**3rd Grade Digital Learning Launch Unit - Science**

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| **Unit Topic:** Life Cycles  **Estimated Time:** 1-2 weeks | | | |
| **Standards** | | | |
| **S2L1. Obtain, evaluate, and communicate information about the life cycles of different living organisms.**  a. Ask questions to determine the sequence of the life cycle of common animals in your area: a mammal such as a cat, dog or classroom pet, a bird  such as a chicken, an amphibian such as a frog, and an insect such as a butterfly.  b. Plan and carry out an investigation of the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.  c. Construct an explanation of an animal’s role in dispersing seeds or in the pollination of plants.  d. Develop models to illustrate the unique and diverse life cycles of organisms other than humans.  [Click here to see the life science learning progression and possible student misconceptions: Appendix A](#appendixA) | | | |
| **Science and Engineering Practices & Crosscutting Concepts:** [See Appendix B](#AppendixB) | | | |
| **Teacher Background Knowledge** | | | |
| *This section is included for your own background knowledge and*  *is not intended for direct student instruction.*   * One of the most important principles in biology is the life cycle. All living organisms from the most simple to the complex go through life stages starting with their own birth to the birth of the next generation. Although the details differ for different organisms, they all pass through distinct life stages in which they grow and change until they are ready to reproduce. This statement holds true for both plants and animals. * The Animal Kingdom contains an astonishing variety of life forms including sponges, jellyfish, snails, worms, insects, spiders, starfish, fish, snakes, frogs, birds and humans. Although there is tremendous variety within this kingdom, all life cycles result in offspring that resemble their parents. All mammals give birth to live young, while birds give birth to eggs that are then incubated to hatch live young. In general, frogs lay their eggs in water. The eggs then hatch into tadpoles which look like little fish with a tail and gills for breathing. As the tadpoles grow, they develop legs, their tail shortens, and their gills close as the lungs develop. The adult will then leave the water to live on land. Insect life cycles such as a butterfly start with an egg out of which hatches a larva (caterpillar) which consumes food to grow. The larva then transforms into a pupa (chrysalis) from which hatches the adult butterfly. * The Plant Kingdom contains a wide variety of plants which includes mosses, ferns, conifers (e.g., pine trees, fir trees, cedars), and the most familiar flowering plants. Not all plants produce flowers or reproduce by seed. To keep things simple, the discussion of plant life cycles should be limited to the typical, seed-bearing flowering plants that most students are familiar with. A typical life cycle of a seed plant begins with the seed germinating into seedling, then an adult plant with flowers, then an adult plant with seeds which starts the cycle over again. Many children may have the misconception that seeds are not alive, but all living things arise from other living things. Seeds are formed from the union of two living cells – sperm and egg. Children may also have the misconception that seeds contain tiny adult plants already formed inside waiting for the sun’s energy to sprout. Seeds contain a tiny plant embryo that depends on the stored food inside the seed to grow until it can begin to photosynthesize (make its own food) on its own. * Fungi (e.g., mushrooms, mold, yeast) are living organisms that are neither plant nor animal but are classified into their own kingdom. Most fungi obtain food by the decomposition of other organic matter such as dead plants and animals. Their life cycles vary, but most begin as spores. The visible mushroom structure that most of us are familiar with is the fruiting body part of the life cycle that releases spores into the air which will grow into other mushrooms. | | | |
| **Big Ideas/Enduring Understandings:**   * All living things have a life cycle * Animals have life cycles that include being born or hatched, * developing into adults, reproducing, and dying * The stages of life cycles are different for different plants and animals * Some animals/plants are alike in the way they look, and in the * things they do, and others are very different from one another * Almost all living things need water, food, and air * Plants have life cycles that include germination, growing, reproducing, and dying * Living things are interdependent with their living and nonliving surroundings | | **Essential Questions:**   * How are life cycles different for different living things? * How does a plant grow from a seed? * How do animals help disperse seeds and pollinate plants? | |
| **Vocabulary:**  Life Cycles  Mammal  Bird | Amphibian  Insect  Plant | Seed  Changes  Dispersing | Pollination  Model  Organisms |
| **Literature Connections:**  Arnold, Katya. (1997). Katya’s book of mushrooms  Fleisher, Paul. (1999). Salt marsh  Giesecke, Ernestine. (1999). Outside my window: Mammals  [Goldin, Augusta. (1999). Ducks don’t get wet](https://youtu.be/F9TKHGz5xDw)  Hickman, P. & Collins, H. (1999). A new duck: My first look at the life cycle of a bird  Ling, Mary. (1992). See how they grow: Butterfly  National Geographic Society. (1995). Creepy crawly creatures Rockwell, Anne. (2001). Growing like me  [Rockwell, Anne. (2001). Bugs are insects](https://youtu.be/1fd4-0g042s)  Sill, Cathryn. (1997). About mammals: A guide for children  Stewart, M. (2004). A parade of plants Investigate science  Walker, Sally. (2001). Fireflies  Watts, Barrie. (1987). Dandelion. (Also available in the series: Apple tree, Bird’s nest, Bean and plant, Butterfly and caterpillar, Chicken and egg, Hamster, Ladybug, Mushroom, Snail, Spider’s web, Tadpole and frog.) | | **STEM Career Connections:**  Apiculturist  Animal Caretaker (farm or zoo)  Environmental Engineer  Veterinarian | |
| **Materials and Safety Considerations:**  \*\*Lessons are designed with simplicity in mind. Full materials lists and safety considerations can be found if you look below for “Click here for full lesson.” | | | |

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| **The First 10 Days** | | |
| **Day 1** | **Opening** | ***TOPIC 1: Animal and Insect Life Cycles***  **Phenomenon:** The living things around me go through a unique life cycle  **ENGAGE:**  Students will engage in observations of real living things (class pet, chickens, butterflies, etc) so that they can come up with questions regarding each life stage. Introduce a pet or show pictures of the different living things listed in the standard. Ask students if the animals have always looked like their adult stage. Record student thoughts. |
| **Work Session** | Students will handle and observe an egg and then list questions about what it could become and what could happen to that egg in the future. |
| **Closing** | Allow students to share their questions with the class and make a class list. |
| **Day 2** | **Opening** | Choose one of the literature connections above (or choose your own) to share information about life cycles with students. Introduce their activity and explain what they should do. |
| **Work Session** | Have students complete the [Does it have a life cycle?](https://www.dropbox.com/sh/e830by6303tqdss/AABh0A8BrGz6MEdXzNxlIlXFa?dl=0&preview=DoesItHaveALifeCycleV3-ch14.pdf) probe to assess prior knowledge. This probe helps determine whether students recognize that although life cycles vary in length and developmental stages, all multicellular organisms go through a life cycle. |
| **Closing** | Allow students to share their answers/thoughts about the probe. Use the teacher notes to facilitate conversation and wrap up the lesson. |
| **Day 3** | **Opening** | Explain the activity below. Demonstrate and think out loud while writing a C-E-R (Claim, evidence, reasoning) statement explaining why you think one set of pictures represents a certain animal. Students will use their work time to do this for the other mystery sets of pictures. |
| **Work Session** | **EXPLORE:**  Students will engage with life cycle mystery boxes (detailed instructions found in the full linked lesson below) where they determine which life cycle each box represents through questioning and examination. Life cycle mystery boxes can be presented physically through teacher video instruction OR you can share [this collection of images](https://cobbk12org-my.sharepoint.com/:p:/g/personal/erin_harris_cobbk12_org/EV2qM3UlMw5BvqD7FxZm7lgBxdFcAuknHNCH-Lzzu3AjaQ?e=l3d9qY) and allow students to try and discover the mystery organism. (Answers: #1 Dog, #2 Frog, #3 Butterfly, #4 Bird, #5 Turtle) |
| **Closing** | Allow students to share their C-E-R statements with the class and give feedback. |
| **Day 4** | **Opening** | Depending on which assignments you choose from the list below, share information with students that will help them be successful in their work for the day. |
| **Work Session** | **EXPLAIN:**  The full lesson linked below includes detailed lists of books, videos, websites, and online interactives for teaching each different life cycle. Pick and choose what’s best for your class from this list.  HMH GA SCIENCE RESOURCES   * Unit 4, Lesson 1 (pp. 127A-138) * Digital Lesson- *What are Some Animal Life Cycles?* * Flip Chart page 17- *Where’s the Catepillar?* * Unit 4, Lesson 1 (pp. 168-169) * Flip Chart page 17- *What’s My Life Cycle?*   HMH DIMENSIONS RESOURCES (ONLINE)  Grade 3 (All online)   * SE/TE: Unit 4 Lesson 2, pp. 208-221 * SE/TE: Unit 4 Lesson 1, pp. 184-199; Unit 4 Lesson 2, pp. 218-221 * Hands on Activity- *Observing Mealworm Metamorphosis* (pp. 222-235)   Online: Unit 4 You Solve It Simulation: *Insect Life Cycles*; Unit 4 Project- *Life Cycle Models* |
| **Closing** | Close this lesson using an ABC Summary- Give students a letter of the alphabet and ask them to make a statement about something they learned that begins with that letter. |
| **Day 5** | **Opening** | **EXPAND:**   1. Students will brainstorm threats to animals/insects at different stages of their life. Model creating a problem/solution model for one problem. |
| **Work Session** | 1. Students will create problem/solution models representing 1-2 additional threats to animals/insects at different stages of their life. 2. Flip Chart page 22 and accompanying Student Worktext pages: Unit 5, Lesson 2 |
| **Closing** | Have students complete a 6-word summary of what they’ve learned and share them with the class.  Organizer here: <https://cobb.discoveryeducation.com/learn/player/6a99e3f9-426e-4563-ba5c-4f10789908ce> |
| **Day 6** | **Opening** | Demonstrate how to draw a life cycle and then make it into a puzzle! |
| **Work Session** | **EVALUATE: (Choose most fitting assignment for your class)**   1. Students will create, label, and assemble life cycle puzzles/flow charts/images 2. HMH Dimensions:   3rd Grade, p. 231 “Lesson Check” #1   1. HMH Georgia Science:   2nd Grade, p. 138 “Apply Concepts” |
| **Closing** | Pose several true/false questions to students based on the work you assign above. Students will answer with a thumbs up or thumbs down. |
| **Day 7** | **Opening** | ***TOPIC 2: Plant Life Cycles and Seed Dispersal***  **Phenomenon:** The living things around me go through a unique life cycle  **EXPLORE: (This is slightly out of order for the sake of student engagement during work session)**  Plant and germinate real seeds with students and observe how they grow (details found in full lesson linked below) |
| **Work Session** | **ENGAGE:**  Students will use [this interactive](https://www.sciencekids.co.nz/gamesactivities/plantsgrow.html) in order to try and figure out how to help the plants grow. Students will list what the plants needed. |
| **Closing** | Students will come together and list what a plant needs to survive. Assess whether the seed planted during the opening has everything it needs! Check in with the planted seed daily through it’s germination. |
| **Day 8** | **Opening** | Open the lesson by checking on the seed planted the previous day. Have students list the things plants need to survive. Try to come up with hand signals representing each need. (Example: spirit fingers and big smiles to represent sunshine) |
| **Work Session** | **EXPLAIN (Choose what’s best for your students from this list)**  Activities listed with details in lesson linked below including:   * Life cycle diagram * Animals moving seeds matching game * Pollination article * Seed shape investigation   HMH GA SCIENCE RESOURCES   * Unit 4, Lesson 2 (pp. 139A-150) * Digital Lesson- *What are Some Plant Life Cycles?* * Flip Chart p. 18- *Bud a Spud* and *Speedy Seed Race* * Flip Chart p. 19- *How Does a Bean Plant Grow?* And accompanying student work * Text pages: Unit 4, Lesson 3 (pp. 153A-154) * Unit 5, Lesson 1 (pp. 163A-174) * Digital Lesson- *How Do Plants and Animals Need One Another?* * Unit 4 Performance Assessment- *Seeds and Pollen*   HMH DIMENSIONS RESOURCES (ONLINE)   * SE/TE: Unit 4 Lesson 1, pp. 184-199 * Hands On Activity- *How Do Plants Grow?* (pp. 191-193)   Online: Unit 4 Performance Task- *Cool Beans* SE/TE: Unit 3 Lesson 2, pp. 124-139 |
| **Closing** | Review plant need hand signals. Ask students simple questions whose answers are one of the needs. Have them answer with their signals. |
| **Day 9** | **Opening** | **EXPAND**  Mystery Science Lesson and Activity: How did a tree travel halfway around the world?  Begin the lesson with the Exploration section of this Mystery Science Lesson. |
| **Work Session** | Students will create their model seeds and practice dropping them outside the “zone of darkness” explained in the video. |
| **Closing** | Complete the wrap-up section together. |
| **Day 10** | **Opening** | Check the progress of the class planted seed. Introduce today’s assignment to students. |
| **Work Session** | **EVALUATE (Choose what’s best for your students from this list)**   * Students will present findings from their seed growing to the class * HMH Dimensions:   3rd Grade, p. 205 “Lesson Check” #1   * HMH Georgia Science:   2nd Grade, p. 148 #3   * HMH Dimensions   2nd Grade, p. 234 “Apply What You Know”  2nd Grade, p. 237 “Can You Solve It?” |
| **Closing** | Close this lesson using an ABC Summary- Give students a letter of the alphabet and ask them to make a statement about something they learned that begins with that letter. |

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| [Click here to download the unabridged version of the topic one lesson](https://cobbteachingandlearningsystem.cobbk12.org/GetFile.aspx?f=f8460ec8-403f-49dc-a799-49d8a2abb4fd&t=v) | | | [Click here to download the unabridged version of the topic two lesson](https://cobbteachingandlearningsystem.cobbk12.org/GetFile.aspx?f=0112ea90-040a-42e2-920b-e3114be31330&t=v) | |
| **ADDITIONAL RESOURCES** | | | | |
| **STEM Challenges**   * Save the Monarchs * HMH Dimensions:   + Grade 3, Unit 4 Lesson 2, “Hands On-Apply What You Know” *Design a Nest* p. 216   + Grade 3, Unit 4 Lesson 1, “Take it Further” *Xtreme Plant Engineering* pp. 203-204   + Grade 2, Unit 3 Lesson 2, “Hands on Activity” *Plan and Build a Model Tool* | **Science Probes**   * [Does it have a life cycle?](https://www.dropbox.com/sh/e830by6303tqdss/AABh0A8BrGz6MEdXzNxlIlXFa?dl=0&preview=DoesItHaveALifeCycleV3-ch14.pdf) * [Needs of Seeds](https://www.dropbox.com/sh/e830by6303tqdss/AABh0A8BrGz6MEdXzNxlIlXFa?dl=0&preview=NeedsOfSeedsV2-ch13.pdf) * [Is it food for plants?](https://www.dropbox.com/sh/e830by6303tqdss/AABh0A8BrGz6MEdXzNxlIlXFa?dl=0&preview=IsItFoodForPlantsV2-ch15.pdf) | **Picture Perfect Sci**  From Picture Perfect:   * Rice is Life   From More Picture Perfect:   * Loco Beans * Wiggling Worms   From Even More P.P.:   * Amazing Caterpillars * Seeds on the Move | | **Mystery Science**   * How did a tree travel half way around the world? * Why do plants grow flowers? * Why do plants give us fruit?   *Mini-Lessons:*   * Why do leaves change color in the fall? * How do flowers bloom in spring? |
| **Differentiation:**  \*\*Click on full versions of lessons listed above for specific suggestions for differentiation | | | | |

**APPENDIX A**

**Possible Misconceptions:**

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| **Misconceptions** | **Proper Conceptions** |
| * Only some organisms, such as insects with complete metamorphosis, have a life cycle * Plants and coral that are stationary are not living * Plants that shed their leaves are dead, but come back to life again in spring * Seeds you can buy at the store are manufactured * Roots obtain food for the plant from the soil * Only large land mammals are animals Humans are not animals | * All organisms have life cycles that include being born, developing into adults, reproducing themselves, and dying. There are many kinds of life cycles * A living organism is something that must have food, can grow, usually moves, and dies. * A plant is a living thing that can make its own food, grows, usually does not move, reproduces, and dies. * Plants produce their own seeds * An animal is a living thing that cannot make its own food, but gets its energy and nutrients by eating other organisms. Most animals can move from one place to another * Humans are animals |

**Disciplinary Core Idea: Life Science Learning Progression**

**Classification:**

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| **K & 1st** | **2nd** | **5th** | **7th** | **High School** |
| **SKL1. Obtain, evaluate, and communicate information about how organisms (alive and not alive) and non-living objects are grouped.**  a. Construct an explanation based on observations to recognize the differences between organisms and nonliving objects.  b. Develop a model to represent how a set of organisms and nonliving objects are sorted into groups based on their attributes.  **SKL2. Obtain, evaluate, and communicate information to compare the similarities and differences in groups of organisms.**  a. Construct an argument supported by evidence for how animals can be grouped according to their features.  b. Construct an argument supported by evidence for how plants can be grouped according to their features.  c. Ask questions and make observations to identify the similarities and differences of offspring to their parents and to other members of the same species.  **First Grade:**  **S1L1. Obtain, evaluate, and communicate information about the basic needs of plants and animals.**  a. Develop models to identify the parts of a plant—root, stem, leaf, and flower.  b. Ask questions to compare and contrast the basic needs of plants (air, water, light, and nutrients) and animals (air, water, food, and shelter).  c. Design a solution to ensure that a plant or animal has all of its needs met. | **S2L1. Obtain, evaluate, and communicate information about the life cycles of different living organisms.**  a. Ask questions to determine the sequence of the life cycle of common animals in your area: a mammal such as a cat, dog or classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly.  b. Plan and carry out an investigation of the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.  c. Construct an explanation of an animal’s role in dispersing seeds or in the pollination of plants.  d. Develop models to illustrate the unique and diverse life cycles of organisms other than humans. | **S5L1. Obtain, evaluate, and communicate information to group organisms using scientific classification procedures.**  a. Develop a model that illustrates how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibian, reptile, bird, and mammal) using data from multiple sources.  b. Develop a model that illustrates how plants are sorted into groups (seed producers, non-seed producers) using data from multiple sources. | **S7L1. Obtain, evaluate, and communicate information to investigate the diversity of living organisms and how they can be compared scientifically.**  a. Develop and defend a model that categorizes organisms based on common characteristics.  b. Evaluate historical models of how organisms were classified based on physical characteristics and how that led to the six kingdom system (currently archaea, bacteria, protists, fungi, plants, and animals).  *(Clarification statement: This includes common examples and characteristics such as, but not limited to, prokaryotic, eukaryotic, unicellular, multicellular, asexual reproduction, sexual reproduction, autotroph, heterotroph, and unique cell structures. Modern classification will be addressed in high school.)* | **SB4. Obtain, evaluate, and communicate information to illustrate the organization of interacting systems within single-celled and multi-celled organisms.**  a. Construct an argument supported by scientific information to explain patterns in structures and function among clades of organisms, including the origin of eukaryotes by endosymbiosis. Clades should include:   * archaea * bacteria * eukaryotes * fungi * plants * animals   *(Clarification statement: This is reflective of 21st century classification schemes and nested hierarchy of clades and is intended to develop a foundation for comparing major groups of organisms. The term 'protists' is useful in describing those eukaryotes that are not within the animal, fungal or plant clades but the term does not describe a well-defined clade or a natural taxonomic group.)*  b. Analyze and interpret data to develop models (i.e., cladograms and phylogenetic trees) based on patterns of common ancestry and the theory of evolution to determine relationships among major groups of organisms.  c. Construct an argument using valid and reliable sources to support the claim that evidence from comparative morphology (analogous vs. homologous structures), embryology, biochemistry (protein sequence) and genetics support the theory that all living organisms are related by way of common descent.  d. Develop and use mathematical models to support explanations of how undirected genetic changes in natural selection and genetic drift have led to changes in populations of organisms.  *(Clarification statement: Element is intended to focus on basic statistical and graphic analysis. Hardy Weinberg would be an optional application to address this element.)*  e. Develop a model to explain the role natural selection plays in causing biological resistance (e.g., pesticides, antibiotic resistance, and influenza vaccines). |

**APPENDIX B**

**Science and Engineering Practices:** Based on the fourth quarter standards, there may be a gap in the understanding of the following Science and Engineering Practices:

# Obtaining, Evaluating, and Communicating Information: Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations as well as orally, in writing, and through extended discussions. Scientists and engineers employ multiple sources to obtain information that is used to evaluate the merit and validity of claims, methods, and designs.



**Cross-Cutting Concepts:**

