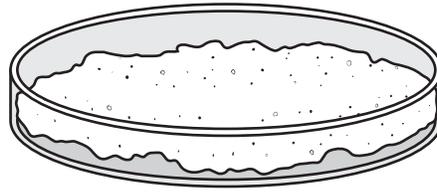


Materials for the Investigation:

The materials shown below represent different textures that could be used to pick up and drop off pollen.



The material shown below represents pollen.



Safety: DO NOT put any objects in your mouth, nose, or ears.

Procedure:

- You and your partner(s) will work together to do this investigation.
- You will record all the data that you collect in the data tables on page 6.

Part A: Observe the Materials

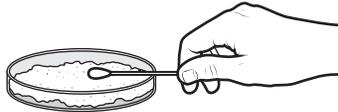
1. Remove one pollinating stick from bag X and place it on the X on the Pollen Drop Off Sheet. Do the same with bags Y and Z. When you remove the stick from bag Z, remember to also pull it out of the wax paper.
2. Observe the texture at the end of each stick.
3. Record a description of the texture of each material in the table below.
4. Place your used sticks in the large plastic bag.

Description of Pollinating Sticks

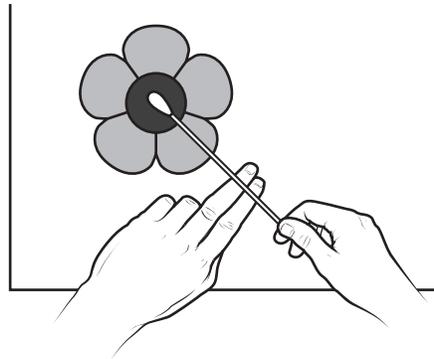
Stick	Texture of the Material
X	
Y	
Z	

Part B: Testing the Materials and Recording Your Data

1. Pour all the pollen into the pollen dish on your Placemat. Return the empty pollen bag to the Placemat.
2. Take a new stick from the bag labeled X.
3. Roll the stick across the top of the pollen for three turns. Then carefully roll the stick once above the dish to remove extra pollen. Be careful not to tap the dish.



4. Compare the tip of the stick to the Pickup Key on page 6. Write the number in **Data Table 1** that closely represents how much pollen you picked up. **Do not go on to step 5 until you complete this step.**
5. Take the stick carefully over to the center of the empty flower for Trial 1 on the Pollen Drop Off Sheet. Rest your hand on the table and place the stick on top of two fingers, as shown in the picture below. Tap the stick three times.



6. Using the Drop Off Key on page 6, write the number in **Data Table 2** that closely represents how much pollen you dropped off in the center of the flower.
7. Place your used stick in the large plastic bag.
8. Repeat steps 2–7 two more times for a total of three trials.
9. Repeat steps 2–8 with stick **Y**.
10. Repeat steps 2–8 with stick **Z**.
11. After you have recorded all your data, record the median amount for the three trials in Data Table 1 and Data Table 2.

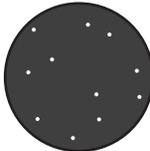
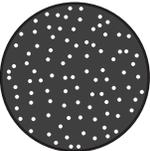
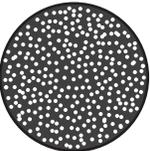
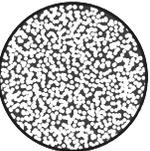
Pickup Key

No Pollen (0)	Very Small Amount of Pollen (1)	Small Amount of Pollen (2)	Medium Amount of Pollen (3)	Large Amount of Pollen (4)	Very Large Amount of Pollen (5)
					

Data Table 1: Amount of Pollen Picked Up by Each Texture

Stick	Trial 1	Trial 2	Trial 3	Median
X				
Y				
Z				

Drop Off Key

No Pollen (0)	Very Small Amount of Pollen (1)	Small Amount of Pollen (2)	Medium Amount of Pollen (3)	Large Amount of Pollen (4)	Very Large Amount of Pollen (5)
					

Data Table 2: Amount of Pollen Dropped Off by Each Texture

Stick	Trial 1	Trial 2	Trial 3	Median
X				
Y				
Z				

