

CCPS Science Unit Plan

Grade	7	Subject	Science	Unit #	2
Unit Name	Genetics		Timeline	8 Weeks	
How to use the Framework	<p style="color: red;">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.</p>				
Unit Overview	<p>This unit will lead students to an understanding of how traits are passed from one generation to another. Students will understand the roles that genes and chromosomes have and how traits are passed through generations by sexual or asexual reproduction in organisms. Students will be able to apply their understanding of genetics and how technology has influenced genetics. This understanding will guide them to the concept of selective breeding and how it can be used to produce desired traits in plants and animals. This unit is a springboard for the evolution unit and will allow students to compare and contrast natural selection and artificial selection.</p> <ol style="list-style-type: none"> 1. Genes, Chromosomes & Inherited Traits 2. Asexual and Sexual Reproduction 3. Selective Breeding 				
Lesson Plan guidance document and template	<p> CCPS Lesson Plan Template Day View Lesson Plan Template Week View Department of Science Guidance Document </p> <p>Textbook: Inspire Science-Life Unit 3 Reproduction of Organisms & Unit 4 Change Over Time (for selective breeding)</p>				
3Dimensional Instruction	<u>GSE</u>	<u>Science and Engineering Practices</u>	<u>Crosscutting Concepts</u>		
	<p>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.</p> <p>a. Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait.</p> <p>b. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation. (Clarification statement: Models could include, but are not limited to, the use of monohybrid Punnett squares to demonstrate the heritability of</p>	<ul style="list-style-type: none"> ● Develop and use a model to describe phenomena. ● Planning and Carrying Out Investigations ● Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. Engaging in Argument from Evidence ● Obtaining, Evaluating, and Communicating Information 	<ul style="list-style-type: none"> ● Cause and Effect ● Structure and Function 		

	<p>genes and the resulting genetic variation, identification of heterozygous and homozygous, and comparison of genotype vs. phenotype.)</p> <p>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 is specifically in reference to artificial selection and the ways in which it is fundamentally different from natural selection.)</p>		
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NGSS Alignment	NGSS Alignment to Disciplinary Core Ideas see pages 62 & 91**
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Weekly Lesson Tasks

Week 1					
GSE: S7L3a. Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait.	Focused Concept: Introduction to Genetics; Inheriting Traits				
Phenomenon: Why do some offspring look like their parents while others do not?	DQ: How are traits passed from one generation to the next?				
SEP: Developing and Using Models	CCC: Cause and Effect				
Learning Target:	Day 1	Day 2	Day 3	Day 4	Day 5
The students will be able to (SWBAT)	SWBAT identify and analyze genetic traits and phenotypes within their peer group through activities, discussions, and the creation of bar graphs, while applying the vocabulary terms "trait" and "phenotype."	SWBAT identify and categorize traits as inherited or acquired after watching a video and engaging in class activities, discussions, and note-taking.	SWBAT understand and explain key concepts of genetics and heredity, including the role of DNA and chromosomes, by taking notes, answering guided questions, and creating a social media page for an inherited trait.	SWBAT analyze genetic traits to determine parent-offspring relationships in cats, read and annotate articles about Gregor Mendel, and construct an argument using the C-E-R framework to explain why offspring sometimes resemble their parents.	SWBAT understand and explain the concept of inheritance through the creation of a Frayer Model.

<p>Opening</p>	<p>TW guide students through the Inspire Science activity, "Science Probe: Ladybugs."</p> <p>Each student will receive a sticky note. On the whiteboard or a sheet of chart paper, the teacher will create a bar graph featuring the names of the six students involved in this activity. Students will write their answers on their sticky notes and place them above the corresponding names. This will be followed by a class discussion.</p>	<p>Students will create a list of traits they believe they inherited after watching this short video</p> <p>Teacher will time the students completing this activity and then survey the class to see how many common traits students feel they inherited.</p>	<p>Engage students and activate prior knowledge about genetics, the cell nucleus, chromosomes, DNA, and genes.</p> <p>TW distribute images of the cell nucleus, chromosomes, DNA, and genes to students. Instruct students to observe the images and write down their observations and inferences about how these images relate to genetics. Facilitate a class discussion where students share their ideas and connect them to key concepts of genetics.</p> <p>Students Will (SW) observe the provided images and write down their observations and inferences. Participate in a class discussion to share and explore their ideas about genetics and heredity.</p>	<p>TW provide student groups with images of parent cats and their offspring.</p> <p><i>(Consider before making copies: Writing numbers on the adult cats and letters on the kittens could support student explanation in this activity)</i></p> <p>SW observe the images provided by the teacher. In their science notebooks, SW record their thoughts on which kitten they believe belongs to each group of parents.</p>	<p>TW display an example presentation: Teacher will provide an example Frayer Model on "Chromosome."</p> <p>Materials: Projector or whiteboard, example Frayer Model template on Chromosome.</p> <p>Content of Example Frayer Model on Chromosome:</p> <ul style="list-style-type: none"> -Definition: A structure within the cell nucleus that is made of DNA and proteins; chromosomes contain genes. -Picture: A labeled diagram of a chromosome showing its structure. -Example: Human chromosome 1. -Non-Example: A mitochondrion (not a chromosome but a different cell structure).
<p>Guided Practice/ Transition</p>	<p>TW ask students to clasp their hands together. Verbally survey students to see who has their right thumb on top or their left thumb on top.</p> <p>TW will introduce vocabulary terms: Trait & Phenotype.</p> <p>TW review the genetics traits from the website (<i>TW Omit PTC tasting</i>,</p>	<p>TW display Guided notes introducing Inherited and Acquired Trait using this Google Slide</p> <p>SW write notes on the Guided Note Sheet</p>	<p>TW display Guided notes introducing Genetics and Heredity using this Google Slide.</p> <p>SW write in notes on the Guided Note sheet</p> <p>Check students knowledge with the following questions:</p> <ul style="list-style-type: none"> ➤ Why is DNA 	<p>Students will receive articles about Gregor Mendel tailored to their reading levels. (It's beneficial to pre-assign groups before class and, if necessary, discuss this task with ELA and support teachers beforehand.)</p> <p>TW encourage ADI annotation and support small groups</p>	<p>Group Work: Divide students into groups and explain that they will be creating a Frayer Model for the term "Inheritance."</p> <p><i>(Teacher: Feel free to add additional unit terms to this activity)</i></p> <p>Materials Needed: Large chart paper or poster board, markers, student notebooks, and access to</p>

	<p><i>the last paragraph)</i></p> <p>Each student will complete the "An Inventory of My Traits: Survey." In groups, students will use the provided data table to find out how many people in their group have each trait.</p>		<p>often called a blueprint?</p> <ul style="list-style-type: none"> ➤ In the process of heredity, what word do we use for a characteristic? ➤ Chromosomes travel in pairs, but where are chromosomes located? ➤ Why does everybody have two copies of each chromosome? ➤ What is located inside each chromosome? ➤ Pieces of DNA that makes proteins that determine our traits are called? 		<p>textbooks or notes. Frayer Model Template:</p> <p>Definition: What inheritance means in a genetic context. Picture: A visual representation that illustrates inheritance (e.g., family tree, trait passing from parents to offspring). Examples: Instances of genetic inheritance, such as eye color, hair type, or specific genetic disorders. Non-Examples: Acquired traits, such as a tattoo or learned skills.</p>
<p>Independent Practice</p>	<p>Individually, students will create a bar graph showing four (or more) selected traits identified among their group members.</p>	<p>Students will read, “Inherited and Acquired Traits”. Revisit that list from the opening and indicate if its I or A.</p>	<p>SW Create an Instagram post or magazine cover as if you are DNA, boasting about being the blueprint of genetics.</p> <p>Instructions</p> <p>1. Instagram Post: Imagine you are DNA and you are posting on Instagram about your role as the blueprint of genetics.</p> <ul style="list-style-type: none"> - Content: Describe why DNA is considered the blueprint of genetics. Highlight its importance in inheritance and how it carries genetic information. - Creativity: Use hashtags, emojis, and a 	<p>Construct an argument using the C-E-R framework. SW make a claim about why offsprings sometimes look like their parents.</p>	<p>Gallery Walk: Display the Frayer Models around the room.</p> <p>Instructions: Have students participate in a gallery walk where they move around the classroom, observe, and take notes on each group’s model.</p> <p>Activity: Provide sticky notes for students to leave positive feedback or questions on each model.</p>

catchy caption to make your post engaging.

- Design: Use the provided Instagram Template (Instagram Template.pptx.pdf) to format your post.

2. Magazine Cover (Alternative Option): If you prefer not to create an Instagram post, design a magazine cover featuring DNA as the main subject.

- Content: Similar to the Instagram post, explain why DNA is the blueprint of genetics. Include headlines and articles that would make the cover appealing.

- Creativity: Use images, bold headlines, and vibrant colors to make your cover eye-catching.

TW provide encouragement and guidance:

- Express your understanding creatively.
- Think about why DNA is crucial in genetics and make sure to include this reasoning in your post or magazine cover.

Questions to Consider:




- Why is DNA called the blueprint of genetics?
- How does DNA carry and transmit genetic information?
- What makes DNA so essential for inheritance?

			<p>Remember, the goal is to showcase your knowledge in a creative and fun way!</p> <p>Instagram Template...</p> <p>Magazine Cover Te...</p>		
Assessment Summary	<p>SW write and answer in their science notebook: What do you think determines the types of traits you have?</p> <p>Additionally, students will be asked to suggest another genetic trait that they feel should be added to the survey</p> <p><i>(Teacher: Emphasize on the vocabulary term phenotype)</i></p>	<p>Think-Pair-Share: Checkpoints questions from slides 9-14</p>	<p>Exit Ticket:</p> <p>Description: At the end of class, have students write a brief summary answering the question, "Why is understanding the role of DNA and chromosomes important for understanding heredity?"</p> <p>Rubric: Complete and Insightful (4 pts): Provides a detailed explanation with clear understanding. Mostly Complete (3 pts): Provides a correct explanation but lacks depth. Partially Complete (2 pts): Basic explanation with some misunderstandings. Incomplete (1 pt): Limited explanation with major errors.</p>	<p>Using the guided notes, and annotated articles from the previous lesson. Students will revisit their claims and provide evidence and reasoning</p>	<p>Exit Ticket: Write one thing you learned about inheritance today and one question you still have.</p>
Small Group Tasks (TBA)					

Week 2

GSE: S7L3a. Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific

Focused Concept: Dominant and Recessive Traits / Phenotypes and Genotypes

trait.					
Phenomenon: Why do some offspring look like their parents while others do not?			DQ: How are traits passed from one generation to the next?		
SEP: Developing and Using Models, Constructing Explanations and Designing Solutions			CCC: Cause and Effect		
Learning Target:	Day 6	Day 7	Day 8	Day 9	Day 10
The students will be able to (SWBAT)	SWBAT explain the concepts of dominant and recessive traits and their impact on phenotypes and genotypes through guided notes, discussions, and activities.	SWBAT differentiate between phenotypes and genotypes and model their relationship using examples and Punnett squares.	SWBAT explain Mendel's experiments with pea plants and describe the laws of inheritance through class activities and discussions.	SWBAT apply knowledge of dominant and recessive traits to predict outcomes in a simulated genetic experiment using beetles.	SWBAT understand how dominant and recessive genes influence inheritance through interactive lab simulations.
Opening	<p>TW present a quick quiz using Google Slides on traits (dominant vs. recessive) using real-life examples (e.g., detached earlobes, dimples).</p> <p>-Discussion: TW lead a class discussion to review dominant and recessive traits based on the quiz responses.</p>	<p>TW show images of various plants and animals with different visible traits. Students will guess the potential genotypes responsible for the phenotypes.</p>	<p>Watch a short video about Gregor Mendel's experiments and contributions to genetics.</p> <p> An Introduction to ...</p>	<p>TW review key concepts about traits, phenotypes, and genotypes relevant to the lab.</p>	<p>Discussion: Briefly review the concepts of dominant and recessive traits using examples from Mendel's pea plants and the previous day's beetle lab.</p> <p>Prompt: "What are dominant and recessive traits, and how do they affect the appearance of offspring?"</p>
Guided Practice/Transition	<p>SW read pages 1-4 (stop before <i>What Controls Traits?</i>) of <i>Reproduction of Organisms: Inheritance</i></p> <p> Reading Essentials-I...</p> <p>Activity: Read the section adding terms and short summary to notebooks.</p> <p>Discussion: Review concepts in class.</p> <p>TW Ask: How do you think traits are passed from one generation to the next? <i>Students should arrive at</i></p>	<p>SW read pages 5-7 of <i>Reproduction of Organisms: Inheritance</i></p> <p> Reading Essentials-I...</p> <p>- Activity: Read about phenotypes and genotypes. Practice using Punnett squares to predict outcomes of genetic crosses.</p> <p>- Discussion: Work through example problems as a class.</p>	<p>Research Mendel's experiments and summarize the three laws of inheritance.</p> <p>- Discussion: Engage in a think-pair-share activity about the impact of Mendel's discoveries.</p> <p>TW use questions to guide:</p> <p>1. Think: Reflect on how Mendel's discoveries about genes and chromosomes help us understand how</p>	<p>Introduction to the Beetle Genes lab activity.</p> <p>TW guide students through the initial setup and hypothesis formulation.</p> <p>Review vocabulary from previous lessons: traits (dominant & recessive), phenotype, heredity, genetics, genes, alleles, genotype, homozygous, and heterozygous.</p>	<p>Introduction to Gizmos Lab: Explain the Gizmos "Mouse Genetics (One Trait)" lab activity.</p> <p>Overview: Students will breed "pure" mice with known genotypes that exhibit specific fur colors to understand how traits are passed on via dominant and recessive genes.</p> <p>Materials Needed: Devices with internet access, Gizmos access link, notebooks for recording observations.</p>

	<p><i>the idea that something is passed on.</i></p> <p>What does the X symbol mean in the figure? It indicates that the two plants were crossed.</p> <p>What do you think Mendel observed when he crossed a true breeding plant with purple flowers with a true breeding plant with white flowers? All the offspring had purple flowers.</p> <p>Can you give an example of another hybrid you are familiar with? (emphasize of the word hybrid) <i>Students might refer to hybrid gas-electric vehicles or hybrid bicycles (on-road and off road hybrids)</i></p> <p>Help students conclude that hybrids are a combination of two or more things.</p>		<p>traits are inherited. What do you find most interesting about his work?</p> <p>2. Pair: Discuss with a partner how Mendel's findings have impacted what we know about genetics today. Share examples of how this knowledge is used in modern science.</p> <p>3. Share: Present your discussion to the class. How do Mendel's laws help us explain the role of genes and chromosomes in inheriting traits? Can you give a real-life example?</p>		
<p>Independent Practice</p>	<p>Students will create a foldable that includes definitions and examples of dominant and recessive traits.</p> <p>-Materials:Construction paper, markers.</p>	<p>Students will complete a worksheet with various scenarios to determine phenotypes and genotypes using Punnett squares.</p>	<p>TW lead with question: What is a phenotype? How can you model a family's phenotypes?</p> <p>SW read through the interactive presentation (<i>TW assign online Inspire Lesson 1: Explore/Explain How can you model a family's phenotypes?</i>)</p> <p>How can you model a family's phenotypes?</p> <p>TW ask: How is a pedigree similar to a Punnett Square? Students</p>	<p>Conduct the Beetle Genes lab.</p> <p>- Materials: Beetle lab kits (genotype cards, trait charts), student edition</p> <p>Process: Students will simulate breeding beetles with different traits, record data on phenotypes and genotypes, and predict outcomes based on genetic principles.</p>	<p>SW follow along on their Student Exploration sheet answering the prior knowledge questions, warm-up and completing Activity A,B, or C (teacher decision)</p>

			<p><i>should reply, both are models that involve heredity.</i></p> <p>What indicates if a family member is male or female? <i>The shape used to represent the family member.</i></p>		
Assessment/Summary	Name two dominant and two recessive traits of a selected animal or plants.	Practice problems using Punnett squares to predict trait inheritance for different scenarios.	Each group (or student volunteers) presents their timeline and explains Mendel's laws in their own words.	Students complete a lab report documenting their hypotheses, methods, results, and conclusions from the Beetle Genes lab	SW Think-pair Share Question 6 Summarize : In your own words, describe what heredity is and how it works in mice.
Small Group Tasks (TBA)					

Week 3

GSE: S7L3a - Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait.

S7L3b. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation.

Focused Concept:

- Inheritance
- Asexual and Sexual Reproduction
- Regeneration and Vegetative Reproduction

Phenomenon: How does this sea star reproduce?

DQ: How do multicellular organisms reproduce?

SEP: Developing and Using Models, Constructing Explanations and Designing Solutions

CCC: Cause and Effect

Learning Target:	Day 11	Day 12	Day 13	Day 14	Day 15
The students will be able to (SWBAT)	SWBAT apply concepts of inheritance including dominant and recessive traits, phenotypes, and genotypes through the Gizmos "Inheritance" simulation.	SWBAT summarize findings from the Gizmos simulation and begin exploring the basics of asexual and sexual reproduction.	SWBAT explain the phenomenon of sea star regeneration as an example of asexual reproduction using the CER framework.	SWBAT describe processes of regeneration, budding, and vegetative reproduction and their roles in asexual reproduction.	SWBAT demonstrate their understanding of asexual and sexual reproduction through a hands-on activity and a summarizing exercise.

<p>Opening</p>	<p>TW Recap key concepts from Week 2 using a brief class discussion and a quick question-and-answer session.</p>	<p>Group discussion on findings and insights from the Gizmos simulation.</p>	<p>TW show 3 characters and ask students are engagement question. What do you think will happen if these characters lose an arm?</p> <p>■ Engage Question- R...</p> <p><i>Characters are Groot from Marvel and Piccolo from DragonBallZ, both characters are known to grow back their limbs. Guide students to the term regenerate and allow for students discussion about other characters that can regenerate.</i></p>	<p>Review the sea star CER and introduce new vocabulary: regeneration, budding, vegetative reproduction.</p>	<p>TW Host a quick review game on asexual reproduction vocabulary using flashcards.</p>
<p>Guided Practice/Transition</p>	<p>Introduce and navigate the Gizmos "Inheritance" simulation. Instructions: Guide students through the initial setup and use of the simulation, focusing on various genetic crosses. Activity: Students complete guided exercises in the simulation, exploring inheritance patterns.</p>	<p>Watch a short video on asexual and sexual reproduction to transition into the new topic. ▶ Asexual and Sexual ...</p> <p>Discussion: Discuss the differences between the two modes of reproduction and their implications for genetic diversity.</p>	<p>Show an introductory video or images about sea star regeneration.</p> <p>Discussion: Engage students in an initial discussion about how sea stars can regenerate from chopped parts. Encounter the Phenomenon – read/watch about the sea star and discuss how they can regenerate. (see Lesson 2: Engage-Encounter the Phenomenon) - Discussion: Facilitate a class discussion on how this phenomenon relates to asexual reproduction and regeneration.</p>	<p>SW read/work through inspire (TW assign Explore/Explain -Read About: How can one organism make more organisms) Read about how organisms can reproduce through regeneration, budding, and vegetative reproduction . Discussion: Discuss different types of asexual reproduction and how they contribute to species survival.</p>	<p>Conduct the "Modeling Offspring" lab from Inspire Science</p>

Independent Practice	Complete the Gizmos worksheet to reinforce understanding of inheritance concepts. <i>TW determine which sections of this Gizmo students are to complete</i> - Materials: Gizmos account, worksheet.	In groups SW Create a T-chart comparing asexual and sexual reproduction, noting examples of organisms and reproduction processes.	Complete the CER (Claim, Evidence, Reasoning) on sea star regeneration using Inspire.	Complete a worksheet that includes scenarios on how different organisms reproduce asexually, applying the new vocabulary.	SW complete “Analyze and Conclude” of the lab.
Assessment/Summary	Exit Ticket: Explain how using the Gizmos simulation helped you understand dominant and recessive traits.	Share and discuss the T-charts in small groups.	Exit Ticket: Write one interesting fact you learned about regeneration.	Review the worksheet answers as a class, clarifying any misconceptions.	Exit Ticket: Describe one way that the lab helped you understand how traits are inherited through sexual reproduction.
Small Group Tasks (TBA)					

Week 4

GSE: S7L3a - Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait.

S7L3b. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation.

Focused Concept:

- Inheritance Review
- Advantages and Disadvantages of Sexual and Asexual Reproduction
- Cloning
- Reproduction and Growth Strategies in Animals

Phenomenon: What strategies enable birds of paradise to reproduce successfully, and what affects how they grow?

DQ: What are the advantages and disadvantages of sexual and asexual reproduction?

SEP: Developing and Using Models, Constructing Explanations and Designing Solutions, Obtaining, Evaluating and Communicating Information

CCC: Cause and Effect

Learning Target:	Day 16	Day 17	Day 18	Day 19	Day 20
The students will be able to (SWBAT)	SWBAT review key concepts from Weeks 1-3 and demonstrate understanding through a	SWBAT understand the concept of cloning and its implications using the example of Dolly the	SWBAT understand albinism as a genetic trait and how it is inherited through sexual and asexual	SWBAT explore different strategies animals use to reproduce and ensure the growth of their young	SWBAT analyze various strategies animals use to reproduce and how these strategies affect the

	formal assessment.	sheep.	reproduction.		survival and growth of their offspring.
Opening	Engage students in a review game such as Kahoot! or Jeopardy, focusing on dominant and recessive traits, phenotypes, genotypes, and the basics of sexual and asexual reproduction.	TW accesses students' prior knowledge about cloning through a K-W-L chart (Know, Want to Know, Learned). Prompt: "What do you know about cloning? What do you want to learn?"	Prompt: What do you know about albinism? How do you think it affects organisms? TW Introduce: Albinism as a genetic condition characterized by the absence of pigment in skin, hair, and eyes. (phenotypes)	Watch the "Bird Dance" video featuring birds of paradise to introduce the new phenomenon. <i>Inspire Science/ Lesson 3: Reproduction and Growth of Animals- Engage</i>	Review CERs from the previous day on animal reproduction strategies.
Guided Practice/Transition	Discuss any difficult questions from the game to reinforce concepts. Common Formal Assessment #1 Students will take the assessment on genetics using Illuminate.	SW read "A Closer Look: Cloning and the Future." (TW assign or display from Inspire Online) Watch a video on Cloning with Dolly. How to clone-How ... Have student add to the L of the KWL	TW Show: A short video about an albino panda. Discuss the visual and genetic aspects of albinism seen in the panda. Punnett Square Activity: Step 1: Students work in pairs to use Punnett squares to predict the likelihood of albinism in offspring. Step 2: Compare the outcomes of sexual reproduction scenarios. Step 3: Discuss how albinism would be passed in asexual reproduction (cloning).	Brainstorm ideas, discussing how birds of paradise reproduce successfully. TW facilitate brainstorming and note ideas.	Explore p. 36-Teacher What are the advantages and disadvantages of sexual and asexual reproduction? Activity: Discuss examples of reproductive strategies in animals, such as nurturing young, building nests, and migration.
Independent Practice	Allow students who complete the assessment early to work on a genetics word search. DNA, gene, etc.). On the bottom or back. Have students identify which terms from the word search they need more support understanding and discuss these in small groups.	SW in groups create a reflection on cloning, including what cloning is, how Dolly was cloned, and one potential benefit and one potential ethical concern about cloning. Allow students choice with the creation of this activity; posters, writing, presentation.	Students will pick an animal. TW then tell students that their animal is albino living in its natural habitat. SW Write a short paragraph on how albinism affects the survival and reproduction of organisms. Consider both advantages and disadvantages in different environments. Prompt: How might	Complete a CER where the claim is "Animals reproduce and ensure the growth of their young by..." using observations from the video and prior knowledge.	Write a short essay describing a specific animal's reproductive strategy and how it impacts the growth and survival of its young, incorporating previous knowledge of inheritance.

			albinism be an advantage or disadvantage in an organism's environment?		
Assessment/Summary	Exit Ticket Provide students with index cards, have them write their names and write down one term or concept from the unit that you found challenging and would like to review further.	TW ask groups to share their creations of cloning. Encourage peers to determine comment on other groups' work.	TW Summarize: The key concepts covered, focusing on how albinism serves as an example of genetic traits inherited through different types of reproduction. Exit Ticket: Write down one new thing you learned about albinism and one question you still have.	Provide students with a list of animals facts . Students must take 3 Unit terms from the current unit to apply to a selected 3 of the given facts. Example: #2 is a result of asexual reproduction or # 7 is a phenotype-large eyes	Share essays in small groups and discuss similarities and differences in reproductive strategies
Small Group Tasks (TBA)	Teacher collects the exit tickets to create unique groups				

Week 5

GSE:S7L3a - Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait.	Focused Concept: - Reproduction and Growth Strategies in Animals - Animal Behaviors - Protecting Young				
S7L3b. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation.					
SEP:Developing and Using Models, Constructing Explanations and Designing Solutions, Obtaining, Evaluating and Communicating Information	CCC: Cause and Effect				
Phenomenon: What strategies enable birds of paradise to reproduce successfully, and what affects how they grow?			DQ: How are young animals protected?		
Learning Target:	Day 21	Day 22	Day 23	Day 24	Day 25
The students will be able to (SWBAT)	SWBAT compare and contrast sexual and asexual reproduction using a Venn Diagram.	SWBAT develop and use models to describe genetic outcomes in asexual and sexual reproduction.	SWBAT list the needs for growth in young animals and humans and compare these needs between species.	SWBAT distinguish between innate and learned behaviors and use models to explain genetic outcomes in offspring.	SWBAT understand the different ways birds build nests to protect their young and relate this to animal behaviors.

<p>Opening</p>	<p>Quick review game covering key concepts from the previous weeks.</p>	<p>Why do offspring from asexual reproduction have identical genetic information to their parent while those from sexual reproduction do not?</p>	<p>Prompt: What do you need to grow up? How might this differ for animals?</p> <p>TW Discuss: Differences in growth needs between humans and animals.</p>	<p>Scenario: Tommy’s parents sent him to school in a clean uniform, a charged chromebook and all his school supplies everyday. Tommy failed all his classes and was suspended for fighting.</p> <p>TW scaffold student discussion of the scenario to consider that Tommy had all his needs, his behaviors affected his outcome at school.</p> <p>Prompt: What do you think are innate and learned behaviors? Discuss with a partner.</p>	<p>How do birds build nests? What materials do they use?</p> <p>▶ What Are Nests Mad...</p>
<p>Guided Practice/Transition</p>	<p>TW review the purpose and structure of a Venn Diagram.</p> <p>Students create a Venn Diagram comparing sexual and asexual reproduction.</p> <p>In pairs, students discuss their diagrams and share insights with their elbow partner.</p>	<p>Using the worksheet identify the pictures as either sexual reproduction or asexual reproduction.</p> <p>TW host a class discussion on this section of the worksheet.</p>	<p>Brainstorming Session:</p> <p>Step 1: Individually list things needed to grow up for humans and animals.</p> <p>Step 2: Pair and share with a partner.</p> <p>Step 3: Add ideas to a class list on the whiteboard or chart paper.</p> <p>Step 4: Facilitate a discussion comparing human needs with animal needs, developing a comprehensive list for animals.</p> <p>TW Assign: Student groups or pairs to focus on specific needs identified for animals.</p> <p>TW Instruct: Groups to take away 2-3 identified needs from the animal list.</p>	<p>Innate vs. learned behaviors and the task of creating an educational poster.</p> <p>TW lead a discussion on innate behaviors and learned behaviors in human children,</p>	<p>TW provide students with various crafting materials, bags etc (see page 54 in the textbook)</p> <p>SW</p> <ol style="list-style-type: none"> 1. Research various bird nests and how birds build them. 2. In groups, design and build a model nest using available materials. 3. Present nests and explain the choices of materials and design. 4. Discuss how building a nest helps protect young birds and relates to animal
<p>Independent Practice</p>	<p>Complete Three-Dimensional Thinking questions on the</p>	<p>Students will complete matching questions 9-23, focusing on vocabulary.</p>	<p>SW create an Announcement (flyer, newspaper-front page,</p>	<p>Review the innate vs. learned behaviors poster on page 53.</p>	<p>Cont. steps-2-4</p>

	<p>Inspire using the diagrams for support.</p> <p><i>TW Assign- found on Lesson 2: Types of Reproduction under Evaluate</i></p>	<p>omit questions 24-27 instead in groups will be assigned one vocabulary term to create a Frayer model</p>	<p>social media style announcement, commercial with script etc)</p> <p>Step 1: Assign each group an animal species. Step 2: Groups develop an announcement based on the needs taken away, discussing whether their animal can reproduce or be the last of its lineage. Rubric: Provide a rubric for the announcement based on clarity, relevance to the animal's needs, and presentation skills. (20 minutes)</p> <p>Student groups will present announcement.</p>	<p>In small groups, create a poster about 7th grade students at their middle school. Displaying the innate behaviors vs the learned behaviors. (Explain to students that neither has to be negative)</p> <p>Include examples and visuals for both types of behaviors.</p>	
Assessment/Summary	<p>Write one advantage and one disadvantage of both sexual and asexual reproduction.</p>	<p>Students will answer questions 28-29 and on the back of their paper write why they choose their answer.</p>	<p>TW Lead: A reflection on the activity, focusing on understanding the role of growth needs in animal reproduction.</p> <p>Exit Ticket: Write down one new thing you learned about animal growth needs and reproduction.</p>	<p>Innate vs Learned Behaviors Gallery Walk</p> <p>Quizizz</p>	<p>Write a paragraph on how building a nest helps protect young birds and what this teaches us about animal behaviors.</p>
Small Group Tasks (TBA)					

Week 6

GSE:S7L3b. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation. (Clarification statement: Models could include, but are not limited to, the use of monohybrid Punnett

**Focused Concept:
Reproduction and Growth of Plants
Introducing Selective Breeding**

squares to demonstrate the heritability of genes and the resulting genetic variation, identification of heterozygous and homozygous, and comparison of genotype vs. phenotype.)

S7L3c. 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 is specifically in reference to artificial selection and the ways in which it is fundamentally different from natural selection.)

SEP: Constructing Explanations and Designing Solutions, Engaging in Arguments from Evidence, Obtaining, Evaluating and Communicating Information

CCC: Cause and Effect

Phenomenon: What structures enable the purple tansy plant to successfully reproduce, and what affects how it grows?

DQ: What strategies do plants use to reproduce successfully and grow?

Learning Target:	Day 26	Day 27	Day 28	Day 29	Day 30
The students will be able to (SWBAT)	SWBAT analyze how plants reproduce and grow, focusing on the structures and mechanisms involved.	SWBAT describe the process of pollination and its role in plant reproduction.	SWBAT complete the Genetics #2 Assessment	SWBAT explain the concept of selective breeding and its applications in enhancing desired traits.	
Opening	Inspire Lesson 4: Reproduction and Growth of Plants-Encounter the Phenomenon: TW show a photo of the purple tansy plant. -Prompt: What structures enable the purple tansy plant to successfully reproduce, and what affects how it grows? -Discussion: Lead a class discussion on plant structures involved in reproduction.	Key points from the CER activity on plant reproduction structures. Discussion: Clarify any questions from the previous day.	TW review key concepts of genetics: Genes and chromosomes determine the expressions of inherited traits. Many traits of an organism are inherited from its biological parents. Every organism requires a set of instructions for specifying its traits; heredity is the passage of these instructions from one generation to next All organisms reproduce	Use new text/unit. <i>Inspire Science Unit 4</i> Introduce Selective Breeding Guiding Question: In what ways have you seen humans alter the traits of organisms? TW show Video on selective breeding and its	SW write a see-think-wonder on the following video on GMO Prompt: What are the advantages and disadvantages of GMO?

			sexually or asexually.	impact on modern agriculture and animals.	
Guided Practice/Transition	<p>Claim-Evidence-Reasoning (CER) framework.</p> <p>- Activity: Students start forming claims related to plant reproduction beginning with "Plants produce and grow by..."</p>	<p>TW Explain: Pollination as a key process in plant reproduction.</p> <p>- Materials Needed: Diagrams or illustrations of pollination.</p> <p>Pollination Process: Step 1: Discuss different types of pollination (e.g., wind, insects). Step 2: Watch a short video on pollination to reinforce learning.</p>	<p>Complete the Genetics #2 Assessment on Illuminate. Access to Illuminate for the assessment.</p>	<p>Encounter the Phenomenon. (<i>Inspire/ Unit 4- Lesson 3</i>): TW have students study the pictures of dogs. Students will answer questions: What traits do you desire in a dog? Is there a way to get these traits?</p> <p>(see Dog Days on Inspire Education website)</p>	<p>SW read page 56-58 of student edition (unit 4)</p> <p>TW facilitate a class discussion: How should GMO/ modified food products be communicated to consumers?</p>
Independent Practice	<p>Step 1: Students write down their claims individually.</p> <p>Step 2: Pair-share to discuss evidence from the photo and prior knowledge.</p> <p>Step 3: Begin crafting reasoning based on discussions.</p> <p>SW complete the CER framework, focusing on how plant structures facilitate reproduction and growth.</p>	<p>Blowing in the Wind" lab on Inspire</p> <p>Purpose: Design a seed structure and model seed dispersal considering how plants find mates and spread seeds if they cannot move.</p>	<p>Students will be given the Human Genetics Disorder Project</p>	<p>Students will complete the "Developing Dogs"</p> <p>TW Assign lab through inspire</p>	<p>Allow students time to work on Human Genetics Disorder Project</p>
Assessment/Summary	<p>Exit Ticket: Write down one new thing you learned about how plants reproduce.</p>	<p>Exit Ticket: Write down one example of a plant adaptation for pollination.</p>	<p>TW lead a Q & A on the project</p>	<p>Write one way selective breeding is different from natural selection</p>	<p>Research: SW write down their favorite food and then do a quick search to see if its possible that it went through genetic engineering.</p>
Small Group Tasks (TBA)					

Week 7

GSE: S7L3c. 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 is specifically in reference to artificial selection and the ways in which it is fundamentally different from natural selection.)


Focused Concept:
Artificial Selection, Genetic Engineering, Comparing Natural Selection to Selective Breeding

SEP: Engaging in Argument from Evidence, Constructing Explanations and Designing Solutions ,Obtaining, Evaluating, and Communicating Information

CCC: Cause and Effect Systems and System Models Ethical Implications

Phenomenon: How can humans intentionally shape the traits of organisms to achieve desired outcomes?

DQ: What are the ethical implications of genetic engineering compared to natural selection and selective breeding?

Learning Target:	Day 31	Day 32	Day 33	Day 34	Day 35
The students will be able to (SWBAT)	SWBAT identify examples of artificial selection and explain genetic engineering applications.	SWBAT analyze ethical issues in genetic engineering and debate regulatory perspectives.	SWBAT compare natural selection and selective breeding using examples and a Venn diagram.	Students will present their research on a specific genetic disorder, demonstrating their understanding of the disorder's characteristics, inheritance patterns, symptoms, treatment options, and impact.	Students will present their research on a specific genetic disorder, demonstrating their understanding of the disorder's characteristics, inheritance patterns, symptoms, treatment options, and impact.
Opening	<p>Prompt: Imagine you're a dog breeder, what traits do you want in your dog? What dog today already has those desired traits?</p> <p>TW lead a class discussion to answer questions and review artificial selection.</p>	<p>See Think Wonder</p> 	TW show examples of natural selection in nature (e.g., peppered moths, Darwin's finches) and discuss observable traits.	<p>Greet students and introduce the purpose of the day: presenting their research on genetic disorders.</p> <p>Explain that each student will have a chance to present their findings to the class.</p> <p>Emphasize the importance of active listening and respectful behavior during presentations.</p>	<p>Greet students and introduce the purpose of the day: presenting their research on genetic disorders.</p> <p>Explain that each student will have a chance to present their findings to the class.</p> <p>Emphasize the importance of active listening and respectful behavior during presentations.</p>

				<p>Review of Presentation Expectations</p> <p>Briefly go over the rubric that will be used for evaluating presentations. Remind students of the key components each presentation should cover: disorder name, definition, symptoms, cause, inheritance pattern, treatment options, diagnosis methods, prevalence, and any new research findings.</p>	<p>Review of Presentation Expectations</p> <p>Briefly go over the rubric that will be used for evaluating presentations. Remind students of the key components each presentation should cover: disorder name, definition, symptoms, cause, inheritance pattern, treatment options, diagnosis methods, prevalence, and any new research findings.</p>
<p>Guided Practice/Transition</p>	<p>SW Watch a video on the history of artificial selection in agriculture. Discuss key examples and outcomes.</p> <p>Video</p>	<p>TW Divide the class into two groups for a structured debate on the ethical considerations of genetic engineering in agriculture and medicine.</p> <p>Sample Debate Questions</p>	<p>SW Use a Venn diagram to compare and contrast natural selection and selective breeding. Fill in key similarities and differences as a class.</p>	<p>Follow the schedule of student presentations. Encourage presenters to engage the audience by asking questions or prompting discussions related to their disorder. Facilitate a brief Q&A session after each presentation to clarify any doubts or questions from the audience.</p> <p>Peer Evaluation</p> <p>Distribute evaluation sheets or provide guidelines for peers to take notes during each presentation. Instruct students to provide constructive feedback based on the rubric criteria.</p>	<p>Follow the schedule of student presentations. Encourage presenters to engage the audience by asking questions or prompting discussions related to their disorder. Facilitate a brief Q&A session after each presentation to clarify any doubts or questions from the audience.</p> <p>Peer Evaluation</p> <p>Distribute evaluation sheets or provide guidelines for peers to take notes during each presentation. Instruct students to provide constructive feedback based on the rubric criteria.</p>
<p>Independent Practice</p>	<p>In groups SW students research and create a poster or infographic on a specific example of artificial selection in agriculture or animal breeding.</p>	<p>Write a short reflective essay discussing their personal stance on the ethical implications of genetic engineering.</p>	<p>Partners SW Complete the Selective Breeding Worksheet</p>	<p>After all presentations are completed, instruct students to individually reflect on what they learned. Provide each student with a prompt or question related to the day's presentations, such as "What was the most</p>	<p>After all presentations are completed, instruct students to individually reflect on what they learned. Provide each student with a prompt or question related</p>

				surprising aspect of today's presentations?" or "How might understanding genetic disorders impact healthcare?"	to the day's presentations, such as "What was the most surprising aspect of today's presentations?" or "How might understanding genetic disorders impact healthcare?"
Assessment/Summary	Groups present their posters or infographics. Discuss common themes and differences in artificial selection practices.	Share insights from the debate and essay reflections. Summarize key ethical concerns and viewpoints.	Share explore questions 13 with class	Why is it important to understand genetic disorders?"	What role does genetic research play in improving healthcare?"
Small Group Tasks (TBA)					

Week 8

GSE:S7L3a - Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait.

S7L3b. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation. (Clarification statement: Models could include, but are not limited to, the use of monohybrid Punnett squares to demonstrate the heritability of genes and the resulting genetic variation, identification of heterozygous and homozygous, and comparison of genotype vs. phenotype.)

S7L3c. 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 is specifically in reference to artificial selection and the ways in which it is fundamentally different from natural selection.)

Focused Concept: Reviewing concepts and vocabulary of Unit 2

Students will consolidate their understanding of genetic inheritance, asexual vs. sexual reproduction, and selective breeding, preparing for assessments and applying knowledge to real-world examples.

SEP: Constructing Explanations and Designing Solutions, Developing and Using Models, Asking Questions and Defining Problems,

CCC: Cause and Effect, Structure and Function, Stability and Change

Phenomenon: Why do siblings look different from each other while clones look identical?

DQ: How do genes and chromosomes determine the traits of an organism, and how can humans influence these traits through selective breeding?

Learning Target:	Day 36	Day 37	Day 38	Day 39	Day 40
<p>The students will be able to (SWBAT)</p>	<p>SWBAT construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait.</p>	<p>SWBAT create a Punnett square to explain the case study.</p>	<p>SWBAT compare sexual and asexual reproduction using video, read-aloud, and article sources, completing multiple-choice and fill-in-the-blank questions, and explaining the role of DNA in reproduction.</p>	<p>SWBAT reflect on their learning experiences in the genetics unit.</p>	<p>SWBAT demonstrate their understanding of key concepts in genetics by successfully completing the unit exam, applying knowledge of genes, chromosomes, inheritance patterns, and genetic variation.</p>
<p>Opening</p>	<p>See-Think-Wonder Case Study Video</p>	<p>TW ask students Who is Mendel? and then show a quick video on his life. Discuss Mendel's experiments and principles of inheritance. Review terms like alleles, homozygous, and heterozygous.</p>	<p>Asexual/Sexual Reproduction video</p>	<p>TW host class discussion on the genetics unit, reflecting on labs and acquired knowledge</p>	<p>TW Engage students with a brief recap of key concepts from the unit using a fun and interactive review game or quiz. This could involve: Kahoot or Quizizz quiz with questions covering major topics from the genetics unit. Quick brainstorming session where students list key terms or concepts they've learned. Reviewing a challenging genetics problem or scenario as a group.</p>
<p>Guided Practice/Transition</p>	<p>SW create a Punnett's square that explains the</p>	<p>Review key vocabulary</p>	<p>TW host a read aloud on Sexual and Asexual</p>	<p>TW provide students with choice board activities that</p>	<p>TW review Unit Test expectations</p>

	traits of the twins from the video. TW Lead a discussion on the structure and function of genes and chromosomes.		Reproduction Article SW complete the multiple choice question companion.	review the Genetics unit or Study Guide	
Independent Practice	Students analyze pedigrees of genetic traits and identify patterns of inheritance. They predict the likelihood of offspring inheriting specific traits. [Insert practice sheet]	SW will create a minion using the worksheet	SW complete the fill in the blank questions.	SW complete choice board or study guide	Genetics Unit Test
Assessment/Summary	Personal Connection: Do you or someone you know have traits that make them differ from their family, explain?	Have students illustrate their creation using the traits inherited	Describe the relationship between DNA and reproduction.	Students will provide feedback to the teacher on what they enjoyed most and least about the genetics unit.	TW survey next unit by asking students, how are animals and plants classified?
Small Group Tasks (TBA)					

Assessment Prep

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

Unit 2: Genetics 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
Modeling Offspring	Inheritance Mouse Genetics Genetic Engineering	

Additional Resources/Tasks

Supplemental Resources	
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