

Unit 6: Genius Hour: Solve Real-World Science Problems

5th Grade Science: Enrichment

25 Class Meetings

Revised June 2026

Essential Questions

- How can we use science ideas to investigate and solve real-world problems?
- How do scientists and engineers use research, evidence, and models to explain their thinking?
- How can we communicate scientific ideas clearly to others?

Enduring Understandings with Unit Goals

EU 1: Scientists Ask Questions and Use Evidence to Build Understanding

- Scientists investigate questions by gathering and analyzing information.
- Strong explanations are supported by evidence from multiple sources.
- Research helps us better understand real-world problems.

EU 2: Science Concepts Help Explain and Solve Real-World Problems

- Science ideas (energy, matter, ecosystems, Earth systems) can be applied to real situations.
- Problems can be solved by analyzing causes and proposing solutions.
- Models and explanations help show how a solution works.

EU 3: Communicating Scientific Thinking Is Essential

- Scientists share ideas through writing, speaking, and visual models.
- Clear communication includes evidence, reasoning, and domain-specific vocabulary.
- Feedback and revision improve scientific work.

Standards

Common Core State and NGSS Standards:

5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

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3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

CCSS.ELA-Literacy.RI.5.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-Literacy.RI.5.2: Determine the main idea of a text and explain how it is supported by key details; summarize the text.

CCSS.ELA-Literacy.RI.5.4: Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

CCSS.ELA-Literacy.RI.5.9: Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.

CCSS.ELA-Literacy.W.5.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

CCSS.ELA-Literacy.W.5.2.a: Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.

CCSS.ELA-Literacy.W.5.2.b: Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.

CCSS.ELA-Literacy.W.5.2.c: Link ideas within categories of information using words and phrases (e.g., *another, for example, also, because*).

CCSS.ELA-Literacy.W.5.2.d: Use precise language and domain-specific vocabulary to inform about or explain the topic.

CCSS.ELA-Literacy.W.5.2.e: Provide a concluding statement or section related to the information or explanation presented.

CCSS.ELA-Literacy.W.5.4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience

CCSS.ELA-Literacy.W.5.5: With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.

CCSS.ELA-Literacy.W.5.6: With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.

CCSS.ELA-Literacy.W.5.7: Conduct short research projects that build knowledge through investigation of different aspects of a topic.

CCSS.ELA-Literacy.W.5.8: Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information and provide a list of sources.

CCSS.ELA-Literacy.W.5.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.

CCSS.ELA-Literacy.SL.5.1: Engage effectively in a range of collaborative discussions (one-on one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-Literacy.SL.5.1.a: Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.

CCSS.ELA-Literacy.SL.5.1.b: Follow agreed-upon rules for discussions and carry out assigned roles.

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CCSS.ELA-Literacy.SL.5.1.c: Pose and respond to specific questions to clarify or follow up on information and make comments that contribute to the discussion and link to the remarks of others.

CCSS.ELA-Literacy.SL.5.1.d: Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

CCSS.ELA-Literacy.SL.5.2: Paraphrase portions of a text read aloud, or information presented in diverse media and formats, including visually, quantitatively, and orally.

CCSS.ELA-Literacy.SL.5.3: Identify the reasons and evidence a speaker provides to support particular points.

CCSS.ELA-Literacy.SL.5.4: Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. Asking Questions & Researching Topics

- Generate questions about real-world science problems
- Identify problems related to environment, animals, resources, or systems
- Conduct research using multiple sources
- Take notes and organize information

2. Applying Science Ideas & Developing Solutions

- Connect research to science concepts (energy, matter, ecosystems, etc.)
- Identify causes and effects of the problem
- Design a solution or explanation
- Create models, diagrams, or prototypes.

3. Communicating & Presenting Ideas

- Write an explanatory piece using evidence
- Create a visual (poster, model, slideshow)
- Present findings clearly using academic language
- Revise work based on feedback

Vocabulary and Key Terms: research, investigation, evidence, claim, reasoning, explanation, model, data, analysis, solution, problem, design, prototype, revise, feedback, environment, impact, energy, matter, system, cause, effect, conclusion, presentation

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Interdisciplinary Connection:

ELA

Daily Learning Objectives with *TWPS*

Students will be able to...

- Understand what Genius Hour is and generate science-based questions.
 - *What real-world problems or questions about science interest you most, and why?*
- Identify and categorize science topics (energy, ecosystems, Earth systems, etc.).
 - *How can you connect your ideas to something we've learned in science this year?*
- Distinguish between strong and weak research questions.
 - *What makes a question "researchable" instead of just interesting?*
- Develop and refine a focused research question.
 - *How can you revise your question to make it clearer and more specific?*
- Plan how to investigate a science question.
 - *What steps will you take to answer your question, and why?*
- Gather information from multiple sources.
 - *How do you know if a source is helpful or reliable?*
- Take organized notes from sources.
 - *How can you organize your notes so they help you answer your question?*
- Identify key ideas and main points in research.
 - *What are the most important ideas you are learning about your topic?*
- Connect research to science concepts (energy, matter, systems).
 - *How does your topic connect to something we've learned in science?*
- Summarize findings and identify patterns or causes.
 - *What patterns or cause-and-effect relationships do you notice?*
- Identify a problem or explain a phenomenon based on research.
 - *What problem are you trying to solve, or what are you trying to explain?*
- Develop a claim based on research.
 - *What is your main claim or idea, and what evidence supports it?*
- Brainstorm possible solutions or explanations.
 - *What are different ways you could solve or explain your problem?*
- Select the best solution based on criteria and constraints.
 - *Why is your chosen solution the best option?*
- Plan a model, prototype, or visual representation.
 - *How will your model help others understand your thinking?*
- Begin creating project (model, poster, prototype, etc.).
 - *How does your project show your understanding of the science behind it?*
- Explain how your solution connects to science concepts.
 - *What science ideas explain why your solution works?*
- Draft an explanatory piece using evidence.
 - *How can you clearly explain your idea using facts and evidence?*
- Use domain-specific vocabulary in writing.
 - *How can you strengthen your writing by using scientific vocabulary?*
- Revise writing based on feedback.

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- *What feedback did you receive, and how can you improve your work?*
- Edit for clarity, organization, and accuracy.
 - *How can you make your explanation clearer for your audience?*
- Prepare a clear and organized presentation.
 - *What are the most important ideas your audience needs to understand?*
- Practice presenting using evidence and reasoning.
 - *How can you explain your thinking so others understand your reasoning?*
- Present project to an audience.
 - *How does your project show your understanding of science concepts?*
- Evaluate peer presentations and provide feedback.
 - *What did another student do well, and what could they improve?*
- Reflect on learning and growth.
 - *How has your understanding of science changed through this project?*

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Paragraph frames and sentence starters
- Teacher modeling
- Think-write-pair-share and small-group discussions
- Graphic organizers
- Accountable talk
- Homework
- Word walls with visuals (Venn Diagrams)
- Small group instruction
- Visual exemplars with teacher and student critiques
- Text and video chunking
- Spiraling back to guiding questions
- Close reading with text-dependent questions

EL Differentiation Strategies

- Key vocabulary, Word Banks and Word Walls with visuals
- TWPS (Think, write, pair, share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit teacher modeling
- Graphic organizers
- Strategic Grouping
- Non-verbal assessments

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Assessments

FORMATIVE ASSESSMENTS:

- Do Now
- Academic Discourse
- Exit Slips
- Accountable Talk Discussions
- Completed notes
- Completed graphic organizers
- Homework
- Performance Task – “Genius Hour Expo”
 - Teacher’s Scoring Guide

SUMMATIVE ASSESSMENTS:

- Quiz: Article Quizzes (EU1, EU2)
- Unit Task: “Genius Hour Expo” (EU1, EU2 and EU3)

Unit Task

Unit Task Name: Genius Hour Expo

Description: Upon completing the unit, students will independently investigate a real-world science question of their choice. Students will research their topic, connect it to scientific ideas learned throughout the year, and develop either a solution to a problem or an explanation of a scientific phenomenon. Students will present their findings through a project that includes a written explanation, visual model or representation, and oral presentation. Students must use evidence, scientific vocabulary, and reasoning to support their ideas

Evaluation: Teacher’s Scoring Guide

Unit Resources

- NewsEla
- Google Slides (Teacher’s)
- Student Journals
- Chromebooks
- ReadWorks
- Virtual Fieldtrips
- Google Classroom
- Mystery Science