



[COURSE NAME] Curriculum Map

Our curriculum writing process uses a backwards-design approach. The three stages of backward design are:

STAGE 1 Desired Results	STAGE 2 Evidence	STAGE 3 Learning Plan
<i>If the desired result is for learners to ...</i>	<i>Then, you need evidence of the students' ability to ...</i>	<i>Then, the learning activities need to ..</i>

[UNIT NAME]

Overall Unit Goals:

- XXX
- XXX
- XXX

STAGE 1 Desired Results	Learning Standards COPIED and LINKED FROM THE WONDER OF SCIENCE <u>HS-ESS1-1: Nuclear Fusion and the Sun's Energy</u> Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation. (Scale, Proportion, and Quantity) <u>HS-ESS1-2: The Big Bang Theory</u> Construct an explanation of the big bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe. (Energy and Matter) <u>HS-ESS1-3: Stellar Nucleosynthesis</u> Communicate scientific ideas about the way stars, over their life cycle, produce elements. (Energy and Matter) <u>HS-ESS1-4: Orbital Motions</u>
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		Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. (Scale, Proportion, and Quantity) HS-ESS1-7: Cyclic Changes Construct an explanation using evidence to support the claim that the phases of the moon, eclipses, tides and seasons change cyclically. ANCHOR PHENOMENON - (note to AMY - similar to sacred texts in ELA. This might also need to be listed in a master document so that when teachers are planning they can cross-reference this so that an anchoring phenomenon cannot be taken or reused.) Universe - Map
	Essential Questions	Drafts Questions needing final revisions <i>How has technology shaped our understanding of the scale of the Universe?</i> <i>How has technology shaped our understanding of the origins of the Universe?</i> <i>How has technology shaped our understanding of energy and matter of the Universe?</i> <i>Where does matter and energy come from?</i> <i>How does matter and energy move in the Universe?</i>
	Knowledge, Skills, and Understandings <i>Please use this space to specify the learning objectives of this unit. Be sure to consider:</i> <u>Understandings</u> (concepts that students make meaning of) <u>Knowledge</u> (facts, vocabulary, definitions, etc) <u>Skills</u> (what students will be able to do)	COPIED FROM EVIDENCE STATEMENTS (colored boxes), ESS1-7 (NYSSLS Standard not included in this example) DCI - Science Concepts ESS1.A: The Universe and Its Stars: The star called the sun is changing and will burn out over a lifespan of approximately 10 billion years. (HS-ESS1-1) PS3.D: Energy in Chemical Processes and Everyday Life: Nuclear fusion processes in the center of the sun release the energy that ultimately reaches Earth as radiation. (secondary) (HS-ESS1-1) ESS1.A: The Universe and Its Stars: The study of stars' light spectra and brightness is used to identify compositional elements of stars, their movements, and their distances from Earth. The Big Bang theory is supported by observations of distant galaxies receding from our own, of the measured composition of stars and nonstellar gases, and of the maps of spectra of the primordial radiation (cosmic microwave background) that still fills the universe. Other than the hydrogen and helium formed at the time of the Big Bang, nuclear fusion within stars produces all atomic nuclei lighter than and including iron, and the process releases electromagnetic energy. Heavier elements are produced when certain massive stars achieve a supernova stage and explode. (HS-ESS1-2, HS-ESS1-3)

PS4.B: Electromagnetic Radiation: Atoms of each element emit and absorb characteristic frequencies of light. These characteristics allow identification of the presence of an element, even in microscopic quantities. (secondary) (HS-ESS1-2)

ESS1.A: The Universe and Its Stars: The Universe and Its Stars The study of stars' light spectra and brightness is used to identify compositional elements of stars, their movements, and their distances from Earth.

Other than the hydrogen and helium formed at the time of the Big Bang, nuclear fusion within stars produces all atomic nuclei lighter than and including iron, and the process releases electromagnetic energy. Heavier elements are produced when certain massive stars achieve a supernova stage and explode.

ESS1.B: Earth and the Solar System: Kepler's laws describe common features of the motions of orbiting objects, including their elliptical paths around the sun. Orbits may change due to the gravitational effects from, or collisions with, other objects in the solar system. (HS-ESS1-3, HS-ESS1-4)

CCC - Crosscutting Concepts

Scale, Proportion, and Quantity: The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs. (HS-ESS1-1)

Energy and Matter: Energy cannot be created or destroyed—only moved between one place and another place, between objects and/or fields, or between systems. (HS-ESS1-2)

Energy and Matter: In nuclear processes, atoms are not conserved, but the total number of protons plus neutrons is conserved. (HS-ESS1-3)

Scale, Proportion, and Quantity: Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth). (HS-ESS1-4)

SEP - Practices or Skills

Develop and Use a Model: Develop a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-ESS1-1)

Constructing Explanations: Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Obtaining, Evaluating & Communicating Information: Communicate scientific ideas (e.g., about phenomena and/or

		the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically). (HS-ESS1-3) Using Mathematical and Computational Thinking : Use mathematical or computational representations of phenomena to describe explanations. (HS-ESS1-4)																							
	Connections to CORE/PATH/ Elem Building Goals Connections to STRIDES <i>Many elements of CORE, PATH, and STRIDES are inherent in all that we do. Here, please select an element of CORE/PATH, and/or STRIDES that lends itself to living in this unit through intentional planning and explicit instruction.</i>																								
STAGE 2 Evidence	Performance Task(s)	<table><tr><td>HS-ESS1-1</td><td>The Life and Death of Stars</td><td>KEY - Life and Death of Stars</td><td>Evidence Statement</td></tr><tr><td>HS-ESS1-2</td><td>The Four Pillars of Evidence</td><td>KEY - The Four Pillars of Evidence</td><td>Evidence Statement</td></tr><tr><td>HS-ESS1-3</td><td>We Are Made of Star Stuff</td><td>KEY - We Are Made of Star Stuff</td><td>Evidence Statement</td></tr><tr><td>HS-ESS1-4</td><td>The Orbits of Saturn's Moons</td><td>KEY - The Orbits of Saturn's Moons</td><td>Evidence Statement</td></tr><tr><td>HS-ESS1-7 (MS-ESS1-1)</td><td>(Total Lunar Eclipses)</td><td>Key - Total Lunar Eclipses</td><td>Evidence Statement</td></tr></table>				HS-ESS1-1	The Life and Death of Stars	KEY - Life and Death of Stars	Evidence Statement	HS-ESS1-2	The Four Pillars of Evidence	KEY - The Four Pillars of Evidence	Evidence Statement	HS-ESS1-3	We Are Made of Star Stuff	KEY - We Are Made of Star Stuff	Evidence Statement	HS-ESS1-4	The Orbits of Saturn's Moons	KEY - The Orbits of Saturn's Moons	Evidence Statement	HS-ESS1-7 (MS-ESS1-1)	(Total Lunar Eclipses)	Key - Total Lunar Eclipses	Evidence Statement
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	Other Evidence																								

STAGE 3
Learning Plan

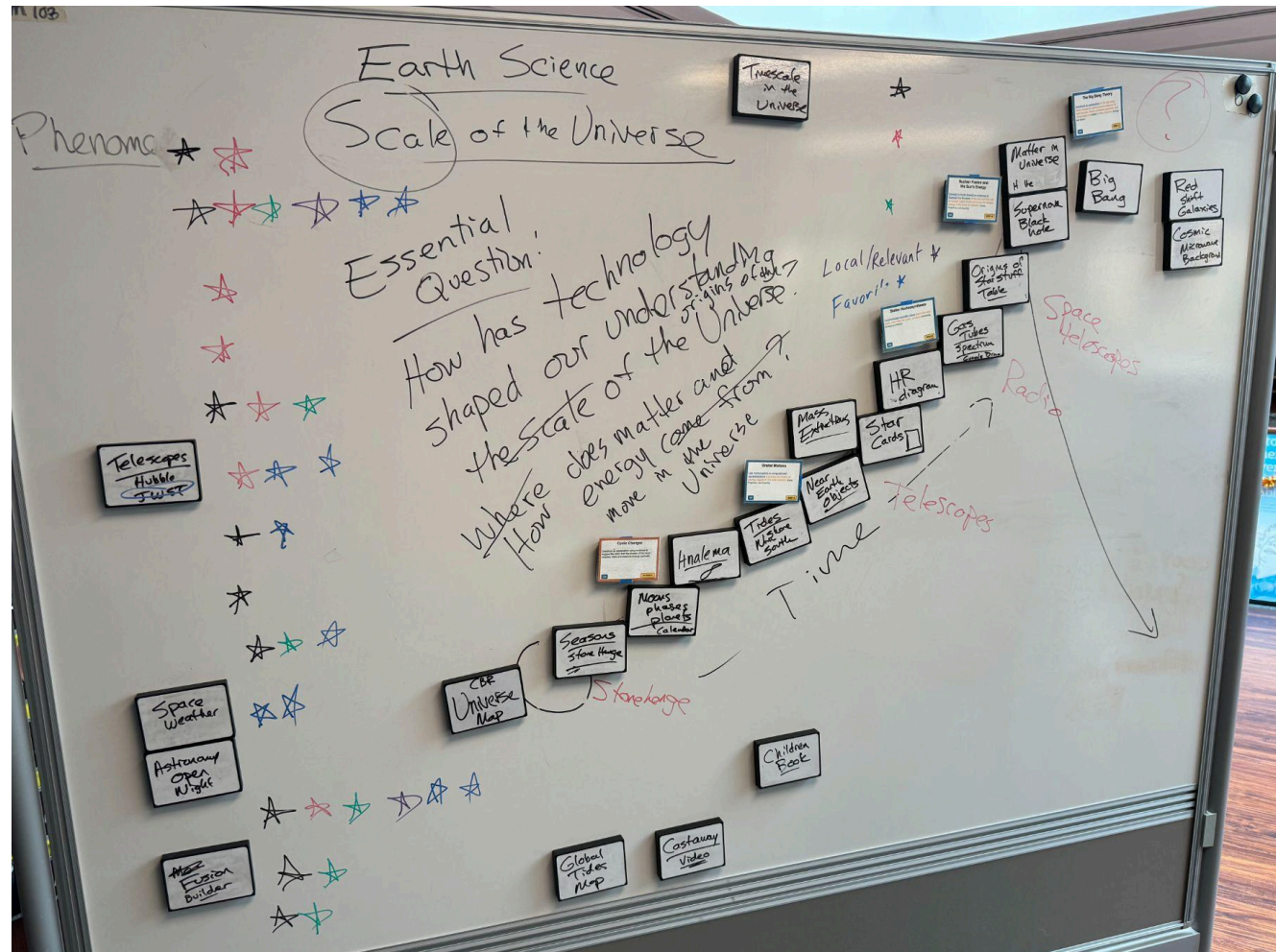
Instructional Strategies & Learning Experiences

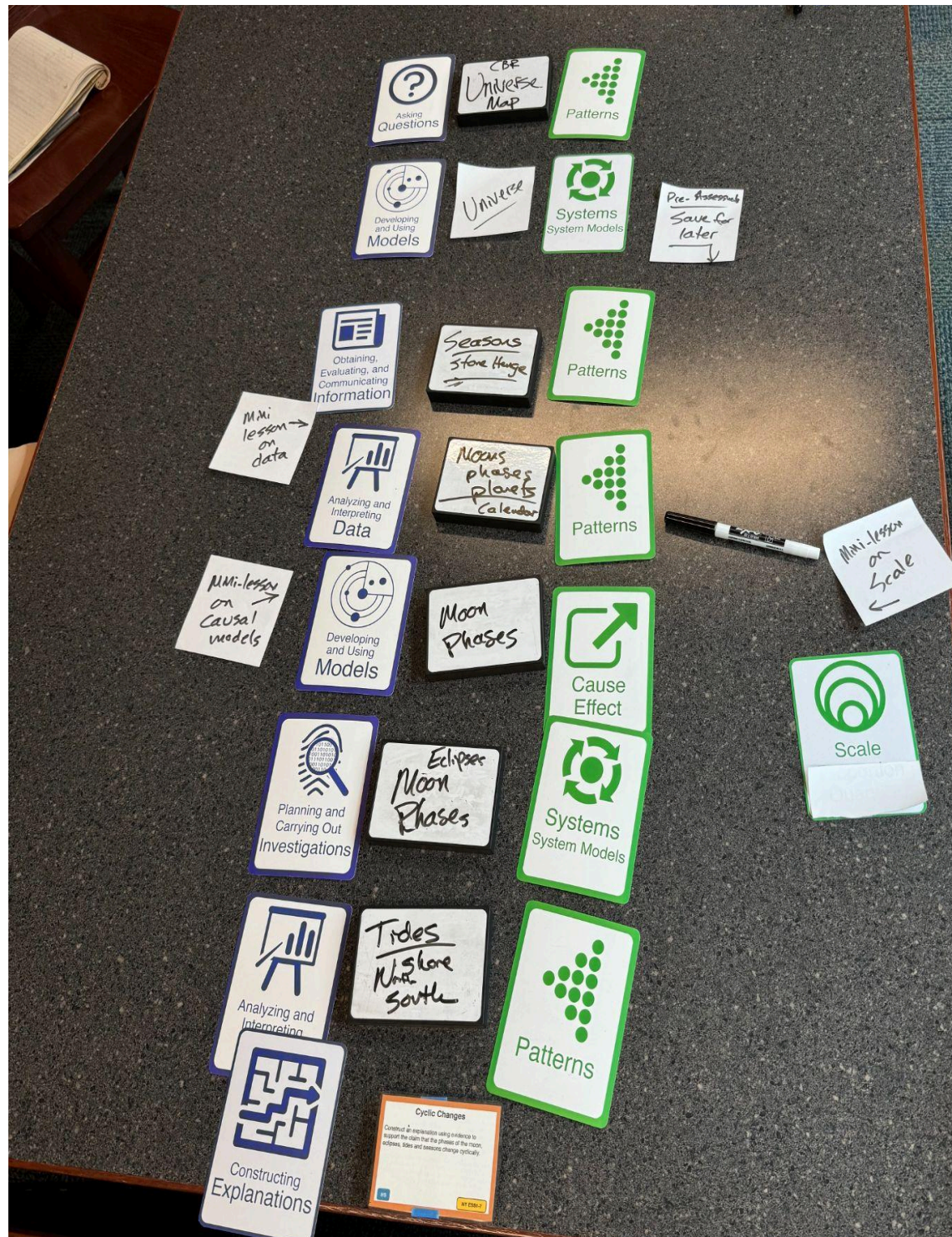
Please use this space to specify the learning experiences in this unit in a way that is helpful to you.

For example, you might:

- list a sequence of lesson objectives
- get into greater detail of lesson content
- use the space to link to resources
- specify instructional strategies
- describe daily/weekly instructional routines that drive learning

Ultimately, consider what instruction will help you reach the goals in Stages 1 & 2.





		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.
		CBR map of the Universe	Students will ask questions about patterns of the CBR map.	Introducing the anchoring phenomenon.	
		Formative Assessment - What information are you collecting to know that they met the target?		Assess questions using the rubric of a scientific question.	
		Universe	Students will develop a system model of the universe.		
		Formative Assessment - What information are you collecting to know that they met the target?			
		StoneHenge	Students will obtain information about the patterns in StoneHenge.		
		Formative Assessment - What information are you collecting to know that they met the target?			
		Moons, phases, planets / calendar	Students will analyze and interpret patterns in the data of phenomenon.		
		Formative Assessment - What information are you collecting to know that they met the target?			
		Moon Phases			
