

Authentic Literacy and Language for Science - Moreno/Newell

Appendix Table A

Appendix Table A. *Description of Lessons in the Heredity and Life Cycles unit.*

Day	Topics	Science Investigation	English Language Arts
1	Team Building for Scientific Research	<p>Students compare and discuss the effectiveness of working alone vs. working in as team of four students to complete memory tasks.</p> <p>Students are introduced to their roles within their science collaborative groups and how these groups are similar to scientific teams.</p> <p>Teacher explains the sequence of activities (firsthand science investigation, science-specific disciplinary literacy mini-lesson, and small group inquiry circle).</p>	<p>Mini-Lesson Teachers introduces students to language related to science-specific roles on teams and co-constructs an Anchor Chart with the class depicting science sentence stems (i.e., I observe...; I predict ...' I still have a question about ...).</p> <p>Inquiry Circle Students read a fiction portal text selected by teacher to engage them in topic of butterfly life cycles. Examples of portal texts include:</p>
2	How Do Scientists Study Living Organisms?	<p>Students discuss strategies for asking a research question or preparing for an investigation on a living system.</p> <p>They construct classroom habitats to house butterfly larvae using plastic salad boxes.</p>	<p>Mini-Lesson Teacher demonstrates how to record information from research resources as a table. With the class, the teacher co-constructs a sample "Inquiry Chart" with a series of questions/topics about butterfly life cycles (e.g., What We Know, Characteristics of Adults, Offspring, etc.)</p> <p>Inquiry Circle Students select a new organism whose life cycle they will investigate using text resources from a pre-selected list. They set up "inquiry charts" in which they will record their groups' findings related from their text-based research.</p>
3	How Do Tools Extend the Senses? Making Things Appear Larger – Magnifier Experience	<p>Students practice using magnifiers to observe objects around their classroom.</p> <p>Students discuss in groups and with teacher how we use tools to discover new information. We can use tools such as computers and iPads to access credible online resources to gather the information we need. In science, we use tools like hand lenses to gather information about things that are too small to see without assistance.</p>	<p>Mini-Lesson Teacher explains and models the strategy—how to read for answers to specific questions—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart to post.</p> <p>Inquiry Circle Students finish setting up "inquiry charts" in which they will record their groups' findings related from their text-based research. They begin work on the "what we know" section.</p>
4	Measuring Caterpillars	<p>Students practice using a millimeter ruler to measure the length of larvae. They discuss strategies to ensure consistency of measurements of butterfly larvae (from outside the clear habitat). Measuring the larvae continues on a daily basis until the larvae pupate.</p>	<p>Mini-Lesson Teacher explains and models the strategy—using internal text features—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart.</p> <p>Inquiry Circle Students choose resources from the pre-screened list to look for answers to the first category in their inquiry chart.</p>
5	Where Are the Caterpillars?	<p>Students create maps of the movement of larvae within their habitats and look for changes in behavior over the next several days. They continue daily larva observations and measurements.</p>	<p>Mini-Lesson Teacher explains and models the strategy—skimming and scanning—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart.</p> <p>Inquiry Circle Students continue work on their inquiry charts and apply skimming and scanning to look for information.</p>
6	Paying Attention to Details: Why do scientists record their observations?	<p>Students are challenged to make a sketch of an object in the classroom, first from memory and then from an extended observation. They continue daily larva observations and measurements.</p>	<p>Mini-Lesson Teacher explains and models the strategy—determining the main idea—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart.</p> <p>Inquiry Circle Students continue work on their inquiry charts and practice applying the new strategy to look for information.</p>
7	Making Connections	<p>Students continue daily larva observations and measurements. The Making Connections model is introduced in the mini-lesson. The model involves thinking about the text and how it relates to myself, another text, or the world. I can also think about science and how it relates to myself, other sciences, and the world.</p>	<p>Mini-Lesson Teacher explains and models the strategy—making connections—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart.</p> <p>Inquiry Circle Students continue work on their inquiry charts and discuss making connections as they read.</p>

Appendix Table A. *Description of Lessons in the Heredity and Life Cycles unit (continued).*

Day	Topics	Science Investigation	English Language Arts
8	Monitoring Change	Students continue with the larvae measurements and movement charts—which should be changing in preparation for the pupal stage (chrysalis formation).	<p>Mini-Lesson Teacher explains and models the strategy—monitoring comprehension—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart.</p> <p>Inquiry Circle Students continue work on their inquiry charts.</p>
9	Monarch Migration	Science Investigations are focusing on other aspects of the butterfly life cycle, because their classroom organisms are in the chrysalis phase. Students play a simulation of North American Monarch butterfly migration and relate it to smaller migrations of painted ladies.	<p>Mini-Lesson Teacher explains and models the strategy—comprehension fix-up strategies—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart.</p> <p>Inquiry Circle Students continue work on their inquiry charts.</p>
10	Inherited Butterfly Wing Characteristics, part one	Students learn to summarize and retell important findings from their reading and begin a two-day activity in which they observe wing patterns of parent and offspring butterflies.	<p>Mini-Lesson Teacher explains and models the strategy—summarizing—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart.</p> <p>Inquiry Circle Students continue concluding work on their inquiry charts. They begin to summarize information from their various sources to finalize their findings about the life cycle of their selected organism.</p>
11	Inherited Butterfly Wing Characteristics, part two	Students reach conclusions about patterns of inheritance based on their observations.	<p>Mini-Lesson Teacher explains and models the strategy—drawing conclusions—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart.</p> <p>Inquiry Circle Students conclude work on their inquiry charts about the life cycle of their selected organism.</p>
12	Caterpillar Growth Line Graph Lesson	Students generate graphs based on their larvae measurements and look for patterns in caterpillar growth. They also have almost completed their inquiry charts with answers to their questions about their group's selected organism, so that they can begin to compare the life cycles.	<p>Mini-Lesson Teacher explains and models the strategy—synthesizing—by telling what the strategy is, when and why to use the strategy and how to employ the strategy. Teacher and students co-create an anchor chart.</p> <p>Inquiry Circle Students work together to create a synthesis statement around their organism.</p>
13	Famous Scientist	Students learn about the work of butterfly scientist, Henry Bates, and how he presented his work in collections and publications. They conduct simulated scientist interviews in pairs.	<p>Mini-Lesson Teacher coaches students in the selection of a capstone product to present their findings.</p> <p>Inquiry Circle Inquiry circle groups work together to create a capstone product to share at the scientific symposium. Groups select the type of product they will create (written report, art diorama, news story, etc.) and begin work</p>
14	Butterfly Offspring, part one	Students conduct a simulation of inherited traits and butterfly offspring appearance (phenotype).	<p>Mini-Lesson Teacher coaches students in the preparation of their capstone products to present their findings</p> <p>Inquiry Circle Students continue the development of their capstone products or presentations.</p>
15	Butterfly Offspring, part two	Students conclude a simulation of inherited traits and butterfly offspring appearance (phenotype).	<p>Scientific Symposium Each Inquiry Circle group presents its capstone product to the class.</p>