



Coherence and Alignment Among Science Curriculum, Instruction, and Assessment (CASCIA) Project

Grade 5 Unit 2: Matter and Energy in Organisms and Ecosystems

Family Guidance and Learning Resources for Performance Category 2

October 2023

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Purpose

The purpose of this document is to help families understand their student's performance on the Grade 5 Unit 2 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 the interconnectedness of organisms and environments within ecosystems and how matter cycles and energy flows within these ecosystems that enable living things to grow and survive. Students develop their experience and skills with evaluation and explanation through constructing explanations, models, and arguments.

Performance Category 2: Model Relationships in Ecosystems

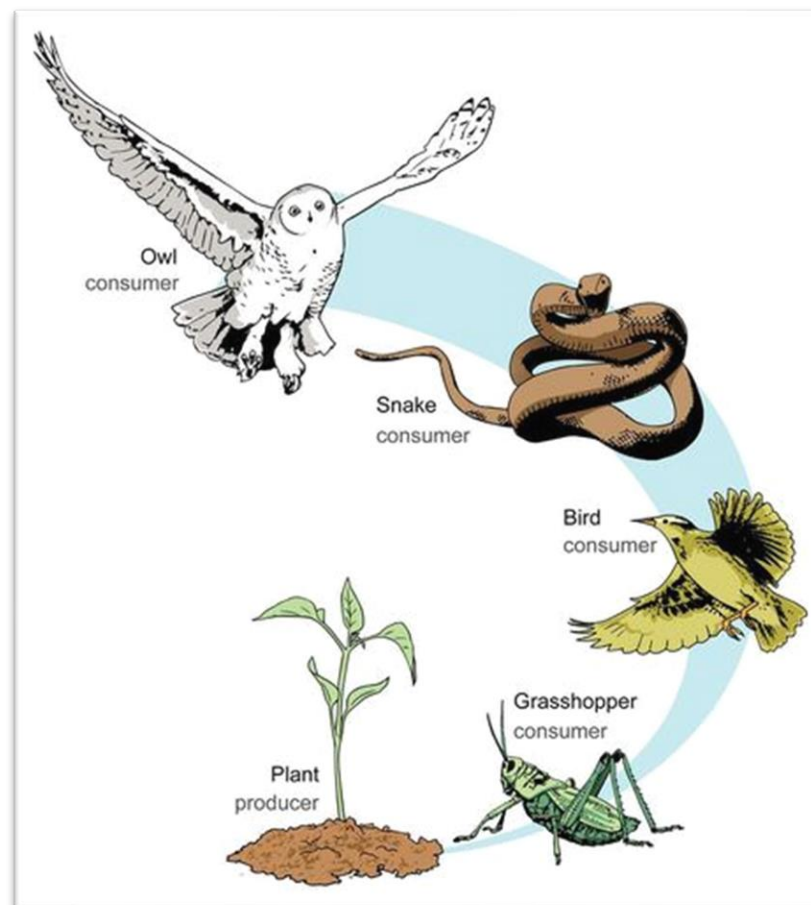
Prompts for this performance category require students to develop or use models to support descriptions and predictions of relationships about:

- the movement of matter among plants, animals, and decomposers
- the role of decomposition in the cycling of matter, including restoring materials back to the soil
- how a newly introduced species may disrupt the balance of a healthy ecosystem

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 page 2) 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 3-5) to engage with and support your student's science learning at home.

Grade 5 Unit 2: Matter and Energy in Organisms and Ecosystems



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**Interpretive Guidance for Performance Category 2:
Model Relationships in Ecosystems**

Red (0-4 score points earned)

- **Extensive** additional instruction and reteaching of these skills is recommended.
- The student needs significant opportunities to reinforce and apply these skills in future learning.

Yellow (5-8 score points earned)

- **Moderate** additional instruction on these skills is recommended.
- The student needs additional opportunities to strengthen these skills in future learning.

Green (9-11 score points earned)

- **Minimal to no** additional instruction on these skills is recommended.
- The student is ready to extend these skills in future learning.

What These Results Mean

This student is likely able to:

- Present **incomplete and/or inaccurate** representations related to materials plants need for growth or energy transfer in an ecosystem.
- Present **incomplete and/or inaccurate** representations of the cycling of matter or flow of energy in a food web.
- Demonstrate **partial** understanding of the impacts of the introduction of new species into a balanced ecosystem and **show limited understanding** of a system in terms of its components and their interactions.

This student is likely able to:

- Present **clear and complete** representations with **minor errors** of materials plants need for growth or energy transfer in an ecosystem.
- Use a model to develop **incomplete but accurate** explanations of the cycling of matter or flow of energy in a food web.
- Demonstrate **partial** understanding of the impacts of the introduction of new species into a balanced ecosystem and **apply some of these concepts** to describe a system in terms of its components and their interactions.

This student is likely able to:

- Present **clear, complete, and accurate** representations of materials plants need for growth or energy transfer in an ecosystem.
- Use a model to develop **thorough and accurate** explanations of the cycling of matter or flow of energy in a food web.
- Demonstrate **complete and accurate** understanding of the impacts of the introduction of new species into a balanced ecosystem and **clearly relate these ideas** to describe a system in terms of its components and their interactions.

Family Resources and Recommendations for Performance Category 2: Model Relationships in Ecosystems

Resources and Recommendations to Support Science Learning at Home

Engage in the Topic <i>What is an ecosystem?</i> <i>What are the components of an ecosystem?</i>	An ecosystem is an area where living and non-living components work together to form a system of living things. Components within any ecosystem are connected. That means that earthworms you may see in your yard actually have a relationship to you! Watch this video [6:50] with your student to find out more about ecosystems and the relationships of the organisms that make up the ecosystem. Discuss the following with your student: • How does it feel to think you are connected to an earthworm, a beetle, or a mushroom?
Explore the Topic <i>How do living and nonliving things interact in an ecosystem?</i>	Read this article with your student. After each section, pause to reflect on the key ideas your student has learned. Use the provided images of the food chain/food web and energy pyramid and the information in the article to talk about how matter cycles and energy flows in an ecosystem. When you are finished, help your student make connections between the information in the article and a local ecosystem, like your student's backyard or schoolyard. Discuss the following questions: • Why can your backyard or schoolyard be considered an ecosystem? (Your yard is an area that contains living and non-living things.) • Name some living and non-living components of your backyard, or schoolyard, ecosystem (Examples: grass, insects, trees, soil, snakes, flowers, squirrels, birds, worms). • How are these components connected? (Example: insects and worms eat grass and leaves, birds eat insects and worms, snakes eat birds and bird eggs)
Explain the Topic <i>What do animals and plants need to survive? How can I use a model to explain this?</i>	With your student, read and complete the activities in this lesson. After completing the chain link model, ask your student to explain how this model can be used to explain what animals and plants need in order to survive. (Each component is a link. Each link shows an organism that eats the link before. Nutrients from each link pass to the next. Without the link, the chain would break apart.)
Explain the Topic <i>Why don't healthy ecosystems run out of nutrients?</i> <i>How can I revise my model?</i>	Read this article and watch this video [3:04] with your student. Discuss the following questions: • What do decomposers recycle? (Nutrients that have been passed along the food chain in an ecosystem.) • What are some decomposers? (Give specific examples such as mushrooms, insects, worms, bacteria.) • Why is the chain model you constructed not complete? (The model does not include a decomposer.)

	Why don't healthy ecosystems run out of nutrients? (Matter, unlike energy, gets recycled in an ecosystem. Nutrients are non-living matter that have been passed through a food chain in an ecosystem. Decomposers recycle the nutrients back into the soil. Plants use the nutrients in the soil to grow.) Can you revise your model to explain this? Have your student use the following model template to draw a revised model. Their model should look similar to this sample model.
Evaluate the Topic <i>What do I know about relationships in ecosystems?</i>	Ask your student questions 1-10 on page 1 of this quiz to see what they have learned about relationships among components in an ecosystem.

Resources

1. [Food Chains for Kids](https://www.youtube.com/watch?v=0DL4AUBe3WA), Smile and Learn
[https://www.youtube.com/watch?v=0DL4AUBe3WA]
2. [Ecosystem](https://kids.britannica.com/kids/article/ecosystem/433377), Britannica Kids
[https://kids.britannica.com/kids/article/ecosystem/433377]
3. [What Do Animals Need to Stay Alive? Food!](https://www.dec.ny.gov/docs/remediation_hudson_pdf/hrlpk3fchain.pdf), Hudson River Estuary Program
[https://www.dec.ny.gov/docs/remediation_hudson_pdf/hrlpk3fchain.pdf]
4. [Decomposers](https://education.nationalgeographic.org/resource/decomposers/), National Geographic
[https://education.nationalgeographic.org/resource/decomposers/]
5. [Decomposers](https://nebraskapublicmedia.pbslearningmedia.org/resource/tdc02.sci.life.oate.decompose/decomposers/), NOVA
[https://nebraskapublicmedia.pbslearningmedia.org/resource/tdc02.sci.life.oate.decompose/decomposers/]
6. [Matter Cycling System Model](https://static1.squarespace.com/static/59c3bad759cc68f757a465a3/t/5e18a882766381076cf9e64c/1578674307023/5-LS2-1+Matter+Cycling+System+%28Student+Version%29.pdf), model template by Wonder of Science
[https://static1.squarespace.com/static/59c3bad759cc68f757a465a3/t/5e18a882766381076cf9e64c/1578674307023/5-LS2-1+Matter+Cycling+System+%28Student+Version%29.pdf]
7. [Matter Cycling System Model](https://static1.squarespace.com/static/59c3bad759cc68f757a465a3/t/5e18a887d0ce055ea0e8c15c/1578674312200/5-LS2-1+Matter+Cycling+System+%28Teacher+Version%29.pdf), completed model template example by Wonder of Science
[https://static1.squarespace.com/static/59c3bad759cc68f757a465a3/t/5e18a887d0ce055ea0e8c15c/1578674312200/5-LS2-1+Matter+Cycling+System+%28Teacher+Version%29.pdf]
8. [5th Grade Science Movement of Matter](https://www.varsitytutors.com/5th_grade_science-help/life-science/movement-of-matter), Varsity Tutors
[https://www.varsitytutors.com/5th_grade_science-help/life-science/movement-of-matter]