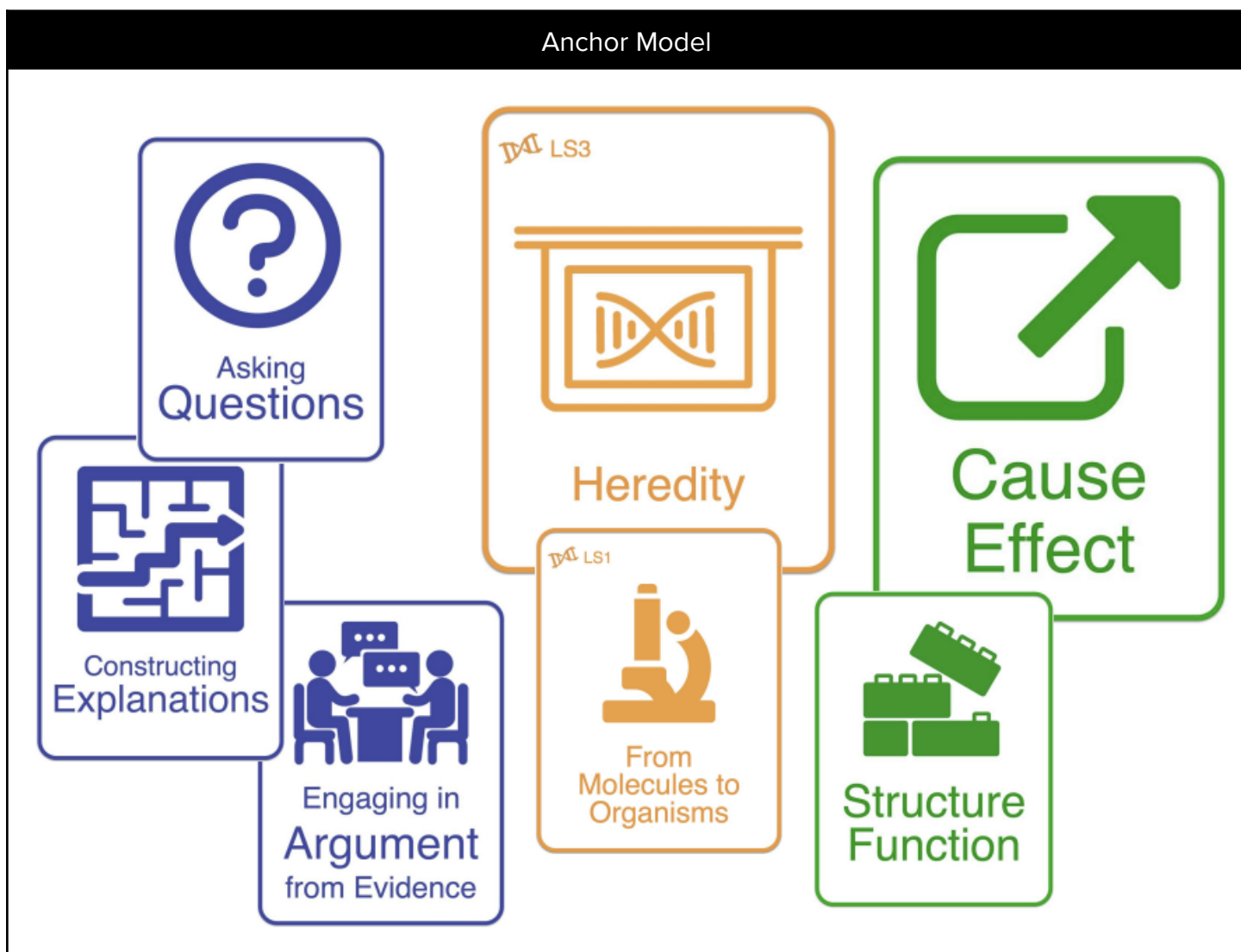


Storyline Unit Design

Understanding by Design (UbD) Template*

Unit		Course(s)	
Designed by		Time Frame	

 This work is licensed under a Creative Commons [Attribution-NonCommercial 4.0 International](https://creativecommons.org/licenses/by-nc/4.0/) License.



Stage 1: Desired Results

Performance Expectations

HS-LS1-1: Genes, Proteins, and Tissues

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS3-1: Chromosomal Inheritance

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. (Cause and Effect)

HS-LS3-2: Inheritable Genetic Variation

Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. (Cause and Effect)

Anchoring Phenomenon

[Anchoring Phenomenon Worksheet](#)

Albinism ([video](#))

Enduring Understandings

DNA is responsible for the production of all proteins in our bodies.

The proper structure of our proteins is essential if they are to be able to perform their function.

Changes in DNA lead to changes in living things - sometimes this is beneficial and sometimes this is harmful.

Essential Questions

Type Here



Stage 2: Assessments

HS-LS1-1 - [Stay Green Mutants](#)
 HS-LS3-1 - [The Royal Jelly](#)
 HS-LS3-2 - [Human Hand-Walkers](#)

[Assessment Screening Tool Slides](#)

Backward Design Elements

What new skills (practices) will students need to learn?	What thinking concepts will students need to learn?	What science concepts will students need to learn?
<i>CER</i> <i>Asking questions</i> <i>Engaging in argument from evidence.</i>	<i>How structure (proteins) affects their function.</i> <i>What causes mutations and what are the effects on the body</i>	<i>Structure of DNA.</i> <i>What are proteins and their wide range of functions.</i> <i>How genetic traits are passed on.</i> <i>How traits are manifested.</i> <i>Meiosis</i> <i>Mutations</i>



Stage 3: Learning Plan

 Phenomenon or Problem	 Learning Performance - What will they do? The three dimensions woven together into a single learning performance.	 Why is this important? How does this activity help build understanding of the anchoring phenomenon.	 Learning Experience - How will they do it? Graphic organizers, protocols, scaffolds, labs, mini-lesson, student discourse, etc.
<i>Albinism (video)</i> <i>Focus on the science more than the social aspect</i> <i>Animation of unzipping DNA and how it forms all the way to Proteins</i>	<i>Ask questions - about Albinism Similarities and Differences and Patterns</i> <i>Develop Models - how they think albinism occurs/ is caused</i> <i>Cause and effect</i> <i>DNA structure</i> <i>Develop a model/ obtaining and communicating information</i>	<i>Cause is genetic mutation</i> <i>Effect is the side effects of Albinism</i>	<i>-Create a list of questions [individually] then share in small groups - make a list of 5 best questions and put on the wall - Gallery walk - mark the best ones for a class question bank] Put all best q's on one sheet</i> <i>-Generate a model as to how you think this happens -or comparing a 'normal' person with the albinistic condition C/E - what causes this to happen [anchor chart to save and look at later at end of unit] A3 paper - in half - initial model on left then final model on right (T charts on each side)</i> <i>DNA models - of each level - build a DNA structure; (slide animation of this process) - take a picture of it ; Genes - zoom into a section of the DNA to show gene); (use pic to show amino acids); Polypeptides; Proteins</i> <i>We give students the normal model - students build a model of the mutated protein</i>
Formative Assessment - What information are you collecting to know that they met the target?			
Normal melanin production model	Students will use the model of DNA→gene→protein to determine the cause of albinism.		→toothpick and marshmallows (30 minute activity ONLY) - →Give students a model of the steps →Systems model
Formative Assessment - What information are you collecting to know that they met the target?			



Formative Assessment - What information are you collecting to know that they met the target?			
Formative Assessment - What information are you collecting to know that they met the target?			
Summative Assessment What information are you collecting to know that they met the target?			
Formative Assessment - What information are you collecting to know that they met the target?			
Formative Assessment - What information are you collecting to know that they met the target?			
Formative Assessment - What information are you collecting to know that they met the target?			
Formative Assessment - What information are you collecting to know that they met the target?			
Formative Assessment - What information are you collecting to know that they met the target?			
Summative Assessment What information are you collecting to know that they met the target?			



Formative Assessment - What information are you collecting to know that they met the target?			
Formative Assessment - What information are you collecting to know that they met the target?			
Formative Assessment - What information are you collecting to know that they met the target?			
Formative Assessment - What information are you collecting to know that they met the target?			
Summative Assessment What information are you collecting to know that they met the target?			

Materials / Resources

Vocabulary

HS-LS1-1

Structure of DNA
Essential life functions
Structure and Function
Gene
Protein
Cell
Tissue

HS-LS3-1

Chromosomes
DNA
- Genes
- Other functions (regulatory, structural, unknown)
Proteins
Inheritance
Parents and offspring
Traits
Cause and Effect

HS-LS3-2

Genetic variation
Meiosis
Mutations
- DNA replication
- Environmental
Inheritance
Cause and Effect

Mini Lessons

[Causation Level 6 - Causation and Correlation](#)

[Causation Level 6 - Causation and Correlation Thinking Slides](#)



This work is licensed by the author(s) under a Creative Commons [Attribution-NonCommercial 4.0 International](#) License.

Hosted by [The Wonder of Science](#)

Structure & Function Level 5 - Molecular-Level Structures
Structure & Function Level 5 - Molecular-Level Structures Thinking Slides

Graphic Organizers

Phenomena Observation Graphic Organizer
Questioning Graphic Organizer
Modeling Graphic Organizer
Planning an Investigation Organizer - Experimental
Planning an Investigation Organizer - Observational
Investigation Evidence Organizer
Engaging in Argumentation Organizer

Differentiation / Modifications



This work is licensed by the author(s) under a Creative Commons [Attribution-NonCommercial 4.0 International](https://creativecommons.org/licenses/by-nc/4.0/) License.

Hosted by [The Wonder of Science](https://www.thewonderofscience.com/)

Phenomenon Worksheet

Back to [Stage 1](#)

◀ **HS-LS1-1 Genes, Proteins and Tissues**

◀ **HS-LS3-1 Chromosomal Inheritance**

◀ **HS-LS3-2 - Inheritable Genetic Variation**

◀ **Local**

◀ **Favorite**

◀

Henry the Hexapus

Down Syndrome

Aging

Epigenetics

CRISPR

Albinism ([video](#))

Dog birth defects

Tumor growth

[Apple Database](#)

Cri-du-Chat (Crying Cat Syndrome) Assessment?

Broccoli, colliflower, sprouts, kale - all one species.

Rabbit walking on front legs [Handstand Rabbit](#)

Cancer (What happened to Bob?)

Addie



This work is licensed by the author(s) under a Creative Commons [Attribution-NonCommercial 4.0 International](#) License.

Hosted by [The Wonder of Science](#)

HS-LS1-1: Genes, Proteins and Tissues

[Evidence Statement](#)Assessment: Stay Green Mutants ([Google Template](#))

Reflections: Type Here			
	No	Partial	Yes
1. The assessment contains a phenomenon (science) or a problem (engineering)			
2. The prompts match the Science and Engineering Practice (SEP) and engage students in sense making.			
3. The stimuli have multiple and sufficient information needed to utilize the SEP . (e.g. multiple data sets to analyze)			
4. The prompts elicit observable understanding of the Disciplinary Core Idea (DCI) .			
5. The prompts explicitly mention the Crosscutting Concept (CCC) .			
6. The prompts include language (i.e. bullets) from grade appropriate progressions. (SEP) (DCI) (CCC)			
7. The graphic organizers provide space for the observable features (e.g. 1, 2, 3...) in the evidence statement. (e.g. claim, evidence and reasoning)			
8. The entire assessment contains information that is scientifically accurate and properly attributed. (e.g. don't make up data and include the source)			
9. The prompts point in the direction of explaining a phenomenon (science) or designing a solution (engineering).			
10. The phenomenon or problem is authentic, interesting, and requires students to figure something out.			
11. The phenomenon or problem is novel to show the transfer of knowledge. (i.e. not in the unit)			



HS-LS3-1: Chromosomal Inheritance

[Evidence Statement](#)Assessment: The Royal Jelly ([Google Template](#))

Reflections:			
	No	Partial	Yes
1. The assessment contains a phenomenon (science) or a problem (engineering)			
2. The prompts match the Science and Engineering Practice (SEP) and engage students in sense making.			
3. The stimuli have multiple and sufficient information needed to utilize the SEP . (e.g. multiple data sets to analyze)			
4. The prompts elicit observable understanding of the Disciplinary Core Idea (DCI) .			
5. The prompts explicitly mention the Crosscutting Concept (CCC) .			
6. The prompts include language (i.e. bullets) from grade appropriate progressions. (SEP) (DCI) (CCC)			
7. The graphic organizers provide space for the observable features (e.g. 1, 2, 3...) in the evidence statement. (e.g. claim, evidence and reasoning)			
8. The entire assessment contains information that is scientifically accurate and properly attributed. (e.g. don't make up data and include the source)			
9. The prompts point in the direction of explaining a phenomenon (science) or designing a solution (engineering).			
10. The phenomenon or problem is authentic, interesting, and requires students to figure something out.			
11. The phenomenon or problem is novel to show the transfer of knowledge. (i.e. not in the unit)			



HS-LS3-2: Inheritable Genetic Variation

[Evidence Statement](#)Assessment: Human Hand-walkers ([Google Template](#))

Reflections:			
	No	Partial	Yes
1. The assessment contains a phenomenon (science) or a problem (engineering)			
2. The prompts match the Science and Engineering Practice (SEP) and engage students in sense making.			
3. The stimuli have multiple and sufficient information needed to utilize the SEP . (e.g. multiple data sets to analyze)			
4. The prompts elicit observable understanding of the Disciplinary Core Idea (DCI) .			
5. The prompts explicitly mention the Crosscutting Concept (CCC) .			
6. The prompts include language (i.e. bullets) from grade appropriate progressions. (SEP) (DCI) (CCC)			
7. The graphic organizers provide space for the observable features (e.g. 1, 2, 3...) in the evidence statement. (e.g. claim, evidence and reasoning)			
8. The entire assessment contains information that is scientifically accurate and properly attributed. (e.g. don't make up data and include the source)			
9. The prompts point in the direction of explaining a phenomenon (science) or designing a solution (engineering).			
10. The phenomenon or problem is authentic, interesting, and requires students to figure something out.			
11. The phenomenon or problem is novel to show the transfer of knowledge. (i.e. not in the unit)			

