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| Title | Designing a Garden to Attract Pollinators (This lessons takes 2 days) |
| Overview | Students will revisit the issue of declining pollinator and the effect on crops. Students will brainstorm possible solutions. Students can be guided to the development of a school yard pollinator habitat to attract pollinators by providing them with food and shelter. |
| Standards | **Science**  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.  3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.  Science and Engineering Practices:   * Constructing explanations and designing solutions. * Engaging in argument from evidence. * Obtaining, evaluating and communicating information |
| Materials/Advance Preparation Needed | **Materials:**   * Variety of gardening and plant resource books and publications (listed in unit overview) * Clipboards and science journal or paper * For each small group: a large sheet of paper or “portable” dry erase board along with markers   **Advance Preparation**: Steps 1-5 of the lesson are completed the first day; step 6 is completed the 2nd day. *If you are not able to do this activity in April/May or September, you will need to take digital photos in advance to use instead of making observations outdoors in step 1.*Examine your schoolyard for possible locations (including designated gardens) of plants to attract pollinators. It will be best to identify more than one area to facilitate some variety in the group work in the last step of the procedures. If you actually are going to plant/install gardens, check with your principal and custodial/grounds-keeping staff for necessary permissions and the best locations for such (note that most plants will need at least 6 hours of sunlight). |
| Procedures/Steps:  (Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions) | 1. Have students take paper and clipboards (or their journal) outside on the school grounds have students observe and record the plant life that currently exists in area(s) that you may grow plants for attracting pollinators. Have them also sit quietly for 5 minutes and observe and record the animal life that is present.  2. Take digital photos of the areas that may become pollinator gardens (and have students make sketches, time allowing) for “before and after” comparisons.  3. Return to the classroom review with students the value of pollinator habitats. Then discuss their observations that they just made outdoors along with what might be observed if we were to transform these areas into pollinator habitats.  4. Ask students (as a means of review of past learning): “Other than plants that attract pollinators, what else do we need to be mindful about when creating pollinator habitat?” As students respond, make sure to cover (a) the need for a plant sequence that creates blooms (provides nectar) continuously throughout spring and summer, (b) the need for plants that allow for the Monarch butterfly to complete a lifecycle, and (c) the importance of including plants that are native to the region in which we live.    5. Ask students what they have observed in their yard at home as to plants that attract pollinators. Does anyone have a “pollinator garden?” Gain input from students as to types of plants in their yards, when they blossom, and what pollinators are attracted.  6. This final step is a culmination of learning to date in this and all prior lessons. Place students in small groups and have them design a pollinator garden for one of the areas that they have visited outside. Their design needs to include: a garden area in which blooms/flowers will be present continuously from May through September; at least some plants that are native to our region; some plants that will allow Monarch butterflies to complete their lifecycle. They should provide a sketch of their garden area showing the location of the plants and labeling it with the names of the plants, months that the plants are blooming, the word “native” for each plant that is native to the area, and the names of pollinators that will be attracted. Ideally, students also should include in their sketch a rough drawing of what each plant looks like.  \*Provide students with a copy of rubric before they begin their design. |
| Assessment (What will be the evidence of student learning?) | Students will respond to the following statements in science notebook:  1. Make a claim about the benefits of planting a pollinator garden.  2. Construct an argument with evidence of the benefits your garden brings to the environment.  Students will design and present their garden pollinator garden. |

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| **Plant Choices** | Excellent  The garden design includes at least 5 different types of plants that are all pollinator friendly, some are native to the area and provide continuous blooms (May-September) | Good  The garden design contains at least 4 types of plants that are pollinator friendly. Missing native plants or continuous bloom. | Fair  The garden design contains at least 3 types of plants that are pollinator friendly. | Still learning  The garden design contains less than 3 types of plants that are pollinator friendly. |
| **Pollinators** | Excellent  The plants chosen attract at least four different pollinators, including Monarch butterfly.  Shows somewhere on the garden design what type of pollinator that goes with each flower. | Good  The plants chosen attract at least three different pollinators.  Shows somewhere on the garden design what type of pollinator goes with all but one flower. | Fair  The plants chosen attract at least one different pollinator.  Shows somewhere on the garden design what type of pollinator goes with all but two flower. | Still learning  The plants chosen do not attract any pollinators.   Show somewhere on the garden design what type of pollinator goes with each flower. |
| **Design Plan** | Excellent  Design plan is professional, clean, neat, includes name of plant, picture, height of plants, time that it blooms, and color of flowers. | Good  Design plan includes all but one of the listed criteria. | Fair  Design plan includes all but two of the listed criteria. | Still learning  Design plan is missing three or more parts. |
| **Presentation** | Excellent  Complete on a large piece of paper. Work is excellent! | Good  Presentation is done nicely, however, improvements could be made. | Fair  Incomplete, but the work is nicely done. | Still learning  Incomplete and/or lacking in the quality of work |

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Comments: