CCPS Science Unit Plan

Grade	7th grade	**Subject**	Science	**Unit #**	Three
Unit Name	Life's History: Evolution and Classification		**Timeline**	Six weeks	
How to use the Framework	This Framework should be used to implement daily science instruction. The resources and instructional strategies reflected in the Framework will provide a foundation for effective implementation and student mastery of standards. Please see the hyperlinked abbreviation document to ensure understanding of all abbreviations used with this framework.				
Unit Overview	This unit explores the fundamental principles of biological evolution and classification. Students will delve into the history of life on Earth, examining how organisms have evolved and diversified over millions of years. The unit will cover key concepts such as natural selection, genetic variation, and speciation, providing a comprehensive understanding of the mechanisms driving evolution. Through the study of taxonomy, students will learn how scientists classify and organize living organisms into a hierarchical system based on shared characteristics and evolutionary relationships. Key topics include: Introduction to Evolution: Understanding the theory of evolution by natural selection, the evidence supporting it, and its significance in biology. Mechanisms of Evolution: Exploring genetic variation, mutation, gene flow, genetic drift, and natural selection. Speciation: Investigating how new species arise and the factors contributing to speciation events. Fossil Record and Transitional Forms: Examining the fossil record as evidence for evolution and identifying key transitional fossils. Principles of Classification: Learning about the Linnaean system, binomial nomenclature, and the criteria used for classifying organisms. Students will engage in hands-on activities, including constructing phylogenetic trees, analyzing genetic sequences, and exploring case studies of evolutionary change. By the end of the unit, students will have a deep appreciation for the complexity of life and the interconnectedness of all living organisms through evolutionary history.				
Lesson Plan guidance document and template	CCPS Lesson Plan Template Day View Lesson Plan Template Week View Department of Science Guidance Document				
3Dimensional Instruction	**GSE**	**Science and Engineering Practices**	**Crosscutting Concepts**		

	S7L5. Obtain, evaluate, and communicate information from multiple sources to explain the theory of evolution of living organisms through inherited characteristics. a. Use mathematical representations to evaluate explanations of how natural selection leads to changes in specific traits of populations over successive generations. (Clarification statement: Referencing data should be obtained from multiple sources including, but not limited to, existing research and simulations. Students should be able to calculate means, represent this data in a table or graph, and reference it when explaining the principles of natural selection.) b. Construct an explanation based on evidence that describes how genetic variation and environmental factors influence the probability of survival and reproduction of a species. c. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, and extinction of organisms and their relationships to modern organisms. (Clarification statement: Evidence of evolution found in comparisons of current/modern organisms such as homologous structures, DNA, and fetal development will be addressed in high school.) **S7L3. Obtain, evaluate, and communicate information to explain how organisms reproduce either sexually or asexually and transfer genetic information to determine the traits of their offspring.**	Asking questions (for science) and defining problems (for engineering) Developing and using models Planning and carrying out investigations Analyzing and interpreting data Using mathematics and computational thinking Constructing explanations (for science) and designing solutions (for engineering) Engaging in argument from evidence Obtaining, evaluating, and communicating information	**Cause and Effect** Cause and effect relationships may be used to predict phenomena in natural systems. **Patterns** Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them. **Stability and Change** For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

	c. Ask questions to gather and synthesize information about the ways humans influence the inheritance of desired traits in organisms through selective breeding. (Clarification statement: The element specifically addresses artificial selection and the ways in which it is fundamentally different from natural selection.) **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.)		
NGSS Alignment	NGSS Alignment to Disciplinary Core Ideas **LS4.A: Evidence of Common Ancestry and Diversity** ▪ The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth. (MS-LS4-1) ▪ Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent. (MS-LS4-2) ▪ Comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully-formed anatomy. (MS-LS4-3) **LS4.B: Natural Selection** ▪ Natural selection leads to the predominance of certain traits in a population, and the suppression of others. (MS-LS4-4) ▪ In artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed onto offspring. (MS-LS4-5)		

	LS4.C: Adaptation ▪ Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes. (MS-LS4-6)

Week 1	
GSE: S7L3. Obtain, evaluate, and communicate information to explain how organisms reproduce either sexually or asexually and transfer genetic information to determine the traits of their offspring. c. Ask questions to gather and synthesize information about the ways humans influence the inheritance of desired traits in organisms through selective breeding. (Clarification statement: The element specifically addresses artificial selection and the ways in which it is fundamentally different from natural selection.) S7L5. Obtain, evaluate, and communicate information from multiple sources to explain the theory of evolution of living organisms through inherited characteristics. a. Use mathematical representations to evaluate explanations of how natural selection leads to changes in specific traits of populations over successive generations. (Clarification statement: Referencing data should be obtained from multiple sources including, but not limited to, existing research and simulations. Students should be able to calculate means, represent this data in a table or graph, and reference it when explaining the principles of natural selection.) b. Construct an explanation based on evidence that describes how genetic variation and environmental factors influence the probability of survival and reproduction of a species.	Focused Concept: Changes in species occur due to natural selection, reproduction and environmental conditions.
SEP: Asking questions (for science) and defining problems (for engineering) Developing and using models Planning and carrying out investigations Analyzing and interpreting data	CCC: Cause and effect Patterns

Using mathematics and computational thinking Constructing explanations (for science) and designing solutions (for engineering) Engaging in argument from evidence Obtaining, evaluating, and communicating information					
Phenomenon: Available in opening activities			DQ: How do organisms adapt for survival?		
Learning Target:	Day 1	Day 2	Day 3	Day 4	Day 5
The students will be able to (SWBAT)	SWBAT construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	SWBAT describe how selective breeding and natural selection are related.	SWBAT determine how mutation can lead to natural selection and evolution.	SWBAT describe the Five Mechanisms of Evolution.	SWBAT evaluate how a variation can help or harm an organism's ability to survive.
Opening	The teacher will show the animation shown on the website below: Immune Cells Eatin… The teacher will ask students "what do you notice about the cells?"Students may point out that it looks like bigger cells are eating the smaller cells. After engaging students in a short discussion, the teacher will transition the lesson. Teacher note: Use the worksheet below to facilitate the day's lesson: Worksheet-Antibioti… Materials needed for the activity: marshmallows,	The teacher will present the following challenge: A ship that had been used for many years in arctic exploration was sold and moved to a harbor in the warm waters of the Caribbean. Worms that had lived on the ship bottom crawled off in the warm waters and attempted to attach to other ships in this tropical area where there were no similar worms. Some of the worms could survive and reproduce. What would you expect to happen to this group of worms over many generations in this new environment?	Natural selection is a mechanism of evolution. Organisms that are more adapted to their environment are more likely to survive and pass on the genes that aided their success. This process causes species to change and diverge over time. Today's lesson will link the genetics unit with evolution. Students will be presented with the following question: Imagine a white lizard and a brown lizard sitting on a brown rock. A hawk is circling overhead hunting for its next meal. Which lizard do you think the hawk would most likely try	The teacher will open the lesson with a review of the previous day's lesson. The teacher will then show the following video: Is human evolution s… and ask students "what do they notice?" and "what do they wonder?"	The teacher will open the lesson with a review of the week's lessons. Natural selection and selective breeding can both produce changes in animals and plants. The difference between the two is that natural selection occurs in nature, but selective breeding only occurs when humans intervene. Another name for selective breeding is artificial selection. Teachers can use the following presentation to facilitate the day's lesson. Natural Selection G…

	toothpicks, M&M's or Skittles, timer.		to catch? Explain your choice.		
Guided Practice/Transition	Teacher will begin by showing the class a bottle of hand sanitizer and pointing out that the label claims the sanitizer kills 99.99% of germs (bacteria). Ask students to predict what happens to the 0.01% that are not killed. The teacher will then discuss the following questions located on the student worksheet: How does bacteria gain resistance to antibiotics? Monday morning you wake up with a mild sore throat, but you figure it will probably be better in a few days. Unfortunately, you end up staying up really late the next few nights studying for a test and you wake up feeling very sick the morning of the test. You stay home for the day, but you agree to go to the doctor. 1. The doctor prescribes you an antibiotic. This leads you to conclude that _____	Students and the teacher will participate in a class discussion entitled: Natural selection and Artificial Selection. Students will link genetics with natural selection and understand why natural selection is important. Natural vs Artificial …	The teacher will have students log onto ExploreLearning/Gizmos and complete the prior knowledge questions and Gizmo warm-up questions with students. The Evolution: Mutation and Selection Explore Learning worksheet is available on the Gizmo website.	Students will engage in a note-taking activity: Five Mechanisms of evolution. Students will compare and contrast natural selection, genetic drift, mutation, non random mating, and gene flow as drivers of evolution. Mechanisms of Evo…	Students will complete the prior knowledge questions and the Gizmo warm up together as a class. Students will use their laptop computers. Students can work individually or in small groups to complete Activity A and B of the Explorelearning lab: Natural Selection. NaturalSelectionSE

	_____are causing you to feel sick? 2. What is an example of a sickness that an antibiotic would not help? 3. Can you ever think of a time when you had to take antibiotics? Does it make sense why your doctor prescribed you antibiotics? On the way home from the doctor you pick up your prescription from the pharmacy and immediately take the recommended dose. Now let's think about what is happening in your body after taking the antibiotic.				
Independent Practice	Students will complete the lab activity: How bacteria gain resistance to antibiotics? 1. Working in groups of three, students simulate the effect of hand sanitizer on a population of bacteria by taking turns using a toothpick, which represents hand sanitizer, to catch as many "bacteria" (Skittles and mini marshmallows) as	Students will complete the selective breeding review worksheet. Selective Breeding …	Students will use their laptop computers. Students can work individually or in small groups to complete Activity A and B of the Explorelearning lab: Evolution: Mutation and Natural Selection. EvolutionMutationS…	Students will complete the Five Mechanisms of Evolution review worksheet. Mechanisms of Evol…	Students will use their laptop computers. Students can work individually or in small groups to complete Activity A and B of the Explore Learning Lab: Natural Selection.

	they can from a paper plate, one at a time, in seven seconds. Most of the bacteria on the plate are marshmallows, which represent clones that are the same due to asexual reproduction—the y have a soft "shell," are colored white, and are cylindrical in shape. The Skittles represent bacteria that have three mutations resulting in three different traits (colorful, hard shell, and disc shape). After catching as many bacteria as possible, students count the bacteria remaining on the plate and record the number on their data table (see Activity Worksheet). Next, the bacteria "reproduce by fission"—students double the number of remaining bacteria on the plate and record the new number of bacteria in their table. These steps				

	are repeated three times. 2. As part of the simulation, students collect, record, graph, and analyze their data. The data analysis reveals that the bacteria not affected by the selective pressure (the toothpick that represents hand sanitizer) increase. The bacteria that are affected by the selective pressure decrease, and in some cases, die out. As a result, the original population of bacteria evolves to be one that is largely populated by bacteria that are unaffected by the selective pressure. During the procedure, students learn to work cooperatively, read directions carefully, and record data accurately.				

Assessment/ Summary	Students and teacher will complete the closing activity: Teacher will discuss the prior knowledge questions and give out correct answers and review the learning target and teacher will informally assess class's journey toward standard mastery.	How are selective breeding and natural selection related? The teacher will engage students in a short closing discussion of the day's activity.	Which process tends to work more efficiently, natural selection or artificial selection? Why do you think that is? Students and the teacher will discuss the closing question. The closing question will be used to assess student understanding of the Gizmo activity.	Students will write down what they learned on a piece of scratch paper and wad it up. Given a signal, they throw their paper snowballs in the air. Then each learner picks up a nearby response and reads it aloud.	Students and the teacher will complete the closing activities: review the learning target and teacher will informally assess class's journey toward standard mastery.
Small Group Tasks (TBA)					

Week 2	
GSE: S7L5. Obtain, evaluate, and communicate information from multiple sources to explain the theory of evolution of living organisms through inherited characteristics. c. Use mathematical representations to evaluate explanations of how natural selection leads to changes in specific traits of populations over successive generations. (Clarification statement: Referencing data should be obtained from multiple sources including, but not limited to, existing research and simulations. Students should be able to calculate means, represent this data in a table or graph, and reference it when explaining the principles of natural selection.) d. Construct an explanation based on evidence that describes how genetic variation and environmental factors influence the probability of survival and reproduction of a species.	Focused Concept: Natural selection is one of the central mechanisms of evolutionary change and is the process responsible for the evolution of adaptive features. Without a working knowledge of natural selection, it is impossible to understand how or why living things have come to exhibit their diversity and complexity.
SEP: Asking questions (for science) and defining	CCC:Cause and Effect

problems (for engineering) Analyzing and interpreting data Constructing explanations (for science) and designing solutions (for engineering) Obtaining, evaluating, and communicating information Planning and carrying out investigations	Cause and effect relationships may be used to predict phenomena in natural systems. Structure and Function Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function.

Phenomenon: Available during the opening activities	DQ: How can variations in a population result in an adaptation as a consequence of its interactions with its environment over time?

Learning Targets	Day 6	Day 7	Day 8	Day 9	Day 10
The students will be able to (SWBAT)	SWBAT evaluate how a variation can help or harm an organism's ability to survive.	SWBAT analyze variations among a population.	SWBAT trace Darwin's voyage and explore how Darwin used his observations as evidence for evolution.	SWBAT learn about the advantages and disadvantages of variations, by simulating birds with different types of beaks competing for various foods.	SWBAT apply their understanding of adaptations and natural selection to another animal species, analyzing how specific adaptations might affect the population over generations.
Opening	The teacher will have students complete the Science Probe: Tree Snails *(Inspire Science)* The science probe is used to gauge student's understanding of genetics and allow the teacher to identify misconceptions.	The teacher will open the lesson by showing students a picture of two giraffes:  After showing the picture, the teacher will ask students " Do you think all giraffes look alike?" Most students will say yes, but the picture shown should have students noticing that there are small differences within populations. The teacher will then have students read the paragraph above the	The teacher will start the lesson by asking students what would be a dream vacation for them. The teacher should accept any answers. The teacher will then ask students if they have heard of Charles Darwin. The teacher will then have students (or read to the students) the information about Charles Darwin *(Inspire Science)* Lesson Material for …	The teacher will ask students 'How long was Darwin's voyage to the Galapagos Islands?" The teacher will review the activity from the previous day "Travel with Darwin". The teacher will transition the lesson to the Galapagos Finches.	Teacher Discussion: Begin with a brief review of the Bird Beak Adaptation Lab from the previous day. Ask students to share their key findings and reflections on how different beaks provided advantages or disadvantages in acquiring food. Hook Question: Pose a question to students: "How do you think these beak adaptations could affect the population of these birds over many generations?"

		population variation lab on page 34.			
Guided Practice/ Transition	Use the following question to guide students to driving question 1: “Why do you think this plant has flowers that look like bees?” The teacher will have students look at the picture on page 28 of the student textbook and use the Encounter the Phenomenon worksheet located within the textbook teaching resources to guide student understanding of variations. The teacher will revisit mutations and their role in variations in populations. The guiding questions: How might looking like a bee benefit the plant? and What other organisms do you have that mimic other organisms? The teacher will use the online teacher resources and show the video “Nature’s Copycats”. As students are watching the video, the teacher will have students record their thoughts about the video and the photo. The teacher will conduct a short class discussion (-10 minutes). After the short discussion of the video and photo, the teacher will ask students to read the Explain the Phenomenon on page 30. The teacher will ask students to assert a claim	The teacher will transition students into the day’s lesson: Population Variation Lab (page 34). Students will work in learning pairs or quads (each group will need 10 sunflower seeds (pinto beans can be subbed for students who may be allergic to sunflower seeds), magnifying lens, a paper towel, and a metric ruler). The teacher will guide the activity using the instructions within the teacher materials. The lab activity will take 20 to 30 minutes. Student groups will record their group’s data on the form on page 35. The teacher will record all of the student group’s data on a class data created by the teacher. A class data table will make it earlier for students to compare their data. To wrap up the lab, the teacher will complete a class discussion about the seed variations observed by the students. You may choose to have questions 7 and 8 answered as a class discussion piece.	Students will be given the following instructions: Today, you will trace Darwin's voyage by reading the excerpts from his journal. You will find that the journal excerpts are not in chronological order. *The Voyage of the Beagle* is a collection of many of Darwin's journals, and he arranged the entries in this book by geographical area rather than by time. Make a list of the longitude and latitude listings in the correct time sequence. Number them and then place these numbers in the place on the map that corresponds to their longitude and latitude readings. If you have room, label each location on the map with the date he visited. Materials needed: World Map, coloring pencils, journal entries, computer. This activity can be completed via Google Maps using the following document: Traveling w/ Darwi…	The teacher will ask students to “**Write a sentence or two about what you already know about adaptations.”** Students will be given an opportunity to share their information. Students will transition to the Bird Beak Adaptation Lab. The teacher will divide students into groups of four with each group member receiving a different tool.	Scenario: Adaptation of the Arctic Fox Background Information: The Arctic Fox (Vulpes lagopus) lives in the Arctic tundra. It has several adaptations that help it survive in this extreme environment, such as thick fur, a compact body shape, and a keen sense of hearing to locate prey beneath the snow. Task: Imagine that the Arctic environment is experiencing significant changes due to climate change, such as warmer temperatures, changes in prey availability, and altered snow cover. You will analyze how these environmental changes could affect the Arctic Fox's adaptations and its survival over many generations. Instructions: Research: Investigate the current adaptations of the Arctic Fox and their role in survival. Research the effects of climate change on the Arctic environment (e.g.,

	to the Explain the Phenomenon question. The teacher will explain that students will collect evidence as the classroom lessons progress.				rising temperatures, melting ice, shifts in prey populations). Analysis: Identify three main adaptations of the Arctic Fox that help it survive in its current environment. Predict how each adaptation might be affected by the changing Arctic environment. Consider how these changes could influence the Arctic Fox population over multiple generations.
Independent Practice	Classroom Variations Lab *(Inspire Science)* The teacher will have students read the "What are variations?'*(Inspire Science)* The teacher will then ask "Why do variations occur in populations?" and "What variations can you observe among your classmates?'. Students will assemble in lab groups and complete the Classroom Variations lab *(Inspire Science)*. The teacher will walk around and monitor student groups throughout the activity.	Teacher will give the following instructions: Return to the Claim-Evidence-Reasoning graphic organizer on the Explain the Phenomenon and add additional information to support their claim.	Observations Lead to a Theory Students will list ten significant observations Darwin made in one column and the significance of the observations in another column. The teacher will instruct students to reflect on the importance of Darwin's voyage to the development of his theory of natural selection.	Students will complete the lab activity: Bird Beak Adaptation Lab. Students will play the role of hungry birds with various types of beaks. Which beak will give each "bird" an advantage? Students will answer a series of analysis questions based on the lab activity. The ultimate goal of the activity is to learn about the advantages and disadvantages of variations, by simulating birds with different types of beaks competing for various foods. Bird_Beak_Adapta…	Presentation: Create a report or presentation detailing your findings. Include the following sections: Adaptations and Their Current Role: Describe the three key adaptations of the Arctic Fox. Impact of Environmental Changes: Analyze how climate change might impact these adaptations. Future Predictions: Predict how these changes could affect the population of the Arctic Fox over time.

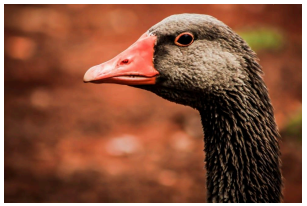
Assessment Summary	To wrap up the lesson, the teacher will discuss the data as a class. The teacher can ask students if they were surprised by the data?	Why are models important to science? How was the class data table an example of a model?	5-3-1 Dialogue Technique 5: Students will each write 5 words or phrases that are essential to the topic. With elbow partners, students will identify, discuss, and come to a consensus regarding 3: 3 words or phrases that are essential to the topic. 1: In groups of four, students will come to a consensus on 1 appropriate word or phrase that they believe is most essential to the topic. Each group will share their word or phrase and explain why it was chosen. Lesson Assessment: Students will summarize the information shared from dialogue generated by the 5-3-1 strategy and enter it in their science notebooks.	Closing: Students will complete the review quiz based on the day's lesson.	Write a paragraph reflecting on the importance of adaptability in changing environments and how this activity helped deepen your understanding of natural selection.
Small Group Tasks (TBA)					

Week 3	
GSE: S7L5. Obtain, evaluate, and communicate information from multiple sources to explain the theory of evolution of living organisms through inherited characteristics. a. Use mathematical representations to evaluate explanations of how natural selection leads to changes in specific traits of populations over successive generations. (Clarification statement:	Focused Concept: Changes in species occur due to natural selection, reproduction and environmental conditions.

Referencing data should be obtained from multiple sources including, but not limited to, existing research and simulations. Students should be able to calculate means, represent this data in a table or graph, and reference it when explaining the principles of natural selection.) b. Construct an explanation based on evidence that describes how genetic variation and environmental factors influence the probability of survival and reproduction of a species.	

SEP: Planning and carrying out investigations Analyzing and interpreting data Using mathematics and computational thinking Constructing explanations (for science) and designing solutions (for engineering) Obtaining, evaluating, and communicating information	**CCC:** **Patterns**: Graphs, charts, and images can be used to identify patterns in data. (MS-LS4-1), (MS-LS4-3) Patterns can be used to identify cause-and-effect relationships. (MS-LS4-2) **Cause and Effect** Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS4-4), (MS-LS4-6)
Phenomenon: Are available during opening activities	**DQ:**

Learning Targets	Day 11	Day 12	Day 13	Day 14	Day 15
The students will be able to (SWBAT)	**SWBAT** explain how the data collected by Peter and Rosemary Grant provide evidence for natural selection, adaptation, and speciation among populations of Galápagos finches	**SWBAT** evaluate how a variation can help or harm an organism's ability to survive.	**SWBAT** evaluate how a variation can help or harm an organism's ability to survive.	**SWBAT** write an investigation report to communicate scientific principles and ideas.	**SWBAT** analyze and interpret fossil evidence to understand the characteristics and behaviors of ancient organisms, and use the geologic time scale to identify the order of significant evolutionary events on Earth.

Opening	Students will view the short film “Galapagos Finch Evolution” (15 minutes). The film traces the research of Peter and Rosemary Grant in the Galapagos. After viewing the film, students and teacher will participate in a class discussion regarding Grant's research. Copy of Galapagos … Students will be asked to answer the following questions: • Who were Peter and Rosemary Grant? • What animal did they study? What did they observe? • How many species of finches did they observe? • Why is their research important?	  The teacher will show the image of a duck and an eagle. Students will engage in the see, think,wonder protocol. The teacher will ask students what type of food they believe the birds eat? and Do students believe the birds live in the same areas?	Lab activity quick quiz (students will complete a five question check up quiz covering material from the lab activity.)	The teacher will lead a class discussion about the core ideas at the heart of the lab, the quality of the students investigations, and nature of scientific inquiry.	Teacher will post image of fossil  We will engage in a see, think, wonder. I will ultimately ask the students what they assume about the image. Student responses will vary from the animal being a fish of some kind, to being aquatic, it is dead.
Guided Practice/Transition	The teacher will transition the lesson to the ADI Lab 18 activity. The teacher will explain that we will use the Grant’s actual data to make a claim for the following question: **Which Mechanism of Microevolution Caused the Beak of the Medium Ground Finch Population on Daphne Major to Increase in Size From 1976 to 1978?**	To ensure student understanding of the task and purpose of the lab activity, the teacher will review students how to use Google sheets and Excel. The data set used in the lab activity is Excel based. 2. Students will begin work on the ADI lab activity using the information from the previous two days’ lessons as guidance. Teacher will circulate	The teacher will review the argumentation process and the creation of a Claim-Evidence-Justificati on Poster. Each group will analyze the data they collected and then they craft an initial argument. The teacher will guide each group as they craft their argument to ensure understanding of the task.	The teacher will allow students to regroup and revisit their arguments. The teacher will review the argumentation process and expectations for the lab report. Student groups can collaborate on the lab report but each group member should turn in their own lab report. Teacher note: The lab report can be assigned	Students will work on a geological time scale scavenger hunt. Students must use the handout to interpret the order of evolutionary events on Earth. Geologic Time Scale GeologicTimeScale…

	Students and the teacher will read the background information and use the ADI reading log to take notes. Reading Log for A… After completing the reading log, the teacher will transition to the data students will use to provide for their claims. 1a. To ensure student understanding of the task and purpose of the lab activity, the teacher will show students how to use Google sheets and Excel. The data set used in the lab activity is Excel based.	among lab groups to ensure student understanding of lab..		through Canvas as a Peer review activity. Assigning through Canvas will allow students to engage in the Peer Review Process of ADI.	
Independent Practice	Students will begin work on Lab 18. Environmental Change and Evolution: Which Mechanism of Microevolution Caused the Beak of the Medium Ground Finch Population on Daphne Major to Increase in Size From 1976 to 1978? from the ADI Life Science lab book. The purpose of this lab is for students to apply what they know about migration, genetic drift, and natural selection to explain the evolution of beak size in a population of birds. Specifically, this investigation gives students an opportunity to use an existing data set to test	Students will continue work on Lab 18. Environmental Change and Evolution: Which Mechanism of Microevolution Caused the Beak of the Medium Ground Finch Population on Daphne Major to Increase in Size From 1976 to 1978? from the ADI Life Science lab book. The purpose of this lab is for students to apply what they know about migration, genetic drift, and natural selection to explain the evolution of beak size in a population of birds. Specifically, this investigation gives students an opportunity to use an existing data set to test	Claim-Evidence-Justification: Students will create a claim-evidence-justification poster based on the lab activity. Students should answer the guiding question: Which Mechanism of Microevolution Caused the Beak of the Medium Ground Finch Population on Daphne Major to Increase in Size From 1976 to 1978? and include scientific evidence and Each group analyzes the data they collected and then they craft an initial argument justification on their poster.	Lab Report Write up Using the previous day's lesson, students will write an individual investigation report using the group's argument. Students will answer the following questions in their report: 1. What were you trying to do and why?, 2. What did you do and why? and 3. What was your argument?	Answers will be recorded on their own answer documents. GeologicTimeScale…

	three different potential explanations for a case of microevolution. Students will formulate their claim and begin working on data collection and graphing.	three different potential explanations for a case of microevolution.	Poster will be created via hard copy or electronically, depending on technology availability		
Assessment/Summary	The teacher will wrap up the lesson by asking students: Which form of microevolution does your group believe causes the change in the finch population?	The teacher will wrap up the lesson by asking students: Which process tends to work more efficiently, natural selection or artificial selection? Why do you think that is?	Student groups will present their Claim-Evidence-Justification Posters. Each student group will hang their poster on the classroom wall for the poster gallery walk. Students will present their initial arguments. The students are encouraged to discuss and critique each argument. They then revise their initial argument within their student group.	Teacher can use the lab checkout questions to assess student understanding of the topic or students can compose a lab report based on their findings. Canvas provides for assignments to be peer reviewed (which aligns with the ADI instructional model)	Exit Ticket: During what era(s) did trilobites live?
Small Group Tasks (TBA)					

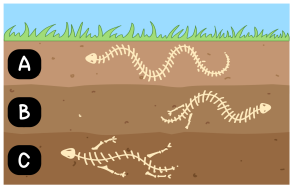
Week 4	
GSE: S7L5. Obtain, evaluate, and communicate information from multiple sources to explain the theory of evolution of living organisms through inherited characteristics. b. Construct an explanation based on evidence that describes how genetic variation and environmental factors influence the probability of survival and reproduction of a species. c. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, and extinction of organisms and their relationships to modern	Focused Concept: The Importance of the Fossil Record in Understanding the History of Life on Earth." This concept includes understanding key elements such as: The existence of organisms that lived millions of years ago. The diversity of life over different geological periods. Extinction events and their documentation in the fossil record. Evolutionary relationships between ancient and modern organisms.

organisms. (Clarification statement: Evidence of evolution found in comparisons of current/modern organisms such as homologous structures, DNA, and fetal development will be addressed in high school.)	
SEP: Planning and carrying out investigations Analyzing and interpreting data Using mathematics and computational thinking Constructing explanations (for science) and designing solutions (for engineering) Obtaining, evaluating, and communicating information	**CCC:** **Patterns**: Graphs, charts, and images can be used to identify patterns in data. (MS-LS4-1), (MS-LS4-3) Patterns can be used to identify cause-and-effect relationships. (MS-LS4-2) **Cause and Effect** Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS4-4), (MS-LS4-6)
Phenomenon: How do fossils, such as Tikaalik, provide evidence of evolution?	**DQ: What can fossils tell us about evolution?**

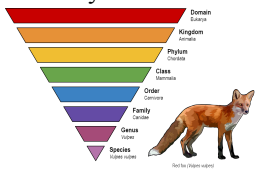
Learning Target:	**Day 16**	**Day 17**	**Day 18**	**Day 19**	**Day 20**
The students will be able to (SWBAT)	**SWBAT** analyze and justify their answers to questions about fossil formation and the transformation of fossils into fossil fuels, and will explore the concept of Pangaea through guided reading and independent analysis of fossil evidence, culminating in a color-coded map based on evidence types.	**SWBAT** consider how whale bones show evidence of evolution and what other types of evidence for evolution exist	**SWBAT** analyze fossil evidence to trace the evolutionary progression of whales and explain how these fossils provide evidence for evolutionary change over geological time.	**SWBAT** understand the importance of the fossil record in documenting the history of life on Earth by exploring key concepts such as existence, diversity, extinction, and evolutionary relationships.	**SWBAT** demonstrate understanding of evolutionary concepts through an assessment, then create a poster or narrative on an organism's evolution, and reflect on new insights and questions about evolution.
Opening	Teacher will present two multiple choice questions. Students must explain their rationale for their answer choices.	TTW Display a photo of a fossil and have students sketch what they believe the organism looked like alive, using their notebooks, paper, or page	Concept Check: Question: Pose the statement to the class: “Evolution occurs within individuals. True or False?”	TW Briefly explain the importance of the fossil record in understanding the history of life on Earth. Introduce key concepts: existence, diversity,	TW Explain the day's schedule to the students, including the assessment and independent activities.

	In order to form a fossil, an organism must usually __ quickly after it dies. A. Decompose B. Go extinct C. Rot D. Be buried What two forces can turn fossils into fossil fuels? A. Temperature and pressure B. Wind and rain C. Erosion and sedimentation D. Volcanoes and earthquakes	79 of their textbooks. Encourage imaginative and detailed drawings to speculate about the organism's features and lifestyle. Follow up by showing the video “Terrific Tiktaalik” to introduce them to the Tiktaalik fossil and its significance in evolution.	Response System: Use a quick response system such as thumbs up/down, whiteboards, or clickers. Clarify: Explain that evolution occurs in populations over generations, not within individuals during their lifetime.	extinction, and evolutionary relationships. TW probe students for understanding of terms. **Existence:** Explain that fossils provide evidence of the existence of organisms that lived millions of years ago. Show examples of fossilized plants and animals, emphasizing that these fossils prove these organisms once existed. **Diversity:** Discuss how the fossil record shows the diversity of life over different geological periods. Provide examples of different types of fossils from various time periods, illustrating how life forms have varied widely over time. **Extinction:** Explain that the fossil record documents extinction events, where species have disappeared from Earth. Discuss major extinction events, such as the one that led to the demise of the dinosaurs, and how these events are recorded in the fossil record. **Evolutionary Relationships:**	

				Describe how fossils help scientists understand evolutionary relationships between ancient and modern organisms. Explain how scientists use fossils to trace the evolution of specific traits and the relationships between different species.	
Guided Practice/Transition	Students will participate in a short passage that discusses the supercontinent, Pangaea. PangaeaIntroduction… Students will popcorn read along with the teacher as they annotate information regarding fossil evidence. Some students will be familiar with this information as it interconnects with certain Geology standards from grade 6 (S6E5g&h). Teacher will provide feedback on guided reading for questions 1 and 2	TTW Discuss with the class what scientists can learn from examining fossils and comparing them to modern organisms. Facilitate a group activity where students write a claim on how the Tiktaalik fossil provides evidence of evolution. Guide them to base their claims on observations and class discussions.	TTW summarize findings from the Pangea lesson and the Tiktaalik CER activity. Use mimio board to display "Evidence for Evolution" presentation to provide additional context. Evidence for Evolution SW complete the guided note sheet "Evidence of Evolution.pdf" during the presentation. Evidence of Evoluti…	SW complete a worksheet that reviews the 5 types evidence of evolution and unit vocal TW guide students through the first section for review. Fossil Evidence WS.…	TW Administer test on the concepts covered in the unit, including: Fossil evidence Evolutionary progression of whales Natural selection vs. artificial selection Genetic variation and inheritance patterns
Independent Practice	Students will complete questions 3-8 on their own. Students who struggle with literacy may be paired with a stronger reader. Students will complete a color coded map based on the particular type of evidence.	SW students complete a Claim, Evidence, and Reasoning (CER) framework in their workbooks (pages 80-81), stating how the Tiktaalik fossil offers evidence of evolution. They should write a clear claim, support it with evidence from their	Group Activity SW be put into pairs or groups to discuss and complete an activity where they number the fossils of whales to determine their evolution over time. Encourage discussion to enhance understanding and collaboration.	Research and Report: TW divide students into groups and assign a specific extinct organism from the fossil record. Students should research the organism, focusing on: When it existed Its diversity and unique traits The causes of its extinction	After completing the assessment, students will work individually or in pairs to research and create a poster or infographic on a specific example of evolution (e.g., the evolution of horses, birds, or insects). Guidelines: Provide guidelines on what

		observations and resources, and explain their reasoning.	Fossils Activity	Its evolutionary relationships to modern organisms Students will write a short report summarizing their findings. Allow students to share/display their findings.	information to include, such as: Description of the organism and its evolutionary history Key fossil evidence supporting its evolution Adaptations and changes over time How this example supports the theory of evolution. *Alternate Assignment:* Students write a short story or create a comic strip that describes the evolutionary journey of an imaginary organism. The story should include: A description of the starting organism Environmental changes that lead to adaptations How these adaptations help the organism survive and reproduce The final form of the organism after several generations.
Assessment/Summary	How would the world be affected if fossils did not exist? List two ways.		The image below shows fossils found in rock.  Which layer of rock is the oldest? How do you know?	Exit Ticket: "Why is the fossil record important in understanding the history of life on Earth?"	Exit Ticket: Ask students to write down one new thing they learned about evolution and one question they still have.
Small Group Tasks (TBA)					

Week 5	
GSE: **S7L5. Obtain, evaluate, and communicate information from multiple sources to explain the theory of evolution of living organisms through inherited characteristics.** c. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, and extinction of organisms and their relationships to modern organisms. (*Clarification statement:* Evidence of evolution found in comparisons of current/modern organisms such as homologous structures, DNA, and fetal development will be addressed in high school.) **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.)	**Focused Concept:** **There are similarities among all organisms, but they are also different and fulfill important roles in the ecosystem.** **Fossil records provide evidence of the connection of modern organisms to ancestral forms.**
SEP: Planning and carrying out investigations Analyzing and interpreting data	**CCC:** **Patterns**: Observed patterns of forms and events guide organization and classification,

Using mathematics and computational thinking Constructing explanations (for science) and designing solutions (for engineering) Obtaining, evaluating, and communicating information			and they prompt questions about relationships and the factors that influence them. (MS-LS4-1), (MS-LS4-3)		
Phenomenon: Are available during opening activities			**DQ: How do the similarities and differences of organisms determine how they are grouped?**		
Learning Target:	**Day 21**	**Day 22**	**Day 23**	**Day 24**	**Day 25**
The students will be able to (SWBAT)	**SWBAT evaluate how a variation can help or harm an organism's ability to survive**.	**SWBAT** identify and classify organisms using taxonomic hierarchy and explain the classification of the Red Panda.	**SWBAT** compare and contrast the characteristics of the six kingdoms of life.	**SWBAT** evaluate how historical models of classification based on physical characteristics led to the current six-kingdom system	**SWBAT** obtain, develop and defend a model that categorizes organisms based on common characteristics.
Opening	The teacher will open the lesson with a linking question: How do you think evolution is used in classification of organisms? *Teacher note: As organisms are often classified based on their distinguishing characteristics. An organism's classification typically gives significant information about its evolutionary history and which other organisms are connected to it.*	Activity: Show a <u>short video</u> on the Red Panda. Students will create a list of the features and behaviors of the Red Panda. Discussion: Is the Red Panda considered a Bear?	Quick review of the previous day's content with a warm-up question: "What is the taxonomic hierarchy?" 	TW Show images of historical classification models (e.g., Aristotle's classification, Linnaean system).	Show a <u>short video</u> on the 6 kingdoms Encourage a discussion on which kingdom is easiest/ harder to understand
Guided Practice/Transition	Students will read and complete an article review using the informational text article: “What’s New?”. Students will read the article and complete a series of questions relating to evolution and classification.	**<u>Presentation:</u>** Overview of the taxonomic hierarchy (Domain, Kingdom, Phylum, etc.).	In groups students will be given bags of random objects. Students must determine how they would classify the object in groups of 3 and why. **G**roup discussion on the characteristics of each	Read and discuss <u>an article</u> on the evolution of classification systems.	Using a graphic organizer, students will take notes on the 6 kingdoms. <u>Presentation</u> <u>Note Sheet</u>

	Resource: WHAT'S … Teacher note: The article can be read as a class or independently based on your learners. Article questions: Resource: Whats Ne… What's New recording: Resource: WHATS…		kingdom. Use diagrams and pictures to visualize differences.		
Independent Practice	Students will complete "Classification Chaos". Students will work in groups of two to three to classify a series of organism cards. After the groups classify their specimens, groups will share their classification criteria. For example, some groups might have grouped their specimens based on where they live, while others groups may have classified based on movement. Classification Chaos Cards 7 Classification Cha…	Students will complete a guide notes sheet with the presentation.	Students work in pairs to create a Venn diagram comparing two kingdoms of their choice.	Students create a timeline showing the development of different classification systems. Resource to support	Students work in pairs or small groups to create a detailed classification model for a set of given organisms. They must justify their categorizations based on observable traits.
Assessment/Summary	Why do you think it is important for scientists to have a common language when naming newly discovered organisms? (List and explain at least 2 reasons.) Students will answer and discuss the closing question within the class.	Students will research to find the scientific name of their favorite animal.	Share Venn diagrams with the class and discuss key differences and similarities.	Exit ticket: "Describe one way in which historical models influenced modern classification."	Each group presents their model to the class, explaining their reasoning and receiving feedback.
Small Group Tasks (TBA)					

Week 6					
GSE: S7L1. Obtain, evaluate, and communicate information to investigate the diversity of living organisms and how they can be compared scientifically. Develop and defend a model that categorizes organisms based on common characteristics. 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.)	**Focused Concept:** Taxonomy is the study of relationships between living things and the formal classification of organisms into groups based upon those hypothesized relationships. Organisms are classified based upon their similarities and differences. The classification system also tells something about the evolutionary relationships among species. Moving down through each level of classification, the number of species in the group decreases, which allows for the inference that those species share a recent evolutionary ancestor.				
SEP: Planning and carrying out investigations Analyzing and interpreting data Using mathematics and computational thinking Constructing explanations (for science) and designing solutions (for engineering) Obtaining, evaluating, and communicating information	**CCC:** Patterns: Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them. (MS-LS4-1), (MS-LS4-3)				
Phenomenon: Available during opening activities			**DQ: How can we construct an identification key to classify organisms?** **Why are scientific names a crucial part in identifying organisms?**		
Learning Target:	**Day 26**	**Day 27**	**Day 28**	**Day 29**	**Day 30**
The students will be able to (SWBAT)	**SWBAT use a dichotomous key and name a variety of organisms.**	**SWBAT explain how dichotomous keys are used to identify organisms and use a dichotomous key to identify unknown organisms.**	**SWBAT identify and provide characteristics of the six kingdoms in the modern system of classification.**	**SWBAT identify and provide characteristics of the six kingdoms in the modern system of classification.**	**SWBAT identify and provide characteristics of the six kingdoms in the modern system of classification.**

Opening					
	 Josiah (name will be changed based on class period) is walking through a park when he sees the spider shown. How could Josiah find out what type of spider it is?	The teacher will show the insect diversity video available on YouTube Bug Out with B… After the clip, allow students to share their thoughts about what was viewed. Prepare a few questions to ask to initiate the discussion: • *Were you were surprised by anything you saw? Why?* • *Do any of you think that we've seen and know all of the life forms that exist?"* Instruct students to turn and talk with a neighbor for 1 minute. Ask for 1-2 students to share their thoughts with the class. End the discussion by clarifying that the earth is full of a variety of organisms and we have not likely seen all the various life forms that exist. Pause and allow students to consider this statement before asking them to respond to this statement with	 The teacher will show a picture of an unorganized room in a house and lead the students in the I see, I wonder protocol. Students will be asked to write down What they see, What they wonder? as they observe the picture. This will lead to a short discussion about the importance of organization in the real world and in science.	The teacher will administer the classification probe to students. The classification probe consists of a picture of an albatross:  	 The teacher will show students a picture of a grocery store and ask students how grocery stores are organized. The teacher will solicit answers from students. (Teacher note: some students may not have as much experience with transitional grocery stores than others. Clayton County has 12 areas within it that have been declared food deserts or areas without a fresh food market within walking distance. If you are interested in that topic, and the potential to link it with ecology, please see the link below: Georgia's food ins…) The teacher will then pass out or show students a sample grocery store layout:

		why they think this is so. Look for students to identify that man does not have the ability to travel to all parts of the earth so we don't know what life exists in places man has not yet gone.		  **What is one trait that could be used to separate these albatrosses into two groups of two birds each?** The teacher will then transition to the day's activities.	Grocery Store Lay… Students will be asked to infer why grocery stores are laid out in what. Students may suggest it's easier, or the healthier food is towards the perimeter to encourage people to shop more. The teacher will then transition to the day's activity.
Guided Practice/Transition	Teacher will introduce the lesson for the day. Students will be guided to the Explore Learning site and instructed to launch the Dichotomous Key Gizmo. The teacher will review the Gizmo prior knowledge questions and the warm-up questions.	The teacher will Introduce the vocabulary associated with the lesson: **dichotomous key**, **organism** and connect the lesson with the previous day's ExploreLearning activity. Using an	The teacher will conduct a brief review of the six kingdoms prior to the commencement of the learning activity. **Exploring the Six Kingdoms** Set up approximately 30 stations in the room. View the materials section for specimen ideas. Each station should have one example specimen from the six	Take the total number of students in your class, and divide that number by four to determine how many teams you will have. Teacher Notes: You may ask students to sit in groups of four as they choose, but assigning	Students will be introduced to the classification unit assessment. Students will complete an in-class project based on the six current kingdoms: Animal Plant Fungi Protist Archaea

		LCD projector, provide instruction on dichotomous keys. Distribute guided notes or use a note-taking format that has been taught. Begin by explicitly teaching the term, dichotomous key. Ask students to identify any prefixes or suffixes in the term. If needed, prompt their thinking by asking students to think of other words that use this same prefix, *di-*. Look for students to identify words like *di*hybrid or *di*oxide (as in carbon dioxide). If they cannot think of these terms, identify them for the class. Identifying these words should help them make the connection that the prefix *di-* means two. Once it's established that *di-* means two, explain that a dichotomous key is a tool that allows the user to determine the identity of items in the natural world, such as trees, wildflowers, mammals, reptiles, rocks, shells, and fish. Emphasize the	kingdoms. Specimens can be pictures, living, models or a combination. Students will need to take out their field notebook, journal, etc. They can title their paper, "Exploring the Six Kingdoms." Inform students to work in groups of two.	groups ahead of time will save time and ensure that you have desirable group-dynamics. A Teacher Sample of a QR code has been provided- to use as an example of how students should scan the codes, and what it should look like on their smart devices after they do so. Provide each student with a clipboard that has a directions sheet Direction%20Sheet… and a blank ResearchSheet . Research Sheet for … Teacher Notes: All the students in each team should have the same letter on their Research sheet. (EX: group 1 should all have "A" on their research sheets, group 2 should all have "B" etc...) You will want to make sure that there is a minimum of one smart device with a QR code reader app downloaded per team. You may wish to show students the sample QR code, and explain to them how they might fill-out their Research sheet according	Eubacteria/Bacteria Six Kingdoms Poster… Teacher note: Make a copy of the presentation to edit the assessment to suit your classroom. For example, you may prefer to have students complete the poster in hardcopy form instead of digitally.

		language connection that dichotomous means "divided into two parts“ Therefore, dichotomous keys always give two choices in each step. Expect that the use of a dichotomous key might still not be clear for most students until the process is modeled during the lab activity.		to what they see on the smart device once they have scanned the code. Once students have received their materials, they may begin moving around the room, using their smart devices or ChromeBooks to scan the QR codes on the Organism Research Cards https://drive.google.com/file/d/19wYXeiQa1vRGuqYQVGHB-QOC0oB8flSn/view?usp=sharing Teacher Notes: Allow students who do not have smart devices to work with a partner who does. (Each student should still be completing their own Research sheet.) If students are unable to download a QR scanning app, but still have access to a smart device, they may use the internet to research the organisms. *Students should be filling-out their Research Sheets with the information they learn about their five assigned organisms through their QR code scans, and then choosing a sixth organism of their choice from the cards around the room to complete their Research*	

				Sheet. *Teacher Notes: Observe students throughout the research process. Assist in technical difficulties.* *Encourage students to make additional "notes" about the organisms, other than just what is required on their Research Sheet.* *When students complete their Research Sheets, they should form new teams of four, (with a team member from each letter group. One "A", one "B", one "C", and one "D") and begin discussing the similarities and differences between all of their organisms. They should have roughly 21-24 organisms to classify, depending on whether or not any of the students in the new team selected the same optional sixth organism.* *Teacher Notes:* Remind students to pay special attention to whether organisms are unicellular or multicellular, and whether they are heterotrophs or autotrophs. Provide each new team with a sheet of chart paper, and allow the new teams to	

				create a graphic organizer, demonstrating how they would like to classify their Eukaryotes into four groups. (You may wish to encourage students to sketch some rough drafts of their graphic organizers on the back of their Research Sheet before using their chart paper.) Teacher Notes: Allow students to form their own groups based on their research and reasoning, do not provide them with the qualities each group should have. Students should naturally arrive at the qualities that separate the four kingdoms of the domain Eukarya (Plant, Animal, Fungus, Protist), but they may not. Encourage them to consider characteristics they overlook. The graphic organizer should be clear, with labels or titles describing the shared characteristics of each group. Students should explain their classification process to you, or out-loud to the class as time allows. *You may wish to have students practice scanning*	

				qr codes in a prior lesson to help the explore portion of this lesson go as smoothly as possible *Teacher Notes:* *You may wish to allow for a "gallery-walk" of classification posters the following day, or display the posters around the room for students to refer back to throughout the unit.* *Reveal the four official kingdoms found through the Linnaean system within the domain Eukarya, according to the Linnaean System; and the characteristics of each.* *Teacher Notes:* *Encourage students to compare these four groups with the groups they developed in their teams.*	
Independent Practice	Students will complete the Dichotomous Key Gizmo. Students will complete Activity A (to learn how to use a dichotomous key) and Activity B (for additional practice)	Students will complete the candy dichotomous key lab. Materials Needed: Tootsie roll, Hershey's kiss, Andes mint, Lollipop, Jolly rancher, Starburst *Teacher note: Review the lab materials, procedures, lab sheet and analysis questions.*	Student groups will visit as many stations as possible, recording observations and inferences in their field notebooks/journals, etc., and in the observation chart provided. I will have students choose one specimen in the class to conduct further research on and present to the class.	Students will be given another QR code that leads them to a "mystery" organism. Mystery Organism …  Students will use their dichotomous key to identify the mystery organism, identify its characteristics, and	Students will complete the Six Kingdom Poster assessment as an independent practice activity. The teacher should monitor students to ensure work production.

		It may be useful to preview the lab analysis questions with the class before releasing students to work because it gives them an idea of what they should be looking to observe, consider or learn while conducting the lab procedures.		compare it to the other organisms they have already identified and classified to explain how it may be related on their Dichotomous Key Reflection Students will further reflect on the models that they have created and how models are important tools in the study of classification **Dichotomous Key L…**	
Assessment/Summary	Engage students in a review of the lab activity. The five question assessment is a great tool to assess student understanding.	Engage students in a "Silent Discussion". This strategy involves asking a question, then having students pass notes at the tables discussing the question. Ask students, "Was it easy for you to identify the various candies? Why or why not? How do you think the ease or difficulty of classifying applies to the classification of organisms in the real world? Circulate the room and read some of their notes to assess their understanding. Randomly select	Students will complete a Two-Dollar Summary: Students will write a two-dollar (or more) summary of the lesson. Each word is worth 10 cents. For extra scaffolding, ask students to include specific words in their statement. ***Teacher Notes:*** *If you have not used qr codes in your classroom before, it would be in your best interest to ask students to download a qr code reader on their smart device as soon as possible to save time tomorrow.* *Remind students they will need to bring their smart devices/ChromeBooks tomorrow!*	The teacher will bring the lesson to a conclusion by holding a discussion comparing the official Linnaean system for classifying organisms from the domain Eukarya into the four Kingdoms: Plant, Animal, Fungus, & Protist. Students will complete the classification learning check: Classification Learni…	Students will complete a short learning check: Instructions are as follows: Read the following statements. Decide whether you agree or disagree with each statement and circle your answer. Write down any previous knowledge you have about the statement that helped you make your choice. Next, read the assigned text and record the exact paragraph in which you found text evidence to prove or disprove each statement. If a statement ends up being false, cross out what is incorrect in the statement sentence and fix the wording to be true. 1. Aristotle's early classification system was based on how organisms moved or where they lived.

		students to share their responses with the class. Listen to their responses to see if they are able to make the connection that use of our senses is also helpful when classifying candy.	*Remember to place the qr codes around the room prior to class beginning. Tape them securely to where you want them to go. (consider student ability level to help you determine whether they should be hidden or in plain-sight.)*		His system Included only three groups of animals. 2. Binomial nomenclature is a three• part naming system that was first developed by a scientist named Carolus Linnaeus in the 1700 's. 3. Only organisms that belong to the same genus can mate with each other and have offspring that are fertile (can have their own offspring). 4. Latin word parts are used when assigning scientific names to organisms so that all scientists can understand each other no matter what native language they speak. 5. Species names often give clues as to where an organism was discovered, the name of the scientist that discovered it, or a distinctive characteristic of the organism. 6. A species-group contains a larger variety (number of types) of organisms as compared to a genus-group. Copy of Classificatio… Classification of Livi…
Small Group Tasks (TBA)					

Assessment Prep

Prepare students for assessment by reviewing the following Assessment Prep Presentation.

Unit 3: Evolution/Classification Assessment Prep

Provide the following guidance:
Ask the students to use what they know about the tasks completed to answer the provided assessment prep question.

- What is the question asking you?
- What do you know about the vocabulary or concept in the question?
- Is this question similar to any investigations or tasks we've completed?
- How can what you've done help you answer this question?
- Just view the assessment question: What is the question asking you?

Guide students to think about how their experience connects to the question.
Using the answer choices provided, ask the students the following:

- Identify a wrong answer: How do I know this answer is incorrect?
- Identify the right answer: How do we know this answer is correct?

Allow the students time to discuss in collaborative groups.

TEACHER NOTE: If students struggle with the question, review it the next day. Do not rush to the next question; instructional time is the only time they have to prepare for the end-of-year assessment.

Labs / Investigations		
Mandatory Labs	**Explore Learning Gizmo**	**Pivot Interactives/Phet**
ADI Lab: Which Mechanism of Microevolution Caused the Beak of the Medium Ground Finch Population on Daphne Major to Increase in Size From 1976 to 1978?	**Dichotomous Keys**	

Additional Resources/Tasks	
Supplemental Resources	Candy Dichotomous Keys Six Kingdoms Poster Project Taxonomy and Classification Lesson