SIPS/CASCIA Science Curriculum

Science Curriculum Project
with Nebraska (lead state), Alaska and Alabama

Webinar Presenters

Ryia Waldern

Ryia Waldern is the Math and Science Content Specialist for the Department of Education and Early Development. She has 15 years of classroom experience spanning 6th-12th grades in both traditional middle school settings and alternative high school programs.

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Michelle Daml

Michelle Daml is a retired Alaska educator and curriculum coordinator. After 27 years in the Fairbanks School District she now works for EdCounts doing Science Assessments. Michelle facilitates the Interior Alaska Science Fair and is a past president of the Alaska Science Teachers Assoc. I love that children want to learn more about their surroundings and how things work.

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Mission, Vision, and Purpose

Mission	Vision	Purpose
An excellent education for every student every day.	All students will succeed in their education and work, shape worthwhile and satisfying lives for themselves, exemplify the best values of society, and be effective in improving the character and quality of the world about them. - Alaska Statute 14.03.015	DEED exists to provide **information**, **resources**, and **leadership** to support an excellent education for every student every day.

State Science Standards Website

- Alaska Science Standards broken into grade level
- Teacher Primers
- DCI/CCC/SPI matrix
- Introduction to standards videos by grade level bands (ASTA/DEED collaboration)
- Links to practice guides for the State Science Assessment. Great tool (with key) to use for group discussions on grade level questions and topics.

DEPT. OF EDUCATION AND EARLY DEVELOPMENT

K-12 Science Standards for Alaska

- Kodiak and Kuspuk school districts had teachers pilot the SIPS lessons.
- Alaska Educators helped write the tasks and instructional materials.
- Alaska Science Specialist along with Nebraska and Alabama Science Specialists wrote the assessments and instructional guides. Hundreds of teachers helped with the development.

Grade 5 PE Topic Bundles

Unit 1 Topic Bundle: **"Matter and Its Interactions"**

Unit 2 Topic Bundle: **"Matter and Energy in Organisms and Ecosystems"**

Unit 3 Topic Bundle: **"Earth Systems and the Solution of Water Problems"**

Unit 4 Topic Bundle: **"Earth and Its Gravitational Force and Motion"**

EOU 1	EOU 2	EOU 3	EOU 4
5-PS1-1	5-PS3-1	5-ESS2-1	5-PS2-1
5-PS1-2	5-LS1-1	5-ESS2-2	5-ESS1-1
5-PS1-3	5-LS2-1	5-ESS3-1	5-ESS1-2
5-PS1-4		3-5-ETS1-1	
		3-5-ETS1-2	
		3-5-ETS1-3	

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All Units/Topic Bundles take into consideration the NGSS and AK State Science Standards

Science and Engineering Practices (SEP)

Disciplinary Core Ideas (DCI)

Cross Cutting Concepts (CCC)

Performance Expectations (PE)

Grade 8 PE Topic Bundles

Unit 1 Topic Bundle: "**Forces and Energy**"

Unit 2 Topic Bundle: "**Gravity and Motion of Objects in the Solar System**"

Unit 3 Topic Bundle: "**Understanding Earth History and the Origin of Species**"

Unit 4 Topic Bundle: "**Providing Solutions to Problems using Simple Wave Properties**"

EOU 1	EOU 2	EOU 3	EOU 4
MS-PS2-2	MS-ESS1-1	MS-LS4-1	MS-PS4-1
MS-PS2-1	MS-ESS1-3	MS-LS4-2	MS-PS4-2
MS-PS3-1	MS-ESS1-2	MS-LS4-4	MS-ETS1-1
MS-PS2-4	MS-PS2-4	MS-LS4-6	
		MS-LS3-1	
		MS-ESS1-4	

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All Units/Topic Bundles take into consideration the NGSS and AK State Science Standards

Science and Engineering Practices (SEP)

Disciplinary Core Ideas (DCI)

Cross Cutting Concepts (CCC)

Performance Expectations (PE)

- Storylines
- Phenomenon
- Performance Level Descriptors
- Tasks
- Assessments
- Parent Support

Grade 5 Unit 1: Matter and Its Interactions

The Grade 5 Unit 1 topic, "Matter and Its Interactions," organizes the Next Generation Science Standards performance expectations with a focus on helping students develop an understanding of matter and its interactions and the structure, properties, and conservation of matter.

Grade 5 Unit 1 Curriculum, Instruction, and Assessment Resources

Unit Map / Instructional Framework (.docx, .pdf)

Curriculum

- Claim, Measurement Target, and PE Bundle (.docx, .pdf)
- Storyline Overview (.ppt, .pdf)
- Student Profile (.docx, .pdf)
- Policy and Range Performance Level Descriptors (.docx, .pdf)
- Stage 1 Learning Goals* (See Unit Map / Instructional Framework)

Assessment

- Stage 2 Instructionally-embedded Assessments* (See Unit Map / Instructional Framework)
- Designing Equitable Assessments for Diverse Learners (.docx, .pdf)
- Sample Instructionally-embedded Assessments:
  - Segment 3: "Weight of Water"
    - Task Specification Tool (.docx, .pdf)
    - Task (.docx, .pdf)
  - Segment 4: "How Did the Balloon Fill?"
    - Task Specification Tool (.docx, .pdf)
    - Task (.docx, .pdf)
- End-of-Unit Assessment (.docx, .pdf)
  - Assessment Scoring Guide (.docx, .pdf)
  - Design Tools:
    - Unpacking Tool (.docx, .pdf)
    - Design Pattern (.docx, .pdf)
    - Task 1 Specification Tool: "What's the Matter" (.docx, .pdf)
    - Task 2 Specification Tool: "What Just Happened?" (.docx, .pdf)
    - Task 3 Specification Tool: "Change or Not?" (.docx, .pdf)

Grade 5 Unit 1: Storyline, Phenomena, and Segments

Storyline Overview

Students make sense of the key disciplinary ideas of matter and its properties, physical and chemical changes, and that the properties of matter can be investigated and used to describe substances, including the conservation of mass during changes.

Anchor Phenomenon

The anchor phenomenon uses a scenario involving baking soda bread, or other yeast-less bread that is relevant to the local population. It is essential that it uses a chemical leavening agent, such as baking soda, to support making the chemical connections later in the unit.

Image Source: Bread Irish Soda Loaf - Free photo on Pixabay - Pixabay

Students compare the bread to one baked without the baking soda and try to explain what happened through investigations carried out over the course of the unit.

Measurement Target

Students are able to apply Science and Engineering Practices with emphasis on developing and using models and planning and carrying out investigations including evaluating evidence using mathematics and computational thinking related to the scale of the structure and properties of matter, including whether or not matter is conserved, and to identify materials and mixtures based upon their properties or results of a reaction before and after mixing.

Relationship to Prior and Subsequent Learning

Unit 1 focuses on physical changes in matter. Unit 2 focuses on matter and energy flows in ecosystems. By building familiarity with ideas related to the conservation and particulate nature of matter early in the year, students are prepared to put this knowledge to work in investigating various life and Earth systems in later units.

Segment 1: Students explore how matter is made up of particles too small to be seen, but that those particles can still be detected. Students then use these understandings to explain the process of "making a cloud in your mouth."

- Construct initial explanation and prediction of anchoring phenomenon.
- Carry out an investigation that shows how one can form a cloud in the mouth.
- Develop and use a model to show that matter is made of particles that are too small to be seen.
- Develop and use a model to show arrangement of particles in different states of matter.
- Revise explanation and prediction made about anchoring phenomenon using particle model.

Segment 2: Students plan and conduct investigations to identify the various types of properties that can be used to identify and describe substances and to investigate a "mystery matter" and determine if it is the same as the substances that were mixed or if it is a new substance.

- Examine a mystery substance and discuss different properties used to characterize substances.
- Construct an explanation about how properties of matter can be used to compare and contrast materials.
- Use properties of substances to determine if substances are the same or different before and after mixing.
- Revise explanation and prediction made about anchoring phenomenon using evidence obtained from properties of the mystery matter.

Segment 3: Students observe and measure properties after heating and cooling and when substances are mixed. Students revisit their particle model to show matter in different states and the structure of mixtures where particles of the original substances still exist but are now mixed together.

- Predict and observe how different colors move when added to milk as evidence of a mixture.
- Characterize weights of substances and mixtures during physical change.
- Investigate reversible physical changes using mixtures and solutions.
- Revise explanation and prediction made about anchoring phenomenon using understanding of mixtures and solutions.

Segment 4: Students investigate formation of new substances in mixing, using properties to identify if a new substance is formed. Students investigate if matter is added or lost in this. They revise their particle model and explanation of the anchor phenomenon.

- Investigate the formation of new substances after mixing.
- Obtain and use information to determine when a new substance has been formed.
- Develop and use a particle model of new substance formation and its implications for weight.
- Plan and carry out an investigation to find out what went right in the anchoring phenomenon.
- Present an explanation of what went wrong in the anchoring phenomenon.

Storylines

Each unit has a specific phenomenon and storyline to help guide instruction. The storyline breaks down the unit and acts as a teacher guide for essential learning and student investigations.

Anchor Phenomenon

The anchor phenomenon uses a scenario involving baking soda bread, or other yeast-less bread that is relevant to the local population. It is essential that it uses a chemical leavening agent, such as baking soda, to support making the chemical connections later in the unit.

Students compare the bread to one baked without the baking soda and try to explain what happened through investigations carried out over the course of the unit.

Image Source: Bread Irish Soda Loaf - Free photo on Pixabay - Pixabay

Anchor Phenomenon

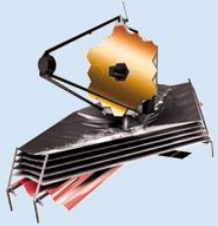
The anchor phenomenon is the basis of driving questions that are visited throughout the unit. In this case, it is about the role of food providing matter and energy for an organism to grow, repair, and survive.

This image of an owl pellet can be a starting point for discussions about the way evidence can be used to understand the flow of energy and matter within a food chain, a food web, and an ecosystem.

Image in the Public Domain. Source: National Parks Gallery

Anchor Phenomenon

In this unit, the anchor phenomenon is about the movement of objects within the solar system, including artificial satellites such as the James Webb Space Telescope (JWST).



This image is a starting point for discussions about how the JWST is able to stay in orbit in outer space and how it is used to study other parts of the universe.

Image Credit: NASA

Phenomenon

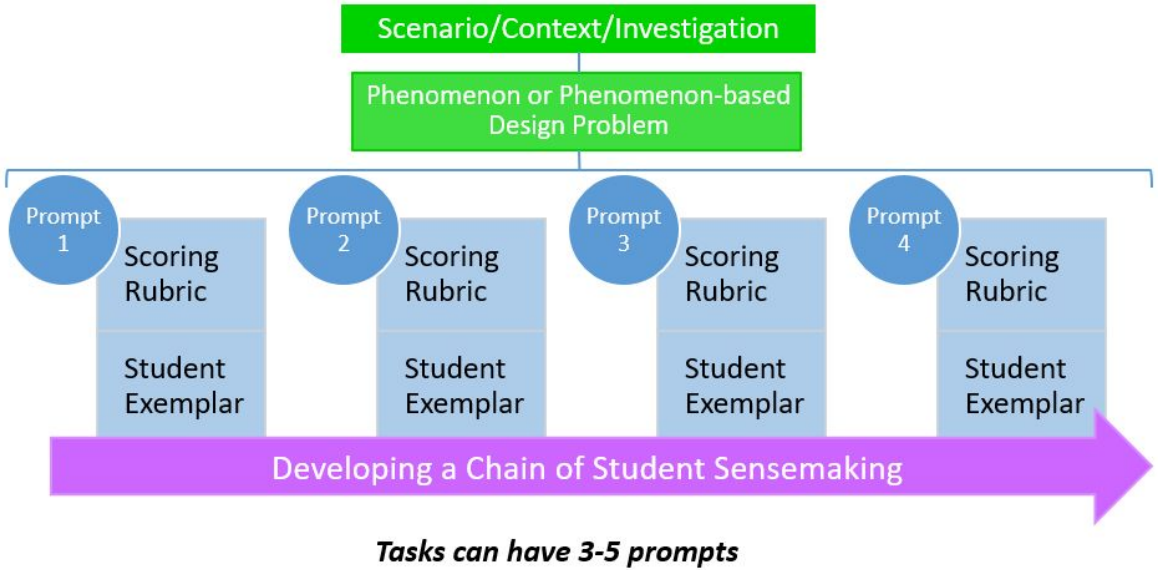
Each unit has a guiding anchor phenomenon that prompts students to ask questions and collect data on investigations related to understanding the overarching phenomenon.

SIPS Unit 3 Range Performance Level Descriptors			
SIPS tasks require students to apply and transfer their science learning through engagement with science and engineering practices (SEPs) and application of the crosscutting concepts (CCCs) to demonstrate their understanding of disciplinary core ideas (DCIs) to make sense of and explain phenomena and/or to design solutions to phenomena-rooted engineering problems.			
Level 1	**Level 2**	**Level 3 (Target)**	**Level 4**
A student performing at this level produces evidence of three-dimensional science learning by their ability to:	A student performing at this level produces evidence of three-dimensional science learning by their ability to:	A student performing at this level produces evidence of three-dimensional science learning by their ability to:	A student performing at this level produces evidence of three-dimensional science learning by their ability to:
• use a provided model to support a simple explanation of a mutation.	• use a provided model to support an incomplete description of the relationship between a mutation and the resulting protein.	• use models to create accurate and complete explanations of how structural changes to genes (i.e., changes in the amino acid sequence) can affect observable structures and functions in organisms.	• use models to create scientifically accurate and complete explanations of how structural changes to genes (i.e., changes in the amino acid sequence) can affect observable structures and functions in organisms.
• partially complete a model to show organisms and their changes over time.	• develop and use a graphical display of the fossil record to identify a pattern in a change to an anatomical structure as evidence to support a claim related to organisms and their changes over time.	• develop and use an accurate and complete graphical display of the fossil record to identify patterns in changes to anatomical structures to provide accurate and complete evidence to support a claim related to organisms and their changes over time.	• develop and use an accurate and complete graphical display of the fossil record to identify patterns in changes to anatomical structures to provide scientifically accurate and complete evidence to support a claim related to organisms and their changes over time.
• identifies a similarity or difference in one anatomical structure of an extinct and modern organism as evidence of an evolutionary relationship.	• construct an explanation of evolutionary relationships based on a similarity or difference in the gross appearance of an anatomical structure(s) of extinct and modern organisms.	• construct an accurate and complete explanation of evolutionary relationships evidenced by similarities and differences in the gross appearance of anatomical structures by comparing anatomical features of extinct and modern organisms.	• construct a scientifically accurate and complete explanation of evolutionary relationships evidenced by similarities and differences in the gross appearance of anatomical structures by comparing anatomical features of extinct and modern organisms.

Performance Level Descriptors

Each unit has an easy to access and use rubric for teachers to know that students have reached specific levels of mastery of the standards covered in that unit

Components of a Task



Tasks can have 3-5 prompts

Each task is built around a scenario, context, or investigation that connects to a phenomenon or phenomenon-based design problem.

As students move through the task, they engage in a chain of sense-making, using ideas from the bundle to explore, explain, or design in response to the scenario.

Student Worksheet

Basketball			Softball			Baseball		
Distance	Apparent Sizes	Average	Distance	Apparent Sizes	Average	Distance	Apparent Sizes	Average
1.0 m			1.0 m			1.0 m		
2.0 m			2.0 m			2.0 m		
3.0 m			3.0 m			3.0 m		
4.0 m			4.0 m			4.0 m		
5.0 m			5.0 m			5.0 m		
6.0 m			6.0 m			6.0 m		
7.0 m			7.0 m			7.0 m		
8.0 m			8.0 m			8.0 m		
9.0 m			9.0 m			9.0 m		
10.0 m			10.0 m			10.0 m		

Data Collection Questions:

1. How did you hold the ruler when you measured the apparent size? Why did you hold it that way?

_____

_____

_____

_____

2. Find someone who held the ruler differently than you did. Why did they do it that way? If you can't find someone who did it differently, write down another way hold the ruler when measuring the apparent size and write down why it is better or worse than what you did.

_____

_____

_____

_____

Prompt 3

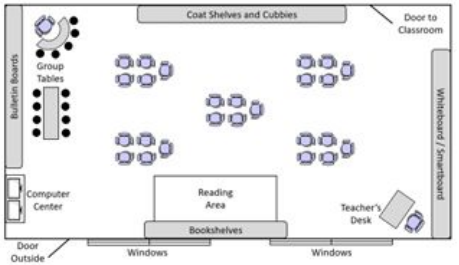
The students then have a final question to answer.

Where in the classroom should students in the Farming Club start growing vegetables in their classroom this spring?

Based on the evidence the students gather:

- Mark on **Figure 1** where the vegetable plants should be placed.
- Explain your answer using data from **Table 1** and **Table 2**.

Figure 1. Classroom Chart



The Farming Club should grow their plants _____

_____

because_____

_____

_____

_____

_____

Prompt 4

Support the claim that there is an energy transfer relationship between plants and the sun using evidence from two of the students' data sets. Use scientific knowledge to show how the evidence supports the claim.

_____

_____

_____

_____

Tasks

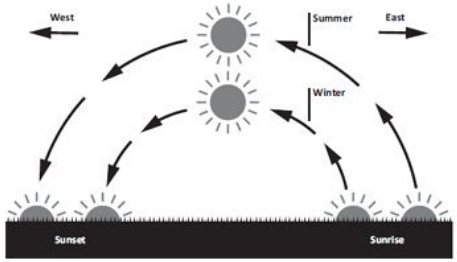
- Standards
- Success Criteria
- Learning goals
- Time estimates for lesson
- Linked video resources
- Student handouts
- Teacher instructions

CASCIA Score Reports and Reporting Mechanisms

Individual Student Report	Classroom Roster Report	Interpretive Guidance and Instructional Strategies	Family Guidance and Learning Resources	Task Interpretation Guide
Summarizes individual student performance on the EOU assessment to monitor student progress and plan meaningful learning opportunities	Summarizes student performance by class on the EOU and offers information about students' instructional needs levels to inform instruction	Provides information to help educators understand their students' performance on the EOU and offers strategies and resources for planning and adjusting instruction	Provides information to help families understanding their student's performance on the EOU and offers resources for engaging their students in science learning at home	Provides information to help educators understand the assessment tasks and prompts, the evidence they elicit about student learning, and to reflect on and plan for instruction

Figure 2 shows the position of the sun across the sky during summer and winter in the northern middle latitudes.

Figure 2. Apparent Path of the Sun



Circle the correct word to complete the sentence.

shorter **longer**

The length of the shadow on the sundial in the **summer** will be _____ than the length of the shadow in the **winter**.

Describe what causes the length of the shadow on the sundial to change from summer to winter.

_____

_____

_____

_____

Prompt 2

Circle the correct word to complete the sentence.

shorter *longer*

*The length of the shadow on the sundial in the **summer** will be _____ than the length of the shadow in the **winter**.*

Describe what causes the length of the shadow on the sundial to change from summer to winter.

In summer, the sun's path is high above the horizon. In winter, the sun's path is low on the horizon. So, the length of the shadow at 2:00 p.m. during the summer would be shorter than the shadow at 2:00 pm during the winter. This is because, in winter, the angle of the sunlight hitting Earth's surface is lower which makes the sundial's shadow longer.

Assessment

- **Rubrics**
- **Student Exemplars**
- **Answer Keys**

Part B.

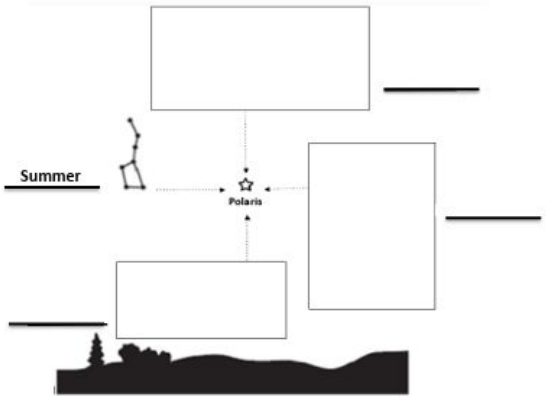
The Micmac people and the Iroquois people living in the northern hemisphere also had a story about the Big Dipper. The stars of Ursa Major (shown in Figure 2) include what we call the Big Dipper. They called this formation of stars Big Bear. They share a story about Big Bear in which seven hunters (the handle) chase the bear (the cup). As fall approaches, the star representing the hunters dips below the horizon. In late fall when the last hunter wounds the bear, the Big Dipper is no longer visible. During the following spring, a new bear leaves the den when the Big Dipper reappears in the night sky.

Figure 3 is an incomplete model of the Big Dipper's apparent motion around Polaris during the four seasons of the year.

Complete the apparent motion of the Big Dipper during the other three seasons in **Figure 3.** The position of the Big Dipper is shown during the summer. Use clues from the song *Follow the Drinking Gourd*, how to locate Polaris using the Big Dipper, and the story told by the Micmac and the Iroquois people to show the locations of the Big Dipper in the other three seasons.

- Draw the relative position of the Big Dipper by showing its **seven (7) stars in fall, spring, and winter** with respect to Polaris in the empty boxes.
- Label each of your drawings as fall, spring, or winter on the blank line paired with each box.

Figure 3. Model of the Big Dipper's Apparent Motion around Polaris

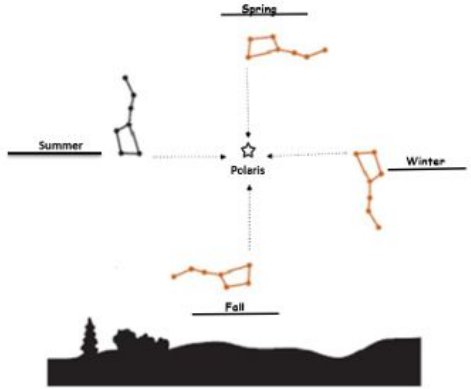


Prompt 1

Part B.

*Complete the apparent motion of the Big Dipper during the other three seasons in **Figure 3.** The position of the Big Dipper is shown during the summer. Use clues from the song Follow the Drinking Gourd, how to locate Polaris using the Big Dipper, and the story told by the Micmac and the Iroquois people to show the locations of the Big Dipper in the other three seasons.*

- *Draw the relative position of the Big Dipper, showing **its seven (7) stars in fall, spring, and winter** with respect to Polaris in the empty spaces.*
- *Label each of your drawings as fall, spring, or winter on the blank line paired with each box.*



Assessment

- **Rubrics**
- **Student Exemplars**
- **Answer Keys**

Classroom Roster Report Page 1

Date : 10/16/25

Teacher : Bessie Lane

School: Spring Valley Elementary

Grade 5 Unit 1 Science: Quarterly Assessment Report
Matter and Its Interactions

The quarterly assessment report summarizes individual student performance on the Grade 5 Unit 1 End-of-Unit (EOU) Science Assessment, **"Matter and Its Interactions,"** which measures students' ability to describe that matter is made of particles too small to be seen by developing a model and use mathematical and computational thinking to understand the cause and effect relationship between physical changes in matter and conservation of weight. This assessment is the first of four quarterly assessments that students will complete this school year. Results from this quarterly assessment can be used to monitor student progress and plan meaningful learning opportunities to ensure students are on track to achieve end-of-year learning expectations.

How To Interpret Your Student's Results

The quarterly assessment classroom roster report summarizes student performance by classroom on the Grade 5 Unit 1 End-of-Unit (EOU) Science Assessment and offers information about students' **instructional needs levels by performance category** that educators can use to inform a variety of individualized, small, and whole group learning opportunities and to make timely and meaningful adjustments to instruction. This report shows the **number and percentage of students** assigned to each instructional needs level (green, yellow, and red) based on the total points they earned on prompts associated with the performance category.

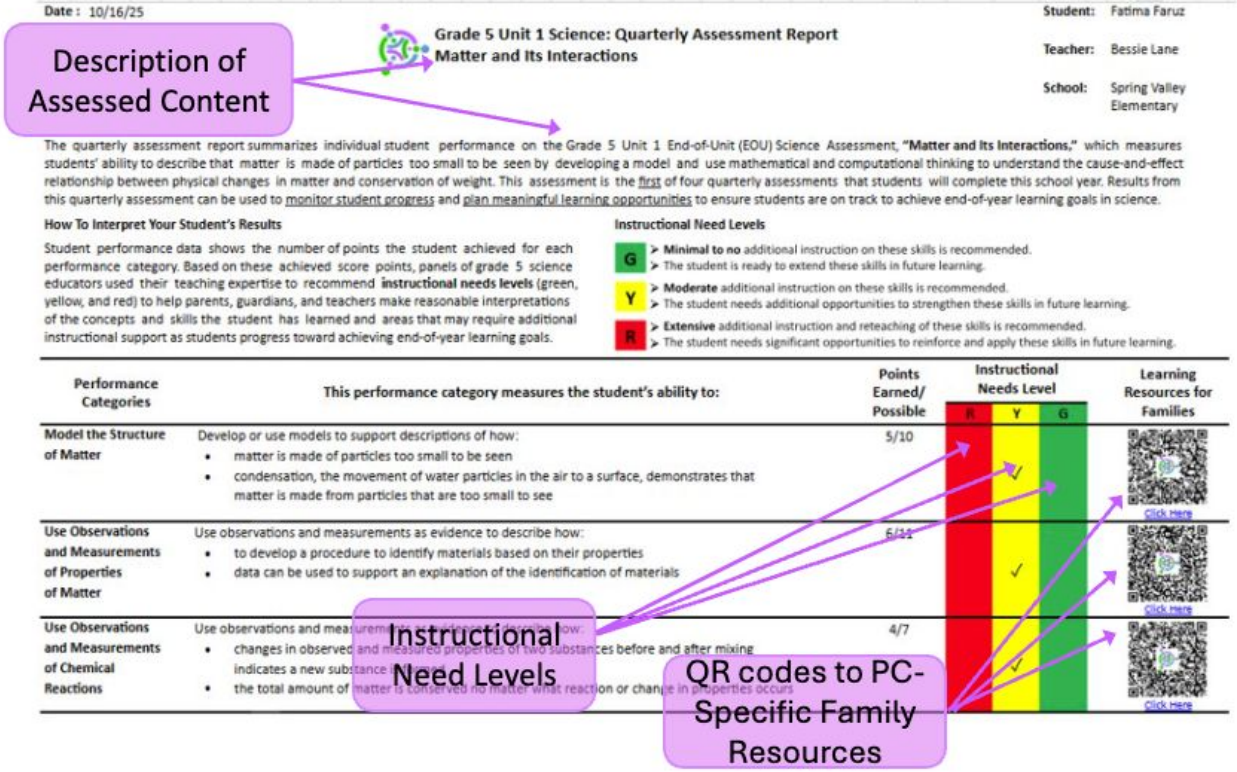
Instructional Need Levels

- **G** ➢ **Minimal to no** additional instruction on these skills is recommended.
  ➢ The student is ready to extend these skills in future learning.
- **Y** ➢ **Moderate** additional instruction on these skills is recommended.
  ➢ The student needs additional opportunities to strengthen these skills in future learning.
- **R** ➢ **Extensive** additional instruction and reteaching of these skills is recommended.
  ➢ The student needs significant opportunities to reinforce these skills in future learning.

Student Performance by Instructional Need Level

Student Name	Classroom Instructional Needs Levels by Performance Category		
	Model the Structure of Matter	Use Observations and Measurements of Properties of Matter	Use Observations and Measurements of Chemical Reactions
Jack Smith	Y (5/10)	Y (4/11)	R (1/7)
Juanita Montez	Y (5/10)	Y (6/11)	Y (4/7)
Sonny James	Y (6/10)	Y (7/11)	Y (5/7)
Prannie Sethbakdi	G (8/10)	G (9/11)	Y (4/7)
Tom Kilter	Y (5/10)	G (8/11)	Y (4/7)
Yoko Umeda	G (9/10)	G (10/11)	G (7/7)
Tracy Jenkins	R (4/10)	Y (4/11)	R (3/7)
Yoko Umeda	G (9/10)	G (10/11)	Y (4/7)
Sam Jones	Y (5/10)	Y (4/11)	R (2/7)
Yoko Umeda	Y (6/10)	Y (6/11)	Y (4/7)
Pedro Sanchez	Y (5/10)	Y (7/11)	G (6/7)
Mary Royal	Y (6/10)	Y (7/11)	Y (5/7)
Caleb Goldstein	R (3/10)	R (3/11)	R (2/7)
Brian Davies	Y (7/10)	G (8/11)	G (6/7)
Luigi Gervazio	G (9/10)	G (10/11)	Y (5/7)
Brian Davies	G (10/10)	G (9/11)	G (7/7)
Kim Ho	G (10/10)	G (10/11)	R (3/7)
Fatima Faruz	Y (5/10)	Y (6/11)	Y (4/7)

CASCIA Individual Student Report (ISR)



Date : 10/16/25

Description of Assessed Content

Grade 5 Unit 1 Science: Quarterly Assessment Report
Matter and Its Interactions

Student: Fatima Faruz
Teacher: Bessie Lane
School: Spring Valley Elementary

The quarterly assessment report summarizes individual student performance on the Grade 5 Unit 1 End-of-Unit (EOU) Science Assessment, **"Matter and Its Interactions,"** which measures students' ability to describe that matter is made of particles too small to be seen by developing a model and use mathematical and computational thinking to understand the cause-and-effect relationship between physical changes in matter and conservation of weight. This assessment is the first of four quarterly assessments that students will complete this school year. Results from this quarterly assessment can be used to monitor student progress and plan meaningful learning opportunities to ensure students are on track to achieve end-of-year learning goals in science.

How To Interpret Your Student's Results

Student performance data shows the number of points the student achieved for each performance category. Based on these achieved score points, panels of grade 5 science educators used their teaching expertise to recommend **instructional needs levels** (green, yellow, and red) to help parents, guardians, and teachers make reasonable interpretations of the concepts and skills the student has learned and areas that may require additional instructional support as students progress toward achieving end-of-year learning goals.

Instructional Need Levels

- **G** ➢ **Minimal to no** additional instruction on these skills is recommended. ➢ The student is ready to extend these skills in future learning.
- **Y** ➢ **Moderate** additional instruction on these skills is recommended. ➢ The student needs additional opportunities to strengthen these skills in future learning.
- **R** ➢ **Extensive** additional instruction and reteaching of these skills is recommended. ➢ The student needs significant opportunities to reinforce and apply these skills in future learning.

Performance Categories	This performance category measures the student's ability to:	Points Earned/ Possible	Instructional Needs Level R	Y	G	Learning Resources for Families
Model the Structure of Matter	Develop or use models to support descriptions of how: • matter is made of particles too small to be seen • condensation, the movement of water particles in the air to a surface, demonstrates that matter is made from particles that are too small to see	5/10		✓		Click Here
Use Observations and Measurements of Properties of Matter	Use observations and measurements as evidence to describe how: • to develop a procedure to identify materials based on their properties • data can be used to support an explanation of the identification of materials	6/11		✓		Click Here
Use Observations and Measurements of Chemical Reactions	Use observations and measurements as evidence to describe how: • changes in observed and measured properties of two substances before and after mixing indicates a new substance is formed • the total amount of matter is conserved no matter what reaction or change in properties occurs	4/7		✓		Click Here

Instructional Need Levels

QR codes to PC-Specific Family Resources

Parent Guides

Quick resource guide to send to parents about content being covered. These include guiding questions and resources to support science conversations at home!

Purpose

The purpose of this document is to help families understand their student's performance on the Grade 8 Unit 3 Science Assessment and to provide resources and recommendations for engaging their student in science learning at home.

Unit Overview

By engaging in this unit, students deepen their knowledge of evidence of a common ancestor interpreted through fossil records, how differences in their structure help explain present-day organisms, and how rock strata help us explain the history of Earth. Students develop and use models, analyze and interpret data, and construct explanations to reveal patterns and cause/effect relationships in the inheritance of traits through natural selection and the adaptation and change in life and populations on Earth.

Performance Category 1: Support Explanations About Organisms That Lived Long Ago

Prompts for this performance category require students to support an explanation with evidence, data, or a model to explain the:

- existence, diversity, extinction, and change of many life forms throughout the history of life on Earth
- anatomical similarities and differences between modern and fossil organisms to infer evolutionary relationships
- relative ages of major events in Earth's history

Grade 8 Unit 3: Understanding Earth History and the Origin of Species

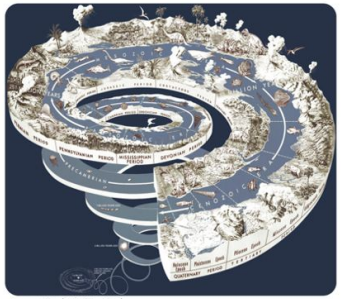


Image: Geologic Time Scale
Credit: Joseph Graham, William Newman, and John Stacy, US Geological Survey
Source: http://commons.wikimedia.org/wiki/File:Geological_time_spiral.png
License: Public Domain

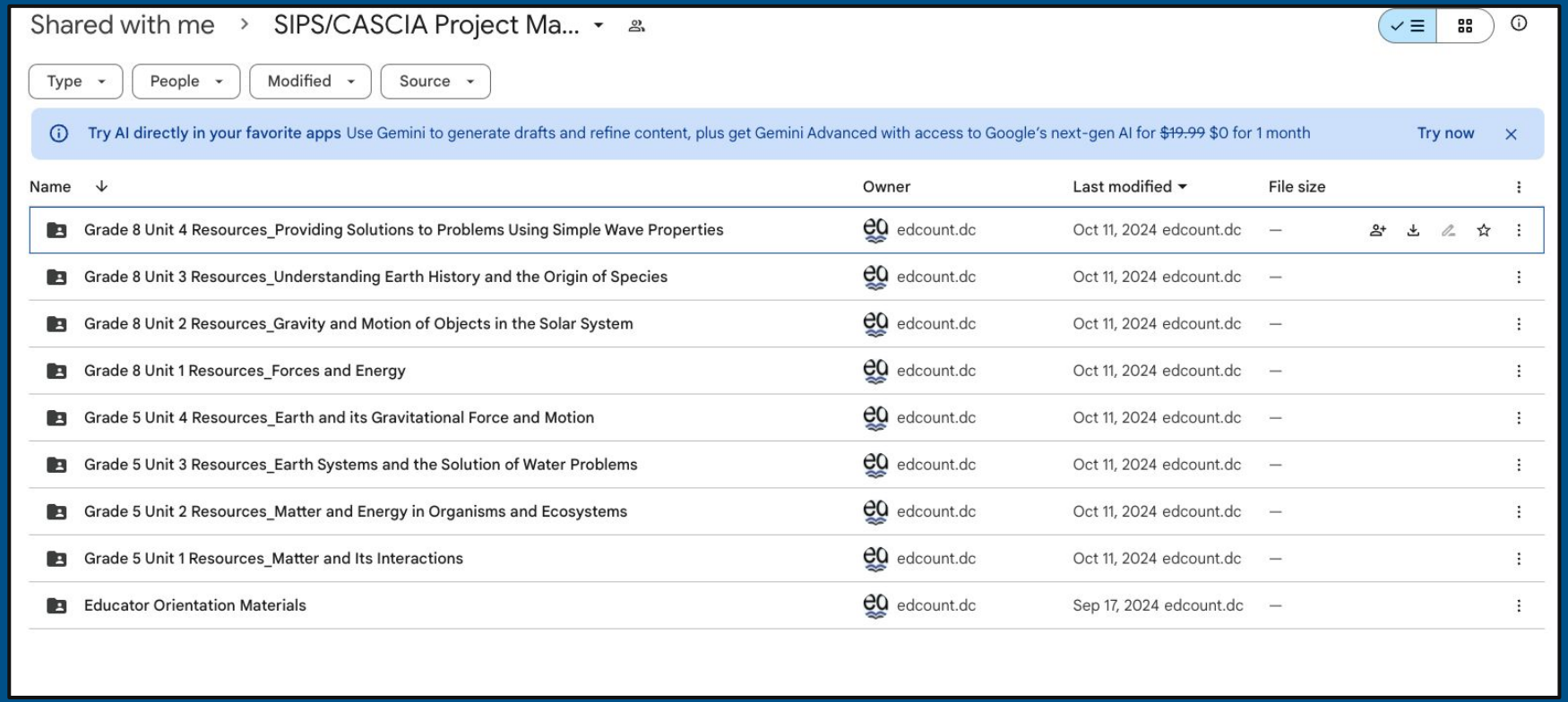
Instructions for Parents/Guardians

1. Refer to your student's score report to determine their instructional needs level—green, yellow, or red—for this performance category.
2. Use the Interpretive Guidance (see pages 2-3) to understand what your student likely knows and is able to do based on their instructional needs level.
3. Use the Family Resources and Recommendations (see pages 4-6) to engage with and support your student's science learning at home.

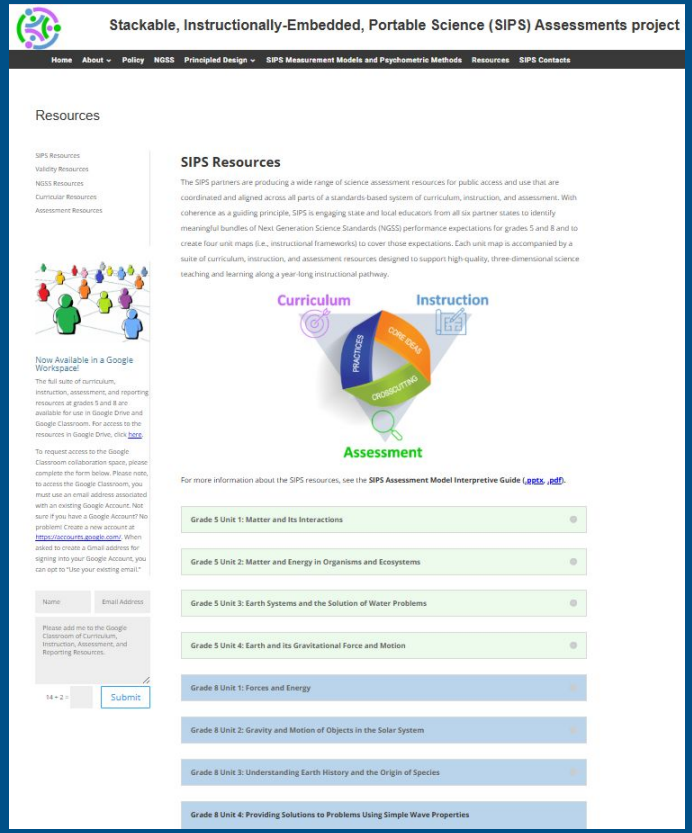
Family Resources and Recommendations for Performance Category 1: Support Explanations About Organisms That Lived Long Ago

Resources and Recommendations to Support Science Learning at Home	
Engage in the Topic • *How can you tell which is older?*	With your student, imagine that you are walking in the midwestern U.S., and you find a rock with an embedded shark tooth. Ask your student to think about the following questions: 1. How could a shark have been where there is no ocean today? 2. Which do you think is older, the shark tooth or the rock? 3. How does a shark tooth end up embedded in a rock?
Explore the Topic • *What do the rock layers tell us about the age of fossils?*	Have your student look at where other fossils are being found in the Midwest by watching this video [1:00-3:00] and discuss how to begin to answer the questions about the shark tooth and the rock (fossil). Have your student use this activity to place rock layers in order. It will be easier if the diagram is printed and cut into strips, but it is not a requirement. They should pay close attention to Steps 1 and 2 before attempting. The answer key is at the bottom of the page.
Explore the Topic • *How are organisms from the past similar to organisms today?*	Say to your student, "The fact that an ancient shark tooth looks very similar to a modern-day shark tooth raises questions about the similarities between fossils of extinct organisms and organisms living today." Explore the following with your student: • Pictures and descriptions of fossils found in the same area of the Midwest Central Lowlands as the shark tooth fossil • Video [end at 1:53] about fossil evidence • Evolution evidence webpage
Explain the Evidence • *What evidence of evolution can be found in the rock layers?* • *What evidence of evolution can be found by comparing the anatomy of organisms?*	Using rock layers to determine age and relative dating is explained in this video [1:44]. The fossils found within the rock layers tell the partial story of how organisms lived, died, and evolved. They show when (and sometimes "how") extinctions occurred. The fossils found within the rock layers also illustrate the similarities in species. Have your student read the *Evidence for Evolution* Fact Sheet to review the similarities in species. If possible, read aloud the "Key Points" at the bottom of the page. In addition to fossils, homologous structures, analogous structures, vestigial structures, DNA and molecular similarities, embryological similarities, and species distribution are each evidence of evolution.

SIPS/CASCIA google folders



SIPS/CASCIA Website



SIPS/CASCIA link on State Standards Website

Alaska Department of Education & Early Development

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Science

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- Sites of Interest
- Assessments

Science Standards

K-12 Science Standards for Alaska (docx, pdf)

Science Standards by grade or course

Grade Level	Standards
All grades, front matter	PDF
Kindergarten	PDF
1st Grade	PDF
2nd Grade	PDF
3rd Grade	PDF
4th Grade	PDF
5th Grade	PDF
Middle School Physical Science	PDF
Middle School Life Science	PDF
Middle School Earth and Space Science	PDF
High School Physical Science	PDF
High School Life Science	PDF
High School Earth and Space Science	PDF

Resources

How to read the standards (docx)
Frequently Asked Questions (docx)
Connections to other subjects (docx)
District Science Standards Planning Guide (pdf, word)
Science Phase Placement Survey (pdf)
SIPS: science curriculum for 5th-8th grade
National Science Teaching Association (NSTA)
Alaska Science Teachers Association (ASTA)
Presidential Awards for Excellence in Mathematics and Science Teaching Resources

Introductory Webinar Series

Questions?

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