



Earth and Space Patterns: Spaceship Earth

Draft Date 06-07-2024	Course Grade 5 Science	Duration 2 Week(s)	Grades 5	Subjects Science	Team Susan Brunk, Jill Koser, Hannah Leicht, Souders Vicki
---------------------------------	----------------------------------	------------------------------	--------------------	----------------------------	--

Focus

In this unit, students explore patterns of the Earth, Sun, Moon, and stars. They investigate how shadows change throughout the day, how the Sun's position changes throughout the year, and how stars change throughout the seasons. They also create Earth, Sun, and Moon models to explore Moon patterns. Students explore our solar system! They investigate how bright the Sun appears from each planet in our solar system in addition to stars of other solar systems in galaxies far away. They also investigate gravity on Earth and gravity on other planets to discover patterns of this incredible force.

Stage 1: Learning Goals

Established Goals	Transfer	
Standards	Long-Term Transfer Goals	
Pennsylvania Academic Standards Science (2023): 5 Standards ■ Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. Clarifying Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.	What kinds of long-term, independent accomplishments are desired? Students will be able to independently use their learning to... ■ Make and use observations to analyze relationships and patterns in order to explain phenomena, develop models, and make predictions. (Communicator) (T1)	
	Meaning	
	Understandings	Essential Questions
	What specifically do you want students to understand? What inferences should they make? Students will understand that... ■ The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in	What thought-provoking questions will foster inquiry, meaning making, and transfer? Students will keep considering... ■ What are the predictable patterns caused by Earth's movement in the solar system? (Q1)

Assessment Boundary: Assessment does not include causes of seasons. (3.3.5.B)	the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year. (U1)	
Profile of a CV Learner	Acquisition of Knowledge & Skill	
■ Communication: Students will be able to independently and confidently adapt their writing and speaking in relation to audience, task, and purpose, as well as practice active listening to understand other perspectives, viewpoints, and cultures. (PCVL.CM)	Knowledge	Skills
	What facts and basic concepts should students know and be able to recall? Students will know... ■ Students will understand the predictable patterns caused by Earth's movement in the solar system, including phenomena such as day and night, seasons, and why the Sun and stars seem to move across the sky. (K1)	What discrete skills and processes should students be able to use? Students can... ■ I can identify and explain the predictable patterns caused by Earth's movement in the solar system. (S1)



Stars and Planets

Draft Date 07-22-2024	Course Grade 5 Science	Duration 1 Week(s)	Grades 5	Subjects Science	Team Susan Brunk, Jill Koser, Hannah Leicht, Souders Vicki
---------------------------------	----------------------------------	------------------------------	--------------------	----------------------------	--

Focus

In this unit, students explore our solar system! They investigate how bright the Sun appears from each planet in our solar system in addition to stars of other solar systems in galaxies far away. They also investigate gravity on Earth and gravity on other planets to discover patterns of this incredible force.

Stage 1: Learning Goals

Established Goals	Transfer	
Standards	Long-Term Transfer Goals	
Pennsylvania Academic Standards Science (2023): 5 Standards - Support an argument that the gravitational force exerted by Earth on objects is directed down. Clarifying Statement: “Down” is a local description of the direction that points toward the center of the spherical Earth. Assessment Boundary: Assessment does not include mathematical representation of gravitational force. (3.2.5.F) - Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.	What kinds of long-term, independent accomplishments are desired? Students will be able to independently use their learning to... Make and use observations to analyze relationships and patterns in order to explain phenomena, develop models, and make predictions. (Communicator) (T1)	
	Meaning	
	Understandings	Essential Questions
	What specifically do you want students to understand? What inferences should they make? Students will understand that... The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws. (U1)	What thought-provoking questions will foster inquiry, meaning making, and transfer? Students will keep considering... What is the universe, and what is Earth’s place in it? (Q1)

Clarifying Statement: N/A

Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage). (3.3.5.A)

Profile of a CV Learner

- Communication: Students will be able to independently and confidently adapt their writing and speaking in relation to audience, task, and purpose, as well as practice active listening to understand other perspectives, viewpoints, and cultures. (PCVL.CM)

Acquisition of Knowledge & Skill

Knowledge

What facts and basic concepts should students know and be able to recall?
Students will know...

- We can infer information about stars and planets based on observations we make from Earth. (K1)
- All forces between objects, regardless of size or direction, arise from only a few types of interactions. (K2)

Skills

What discrete skills and processes should students be able to use? Students can...

- Support an argument that the apparent brightness of the Sun is dependent upon an observer's distance from the Sun (S1)
- Support an argument that gravity exists on all planets and moons, but the amount of gravity is different because it depends on how massive the object is (S2)



Watery Planet

Draft Date 02-09-2026	Course (Draft) Grade 5 English Language Arts, Grade 5 Science	Duration 5 Week(s)	Grades 5	Subjects English Language Arts	Team Jill Koser, SYSTEM USER, Kelly Galbraith, Lind Raymond
---------------------------------	---	------------------------------	--------------------	---	---

Focus

Interdisciplinary Science Unit: In this unit, students consider the profound importance of water as a natural resource. Students investigate the distribution of water, how it cycles through Earth's systems, and explore how it affects human societies. In addition, students will create an infographic detailing a strategy that could be used to conserve water in their community or context. Finally, students will extend their learning by applying their knowledge of science principles to novels and grade level texts.

Stage 1: Learning Goals

Established Goals	Transfer
Standards	Long-Term Transfer Goals
Pennsylvania Core Standards English Language Arts (2014): 5 ■ Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a text based on specific information in the text. (CC.1.2.5.C) ■ Determine a theme of a text from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text. (CC.1.3.5.A) ■ Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent. (CC.1.3.5.D)	What kinds of long-term, independent accomplishments are desired? Students will be able to independently use their learning to... ■ Reading Informational Text / Reading Literature: Read to gain knowledge, build critical thinking skills, and spark curiosity and interest. (T1) ■ Reading Informational Text / Reading Literature: Explore text and other media to seek understanding of multiple perspectives and cultures. (T2) ■ Writing: Communicate information and ideas clearly to address task, purpose, and intended audience. (T3) ■ Speaking and Listening: Effectively utilize appropriate speaking techniques (volume, inflection, pace, etc.) and vocabulary in a variety of settings to clearly communicate ideas and information. (T4) ■ Science: Explain how the natural and designed worlds are interrelated and the application of scientific knowledge and technology can have beneficial, detrimental, or unintended consequences. (Global Citizen, Communicator) (T5)

- **Explain how a series of chapters, scenes or stanzas fits together to provide the overall structure of a particular story, drama, or poem. (CC.1.3.5.E)**
- **Write informative/ explanatory texts to examine a topic and convey ideas and information clearly. (CC.1.4.5.A)**
- Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic; include illustrations and multimedia when useful to aiding comprehension. (CC.1.4.5.C)
- Group related information logically linking ideas within and across categories of information using words, phrases, and clauses; provide a concluding statement or section; include formatting when useful to aiding comprehension. (CC.1.4.5.D)
- Include multimedia components and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (CC.1.5.5.F)

Pennsylvania Academic Standards

Science (2023): 5 Standards

- Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

Clarifying Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate;

Meaning	
Understandings	Essential Questions
What specifically do you want students to understand? What inferences should they make? Students will understand that... ■ Strong inferences are based on specific text details that lead to a broader topic, point, or conclusion. (RI and RL) (U1) ■ Readers notice how elements of a story impact and influence other elements to enhance their understanding of the text. (RL) (U2) ■ The perspective of the narrator impacts how the reader interprets the plot and meaning of the text. (RL) (U3) ■ Effective writers choose organizational structures and transitions to logically connect ideas and information. (Info Writing) (U4) ■ The Earth's surface processes affect and are affected by human activities. (Science) (U5)	What thought-provoking questions will foster inquiry, meaning making, and transfer? Students will keep considering... ■ How do the details help me find the theme or lesson (Literature) and main idea (Info Text)? (Q1) ■ How do the elements of a story work together to help me understand the big picture? (RL) (Q2) ■ How do I know who is telling the story? (RL) (Q3) ■ How do I use organizational structure to connect my ideas and information logically? (W) (Q4) ■ Science: How can we solve problems in the environment? (Q5) ■ Science: How much water is on Earth, and how is it distributed between saltwater and freshwater? (Q6)
Acquisition of Knowledge & Skill	
Knowledge	Skills
What facts and basic concepts should students know and be able to recall? Students will know... ■ Using specific evidence from the text helps to explain what the text is about. (RI) (K1)	What discrete skills and processes should students be able to use? Students can... ■ I can use information and details from the text to explain important relationships/interactions. (RI) (S1)

the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.

Assessment Boundary: Assessment is limited to the interactions of two systems at a time. (3.3.5.C)

- Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

Clarifying Statement: N/A

Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere. (3.3.5.D)

- Generate and design possible solutions to a current environmental issue, threat, or concern.

Clarifying Statement: This could include but is not limited to topics such as biodiversity, watersheds, invasive species, natural resources, etc.

Assessment Boundary: N/A (3.3.5.F)

Profile of a CV Learner

- **Global Citizenship: Students will be able to mindfully and respectfully seek to**

- The narrator's point of view influences how events are described. (RL) (K2)
- Use facts, examples, and details to support what they are writing about. (W) (K3)
- Gather information about a topic from various resources and make decisions about what is best to include in their writing. (W-Content) (K4)
- Use headings, subheadings, and other text features to organize their writing so it is easy to follow. (W-Organization) (K5)
- Science: Students will know that water is distributed on the earth in different ways. (K6)
- Science: Students will know about current issues, threats or concerns in the environment. (K7)

- I can describe the narrator's point of view and how their purpose is conveyed in the text. (RL) (S2)
- I can organize my writing to share important ideas and facts clearly. (W-Info) (S3)
- I can use percentages and data to graph water on earth. (Science) (S4)
- I can create and design solutions to the environmental issues using the design process. (Science) (S5)

understand the ideas and perspectives of others to responsibly participate in all facets of local and global society.
(PCVL.GC)



Chemical Magic

Draft Date 07-15-2024	Course Grade 5 Science	Duration 2 Week(s)	Grades 5	Subjects Science	Team Susan Brunk, Jill Koser, Hannah Leicht, Souders Vicki
---------------------------------	----------------------------------	------------------------------	--------------------	----------------------------	--

Focus

In this unit, students investigate the properties of matter by dissolving everyday chemicals to make solutions and by exploring simple yet surprising chemical reactions. Through these investigations, students begin to build conceptual models for the particulate nature of matter. In this unit, students investigate the properties of matter by dissolving everyday chemicals to make solutions and by exploring simple yet surprising chemical reactions. Through these investigations, students begin to build conceptual models for the particulate nature of matter.

Stage 1: Learning Goals

Established Goals	Transfer	
Standards	Long-Term Transfer Goals	
Pennsylvania Academic Standards Science (2023): 2 Standards - Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. Clarifying Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects. Assessment Boundary: N/A (3.2.2.C) Science (2023): 5 Standards - Develop a model to describe that matter is made of particles too small to be seen.	What kinds of long-term, independent accomplishments are desired? Students will be able to independently use their learning to... Communicate Mathematically: Communicate effectively in a variety of ways based on purpose, task, and audience, using appropriate vocabulary. (Communicator) (T1)	
	Meaning	
	Understandings	Essential Questions
	What specifically do you want students to understand? What inferences should they make? Students will understand that... Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in	What thought-provoking questions will foster inquiry, meaning making, and transfer? Students will keep considering... - How do particles combine to form the variety of matter one observes? (Science) (Q1) - How do substances combine or change (react) to make new substances? (Science) (Q2)

Clarifying Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.

Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles. (3.2.5.A)

- Make and communicate observations and measurements to identify materials based on their properties.

Clarifying Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.

Assessment Boundary: Assessment does not include density or distinguishing mass and weight. (3.2.5.B)

- Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

Clarifying Statement: Examples of reactions or changes could include phase

space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (U1)

- Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (U2)
- Measurements of a variety of properties can be used to identify materials. (U3)
- The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (U4)
- No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (U5)
- When two or more different substances are mixed, a new substance with different properties may be formed. (U6)
- The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (U7)
- No matter what reaction or change in properties occurs, the total weight of the substances does not change.

- How can we describe and understand chemical reactions and predict what will happen? (Science) (Q3)

changes, dissolving, and mixing that form new substances.

Assessment Boundary: Assessment does not include distinguishing mass and weight. (3.2.5.D)

- Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Clarifying Statement: N/A

Assessment Boundary: N/A (3.2.5.E)

Profile of a CV Learner

- Communication: Students will be able to independently and confidently adapt their writing and speaking in relation to audience, task, and purpose, as well as practice active listening to understand other perspectives, viewpoints, and cultures. (PCVL.CM)

(Boundary: Mass and weight are not distinguished at this grade level.) (U8)

- When two or more different substances are mixed, a new substance with different properties may be formed. (U9)

Acquisition of Knowledge & Skill

Knowledge

What facts and basic concepts should students know and be able to recall?
Students will know...

- Matter is made of particles too small to be seen. (K1)
- In a chemical reaction, the atoms in the starting substances (reactants) rearrange to form new substances (products). (K2)
- In a chemical reaction, the total amount of matter stays the same. (conservation of matter) (K3)
- Common signs of a chemical reaction include fizzing or bubbling, a change in color, a change in temperature, and the formation of a solid or gas. These signs help us know that a chemical reaction is taking place. (K4)

Skills

What discrete skills and processes should students be able to use? Students can...

- I can create a model to show that matter is made up of particles too small to be seen. (S1)
- I can investigate how two substances can combine to create a new one without changing the amount of matter. (S2)
- I can describe the change in properties during a chemical reaction and how that helps me understand what is taking place. (S3)



Web of Life

Draft Date	Course	Duration	Grades	Subjects	Team
02-09-2026	(Draft) Grade 5 English Language Arts, Grade 5 Science	4 Week(s)	5	English Language Arts	Jill Koser, SYSTEM USER, Kelly Galbraith, Lind Raymond

Focus

Interdisciplinary Science Unit: In this unit, students explore how organisms depend on one another and form an interconnected ecosystem. Students investigate food chains, food webs, and the importance of producers, consumers, and decomposers. Students will analyze how pollution impacts the ecosystems through informational text analysis. Students then explore a variety of solutions for reducing plastic waste and reducing the amount of plastic that ends up in the ocean.

In this informational text unit, students will be challenged to explain the relationship between two or more scientific ideas, noticing how authors use description, sequence, or cause- and-effect paragraph structure to help readers notice and explain the connections between events. Students will also analyze how authors use a variety of reasons and evidence to support their points, depending on their purpose for writing the text. Throughout the unit, students learn how to prepare for class discussions, determining which evidence best supports a particular idea and how to elaborate on that evidence.

Stage 1: Learning Goals

Established Goals	Transfer
Standards	Long-Term Transfer Goals
Pennsylvania Core Standards English Language Arts (2014): 5 ■ Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a text based on specific information in the text. (CC.1.2.5.C) ■ Use text structure, in and among texts, to interpret information (e.g., chronology,	What kinds of long-term, independent accomplishments are desired? Students will be able to independently use their learning to... ■ Reading Informational Text / Reading Literature: Explore text and other media to seek understanding of multiple perspectives and cultures. (T1) ■ Writing: Communicate information and ideas clearly to address task, purpose, and intended audience. (T2) ■ Evaluate systems, in order to connect how form determines function and how any change to one component affects the entire system. (Global Citizen, Innovative Problem Solver) (T3)

comparison, cause/effect, problem/solution). (CC.1.2.5.E)

- Determine how an author supports particular points in a text through reasons and evidence. (CC.1.2.5.H)
- Integrate information from several texts on the same topic to demonstrate understanding of that topic. (CC.1.2.5.I)
- Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade level reading and content, choosing flexibly from a range of strategies and tools. (CC.1.2.5.K)
- **Draw evidence from literary or informational texts to support analysis, reflection, and research, applying grade level reading standards for literature and informational texts.** (CC.1.4.5.S)

Pennsylvania Academic Standards

Science (2023): 5 Standards

- Support an argument that plants get the materials they need for growth chiefly from air and water.

Clarifying Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.

Assessment Boundary: N/A (3.1.5.A)

- Develop a model to describe the movement of matter among plants, animals, decomposers, and the

Meaning

Understandings

What specifically do you want students to understand? What inferences should they make? Students will understand that...

- Authors use a variety of features to help readers identify the organized text structure. (U1)
- **Effective readers identify key details of informational texts to determine main ideas. (RI) (U2)**
- Strategic readers investigate how multiple authors and texts on a specific topic are situated in a particular place and time. These choices affect the way their work is understood. (RI) (U3)
- Readers use strategies to determine and clarify unknown words in grade level content to develop their ability to independently and effectively handle unfamiliar words encountered in the content they are reading. (RI-Vocab) (U4)
- **Effective writers critically engage with literature or informative texts through analysis, reflection, and research to find evidence to support their ideas. (TDA) (U5)**
- Plants acquire their material for growth chiefly from air and water. (Life Science) (U6)
- Matter that is not food (air, water, decomposed materials in soil) is

Essential Questions

What thought-provoking questions will foster inquiry, meaning making, and transfer? Students will keep considering...

- **How does the author use evidence to explain ideas? (RI) (Q1)**
- How does the way this information is organized help me understand the text? (Q2)
- How is this text similar and different from other texts? (RI) (Q3)
- What should I do when I read a word that I don't know? (RI-Vocab) (Q4)
- **How do I choose relevant information to include in my writing? How does that help support an analysis of text(s)? (TDA) (Q5)**
- How do organisms detect, process, and use information about the environment? (Life Science) (Q6)
- How do organisms interact with the living and nonliving environments to obtain matter and energy? (Life Science) (Q7)

environment.

Clarifying Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.

Assessment Boundary: Assessment does not include molecular explanations. (3.1.5.B)

- Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

Clarifying Statement: Examples of models could include diagrams, and flow charts.

Assessment Boundary: N/A (3.2.5.G)

- Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Clarifying Statement: N/A

Assessment Boundary: N/A (3.3.5.E)

Profile of a CV Learner

- Innovative Problem Solving: Students will be able to independently use their learning to approach new problems with curiosity and creativity while consistently seeking growth through self-reflection and a

changed by plants into matter that is food. (Life Science) (U7)

Acquisition of Knowledge & Skill

Knowledge

What facts and basic concepts should students know and be able to recall?
Students will know...

- **Key ideas and details in the text help me understand what I am reading by making connections between concepts. (RI) (K1)**
- Students can use text structure of a paragraph to notice the connection between the type of details within a paragraph. (K2)
- Connections within, between, and among texts help me understand the main ideas. (RI) (K3)
- There are specific strategies to use when coming across a science word that is unfamiliar. (RI-Vocab) (K4)
- **Students comprehend the texts they read and analyze the author's use of elements and structure to communicate their understanding in an well-written essay. (TDA)**
 1. Reading Comprehension
 2. Analysis of an author's use of literary devices (elements), text structure, or other choices made by the author
 3. Well-written essay to communicate this understanding (K5)

Skills

What discrete skills and processes should students be able to use? Students can...

- **I can explain the relationships between two ideas or concepts in a science text based on specific details in the text. (RI) (S1)**
- I can identify and use the text structure to help me identify key ideas and details in Informational Texts. (S2)
- I can put together (integrate) information from several texts to show I understand the science topic. (RI) (S3)
- I can use context, morphology, or other strategies to figure out the meaning of new science vocabulary words. (RI-Vocab) (S4)
- **I can use what I know about informational texts and structures to analyze and present my ideas. (TDA) (S5)**
- I can describe where plant matter comes from. (S6)
- I can explain how matter moves within different types of ecosystems. (S7)

willingness to accept constructive feedback. (PCVL.IPS)

- Plant matter comes mostly from air and water, not from the soil (K6)
- Matter moves among plants, animals, decomposers, and the environment. (K7)