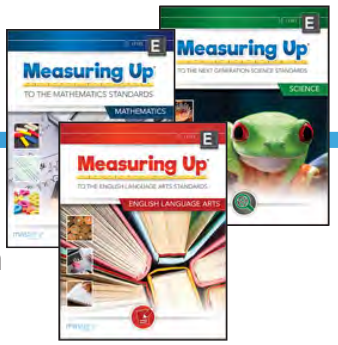
Try It Out! Sample Pack | Science | Grade 5 | Lesson 11
Measuring Up to the Standards



The **Try It Out!** sample pack features:

- 1 full student lesson with complete Teacher Edition lesson
- 1 full Table of Contents for your grade level
- Correlation to the standards

Developed to meet the rigor of the standards, ***Measuring Up*** employs support for using and applying critical thinking skills with direct standards instruction that elevate and engage student thinking.

Standards-based lessons feature introductions that set students up for success with:

- ✔ Vocabulary in Action
- ✔ Relevant real-world connections
- ✔ Clearly identified learning goals
- ✔ Connections to prior learning

Guided Instruction and Independent Learning strengthen learning with:

- ✔ Deep thinking prompts
- ✔ Collaborative learning
- ✔ Self-evaluation
- ✔ Demonstration of problem-solving logic
- ✔ Application of higher-order thinking

Flexible design meets the needs of whole- or small-group instruction. Use for:

- ✔ Introducing standards
- ✔ Reinforcement or standards review
- ✔ Intervention
- ✔ Remediation
- ✔ Test Preparation

Extend learning with online digital resources!

Measuring Up Live 2.0 blends instructional print resources with online, dynamic assessment and practice. Meet the needs of all students for standards mastery with resources that pinpoint student needs with customized practice.

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Lesson 11

HOW DOES AN ECOSYSTEM MEET THE NEEDS OF MULTIPLE SPECIES?

WORD TO KNOW

ecosystem

decomposer

THE BIG IDEA

- Organisms can only live in places where their needs are met.
- Healthy ecosystems allow many different kinds of organisms to live together across time.
- The balance of an ecosystem can be upset when a new organism arrives.

WHAT I NEED TO KNOW

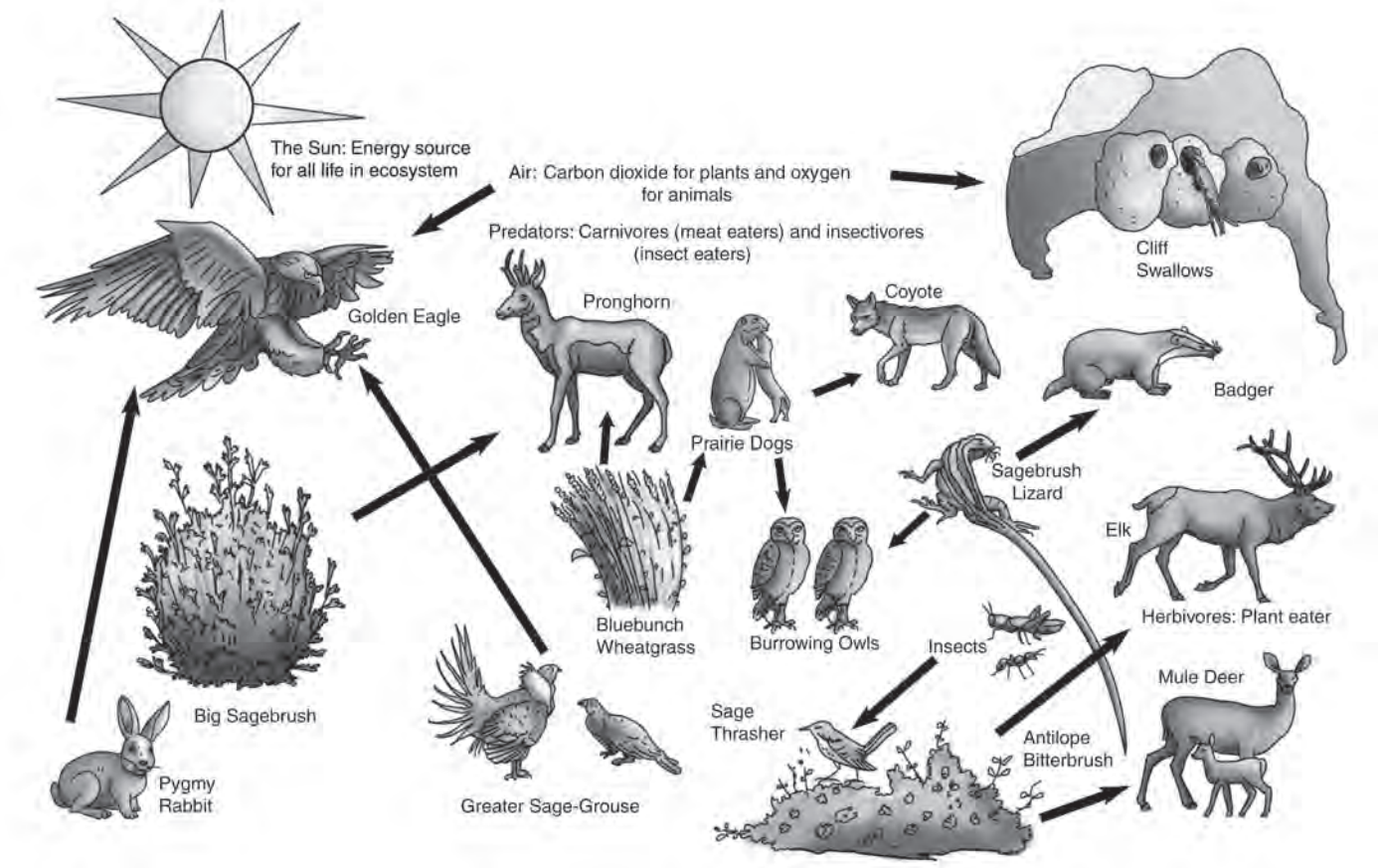
Animals need air, water, food, and shelter. Humans have found ways to meet these needs nearly everywhere on Earth. Can you think of some places where humans cannot live? Why is it difficult or impossible to live there?

Both animals and plants have to inhabit a place where their needs are met. Plants need air, water, nutrients from the soil, and light from the sun. An **ecosystem** is an area in which plants and animals interact with each other, as well as with nonliving things in the environment.

Healthy ecosystems are balanced. That means they have the right mix of nonliving features and organisms that can live together across time. For example, more than 350 species live together in the sagebrush ecosystem of the western United States. Swallows, a type of bird, nest in cliffs and eat insects. Insects pollinate flowers and eat leaves. Lizards and owls eat insects. Lizards and sage grouse hide in the sagebrush. Lizards become meals for badgers. The plants use the soil and snowmelt to produce food, and **decomposers** turn dead material from plants and animals back into soil.

TURN AND TALK

Animals need air, water, food, and shelter to survive. Humans are animals too! Where do you get water? Where does that water come from in the environment? Where does your food come from? What kinds of shelter can you use for protection?



We find large and small ecosystems all over Earth. They include many different types of organisms. Think about the living and nonliving things in a desert versus an ocean or a city park. Physical changes in temperature or weather or changes in organisms affect global ecosystems.

THINK ABOUT IT

Think about an animal in your environment. It might be a robin or a pigeon. It might be an ant or a mouse. What are its needs? How does it meet them in its ecosystem?

Living things change the physical environment. For example, prairie dogs may eat all the grass in a field. The roots of trees and plants slowly break apart rocks. Humans construct buildings and farm the land. When a new kind of organism enters an ecosystem, it affects the whole ecosystem.

When pigs and cattle were brought to Hawaii, they ate native plants. Birds called "Hawaiian honeyeaters" could not find enough nectar to eat, and some species became extinct. Scientists are helping the Hawaiian ecosystem by replanting native plants to increase the number of other native birds.

Changes to one part of an ecosystem will affect plants, animals, or other organisms within it. Some may survive, whereas others may move in, move out, or die.

WHAT I HAVE LEARNED

1. Monarch butterflies and milkweed plants are two species that interact in an ecosystem. Monarch butterflies drink the nectar of milkweed flowers, while helping to pollinate the plant. The butterflies also lay their eggs on milkweeds, the only food that allows their caterpillars to change into butterflies.

   If fewer milkweed plants grow, how will this affect the Monarch butterfly?

   Ⓐ Monarchs will just lay their eggs on a different plant.

   Ⓑ Monarchs and their caterpillars will have less food.

   Ⓒ Monarch caterpillars will learn to eat something else.

   Ⓓ Monarchs will pollinate more plants the next year.

2. A group of coyotes eats 60 prairie dogs every month. If ⅓ of the coyotes die from a disease, how many prairie dogs will the coyotes eat each month?

   Ⓐ 23 Ⓒ 40

   Ⓑ 33 Ⓓ 80

HINT, HINT

If ⅓ of the coyotes are gone, what is the fraction of coyotes that are still there? The coyotes that are still there will need to eat that same fraction of the rabbits. You might think about how to solve this problem if it had simpler numbers, such as imagining that ½ of the coyotes were gone. Then apply your method to the real numbers in the problem.

3. Prairie dogs, deer, and rabbits all eat the grass and other plants in a field where the prairie dogs live. Fewer coyotes are now eating fewer prairie dogs. Rabbits and deer may be affected in a number of ways.

   Think about how rabbits and deer in this ecosystem may be affected. Which of these sentences is not a way that they are likely to be affected?

   Ⓐ Coyotes will eat rabbits and deer more often.

   Ⓑ Rabbits and deer will have to share the food with more prairie dogs.

   Ⓒ Rabbits and deer may have to leave to look for food in another field.

   Ⓓ Rabbits and deer may not have enough food and may die.

4. The banyan tree of India gives shade to people and cattle. Squirrels nest in it and bats have colonies in it. Bats, squirrels, and birds eat the banyan tree's red fruit.

Based on this information, which sentence is the best conclusion?

Ⓐ Banyan trees meet many needs for organisms in their ecosystem.

Ⓑ Banyan trees are useful, so we should plant them in North America.

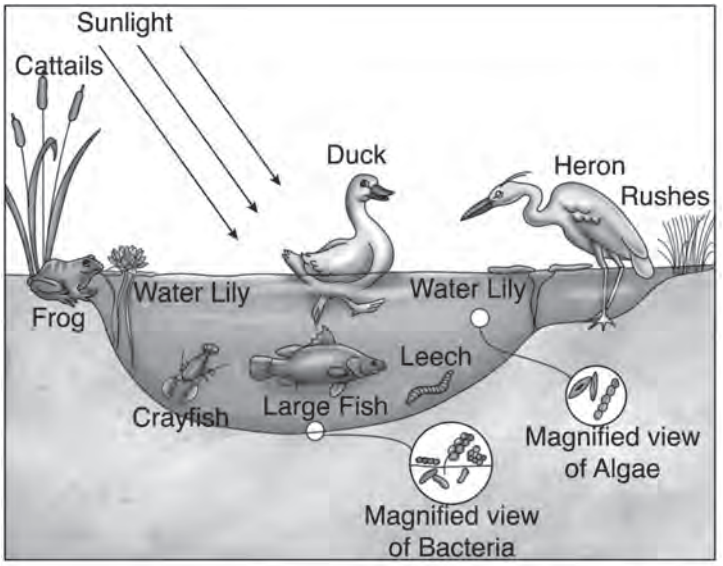
Ⓒ If banyan trees die, there will be no more bats, squirrels, and birds.

Ⓓ Any other tree could replace the banyan trees.

HINT, HINT

What do plants need to live and grow? What are the needs of animals? Remember that living or nonliving parts of an ecosystem can meet these needs.

5. Look at the model of the pond ecosystem. Think about how organisms' needs are met.



Which of the following does not describe a need being met in this ecosystem?

Ⓐ Sunlight allows the water lilies to grow.

Ⓑ The pond provides water for the organisms.

Ⓒ The fish and crayfish are food for the heron.

Ⓓ The soil provides shelter for the cattails.

ANNOTATED
TEACHER EDITION

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CONTENTS

Introduction

Unit I Physical and Chemical Changes

Unit 2 Energy and Matter

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Unit 3 Earth's Systems

Unit 4 Space Systems

References

Correlation to the Next Generation Science Standards

This worktext is customized to the Next Generation Science Standards.

NGSS Grade 5 Standards	Lessons
Disciplinary Core Idea 5-PS1: Matter and Its Interactions	
5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen. *Clarification Statements: Examples of evidence could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water* *Assessment Boundaries: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.*	1, 6
5-PS1-2 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. *Clarification Statements: Examples of reactions or changes could include phase changes, dissolving, and mixing that forms new substances.* *Assessment Boundaries: Assessment does not include distinguishing mass and weight.*	2, 3
5-PS1-3 Make observations and measurements to identify materials based on their properties. *Clarification Statements: 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 Boundaries: Assessment does not include density or distinguishing mass and weight.*	4
5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	5, Unit 1 Lab Investigation
Disciplinary Core Idea 5-PS2: Motion and Stability: Forces and Interaction	
5-PS2-1 Support an argument that the gravitational force exerted by Earth on objects is directed down. *Clarification Statements: "Down" is a local description of the direction that points toward the center of the spherical Earth.* *Assessment Boundaries: Assessment does not include mathematical representation of gravitational force.*	13
Disciplinary Core Idea 5-PS3: Energy	
5-PS3-1 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. *Clarification Statements: Examples of models could include diagrams, and flow charts.*	7, 8
Disciplinary Core Idea 5-LS1: From Molecules to Organisms: Structures and Processes	
5-LS1-1 Support an argument that plants get the materials they need for growth chiefly from air and water. *Clarification Statements: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.*	9

CORRELATIONS

NGSS Grade 5 Standards	Lessons
Disciplinary Core Idea 5-LS2: Ecosystems: Interactions, Energy, and Dynamics	
5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. *Clarification Statements: 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 Boundaries: Assessment does not include molecular explanations.*	10, 11, 12, Unit 2 Lab Investigation
Disciplinary Core Idea 5-ESS1: Earth's Place in the Universe	
5-ESS1-1 Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. *Assessment Boundaries: 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).*	21, Unit 4 Lab Investigation
5-ESS1-2 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. *Clarification Statements: 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.* *Assessment Boundaries: Assessment does not include causes of seasons.*	22, Unit 4 Lab Investigation
Disciplinary Core Idea 5-ESS2: Earth's Systems	
5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. *Clarification Statements: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; 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 Boundaries: Assessment is limited to the interactions of two systems at a time.*	14, 15, 16, 17, 18
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. *Assessment Boundaries: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.*	19, Unit 3 Lab Investigation
Disciplinary Core Idea 5-ESS3: Earth and Human Activity	
5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	20
Disciplinary Core Idea 3-5-ETS1: Engineering Design	
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.	Unit 3 Lab Investigation

NGSS Grade 5 Standards	Lessons
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.	Unit 2 Lab Investigation
3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Unit 1 Lab Investigation

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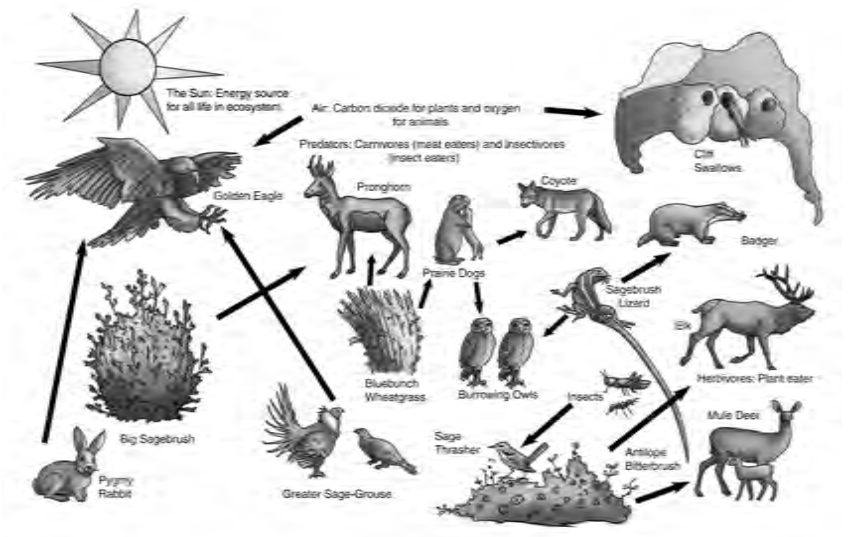

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   [DOK 2]

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   [DOK 2]

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   [DOK 3]

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Unit 2 | Energy and Matter | masteryeducation.com [57]

4. The banyan tree of India gives shade to people and cattle. Squirrels nest in it and bats have colonies in it. Bats, squirrels, and birds eat the banyan tree's red fruit.

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Ⓓ Any other tree could replace the banyan trees.

[DOK 3]

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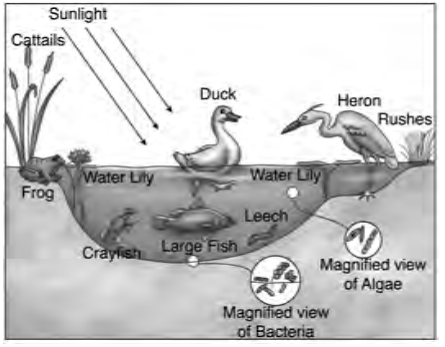

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[DOK 3]

TEACHER NOTES

STANDARDS 5-LS2-1

Performance Expectation

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

Disciplinary Core Idea

LS2.A: Interdependent Relationships in Ecosystems - We can trace the food of almost any kind of animal back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met.

A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.

Science and Engineering Practices

Developing and Using Models. Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

- Develop a model to describe phenomena. Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena
- Science explanations describe the mechanisms for natural events.

Cross Cutting Concepts

Systems and System Models. A system can be described in terms of its components and their interactions.

Prerequisite Knowledge & Standards

PS1.A Structure and Properties of Matter

- Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.
- Different properties are suited to different purposes.
- A great variety of objects can be built up from a small set of pieces.
- There are many different kinds of living things in any area, and they exist in different places on land and in water.
- Living things affect the physical characteristics of their regions.

Math Connection

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.