**3rd Grade Launch Unit**

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| **Unit Topic:** Life Cycles**Estimated Time:** 1-2 weeksThis Launch Unit is designed to address a possible learning gap between 2nd Grade science and 3rd Grade Science. |
| **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 birdsuch 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.
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| **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?
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| **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.” |  **Distance Learning Options:** \*\*Pieces of the lessons that can easily be adapted or used as-is for distance learning are highlighted below |
| **Lesson Components** |
| **PHENOMENA** |
| ***TOPIC 1: Animal and Insect Life Cycles**** The living things around me go through a unique life cycle
 | ***TOPIC 2: Plant Life Cycles and Seed Dispersal**** The living things around me go through a unique life cycle
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| **ENGAGE** |
| ***TOPIC 1: Animal and Insect Life Cycles**** Ideally: 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.
* Secondary: Students will handle and observe an egg and then ask questions about what it could become and what could happen to that egg in the future.
 |  ***TOPIC 2: Plant Life Cycles and Seed Dispersal**** 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.
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| **EXPLORE** |
| ***TOPIC 1: Animal and Insect Life Cycles**** 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.
 | ***TOPIC 2: Plant Life Cycles and Seed Dispersal**** Germinate real seeds with students and observe how they grow (details found in full lesson linked below)
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| **EXPLAIN** |
| ***TOPIC 1: Animal and Insect Life Cycles**** The full lesson linked below includes detailed lists of books, videos, websites, and online interactives for teaching each different life cycle

Life Cycle Video Links* [Dandelion Life Cycle](https://www.youtube.com/watch?v=onOVJd5upkw&feature=youtu.be)
* [Tree Life Cycle](https://www.youtube.com/watch?v=M6JD_ns8mqg&feature=youtu.be)
* [Butterfly Life Cycle](https://www.youtube.com/watch?v=-bZKPrF7PYo&feature=youtu.be)
* [Frog Life Cycle](https://www.youtube.com/watch?v=qDkI3P7RJFw&feature=youtu.be)
* [Chicken Life Cycle](https://www.youtube.com/watch?v=jHTNioUXPkU&feature=youtu.be)
* [Sea Turtle Life Cycle](https://www.youtube.com/watch?v=C5KBXfAoWqA&feature=youtu.be)

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*
 | ***TOPIC 2: Plant Life Cycles and Seed Dispersal**** 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
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| **EXPAND** |
| ***TOPIC 1: Sources of heat energy**** Students will brainstorm threats to animals/insects at different stages of their life and create problem/solution models representing their thoughts
* Flip Chart page 22 and accompanying Student Worktext pages: Unit 5, Lesson 2
 | ***TOPIC 2: Plant Life Cycles and Seed Dispersal**** Students will compare and contrast different types of plants being grown in the classroom
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| [Click here to download the unabridged version of this lesson](https://cobbteachingandlearningsystem.cobbk12.org/GetFile.aspx?f=f8460ec8-403f-49dc-a799-49d8a2abb4fd&t=v) | [Click here to download the unabridged version of this 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?
 |
| **ASSESSMENT** |
| ***TOPIC 1: Animal and Insect Life Cycles**** Students will create, label, and assemble life cycle puzzles/flow charts/images
* HMH Dimensions:

3rd Grade, p. 231 “Lesson Check” #1* HMH Georgia Science:

2nd Grade, p. 138 “Apply Concepts” | ***TOPIC 2: Plant Life Cycles and Seed Dispersal**** 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?” |
| **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
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**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:**

