A Correlation of Scott Foresman SCIENCE to Missouri Grade-Level Expectations for Science Grades K-6
**Introduction**

This document demonstrates the high degree of success students will achieve when using *Scott Foresman Science* in meeting the Missouri Grade-Level Expectations for Science. Correlation page references are to the Teacher’s Edition, which contains facsimile student edition pages.

*Scott Foresman Science* is a Science program that ensures that all children are successful with science. This program was designed to provide teachers and students with:

**Comprehensive content:**
The authors of *Scott Foresman Science* wrote this series to match the National Science Education Standards as well as align with the numerous state standards and frameworks.

**Accessible Science for all students:**
*Scott Foresman Science* enables every student to be successful by giving all students equal access to science content and hands-on activities. *Scott Foresman Science* was written to help students learn how to read in a content area. The use of graphic organizers, authentic text, real-world applications, and appropriate assessment provides students with all the tools they need for successful reading comprehension in science.

**Teacher-tested Activities:**
*Scott Foresman Science* offers a wide variety of hands-on opportunities for students.

- **Explore Activities** provide students with a way to preview the content of lessons and chapters. These inquiry-based activities also provide the teacher with information about the students' prior knowledge about a topic.
- **Investigate Activities** provide students with a patterned activity that either anticipates content to come or confirms content that they have just learned.
- **Experiment Activities** provide students with an opportunity to use the science methods in an extended activity.
- **Inquiry Activities** are provided at grades 3-5 in the Teacher's Edition for those teachers who wish to introduce every lesson with an activity.

The activities in *Scott Foresman Science* work because they were tested extensively. In workshops across the country and at the NSTA's in Las Vegas and Boston, teachers tested each activity in the program. In addition, *Scott Foresman Science* provides unparalleled support for teachers. Activity videos for each Investigate and Experiment Activity accompany the program. Scott Foresman has also established an activity hot-line for teachers with questions or comments on the activities in the program.

**Customized Teacher Resources:**
*Scott Foresman Science* provides teachers with all the resources that they need to be successful with science. *Scott Foresman Science* offers a practical, easy-to-use Teacher's Edition that was designed by teachers. The ancillaries support and enhance science content and meet the needs of various teaching and learning styles.
Technology

Activity Videotapes
Video demonstrations of all Investigate and Experiment activities in the Student Edition prepare teachers for the upcoming lessons.

Practice and Assessment CD-ROM
An interactive game gives multiple-choice practice in English and Spanish. An end of game report lets students know what they need to review.

Classroom Audiotapes and Audio CD (K-2)
Children can learn science as they sing educational lyrics from the Children's Television Workshop that reinforces important themes in each chapter.

Audiotext Cassettes and Audio CDs
A complete audio version of the student edition connects those ESL and LEP students with the important science concepts.

Production CD-ROM
Software lets students create their own multimedia presentations. CD-ROM resources include videoclips, photographs, sound effects, artwork, and charts and graphs.

TestWorks
Teachers can customize tests in both free-response and multiple-choice question form using question resources and graphics found on an easy-to-use CD-ROM.

Teacher Resource Planner
A digital format of all the ancillaries in the Teacher's Resource Package allows teachers to plan, customize, and print a science curriculum that meets all classroom needs.

DataWonder
This program helps students organize data from science activities in the following forms: vertical and horizontal bar, line, circle, pictograph, boxplot, scattergram, stem-and-leaf, and histogram graphs.

www.sfscience.com
This on-line community for students and teachers provides frequent updates in science current events and trivia and lets students publish their own thoughts on science in a special section.
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Standard 1: Properties and Principles of Matter and Energy

A. Properties and Structure of Matter

Benchmark:
1. Objects, and the materials they are made of, have properties that can be used to describe and classify them

Scope & Sequence – Describing Objects and Materials

a. Describe physical properties of objects (size, shape, mass) by using the senses and/or simple tools (magnifier/centimeter ruler)
   B4, B5, B6, B7, B7a, B7b, B8, B9, B9a, B9b, B12, B30, B31, B32, B33, B33b, B34, B35, B36, D7, D7b, D9a, D11, D11a, D13; Your Science Handbook: 6-7

b. Identify materials (cloth, paper, wood, metal, etc.) that make up an object and some of the properties of the materials (color, texture, shiny/dull)
   B10-B11, B11a-B11b, B13, D13

c. Sort objects based on observable properties (material, color, size, shape, mass)
   B4, B5, B6, B7, B7a, B7b, B30, B31, B33, B33b, B34, B35, B36, D7, D11, D13; Your Science Handbook: 6-7

B. Forms and Sources of Energy

Benchmark:
1. Forms of energy (sound and heat) have a source, a means of transfer and a receiver

Scope & Sequence – Sounds

a. Compare the different ways objects such as bells, whistles, and glasses containing water can produce different sounds
   B17, B17a, B17b, B24
b. Create a list of sounds in our everyday life  
B14, B15, B16, B17, B17b

**Standard 2:** Properties and Principles of Force and Motion

**A. Motion**

*Benchmark:*  
1. The position and motion of an object can be described by locating it relative to another object

**Scope & Sequence – Relative Position**

a. Describe an object’s position relative to another object (above, below, in front of, behind)  
A19b, D11b  CHECK “MATH”

**B. Forces**

2. Forces act by making contact with an object (friction) or without touching an object (gravity, magnetism)

**Scope & Sequence – Magnets**

a. Show that magnets can be used to make some things move without being touched  
B32-B33, B33a, B33b, B35

**Standard 3:** Characteristics and Interactions of Living Organisms

**A. Characteristics of Organisms (Plants & Animals)**

*Benchmark:*  
1. Plants and animals are alive and have characteristics and basic needs that make them different from non-living matter

**Scope & Sequence – Plant and Animal Behaviors**

a. Use the five senses to gather information about the structures and behaviors of plants and animals  
A1c-A1d, A14, A15, A15a, A15b, A16, A17, A17a, A17b, A20, A29, A30-A31, A31a, A31b, A33, A35
b. Explain how each sense was used to gather information
A1c-A1d, A15a, A17, A17a, A17b, A31, A31a, A31b, A33, D9a, D9b

Standard 5: Process and Interactions of the Earth's Systems

B. Atmosphere, Weather and Climate

Benchmark:
1. Weather can be described by measurable properties

Scope & Sequence – Observing the Changes in Seasons

a. Observe and describe daily weather
C17 (Enrichment), C19 (Enrichment)

Standard 6: Composition and Structure of the Universe and the Motion of the Objects Within It

A. Earth, Moon and Sun

Benchmark:
4. Seasons can be observed as a change in weather over the course of a year

Scope & Sequence – Observing the Changes in Seasons

a. Observe and describe the characteristics of the four seasons
C15, C18-C19, C19a, C19b, C20

b. Describe how the seasons affect the behavior of plants and animals
C15, C18, C19, C19a, C19b, C20

c. Describe how the seasons affect everyday life
C15, C18, C19a, C19b, C20
Standard 7: Processes of Scientific Inquiry

Benchmark:
1. Scientific inquiry includes the ability of students to develop and test scientifically oriented questions

   a. Raise questions about objects, materials, organisms and events in the environment
   1Ac-1Ad, A7, A7a, A9, A9a, A10, A15, A17a, A19a, A25, A25a, A26-A27, A29, A29a, A31, A31a, B1c-B1d, B7, B7a, B9, B9a, B11a, B12, B17, B17a, B19, B19a, B21, B21a, B22-B23, B29, B29a, B31, B31a, B33, B33a, B35, C1c-C1d, C7, C7a, C9, C9a, C11, C11a, C12, C13, C17, C17a, C19, C19a, C25, C25a, C27a, C28-C29, C31, C31a, C33, D1c-D1d, D7, D7a, D9, D9a, D11, D11a, D13, D17, D17a, D19a, D21a, D27, D27a, D29a, D30-D31, D33, D33a; Your Science Handbook: 24-25

   b. Plan and conduct a simple investigation to answer questions
   A1d, A27, B1d, B17, B23, B29, B31, B33, C1d, C17, C29, D1d, D31; Your Science Handbook: 18-19, 24-25

Benchmark:
2. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations

   a. Observe using the five senses
   A1c-A1d, A7, A7a, A9, A9a, A10, A15a, A17a, A17b, A19a, A25, A25a, A25b, A26-A27, A29a, A29b, A31a, A31b, B1c-B1d, B7, B7a, B7b, B9, B9a, B9b, B11a, B17, B17a, B17b, B19, B19a, B21a, B22-B23, B29, B29a, B31, B31a, B33, B33a, B35, C1c-C1d, C7, C7a, C9, C9a, C11, C11a, C17, C17a, C19, C19a, C25, C25a, C25b, C27a, C27b, C28-C29, C31, C31a, C33, D1c-D1d, D7, D7a, D9, D9a, D9b, D11, D11a, D17a, D19a, D21a, D27, D27a, D29a, D29b, D30-D31, D33, D33a; Your Science Handbook: 3, 24-25

   b. Observe using simple tools and equipment (hand lenses, magnets, balances)
   A7b, A9a, A17a, A17b, A29a, A31, A31a, B1c-B1d, B9, B9a, B9b, B21, B22-B23, B33, B33a, C11, D7, D17a, D21a, D27a, D29a, D33a; Your Science Handbook: 8-9

   c. Measure length and weight using non-standard units
   A7b, A17b, B9, B9a, B9b, D29a; Your Science Handbook: 8-9
d. Compare amounts
A7b, A17b, A25b, B1d, B9, B9a, B9b, C7b, C19b, C25b, D7b, D9b, D21b, D29b; Your Science Handbook: 20-21

**Benchmark:**
3. Evidence is used to formulate explanations

a. Use observations to construct reasonable explanations
A1c-A1d, A7, A7a, A9, A9a, A10, A15a, A17a, A17b, A19a, A25, A25a, A25b, A26-A27, A29a, A29b, A31, A31a, A31b, B1c-B1d, B7, B7a, B7b, B9, B9a, B9b, B11a, B12, B13, B17, B17a, B17b, B19, B19a, B19b, B21, B21a, B21b, B22-B23, B24, B29, B29a, B29b, B31, B31a, B31b, B33, B33a, B33b, B35, C1c-C1d, C7, C7a, C9, C9a, C11, C11a, C12, C13, C17, C17a, C19, C19a, C25, C25a, C25b, C27a, C27b, C28-C29, C31, C31a, C31b, D1c-D1d, D7, D7a, D7b, D9, D9a, D9b, D11, D11a, D13, D17a, D17b, D19a, D19b, D21a, D21b, D27a, D29a, D29b, D30-D31, D33, D33a, D33b; Your Science Handbook: 18-19, 22-23, 24-25

b. Use observations to describe relationships and make predictions
A15a, A17a, A29a, B1c-B1d, B9a, B19, B19a, B29a, B31, B33, C1c-C1d, C7a, C19a, D1c-D1d, D7a, D17a; Your Science Handbook: 12-13

**Benchmark:**
4. Scientific inquiry includes evaluation of explanations in light of scientific principles (understandings).

a. Compare explanations with prior knowledge
A1c-A1d, A27, B1c-B1d, B23, C1c-C12d, C29, D1c-D1d, D31

**Benchmark:**
5. The nature of science relies upon communication of results and justification of explanations

a. Communicate observations using words, pictures, and numbers
A1c-A1d, A7, A7a, A9, A9a, A10, A11, A15a, A17a, A17b, A19a, A19a, A20, A21, A25, A25a, A26-A27, A29, A29a, A31, A31a, A31b, A32, A33, A34, A35, A36, B1c-B1d, B7, B7a, B9, B9a, B11, B11a, B12, B17, B17a, B19, B19a, B21, B21a, B22-B23, B29, B29a, B31, B31a, B33, B33a, B34, B35, B36, B37, B38, C1c-C1d, C7, C7a, C9, C9a, C11, C11a, C12, C13, C17, C17a, C19, C19a, C25, C25a, C27, C27a, C28-C29, C31, C31a, C32, C33, C34, C35, C36, D1c-D1d, D7, D7a, D9, D9a, D11, D11a, D13, D17, D17a, D19, D19a, D21, D21a, D27, D27a, D29, D29a, D30-D31, D33, D33a, D34, D25, D36, D37, D38; Your Science Handbook: 24-25
Standard 1: Properties and Principles of Matter and Energy

A. Properties and Structure of Matter

Benchmark:
2. Matter is anything that takes up space, has mass, and exists as solids, liquids or gases

Scope & Sequence – Balancing and Measuring

a. Measure the mass of objects using a balance
   C11, C11b; Your Science Handbook: 52

b. Given a balance beam, a fulcrum, and various objects, illustrate arrangements in which the beam is balanced
   C11b

c. Compare the mass of objects
   C11b; Your Science Handbook: 52

d. Order objects according to mass
   C11b

B. Forms and Sources of Energy

Benchmark:
1. Forms of energy (sound and heat) have a source, a means of transfer and a receiver

Scope & Sequence – Observing Weather (SC5)

a. Describe the effect of the Sun’s heat on various objects
   B13, B19b, B36, B37, B42, C34, C40, C46, C50, C51, C51b; Your Science Handbook: 41
b. Record the differences in temperature over time on different colored objects placed under a heat source
Related concepts and skills are taught on pages C33, C33b, and Your Science Handbook: 51.

**Standard 2:** Properties and Principles of Force and Motion

**A. Motion**

*Benchmark:*
1. The position and motion of an object can be described by locating it relative to another object

**Scope & Sequence – Describing Motion**

a. Compare the speeds (faster vs. slower) of two moving objects
B50-B51, B51a, B51b, B60

b. Compare the position of an object relative to another object (left of or right of)
Related concepts and skills are taught on pages B41b, C53, C59a, and D25a.

c. Describe an object’s motion as straight, circular or zigzag
B44-B45, B46-B47, B50-B51, B51b

*Benchmark:*
2. The way to change the position or motion of an object is to give it a push or pull (force)

**Scope & Sequence – Describing Motion**

a. Describe ways to change the motion of an object including going slower, going faster, going farther, changing direction or stopping.
B44-B45, B46-B47, B50-B51, B51a, B51b, B52-B53, B54-B55, B60, B62

b. Describe ways the motion of an object may change
B44-B45, B46-B47, B50-B51, B51a, B51b, B52-B53, B54-B55, B60, B62
Standard 3: Characteristics and Interactions of Living Organisms

A. Characteristics of Organisms (Plants & Animals)

Benchmark:
1. Plants and animals are alive and have characteristics and basic needs that make them different from non-living matter

Scope & Sequence – Plant and Animal Characteristics

a. Identify characteristics of living and non-living things
   A50-A51, A53a, A53b, A60, A61, A64

b. Sort living and non-living things in to groups
   A50-A51, A53a, A53b, A60, A61, A64

c. Describe the basic needs of most animals (air, water, food and shelter)
   A40-A41, A43b, A44

d. Describe the basic needs of most plants (air, water, light, nutrients and temperature)
   A14-A15, A18-A19, A19b, A25

e. Conduct a fair test to investigate the effects of removing one of the needs of a plant on its growth (dark vs. light, water vs. no water, etc.)
   A18-A19

Benchmark:
2. Observable characteristics of living organisms can be used to sort and group them

Scope & Sequence – Plant and Animal Characteristics

a. Compare plants based on physical characteristics (stem, leaves, flowers, etc.)
   A12-A13, A13a, A13b, A19a, A20-A21, A24, A63

b. Compare animals based on their physical characteristics (i.e. appendages, skin covering, eyes, beaks, etc.)
**Standard 5:** Process and Interactions of the Earth’s Systems

**B. Atmosphere, Weather and Climate**

**Benchmark:**
1. Weather can be described by measurable properties

**Scope & Sequence – Observing Weather**

a. Observe, measure and record weather using thermometers, rain gauges and weather vanes
   C30-C31, C33b

b. Observe and record cloud cover, precipitation, wind and temperature
   C29, C30-C31, C33a, C33b, C63

c. Summarize the weather data collected
   C29, C30-C31, C33a, C33b, C63

**Standard 7:** Processes of Scientific Inquiry

**Benchmark:**
1. Scientific inquiry includes the ability of students to develop and test scientifically oriented questions

a. Raise questions about objects, materials, organisms, and events in the environment

b. Plan and conduct a simple investigation to answer questions
Benchmark:
2. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations

a. Observe using the five senses

b. Observe using simple tools and equipment (hand lenses, magnets, balances)
A13b, A35, B27, B34, B35a, B53a, B54-B55, B55a, B58-B59, C10-C11, C11a, C11b, C14-C15, C15a, C33, C51, D24-D25, D29a; Your Science Handbook: 4-5, 12-13, 50-52, 54, 55

c. Measure length and weight using non-standard units
A13b, C11a, C11b; Your Science Handbook: 12-13, 52

d. Compare amounts
A13b, A51, A53b, B55b, C6-C7, C11b, D14-D15, D24-D25, D29b; Your Science Handbook: 15, 23, 25, 34-35

Benchmark:
3. Evidence is used to formulate explanations

a. Use observations to construct reasonable explanations

b. Use observations to describe relationships and make predictions
Benchmark:
4. Scientific inquiry includes evaluation of explanations in light of scientific principles (understandings)

a. Compare explanations with prior knowledge

Benchmark:
5. The nature of science relies upon communication of results and justification of explanations

a. Communicate observations using words, pictures, and numbers
Standard 1: Properties and Principles of Matter and Energy

A. Properties and Structure of Matter

Benchmark:
1. Objects, and the materials they are made of, have properties that can be used to describe and classify them

Scope & Sequence – Matter
a. By using simple tools such as a magnifier, centimeter ruler and balance, collect data to describe the physical properties of objects
A18-A19, A56-A57, B11, C13b; Your Science Handbook: 50, 52

Benchmark:
2. Matter is anything that takes up space, has mass, and exists as solids, liquids or gases

Scope & Sequence – Matter
a. Compare properties of water as a solid, liquid and gas
B17, B18-B19, C38-C39, C40-C41, C43a, C44
b. Classify everyday objects/ substances as solid, liquid or gas
B12-B13, B19b, B20

Benchmark:
3. Objects and materials can change

Scope & Sequence – Matter
a. Predict the changes in the properties of objects when heated or cooled melting, freezing, evaporation, condensation)
B16-B17, B18-B19, B20, C38-C39, C40-C41, C43a, C44
b. Measure and compare the difference in temperature as water changes from a solid to a liquid or a liquid to a solid
Related concepts and skills are taught on pages B30-B31, and C32-C33.

c. Record how various solids behave when mixed with water
B14-B15, B19b, B20

d. Give examples of different ways to separate mixtures
B15, C38, C43a

B. Forms and Sources of Energy

Benchmark:
1. Forms of energy (sound and heat) have a source, a means of transfer and a receiver

Scope & Sequence – Matter

a. List sources of heat that can change solids to liquids (sun, stove, fire, body)
B17, B18-B19, B20

b. Give examples of sources of heat that can cause evaporation
C38-C39, C43a, C44

Standard 2: Properties and Principles of Force and Motion

A. Motion

Benchmark:
2. The way to change the position or motion of an object is to give it a push or pull (force)

Scope & Sequence – Investigating Forces

a. Identify the force (push or pull) required to perform a task
B44, B46-B47, B49a, B49b, B52-B53, B54-B55, B55a, B55b, B60, B61, B62
B. Forces

**Benchmark:**
1. A relationship exists between the strength of a force and its effect on the motion of an object

   **Scope & Sequence – Investigating Forces**

   a. Compare the distance traveled of objects with different masses while applying the same force
      B47

   b. Compare the distance traveled of objects with the same mass while applying different amounts of force
      B46, B47, B49a

**Benchmark:**
2. Forces act by making contact with an object (friction) or without touching an object (gravity, magnetism)

   **Scope & Sequence – Investigating Forces**

   a. Show that magnets attract and repel each other
      B50-B51

   b. Recognize the kinds of materials that are attracted to a magnet
      B52-B53, B54-B55, B55a, B55b, B62

   c. Describe magnetism as a force that can push or pull
      B43, B50-B51, B52-B53, B54-B55, B55a, B55b, B62

   d. Describe gravity as a force that pulls
      B42-B43, B48, B49b, B60

   e. Measure and compare the force required to overcome friction and move an object over different surfaces
      B1c-B1d, B49b

**Benchmark:**
3. Ramps affect the force required to move an object

   **Scope & Sequence – Investigating Forces**
a. Measure the amount of force it takes to pull an object up a ramp
Related concepts and skills are taught on pages B1c-B1d and Your Science Handbook: 44.

b. Measure, record and graph the distance an object travels after coming off ramps of different heights
Related concepts and skills are taught on pages B1c-B1d and Your Science Handbook: 44.

c. Apply the use of a ramp to different real life situations
Related concepts and skills are taught on page 44 in Your Science Handbook.

C. Reproduction and Heredity

Benchmark:
1. Organisms (plants and animals) go through life cycles

Scope & Sequence – Life Cycles of Plants and Animals

a. Record observations on the life cycle of different organisms
A16-A17, A17b, A25, A30-A31, A32-A33, A33a, A33b, A34-A35, A36-A37, A44

b. Sequence the stages in the life cycle of a particular organism (butterfly, frog, bean plant, etc.)
A30-A31, A33a, A33b, A36-A37

Standard 5: Process and Interactions of the Earth’s Systems

A. Geosphere

Benchmark:
1. The Earth’s crust is composed of various materials including soil and rocks

Scope & Sequence – Earth Materials: Rocks & Soils

a. Identify, compare and record the physical properties of soils (odor, appearance, grain size, texture and absorption of water) and components (sand, clay and humus)
C20, C21, C24
b. Identify, compare and record the physical properties of rocks (size, shape, color, presence of fossils, etc.)  
C10-C11, C13a

c. Observe common fossils of Missouri  
A46-A47, A50-A51, A52-A53, A53a, A53b, A59b, A60

Benchmark:
2. The Earth’s materials are formed through a variety of processes

Scope & Sequence – Earth Materials: Rocks & Soils

a. Observe and describe the breakdown of plant and animal material into soil through processes such as composting  
C21

b. Observe the effects of freezing and thawing  
B16-B17, B18-B19, B20

Standard 7: Processes of Scientific Inquiry

Benchmark:
1. Scientific inquiry includes the ability of students to develop and test scientifically oriented questions

a. Raise questions about objects, materials, organisms and events in the environment  

b. Plan and conduct a simple investigation to answer questions  
A1d, A9, A11, A17, A19, A57, B1d, B9, B11, B15, B19, B25, B27, B31, B37, B39, B49, B51, B53, B55, C1d, C7, C13, C17, C33, C41, C53, D1d, D13, D15, D25, D27, D39; Your Science Handbook: 17, 25, 29
Benchmark:
2. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations

   a. Observe using the five senses

   b. Observe using simple tools and equipment (hand lenses, magnets, balances, etc.)

   c. Measure length and weight using standard and non-standard units
   A11b, A17, A56-A57, B11, B39b, B47, D29a, D39b; Your Science Handbook: 12-13, 26-27, 50, 52

   d. Compare amounts
   B18-B19, B30-B31, B31a, B31b, B39b, B47, C32-C33, C37b, D12-D13, D14-D15, D15b, D35; Your Science Handbook: 22-23, 26-27, 52

   e. Judge whether measurements are reasonable

Benchmark:
3. Evidence is used to formulate explanations

   a. Use quantitative and qualitative data to construct reasonable explanations
   A1c-A1d, A7, A9, A10-A11, A11a, A11b, A17, A17a, A17b, A18-A19, A23a, A23b, A33a, A33b, A37a, A43, A43a, A49, A51, A53a, A53b, A56-A57, A59a, B1c-B1d, B6-B7, B9, B11, B13a, B13b, B15, B18-B19, B19a, B21, B25, B27, B27a, B27b, B30-B31, B31a, B31b, B37, B38-B39, B39a, B39b, B47, B49, B49a, B49b, B51, B53, B54-B55, B55a, B55b, B57, B59a, B59b, C1c-C1d, C8-C9, C13, C13a, C13b, C16-C17, C17a, C21, C29, C32-C33, C37a, C37b, C39, C40-C41, C43a, C49, C52-C53, C53a, C53b, D1c-D1d, D7, D12-D13, D14-D15, D15b, D24-D25,
b. Use data to describe relationships and make predictions
A1c-A1d, A9, A10, A23a, B1c-B1d, B11, B18, B30-B31, B47, B49, B53, B54, B55a, C1c-C1d, C13, C17a, D1c-D1d, D12-D13, D24-D25, D27, D35; Your Science Handbook: 6-7, 10-11, 12-13, 14-15, 16-17, 22-23, 24-25, 26-27, 28-29, 50, 51, 52, 53

Benchmark:
4. Scientific inquiry includes evaluation of explanations in light of scientific principles (understandings)

a. Evaluate the reasonableness of an explanation

b. Analyze whether evidence supports proposed explanations
Benchmark:
5. The nature of science relies upon communication of results and justification of explanations

a. Communicate simple procedures and results of investigations and explanations through:
   - verbal explanations
   - drawings
   - data tables
   - graphs
   - writings

Standard 1: Properties and Principles of Matter and Energy

B. Forms and Sources of Energy

Benchmark:
1. Forms of energy (sound and heat) have a source, a means of transfer and a receiver

Scope & Sequence – Forms of Energy: Sound

a. Give examples of sounds produced by objects and identify the sources of vibrations (blowing, plucking, tapping)
B86, B88, B90, B91, B100, B104-B105, B106, B107, B108, B109

b. Explore and describe different ways to change pitch (length, thickness, tension)
B89, B91, B92-B93, B98-B99, B106, B107, B109

c. Compare how sound travels through different materials (air in baggie, water, solids)
B94-B95, B97, B106, B107

d. Describe how the ear serves as a detector of sound
B102-B103, B106, B107

Standard 4: Changes in Ecosystems and Interactions of Organisms With Their Environments

A. Populations and Ecosystems

Benchmark:
1. All living organisms interact with each other and their environment in order to live and grow

Scope & Sequence – Interactions & Interdependence of Organisms
a. Identify the ways a specific organism may interact with other organisms or with the environment (mimicry, camouflage, defensive mechanisms, etc.)
A53c, A68, A69

b. Match and explain specific examples of producer/consumer and predator/prey relationships
A70-A73, A80, A81, A108, A109

c. Sequence the flow of energy through a food chain
A53, A72-A73, A80, A81, A108, A110

d. Predict the possible effects of removing an organism from a food chain
A81, A109, A110

Benchmark:
2. Organisms exhibit behaviors that allow them to deal with changes in their environment (hibernation and migration)

Scope & Sequence – Interactions & Interdependence of Organisms

a. Describe changes in animal behaviors and reactions to seasonal changes
A67, A68, C70-C71

b. Collect and record data describing effects of an environmental change on a specific organism

B. Diversity and Adaptation

Benchmark:
1. Plants and animals have specialized structures that help them survive in their environment

Scope & Sequence – Interactions & Interdependence of Organisms

a. Describe specialized structures that help plants survive in their environment (roots, cactus needles, thorns etc.)
A68, A69

b. Describe specialized structures and senses that help animals survive in their environment (i.e. antennae, body covering, whiskers, appendages, etc.)
A66, A67, A68, A69
Standard 5: Process and Interactions of the Earth’s Systems

C. Hydrosphere: Water – Water Cycle

Benchmark:
1. There is a water cycle

Scope & Sequence – Properties of Water/ Water Cycle

a. Investigate that water can freeze into a solid and then melt into a liquid again
   B19, B20-B21, B67, B109

b. Investigate that water can evaporate into a gas and then condense into a liquid again
   B19, B20-B21, B67, B109, C86, C88-C89, C96-C97, C108, C109

c. Illustrate the water cycle
   C96-C97

Benchmark:
2. Water is an essential natural resource

Scope & Sequence – Properties of Water/ Water Cycle

a. Recognize the importance of water to living organisms

Benchmark:
3. The water cycle has a major role in determining the weather and climate

Scope & Sequence – Properties of Water/ Water Cycle

a. Describe the water cycle as it applies to weather and climate
   C86, C88-C89, C94-C97, C108
Standard 6: Composition and Structure of the Universe and the Motion of the Objects Within It

A. Earth, Moon and Sun

Benchmark:
1. The positions of the Sun and Moon change in observable patterns

   Scope & Sequence – Observing Patterns of the Sun, Moon and Shadows

   a. Illustrate and describe how the Sun’s position in the sky changes over time during a day
      C64-C65

   b. Be aware that the Sun can be seen only in the daytime, but the Moon can be seen sometimes at night and sometimes during the day
      C60, C66

   c. Observe and describe how the Moon’s position in the sky changes over time
      C77

   d. Describe daytime as the time between when the Sun first appears over the horizon and disappears below the horizon
      C60, C64-C65, C66

   e. Describe nighttime as the time between when the Sun disappears below the horizon and when the Sun first appears above the horizon
      C74, C77

Benchmark:
2. The shape of the Moon that can be seen from Earth changes in an observable pattern

   Scope & Sequence – Observing Patterns of the Sun, Moon and Shadows

   a. Observe and chart the appearance of the Moon and note the changes in what you see
      C76-C77

   b. Discover the monthly repeating pattern of the appearance of the moon over several months
      C55d, C72-C73, C74-C75, C76-C77
Benchmark:
3. The change in the Sun’s position relative to the Earth causes shadows to change

Scope & Sequence – Observing Patterns of the Sun, Moon and Shadows

a. Record the changes in the Sun’s position in the sky during the course of a day
C72-C73

b. List and order the three things necessary to produce a shadow (light source, object and surface)
C72-C73

c. Chart the shadow changes that are caused by changes in the Sun’s position in the sky
C72-C73

d. Measure in centimeters the change in the length of the shadow cast by a vertical object as the Sun’s position in the sky changes
Related concepts and skills are taught on pages C72-C73.

e. Record the change of direction or position of a shadow from morning to midday to afternoon
C72-C73

Standard 7: Processes of Scientific Inquiry

Benchmark:
1. Scientific inquiry includes the ability of students to develop and test scientifically oriented questions

a. Raise questions about objects, materials, organisms, and events in the environment

b. Plan and conduct a simple investigation to answer questions
Benchmark:
2. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations

a. Observe using the five senses

b. Observe using simple tools and equipment (hand lenses, magnets, balances, etc.)

c. Measure length to the nearest centimeter

d. Measure weight using non-standard units
B14-B15, C6-C7, D1c-D1d; Your Science Handbook: 12-13

e. Compare amounts

f. Judge whether measurements and computation of quantities are reasonable
**Benchmark:**

3. Evidence is used to formulate explanations

a. Use quantitative and qualitative data to construct reasonable explanations

b. Use data to describe relationships and make predictions
   A27, A81, A84, A85, A107, B55, B92-B93, B107, C29, C83, D1c-D1d, D34; Your Science Handbook: 16-17

**Benchmark:**

4. Scientific inquiry includes evaluation of explanations in light of scientific principles (understandings)

a. Evaluate the reasonableness of an explanation

b. Make predictions supported by scientific knowledge
   A27, A81, A84, A85, A107, B55, B92-B93, B107, C29, C83, D1c-D1d, D34; Your Science Handbook: 16-17

c. Analyze whether evidence supports proposed explanations
Benchmark:
5. The nature of science relies upon communication of results and justification of explanations

a. Communicate simple procedures and results of investigations and explanations through:

   verbal explanations
drawings
data tables
graphs
writings


b. Interpret data presented in writings, tables, graphs, and drawings

Standard 1: Properties and Principles of Matter and Energy

A. Properties and Structure of Matter

Benchmark:
4. Matter is made up of moving particles too small to be seen

Scope & Sequence – Forms of Energy: Electricity

a. Develop a simple model that demonstrates the flow of invisible particles through an open or closed circuit
   B59d, B66

B. Forms and Sources of Energy

Benchmark:
1. Forms of energy (electricity and light) have a source, a means of transfer and a receiver

Scope & Sequence – Forms of Energy: Electricity

a. Construct and diagram a complete electric circuit by using a source (battery), a means of transfer (wires) and a receiver (resistance bulbs, diodes, motors, fans)
   B59c, B66-B67, B68-B69, B72-B73, B78-B79, B85-B87, B89, B125

b. Observe and describe the effects of transferring energy from the source to the resistor (heat, light, sound and motion)
   B44, B45, B67, B68-B69, B72-B73, B84

c. Describe the advantages and disadvantages of series and parallel circuits
   B68-B69, B72-B73, B88, B89, B125

d. Classify different materials as conductors or insulators
   B67, B88
Standard 2: Properties and Principles of Force and Motion

A. Motion

Benchmark:
1. The motion of an object can be described as a change in position, direction and speed

Scope & Sequence – Exploring Force & Energy

a. Describe an object’s motion in terms of distance over time (speed)
   B36, B40-B41

Benchmark:
2. An unbalanced force acting on an object changes its speed, direction of motion or both

Scope & Sequence – Exploring Force & Energy

a. Compare the effects of balanced and unbalanced forces on an object’s motion
   B38, B39, B40-B41

   b. Discuss how change of speed is affected by the amount of force and the mass of the object
   B36, B38, B39, B40-B41

B. Forces

Benchmark:
1. A relationship exists between the strength of a force and its effect on the motion of an object

Scope & Sequence – Exploring Motion

a. Explain how increasing or decreasing the force affects the motion of an object
   B36, B38, B39, B40-B41

   b. Explain how the mass of an object affects the force required to move it
   B36
Benchmark:
3. There are different kinds of forces (magnetic, gravitational, frictional)

Scope & Sequence – Exploring Motion

a. Describe gravity as a force that pulls.
B34, B37

b. Identify friction as a force acting on moving objects
B34, B38-B39, B40-B41

c. Compare the effect of different materials and how they increase or decrease friction
B39, B40-B41

Standard 4: Changes in Ecosystems and Interactions of Organisms With Their Environments

A. Populations and Ecosystems

Benchmark:
1. All populations living together and the physical factors with which they interact compose an ecosystem

Scope & Sequence – Ecosystems

a. Categorize populations of organisms as producers, consumers and decomposers by the role they serve in the ecosystem
A63c, A74-A76, A77-A81, A90-A91, A93

Benchmark:
2. As energy flows through the ecosystem, all organisms must capture the portion of energy available to them and transform it to a usable form

Scope & Sequence – Ecosystems

a. Explain how plants produce their own food
A74-A76, A92, A93

b. Differentiate between the three types of consumers (herbivore, carnivore and omnivore)
A63d, A78-A79, A92, A93
c. Describe the flow of energy through a food chain
A63d, A82-A83, A86, A87, A92, A93, A125

Benchmark:
4. All organisms, including humans and their activities, cause changes in their environments that can be either beneficial or harmful to the organisms in the ecosystem

Scope & Sequence – Ecosystems

a. Observe and describe beneficial and harmful activities that affect an ecosystem
A86, A87, A88, A92, A93c, A114-A117, A118, A119, A122, A123, C57

b. Identify examples in Missouri where human activity has had a beneficial or harmful effect on organisms
A86, A87, A88, A92, A93c, A114-A117, A118, A119, A122, A123, C57

Standard 5: Process and Interactions of the Earth's Systems

A. Geosphere

Benchmark:
1. The Earth’s crust is composed of various materials including soils, rocks and minerals

Scope & Sequence – Classification of Rocks and Minerals

• Identify and classify samples of earth materials into rocks or mineral
C48-C51, C54-C55, C60, C61; Your Science Handbook: 35

• Differentiate between rocks and minerals
C48-C51, C54-C55, C60, C61, Your Science Handbook: 35

• Identify minerals using color, texture, smell, luster, hardness, shape and reaction to magnets
C48-C49; Your Science Handbook: 35

• Observe and describe different types of rocks according to properties such as color, texture and layering
C50-C51, C54-C55, C61
**Benchmark:**

2. The Earth’s materials are formed through a variety of processes

**Scope & Sequence – Classification of Rocks & Minerals**

• Describe the different ways rocks are formed  
  C50-C51, C60; Your Science Handbook: 34

• Classify rocks as igneous, sedimentary and metamorphic  
  C50-C51, C61; Your Science Handbook: 34

**Standard 7:** Processes of Scientific Inquiry

**Benchmark:**

1. Scientific inquiry includes the ability of students to develop and test scientifically oriented questions

   a. Formulate testable questions  
      A1c-A1d, A31, A61, A96, B1c-B1d, B6, B21, B34, B41, B57, B62, B73, B79, B87, B92, B105, B115, C1c-C1d, C6, C36, C77, C91, D1c-D1d, D19, D29, D47; Your Science Handbook: 28-29

   b. Conduct a fair test to answer a question  

   c. Recognize the characteristics of a fair test  

**Benchmark:**

2. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations

   a. Observe using simple tools and equipment (hand lenses, magnets, balances, etc.)  
b. Measure length to the nearest centimeter
A1c-A1d, A90-A91, B1c-B1d, B3d, B31c, B40-B41, B46-B47, B55-B57, B78-B79, B114-B115, C3c, C64, C76-C77; Your Science Handbook: 6-7, 16-17, 26-27

c. Measure mass to the nearest gram
B3d, B20-B21, C89-C91

d. Measure temperature to the nearest degree
A72-A73, B3c, B3d, C6

Benchmark:
4. Scientific inquiry includes evaluation of explanations in light of scientific principles (understandings)

a. Evaluate the reasonableness of an explanation
A1d, A36, A44, A73, B1c-B1d, B6, B92, C1c-C1d, D1c-D1d, D34

b. Make predictions supported by scientific knowledge
A29-A31, A60-A61, A90-A91, B1c-B1d, B55-B57, B72-B73, B85-B87, C6, C89-C91, C97, C106-C107, D1c-D1d, D27-D29; Your Science Handbook: 16-17, 22-23

c. Analyze whether evidence supports proposed explanations

d. Recognize that explanations have changed over time as a result of new evidence
C70-C75, C112-C117; Your Science Handbook: 48-59

Benchmark:
5. The nature of science relies upon communication of results and justification of explanations
a. Communicate the procedures and results of investigations and explanations through:
   - verbal explanations
   - drawings
   - data tables
   - graphs
   - writings
Standard 1: Properties and Principles of Matter and Energy

A. Properties and Structure of Matter

Benchmark:
4. Matter is made up of moving particles too small to be seen

Scope & Sequence – Weather

a. Demonstrate how evaporation and condensation provide evidence that matter is made up of moving particles too small to be seen
A134, A138, B31, C1c-C1d, C74, C76-C81, C104, C105, C143, D1c-D1d

B. Forms and Sources of Energy

Benchmark:
2. Energy from the sun (solar radiation) is a major source of energy for weather phenomena

Scope & Sequence – Weather

a. Identify solar radiation as the source of energy for weather phenomena
B91, B96-B97, C74, C84, C100, C101; Your Science Handbook: 35

b. Graph and analyze the heating and cooling rates of soil and water
Related concepts and skills are taught on pages C71c, C75, C84, C88-C89, and C90.

c. Observe and describe the effect of surface temperature on the temperature and movement of the air above
C71c, C90-C91, C100

d. Describe the affect of differences in heating and cooling of land and water on weather patterns
C71c, C90-C91, C100, C101, C104, C105
B. Forces

_Benchmark:_
4. Simple machines (levers, ramps and gears) can be used to affect the force applied to an object and/or direction of movement

_Scope & Sequence – Simple Machines_

a. Explain how work can be done on an object (force applied and distance moved)
B54-B55, B78

b. Explain how simple machines change the amount or direction of force required
Related concepts are taught on page 34 in Your Science Handbook.

c. Identify the simple machines in common tools and household items
Related concepts are taught on page 34 Your Science Handbook.

d. Describe how friction affects the amount of force needed to do work
B1c-B1d, B41c, B41d, B60-B61, B62-B68, B72, B73

__Standard 3:__ Characteristics and Interactions of Living Organisms

A. Characteristics of Organisms (Plants & Animals)

_Benchmark:_
1. Organisms can be classified into groups based on characteristics

_Scope & Sequence – Classifying Living Things_

a. Classify animals as vertebrates and invertebrates
A24-A27, A34, A35

b. Classify animals into classes (amphibians, fish, birds, mammals and reptiles)
A16, A26, A27

c. Explain how characteristics of each class are the basis for classification
A16, A26, A27
d. Differentiate among the plant, animal, Protist, fungi and Moneran kingdoms using the characteristics of organisms (These will be the kingdoms used for assessment)
A17-A18, A34, A35, A142

e. Identify a plant or animal using a simple dichotomous key
Related concepts and skills are taught on pages A16-A21, A24-A27, and A28-A33.

f. Explain the beneficial and detrimental impact of bacteria and fungi
A10, A17, A18, A22-A23, A42, A57, A122, A127, A131, A132, A133, C52, D34-D37, D41

**Standard 5:** Process and Interactions of the Earth’s Systems

**A. Geosphere**

**Benchmark:**
3. The Earth’s surface is constantly changing due to the process of weathering, erosion and human interactions with the Earth

**Scope & Sequence – Earth Processes: Weathering & Erosion**

- Provide examples of where weathering by water, wind, glaciation and plants have changed the surface of the earth
  C21-C223, C28-C29, C38, C39

- Observe and describe evidence that waves, wind, water and ice shape and reshape the Earth’s surface by eroding rock and soil
  C24-C25, C38, C39

- Investigate the variables (amount of water, time, slope) that influence erosion and deposition of Earth’s surface materials
  C3c, C24-C25, C26-C27, C38, C39

- Analyze the ways humans affect erosion and deposition through the clearing of land, planting vegetation and building dams
  C24, C25
B. Atmosphere, Weather and Climate

Benchmark:
1. Properties of weather such as cloud cover, precipitation, wind speed and direction, temperature and pressure can be observed and measured to predict weather changes

Scope & Sequence – Weather

a. Collect and analyze weather data by using a variety of instruments (such as satellites, Doppler radar, barometers, thermometers, anemometers, wind vanes, hygrometers)
C3, C71d, C76, C84, C85, C87, C105; Your Science Handbook: 5, 31, 36-37

b. Predict probable weather conditions using current weather data
C76; Your Science Handbook: 36-37

Benchmark:
2. Dramatic changes in the pressure, temperature and wind create powerful forces that can affect our planet and living thing that inhabit it

Scope & Sequence – Weather

a. Describe the conditions necessary for tornadoes, hurricanes and/ or storms to form
C100, C101; Your Science Handbook: 35

b. Describe the impact of tornadoes, hurricanes and storms on Earth
C100, C101; Your Science Handbook: 35

C. Hydrosphere: Water – Water Cycle

Benchmark:
1. The ability of water to change forms as it moves through a system is called the water cycle

Scope & Sequence – Weather

a. Explain and trace the path of water through the Earth’s systems known as the water cycle
A134, A138, B31, C1c-C1d, C74, C76-C81, C104, C105, C143, D1c-D1d
b. Demonstrate how water in liquid, solid and gaseous state is constantly being recycled
A134, A138, B31, C1c-C1d, C74, C76-C81, C104, C105, C143, D1c-D1d

c. Provide examples of how humans and other living organisms depend on the water cycle
A24, A26, A27, A29, A30, A71c, A83-A85, A104, A118, A130, A134, C8, C48-C51, C70, D24, D61

d. Describe how humans and other organisms affect the water cycle
C39c, C48-C53, C54-C55, C65, C70, C71, C95, D1c-D1d, D3c, D21, D24

**Benchmark:**
2. The water cycle occurs because of heating and cooling and involves the processes of convection and radiation

**Scope & Sequence – Weather**

a. Explain using words and drawings how heating and cooling affect the arrangement and motion of particles
C77-C79

**Benchmark:**
3. Matter is made up of particles too small to be seen

**Scope & Sequence – Weather**

a. Demonstrate how evaporation and condensation provide evidence that matter is made up of particles too small to be seen
A134, A138, B31, C1c-C1d, C74, C76-C81, C104, C105, C143, D1c-D1d

**Standard 7:** Processes of Scientific Inquiry

**Benchmark:**
1. Scientific inquiry includes the ability of students to develop and test scientifically oriented questions

a. Formulate testable questions
A1d, A6, A23, A49, A59, A69, A74, A89, A97, A108, A137, B1d, B23, B39, B41c, B44, B55, B61, B71, B76, B85, B97, B105, B110, B119, B129, B137, C1d, C29, C37, C54-C55, C69, C74, C83, C89, C137, D1d, D6, D15, D27, D57
b. Conduct a fair test to answer a question

c. Recognize the characteristics of a fair test

Benchmark:
2. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations

a. Use a variety of tools and equipment to gather data

b. Measure length to the nearest centimeter

c. Measure mass to the nearest gram
Your Science Handbook: 28-29, 31

d. Measure volume to the nearest milliliter
A6, A135-A137, B3c, B22-B23, C1c-C1d, D1c-D1d, D3d, D7, D25-D27; Your Science Handbook: 26-27, 37

e. Measure temperature to the nearest degree
B3c, B73c, C71c, C71d, C88-C89, D3c; Your Science Handbook: 31

f. Determine the appropriate tools and techniques to collect data
Benchmark:
4. Scientific inquiry includes evaluation of explanations in light of scientific principles (understandings)

a. Evaluate the reasonableness of an explanation
A1d, A6, A23, A59, A74, A89, A97, A117, A137, B1d, B3c, B23, B39, B41c, B41d, B55, B61, B71, B76, B85, B97, B105, B110, B119, B129, B137, C29, C37, C55, C69, C74, C83, C89, C127, C137, D1d, D6, D15, D27, D32, D57; Your Science Handbook: 11, 15, 17, 21, 23, 25, 27, 29

b. Make predictions supported by scientific knowledge

c. Analyze whether evidence supports proposed explanations

d. Recognize that explanations have changed over time as a result of new evidence
**Benchmark:**
5. The nature of science relies upon communication of results and justification of explanations

a. Communicate the procedures and results of investigations and explanations through:
   - verbal explanations
   - drawings
   - data tables
   - graphs
   - writings
Standard 1: Properties and Principles of Matter and Energy

A. Properties and Structure of Matter

Benchmark:
1. Matter is anything that takes up space and has mass and exists in different states

Scope & Sequence – Examining Properties of Matter

a. Measure the amount of space an object takes up (volume)

b. Measure the mass of samples of matter
B1c-B1d, B73c

Benchmark:
2. Matter exists as pure substances or mixtures of substances that have specific physical and chemical properties

Scope & Sequence – Examining Properties of Matter

a. Use appropriate tools (magnet, voltmeter, graduated cylinder, balance, thermometer) to describe a pure substance according to its properties (magnetic, conductivity, melting point, boiling point and solubility)
B36, B37, B38; Your Science Handbook: 42-43

b. Compare the properties of a pure substance (element or compound) to a mixture
B40-B44, B50, B51, B53, B58, B59, B72, B73; Your Science Handbook: 20-21, 37, 42-43

c. Identify the components and properties of different solutions
B1c-B1d, B29c, B40-B47, B48-B49, B72, B73
d. Describe the variables that affect dissolving rate  
B45-B47, B72

e. Using appropriate tools, separate a mixture using different methods  
(filtration, evaporation, chromatography, magnets)  
A24-A25, A60-A61, B29c, C120, C126-C127

**Benchmark:**
3. Matter can change physically and chemically

**Scope & Sequence – Examining Properties of Matter**

a. Identify chemical changes in common objects as a result of interactions  
with heat, light and air (rust, burning, color change)  
B50-B59, B60-B61, B67-B68, B72, B73, B157

b. Identify physical changes in common objects  
B1c-B1d, B3c, B14-B17, B18-B19, B28, B29, B29c, B29d, B32, B34-B39, B40- 
B47, B48-B49, B72, B73, B157

**Standard 3:** Characteristics and Interactions of Living Organisms

**B. Structure and Function of Living Systems**

**Benchmark:**
1. All living things are made of cell(s) with structures that perform different  
functions

**Scope & Sequence – Structure of Life**

a. Compare and contrast plant, animal and other types of cells using  
microscopes and other tools  

b. Identify structures (nucleus, cell membrane, cell wall, chloroplasts,  
vacuoles, cytoplasm) within cells (plants vs. animals)  

c. Explain the function of the cell structures (nucleus, cell membrane, cell wall,  
chloroplasts, vacuoles, cytoplasm)  
A3c, A3d, A16-A19, A20-A21, A31-A33, A34, A35
**Benchmark:**
2. Multi-cellular organisms are interacting systems of cells, tissues, organs and organ networks that carry out life processes

**Scope & Sequence – Structure of Life**

a. Identify and give examples of each level of organization (i.e. examples of tissues and examples of organs, etc.)
A3d, A27, D9, D10-D13, D14-D17, D20, D24-D26, D30, D31, D31c, D31d, D45, D61, D62; Your Science Handbook: 38-39

C. Reproduction and Heredity

**Benchmark:**
1. Reproduction is essential to the continuation of every species

**Scope & Sequence – Structure of Life**

• Explain the importance of reproduction
A40, A42-A43, A44, A45, A46, A50, A51, A70, A71

• Explain why cells need to grow and divide
A3d, A42-A43, A46-A48, A70, A71

**Benchmark:**
2. Sexual reproduction in plants and animals allows for variation

**Scope & Sequence – Structure of Life**

• Compare and contrast asexual and sexual reproduction
A44-A45, A46-A51, A70, A71

• Describe the advantages and disadvantages of asexual and sexual reproduction

**Benchmark:**
3. Chromosomes carry the genetic information that determines heredity

**Scope & Sequence – Structure of Life**

• Identify chromosomes as the component of cells that occur in pairs and carry heredity information
• Describe how genetic material is transmitted resulting in offspring showing
traits from both parents (No mitosis or meiosis at this level)

**Standard 4:** Changes in Ecosystems and Interactions of Organisms With Their Environments

**A. Populations and Ecosystems**

**Benchmark:**
1. All populations living together and the physical factors with which they interact compose an ecosystem

*Scope & Sequence – Ecology: Populations*

a. Identify the biotic and abiotic factors that would affect the population number of particular organisms that an ecosystem could support
A109c, A130-A135, A159,

b. Predict how abiotic and biotic factors determine the populations within an ecosystem
A136-A145, A148-A153, A154, A155

**Benchmark:**
2. As energy flows through the ecosystem, all organisms must capture the portion of energy available to them and transform it to a usable form

*Scope & Sequence – Ecology: Populations*

a. Diagram and describe the flow of energy in an energy pyramid for a given population
A120-A121, 154, 155

**Benchmark:**
3. Matter is recycled in an ecosystem

*Scope & Sequence – Ecology: Populations*

a. Illustrate the recycling of matter in the water, nitrogen and carbon cycles
b. Describe the effects of organisms on the matter within these cycles
A124, A125, A126, A127, A128-A129, A134, A135, A154, A155, A157, A159, 
C115, C116, C122, C128-C131, C138, C139

**Benchmark:**
4. All organisms, including humans and their activities, cause changes in their 
environments that can be either beneficial or harmful to the organisms in the 
ecosystem

**Scope & Sequence – Ecology: Populations**

a. Describe beneficial and harmful activities of organisms, including 
humans, that affect an ecosystem
A124, A125, A126, A127, A128-A129, A134, A135, A141, A142, A143, A144, 
A145, A154, A155, A157, A159, C113-C114, C115, C116, C117, C122, C128-
C131, C138, C139

**Standard 5:** Process and Interactions of the Earth’s Systems

A. Geosphere

**Benchmark:**
2. The Earth’s materials are formed through a variety of processes

**Scope & Sequence – Earth Processes: Earthquakes & Volcanoes**

- Classify rocks by their chemical and physical properties and the processes 
  that formed them
  C68-C73, C77; Your Science Handbook: 34

- Recognize that rocks can cycle from one type to another through the 
  Earth’s internal and external processes
  Your Science Handbook: 34

**Benchmark:**
4. There are internal processes that change the surface of the Earth

**Scope & Sequence – Earth Processes: Earthquakes & Volcanoes**

a. Investigate the abrupt changes in the Earth’s surface that result from 
  earthquakes and volcanic eruptions
  C39D, C44-C49, C77, C124
b. Use data on the location of earthquakes and volcanoes to infer the existence of plates of the Earth’s crust  
C43, C44-C49, C77, C124

c. Illustrate the three main belts of intense earthquake and volcanic activity and relate the belts to the movement of crustal plates  
C43, C44-C49, C77, C124

d. Identify the major plates that make up the Earth’s crust  
C43, C44-C49, C77, C124

e. Compare and contrast different types of plate boundaries  
C43, C44-C49, C77, C124

f. Investigate data from earthquakes, volcanoes and sea floor spreading that provide evidence for crustal plates and their movement of crustal plates (Theory of Plate Tectonics)  
C43, C44-C49, C77, C124

g. Present evidence on the theory that a single super continent once existed  
C44

h. Illustrate the landforms that result when crustal plates collide, separate and slide past one another  
C43, C44-C49, C77, C124

**Benchmark:**
5. The geosphere consists of specific zones that each have unique distinguishable characteristics

**Scope & Sequence – Earth Processes: Earthquakes & Volcanoes**

a. Illustrate, label, and describe Earth’s layers: crust, mantle, inner, and outer core  
C42, C44-C46, C76, C77, C124

b. Describe how the energy of an earthquake travels (seismic waves)  
C47, C48, C50-C51, C52-C53
Standard 7: Processes of Scientific Inquiry

Benchmark:
1. Scientific inquiry includes the ability of students to develop and test scientifically oriented questions
   a. Formulate testable questions
   b. Design and conduct (with guidance) a valid experiment including manipulation of only one variable and multiple trials
   c. Evaluate the design of an experiment

Benchmark:
2. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations
   a. Use a variety of tools and equipment to gather data (microscopes, thermometers, computers, spring scales, balances, and graduated cylinders, etc.)
   b. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, temperature to the nearest degree, weight to the nearest Newton
c. Determine the appropriate tools and techniques to collect data
A1c-A1d, A3c, A14-A15, A24-A25, A31-A33, A35c, A38, A60-A61, A68-A69,
A71c, A98-A99, A106-A107, A109c, A112, A122-A123, A146-A147, B1c-B1d,
B3c, B6, B18-B19, B26-B27, B29c, B32, B48-B49, B60-B61, B69-B71, B73c, B76,
B100-B101, B110-B111, B113c, B116, B130-B131, B152-B153, C1c-C1d, C3c,
C26-C27, C42, C52-C53, C62-C63, C66-C67, C77c, C80, C98-C99, C107c, C110,
C126-C127, C135-C137, D1c-D1d, D6, D8, D14, D18-D19, D20, D24, D27-D29,
D36, D42-D43, D44, D50, D52; Your Science Handbook: 4-5, 6-7, 12-13, 40-41

Benchmark:
4. Scientific inquiry includes evaluation of explanations in light of scientific
   principles (understandings)

a. Evaluate the reasonableness of an explanation
A1d, A33, A38, A61, A74, A99, A107, A112, A123, A147, B1d, B19, B27, B32,
B49, B61, B71, B76, B101, B111, B116, B131, B153, C1d, C27, C53, C63, C80,
C99, C127, C137, C1d, D6, D19, D29, D43; Your Science Handbook: 28-29

b. Make predictions supported by scientific knowledge Analyze whether
evidence supports proposed explanations
B26-B27, B32, B48-B49, B60-B61, B76, B100-B101, B110-B111, B130-B131,
B152-B153, C1c-C1d, C52-C53, C66-C67, C126-C127, D1c-D1d, D6, D18-D19;
Your Science Handbook: 16-17

c. Recognize that explanations have changed over time as a result of new
evidence
A10, A13, A53, A84, A86, B42, B94, B104, B118, B122, B128, B132, C18, C50,
C72, C74, C104, D34; Your Science Handbook: 44-45
Benchmark:
5. The nature of science relies upon communication of results and justification of explanations

a. Communicate the procedures and results of investigations and explanations through:
   - verbal explanations
   - drawings
   - data tables
   - graphs
   - writings