|  |  |
| --- | --- |
| Title | What is Pollination? |
| Overview | Students will learn about the different parts of a flower and dissect various types of flowers in order to identify the different reproductive parts. Students will draw diagram in their science notebooks. Understanding the function of the parts of a flower leads students to understand the role of pollinators in plant fruit production.  Students will make models of flowers using various materials. You can bring in measurement and mathematics by asking students to use rulers to try to make their diagrams or models so that the size of the petals, stem, stamen, pistil, etc. are in the correct proportion as you would find in a life-size model. Demonstrate this for one flower. |
| Standards | **Science**  3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.  **English/Language Arts**  ELA.3.R.C2.4 Determine the meaning of general academic and domain-specific words and phrases in an informational text relevant to a grade 3 topic or subject area.  ELA.3.SL.C13.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, teacher-led) with diverse partners on grade 3 topics and texts, building on others’ ideas and expressing their own clearly.  **Math**  M.3.MD.4 generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch and show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves or quarters.  Mathematical Practices:  • Model with mathematics.  • Use appropriate tools strategically.  • Attend to precision. |
| Materials/Advance Preparation Needed | **Materials**   * Several varieties of fresh flowers – Lilies (Japanese, Tiger, Stargazer) make excellent specimens because they have both female and male parts (perfect flower), and those parts are large and distinct, but also include a variety of flowers, including imperfect flowers. * scissors * hand lens * rulers * colored pencils * science notebooks * Craft supplies for flower models, such as pipe cleaners, tissue paper, construction paper, small pom poms, glue, tape, markers.   **Advanced Preparation:**  Review references for background information for flower anatomy and perfect vs. imperfect flowers.  **References:**   * Great resource for explaining pollination and the anatomy and function of flowers. <http://www.pollinator.ca/bestpractices/flower_anatomy.html> * Nice resource for explaining plant adaptions and pollinators: <http://exploringnature.org/db/detail.php?dbID=26&detID=2794>   Amsel, Sheri. “All About Plants.” Adaptations for Pollination - Birdsfoot Trefoil. Exploring Nature Educational Resource. © 2005 - 2014.   * Diagram of flower: <http://www.familymanagement.com/holidays/flowers/flower_anatomy.html> |
| Procedures/Steps:  (Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions) | **Introduction:**  Explain to students that pollinators have a special relationship with flowers. Plants provide pollinators with food, pollen and nectar, and pollinators help plants reproduce by transferring pollen from the anther to the stigma  Whole class:  Show/read: Plant adaptations and pollinators: <http://www.exploringnature.org/db/detail.php?dbID=26&detID=2794>  After reading the article, discuss and ask students: Can you think of any other reason why this plant is so pollinator specific?  **Science notebook/diagrams and models**  Small group:   1. Have flower specimens available for students to observe. Provide hand lenses, rulers. 2. Show a diagram of flower on projector screen <http://www.familymanagement.com/holidays/flowers/flower_anatomy.html>   or provide students with a handout.   1. Ask students to identify the different parts of a flower.   Students working individually with teacher modeling:   1. Diagram the parts of a flower in science notebook. Ask students to use rulers to try to make their diagrams or models so that the size of the petals, stem, stamen, pistil, etc. are in the correct proportion as you would find in a life-size model   Partners:   1. Dissect a flower, identifying main parts: petals, anther, filament, stamen, stigma, style, and pistil. 2. Students can create a chart in their lab notebook to record information, such as measurements, about the flower parts.   Individual:   1. Design a Flower – Have students make a model of a flower using craft materials based on their observations and measurements from the flower dissection activity. |
| Assessment (What will be the evidence of student learning?) | Students will draw diagrams in their science notebooks.  Students will create models of flowers. |