Montana Pollinator Education Project

**Lesson Title: Pollinator Watch!**

***Grade: K-3 (To be taught in late spring)***

***Duration of Lesson: 1 - 45 minute class and additional observation times.***

***Brief: Students will design flowers to attract pollinators, studying the attractive quality of colors, shapes, and patterns.***

***Materials:***

Montana Pollinator Education Project Bee Identification cards
Montana Pollinator Education Project Poster
Additional pollinator posters from Montana Department of Agriculture if available, can also be seen at: Pollinator Posters

Solo yellow cups 
Brightly colored construction paper
Scissors
Glue
Poster board (one piece for each 4 students)

***Key Terms***
Pollinator, bee, color, shape, size, texture, bright, dull, pattern, fruit, blossom, and attraction.

MONTANA COMMON CORE STANDARDS:

**ELA K-1. Speaking and Listening**

**3. Comprehension and Collaboration:** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

**ELA 2. Speaking and Listening**

**3. Comprehension and Collaboration:** Ask and answer about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

**ELA 3. Speaking and Listening**

**2. Comprehension and Collaboration:** Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

**Math K. Counting and Cardinality**

**4. Count to tell the number of objects:** Understand the relationship between numbers and quantities; connect counting to cardinality.

**Math 1. Measurement and Data**

**4. Represent and interpret data:** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

**Math 2. Measurement and Data**

**10. Represent and interpret data:** Draw a picture graph or bar graph to represent a data set from a variety of cultural contexts, including those of Montana American Indians, with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in the bar graph.

**Math 3. Measurement and Data**

**4. Represent and interpret data:** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories, within cultural context. Solve one- and two- step "how many more" and "how many less" problems using information presented in scaled bar graphs.

**NGSS K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment**

**K-LS1-1:** Use observations to describe patterns of what plants and animals need to survive.

**NGSS 1. Structure, Function, and Information Processing**

**Crosscutting Concepts, Structure and Function**

The shape and stability of structures of natural or designed objects are related to their functions. (1-LS1-1)

**NGSS 2. Interdependent Relationships in Ecosystems**

**Disciplinary Core Ideas, LS2.A: Interdependent Relationships in Ecosystems**

Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

**NGSS 3. Interdependent Relationships in Ecosystems**

**3-LS4-3:** Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

| Understanding(s) /Big Ideas: | Essential Question(s)? |
|---|---|
| Students will understand that certain colors attract pollinators. | Do yellow Solo® plastics attract pollinators? Can paper flowers attract insects? |
| Students will know: Pollinators are attracted to flowers partially by the flower's colors. | Students will be able to: Determine if more pollinators visit bright colored paper flowers if the flowers contain yellow Solo® plastics. |
| **Performance / Observations** | |
| Performance Task(s): Create a paper flower and observe the flowers for pollinator attraction. | Other Evidence: Students will chart the results of their observations. |
| **Learning / Inquiry Activities** | |

## *Introduction*

The tiny hair on a bee is perfect for pollen to attach to, even if the bee does not touch the pollen directly the electrostatic charge of the hair makes the grounded pollen "jump" to the hairs. Hair on some bees like the Bumblebee is also used to help keep the bees warm as well.

http://www.public-domain-image.com/

In this lesson students will construct flowers to attract pollinators. This lesson is best taught in the spring of the school year, between late April and early June when your class can be taken outside for observation periods. Students will make bright colored flowers with pieces of yellow Solo® cup centers to attract pollinators.

Bees are drawn to flowers by their color and scent. Because plants need pollinators in order for survival they have adapted to become attractive to bees. Bees like plants with many layers of flowers, especially tubular flowers and brightly colored flowers. They also prefer flowers that are purple, blue, violet, and yellow, with petals that are large enough to land on and with a sweet scent. Entomologists believe that the yellow of the Solo® plastic cups is the closest color of nature's yellow for making the center of the flower shape in order to draw pollinators.

## *Student Activity:*




Distribute brightly colored paper in purple, blue, violet, yellow, white, red, and orange to students. Inform the students that half of the class will be using pieces of yellow Solo® cups for the centers of their

flowers, while the other half of the class can choose any color they like for the centers. Discuss the fact that pollinators visit flowers for nectar and pollen. Let students know that they will be attaching their completed flowers to a piece of poster board. The poster boards will be set outside and students will gather data on how many pollinators visit each of their flowers. Encourage students to make a wide variety of 3-6 inch flower shapes from the website below: http://theseedsite.co.uk/inflorescences.html

For images of Montana wildflowers please visit: http://montana.plant-life.org/pics_wildflowers.htm

After the students have made the flowers, ask them to mount the flowers on poster board. Mix the flowers up so that those with the Solo® cup centers are mixed in with the others. With the flowers mounted plan a time to take the class outside for an observation period. Ask the students to view the MPEP pollinator cards and to notice the many different shapes, sizes, and colors of pollinators on these cards.

Before going outside for the observation period, each of the students will need a notebook and pencil to record how many insects visit their flower during the observation period. Set up the poster board in an outdoor area close to vegetation like shrubs or existing flower beds. Ask students to sit back 15 feet from the poster board, explaining that they made their flowers large enough to be seen from a distance. Ask students to carefully observe their flower, making a mark on their paper each time they see any insect land on their flower. Try the observations at different times of the day to see if they notice any difference in numbers or types of pollinators that visit during each time period.

Ask each student to tally up the results of any insects visiting their flowers. Some of the insects may not have been pollinators, but other insects and mammals do some indirect pollination just by landing on flowers. Ask the students to graph the number of bees or other pollinators and insects that visited each color of flower. Ask students to compare by charting how may insect visitors the flowers with Solo® cups had compared to the number of insect visitors those without the Solo® cups had. Can the class draw any conclusions about the number of insects who visited the flowers based upon the Solo® cups having been added to the design? Did the students see any of the pollinators as seen on the MPEP Pollinator poster or cards?

Please share your findings by e-mailing lbrenneman@mt.gov, we will feature the results in our Montana Agriculture in the Classroom newsletter