Kansas Elementary Science Flipchart

▲ S.4.1.1.1 The student asks questions that he/she can answer by investigating. **Official Test Specifications** Multiple Choice • Passage Based or Non Passage Based • Pictures and Diagrams Short passages Do not use proper names Mid Level Process Questions Instructional Examples • Use terms or words that elementary students can relate to or have experienced in their school environment. Which is a good example of a question that can be investigated in science? Why can't her question be investigated using science? • Asks questions like: Will the size of the opening of a container change the rate of evaporation of liquids? How much water will a sponge hold? Item Specification a. Change a guestion so it could be answered by a scientific investigation. b. From a group of questions, choose the one that could (or could not) be studied scientifically. c. Given a problem, state the question that could be studied scientifically or choose the correct form of the question. d. Given a description of an investigation, identify the guestion being studied. **State Assessment Practice Item** Students are studying evaporation using different bottles filled with water. Which guestion can the students best answer by doing a science investigation? A) Who first discovered that water evaporates from a bottle? B) Which bottle of water tastes better when evaporation is occurring? C) X Does the shape of a bottle affect how fast water evaporates? Why is evaporation from bottles important for students to study? D) Question Id: 32168, Standard 1 "Science As Inquiry", Benchmark 1 "1", Indicator "1", Sub Indicator "1"

1. Inquiry

▲S.4.1.1.2

The student plans and conducts a simple investigation.

Official Test Specifications

- Multiple Choice
- Use short passages
- Do not use proper names
- Mid Level Process questions

Instructional Example

- Stay away from experimental design steps.
- She gathered her materials. What would her next step be?
- What materials should she collect to do the investigation?
- What is the best test for finding out something?
- Design a procedure to test of the wet strength of paper towels, to experiment with plant growth, or to find ways to prevent soil erosion.

Item Specification

- a. Choose the best test to answer a question using descriptions or illustrations of the experimental set up.
- b. Design a simple experiment to study a scientifically stated question (e.g., determine what will be tested, how it will be tested, including the sequences or stages of the investigation, or how to determine or measure the results).
- c. Given a question under investigation, make a prediction of the outcome (i.e., assess the ability to form a hypothesis, but DO NOT use the term hypothesis.)
- d. Given the details of a study choose which properties to observe or measure.
- e. Given a question, choose the tools and/or materials needed for the investigation.
- f. Identify flaws in a simple experimental design.
- g. Given the details of a study identify features that should stay the same during the investigation (i.e., which parameters should be held constant.).
- h. Recognize a "fair test" of a property or comparison of properties (i.e., tested under the same conditions, tested under controlled conditions, or compared to a standard value or control group).

i. Recognize that more than one trial increases the validity of the results of the investigation.

1. Inquiry				
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State Assessment Practice Item

A scientist wants to find which day during a month has the most rainfall. He will measure rainfall with a rain gauge like the one shown below.



Which would be the **best** time for the scientist to read the rain gauge to find which day had the most rainfall?

- A) only when it is raining
- B) in the middle of each day
- C) X at the end of each day
- D) only when the sun comes out

Question Id: 32192, Standard 1 "Science As Inquiry", Benchmark 1 "1", Indicator "2", Sub Indicator "2"

1. Inquiry			

▲ S.4.1.1.3

The student employs appropriate equipment, tools, and safety procedures to gather data.

Official Test Specifications

- Multiple Choice
- Use short passages
- Do not use proper names
- Low Level Process Questions

Instructional Examples

- Don't get too technical.
- Use appropriate METRIC tools including hand lens, meter stick, tape measure, measuring cups, balance, thermometer, spring scale, graduated cylinder, dropper, and stopwatch/clock.
- The best tool for measuring the vinegar would be...
- How can she safely collect data about the liquid?
- Use a balance to find the mass of the wet paper towel in grams; use a meter tape to measure the diameter of a rock; use the same size containers to compare evaporation rates of different liquids.
- Use appropriate precautions, procedures, and safety equipment when conducting investigations.

Item Specification

- a. Choose the best tool to measure a given property.
- b. Identify the property a given tool measures.
- c. Identify tools that can be used to "extend" the senses in an investigation (e.g., sight, sound, temperature receptors extended with a microscope, amplifier, thermometer).
- d. Identify safe or unsafe procedures when working with materials or tools that are poisonous, flammable, explosive, hot, or sharp.
- e. DO NOT use the term mass or test for it.

State Assessment Practice Item

Students were measuring objects with a spring scale like the one shown in the picture below.



What property does a spring scale measure?

- A) length
- B) X weight
- C) volume
- D) temperature

Question Id: 32197, Standard 1 "Science As Inquiry", Benchmark 1 "1", Indicator "3", Sub Indicator "3"

1. Inquiry

▲ S.4.1.1.4

The student begins developing the abilities to communicate, critique, analyze his/her own investigations, and interprets the work of other students.

Official Test Specifications

- Multiple Choice
- Use pictures and graphs
- Use short passages
- Use major Kansas cities
- Do not use proper names
- High Level Process Questions

Instructional Examples

- Keep the vocabulary simple. Use words that fourth graders can read easily.
- Use pictures, graphs, written language.
- What would be the best way to show his findings?
- Using her graph, which city received the most rain?
- Describe investigations with pictures, graphs, written language, and oral presentations.

Item Specification

- a. Choose the best prediction or conclusion based on the results of an investigation.
- b. Draw conclusions from the results of a simple experiment.
- c. Evaluate conclusions based on the results of a simple experiment.
- d. Evaluate a description of a simple experiment for clarity and completeness.
- e. Describe the flaw or omission in the description of an experiment.
- f. Identify the missing information that would prevent someone else from repeating the experiment.
- g. Choose the best way to display the results of an experiment (e.g., different graph formats or different scales within a single graph format).
- h. Choose data set most likely to have been obtained from a given investigation (LIMIT TO a 3x4 or 4x3 data table).
- i. Identify data or results that seem surprising, contradictory, or unlikely (i.e., extreme outliers).

State Assessment Practice Item

A student did an investigation to find out in which place water would evaporate the fastest. She followed the steps listed below.

- Step 1. Fill 3 glasses with 100 mL of water at 20°C.
- Step 2. Place each glass in a different place.

Step 3. Measure the results after one week.

What should she measure in step 3 to find the results of the investigation?

- A) the width of each glass of water
- B) the distance between each glass of water
- C) X the amount of water in each glass

1. Inquiry

D) the temperature of the water in each glass

Question Id: 32225, Standard 1 "Science As Inquiry", Benchmark 1 "1", Indicator "4", Sub Indicator "4"

The student observes properties and measures those properties using appropriate tools.

Official Test Specifications

- Multiple Choice
- Short Passage
- Use only the following vocabulary:
- Size, Shape, Color, Weight, Temperature, or Volume
- Do not use proper names
- Low Level Process Questions

Instructional Examples

- <u>Tools:</u> (Metric) Meter stick, tape measure, measuring cups, balance, thermometer, scale, graduated cylinder, dropper
- Do not use the term mass or test for it.
- A student observed the properties of a Popsicle placed in the sun. She noticed...
- Which measurement tool would best measure the weight of a football?
- Observe and record the size, shape, volume, color, and temperature of objects using balances, thermometers, and other metric measurement tools.

Item Specification

- a. Understand that weight, size, color, shape, volume, and temperature can be the same for different objects and that weight, shape, volume, and temperature can be different for different samples of the same material.
- b. Read the measurement of a physical property of an object on a tool (including reading the gradations/tic marks of a measuring tool at whole numbers. DO NOT ask to estimate values between scale markings/marked intervals).
- c. Choose correct units of measurement associated with a specific property (DO NOT assess units of mass).

State Assessment Practice Item

Which unit can be used to measure the volume of a liquid?

- A) X liter
- B) gram
- C) meter
- D) degree

Question Id: 32233, Standard 2 "Physical Science", Benchmark 1 "1", Indicator "1", Sub Indicator "1"

2. Physical			
Thysical			

The student describes and classifies objects by more than one property.

Official Test Specifications

- Multiple Choice
- Short Passage
- Use only the following vocabulary:
- Size, Shape, Color, Weight, Temperature, Volume
- Do not use proper names
- Mid Level Process Questions

Instructional Examples

- Do not use the term mass or test for it.
- Which properties best describe the rock?
- Which rock can be described as narrow, jagged, and spotted?
- Observe that an object can be hard, round, and rough; classify objects by two or more properties.

Item Specification

- a. Describe common materials in terms of their properties.
- b. Identify common materials given a description of their properties.
- c. Classify materials or objects into groups based on their properties.
- d. Rank materials or objects based on relative values of a common property.

State Assessment Practice Item

Which food can **best** be described as being long, thin, orange, and lightweight?

- A) X carrot
- B) banana
- C) pumpkin
- D) cucumber

Question Id: 32258, Standard 2 "Physical Science", Benchmark 1 "1", Indicator "2", Sub Indicator "2"

2. Physical			
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The student observes and records how one object interacts with another object.

Official Test Specifications

- Multiple Choice
- Short passages
- Do not use proper names
- Mid Level Process Questions

Instructional Examples

- Use common objects as examples of interactions.
- ...it shows an interaction because...
- What shows the interaction between the milk and the napkin?
- Mix baking soda and vinegar, or tea bag/food coloring and water, and record observations.

Item Specification

- a. Describe how objects with different physical properties (temperature, hardness, texture) interact. (Examples of objects include boiling water and solid wax, salt and water; examples of interactions include they may make a noise, wear away, break apart, produce heat or light, or stick together.)
- b. Identify evidence that a material has changed to a new material (e.g., color change, bubbles, smoke)
- c. For clear-cut examples, distinguish between changes that create new materials (e.g., combustion) and changes that create a different form of the same material (e.g., changes of state).

State Assessment Practice Item

Which is **not** an example of a change from one state of matter to another?

- A) steam condensing on a cold window
- B) ice cubes melting in a dish of powdered drink mix
- C) saltwater boiling to make salt and steam
- D) X powder mixing with water to make a flavored drink

Question Id: 32262, Standard 2 "Physical Science", Benchmark 1 "1", Indicator "3", Sub Indicator "3"

	2.			
F	Physical			
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The student recognizes and describes the differences between solids, liquids, and gases.

Official Test Specifications

- Multiple Choice
- Pictures
- Short passages
- Do not use proper names
- Mid Level Knowledge Questions

Instructional Examples

- Use common items used at home or school by fourth graders. What is the order of the states of matter pictures from left to right?
- Which is a liquid?
- Observes differences between a stick of butter and the butter melted, a chocolate bar and the chocolate melted, ice, melted ice, and evaporating water.
- Understands that a solid has a shape of its own and a liquid takes the shape of its container.
- Observe the differences between an inflated and deflated balloon.

Item Specification

- a. Identify common materials as being solid, liquid, or gas.
- b. Identify the state of a common material at an approximate temperature.
- c. Describe the three states of matter in terms of whether their shape can change or whether their volume can change.
- d. Know that temperature change is related to change in the state of matter.

State Assessment Practice Item

A student fills a dark plastic bottle with water, tightens the cap, and leaves the bottle outside overnight. Which property can the student **best** use to tell whether the water in the bottle will be solid or liquid in the morning?

- A) the color of the bottle
- B) the cloud cover outside
- C) the weight of the bottle
- D) X the temperature outside

Question Id: 32285, Standard 2 "Physical Science", Benchmark 1 "1", Indicator "4", Sub Indicator "4"

2.			
Physical			
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▲ S.4.2.2.1

The student moves objects by pushing, pulling, throwing, spinning, dropping, and rolling and describes the motion.

Official Test Specifications

- Multiple Choice
- Short Passage
- Use only the following examples: push, pull, throw, spin, drop, or roll
- Do not use proper names
- Low Level Knowledge Questions

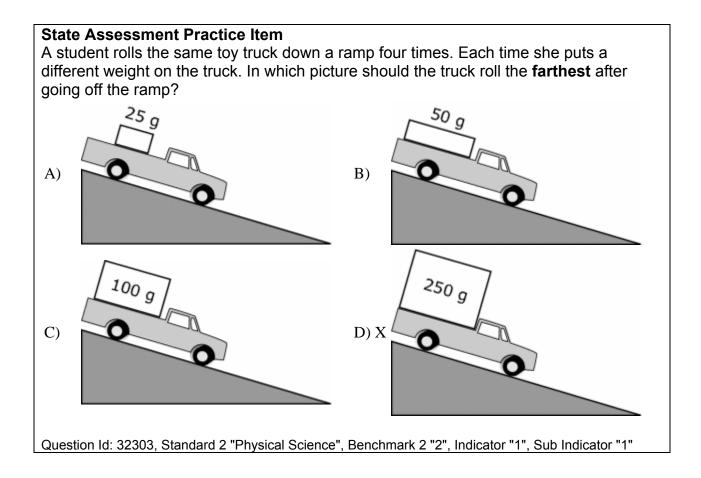
Instructional Examples

- Only use experiences that fourth graders have had.
- A student observed that a leaf fell to the ground. What did he observe?
- What best describes the motion of the ball?
- Spin or roll a variety of objects on various surfaces and explain what causes the objects to move.

Item Specification

- a. Describe the motion of an object as not moving, motion at the same speed for a period of time, speeding up, slowing down, or changing direction.
- b. Understand that a push or a pull causes an object to change its motion.
- c. Understand that the change in the motion of an object is the result of both the amount of force applied and the direction of the force applied to the object.
- d. Understand that heavier objects are harder to start moving or stop object (Specifications b, c, and d assess the general QUALITATIVE understanding of the second law of motion).
- e. Recognize that the motion of an object on a surface is related to the shape and weight of the object and the smoothness of the surface (DO NOT assess the term *friction*.).

2. Physical				
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	2.						
	Physical						
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▲ S.4.2.3.1

The student identifies that the source of sound is vibrations.

Official Test Specifications

- Multiple Choice
- Short Passages
- Do not use proper names
- Low Level Knowledge Questions

Instructional Examples

- Use instruments or objects "all" students (remember hearing impaired and physically impaired students) have experience with.
- A student felt the strings of a guitar when the guitar was strummed. What did she observe when sound was made?
- A student felt a table as it was being hit with a hammer. What did she feel?
- Explore various vibrating objects (tuning forks, rulers, tongue depressors, musical instruments, etc.) that produce sound.

Item Specification

- a. Identify vibration as the type of motion that causes sound. Attribute visual evidence of vibrations to sound (e.g., rice in a tray that shakes when a drum is beat or a full glass of water that ripples and spills because of a loud sound).
- b. Understand that sound is carried from the source to the ear by vibrations in the air or other material.
- c. Know that changing the vibration of an object changes the sound produced by the object.
- d. Know how to make the sound produced from an object louder or softer.
- e. Know that vibrations in different materials will produce sounds with different qualities (i.e., pitch, volume, speed).

State Assessment Practice Item

2. Physical

A student wearing earmuffs is holding a ringing alarm clock but cannot hear it, as shown in the picture below.



How might the student know that the alarm clock is ringing?

- A) The student feels heat with her by The student sees sound waves in the air.
- C) The student sees wind currents in the D) X The student feels vibrations with her air.

Question Id: 32310, Standard 2 "Physical Science", Benchmark 3 "3", Indicator "3", Sub Indicator "3"

▲ 4.2.4.1

The student demonstrates that magnets attract and repel.

Official Test Specifications

- Multiple Choice
- Pictures
- Short passages
- Do not use proper names
- Mild Level Process Questions

Instructional Examples

- Use bar magnets for pictures and/or drawings.
- A student observed what happened when she placed magnets in this position. Which best describes what the student noticed?
- Explore the interactions between two magnets.
- Design a simple experiment with two magnets to show that they attract or repel.
- Which object will be attracted to a magnet?

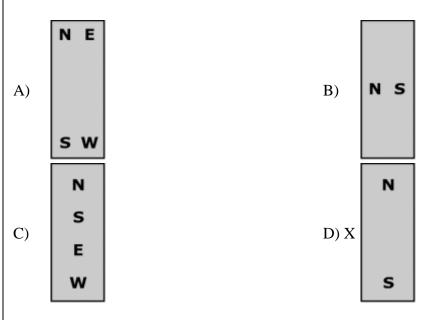
Item Specification

- a. Knows that all magnets have two poles: north and south.
- b. Understand that like poles of magnets repel and unlike poles attract.
- c. Predict whether two approaching magnets will attract or repel.
- d. Understand that distance is related to the strength of magnetic attraction or repulsion between magnets.
- e. Predict which objects will be attracted to a magnet based on the material from which the objects are made (e.g., iron nails, certain rocks, steel washers, thumbtacks, pins, steel paperclips).
- f. Students know that magnets can attract things through solids, liquids, or gases.

State Assessment Practice Item

2. Physical

Which picture correctly shows the poles of a bar magnet?



Question Id: 32328, Standard 2 "Physical Science", Benchmark 4 "4", Indicator "1", Sub Indicator "1"

▲ S.4.2.4.3

The student constructs a simple circuit.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Process Questions

Instructional Examples

- Test only simple and simple series.
- Do not test the identification or distinction between parallel and series circuits.
- Which picture is an example of a simple circuit?
- Which circuit causes the bulb to light?
- What needs to be done to make this circuit light the bulb?
- Use a battery, and wire(s) to light a bulb(s).

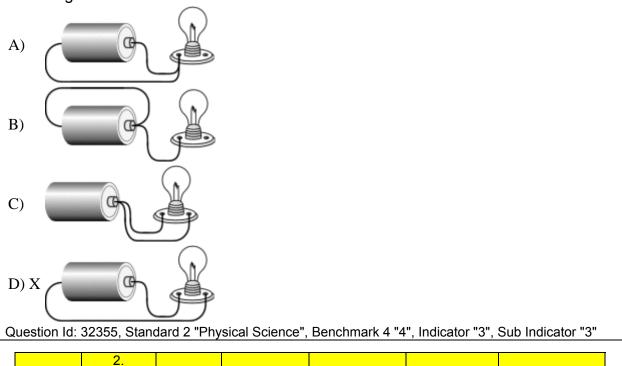
Item Specification

- a. Diagram a complete circuit by connecting electrical components. Include components such as source of electrical energy, wires to conduct, and bulb(s).
- b. Explain how to make a complete circuit from an open circuit (i.e., Understand that a complete circuit provides an uninterrupted, circular path for the flow of electrical current.).
- c. Identify a complete circuit from a group of choices.
- d. Understand that a complete circuit must include a source of electrical energy (e.g., a battery).
- e. DO NOT assess directionality of current.

State Assessment Practice Item

Physical

Which drawing shows the correct placement of the wires in the circuit that will cause the bulb to light?



▲ S.4.3.1.1

The student observes different organisms and compares and contrasts how similar functions are served by different structural characteristics.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- High Level Knowledge Questions

Instructional Examples

- Use only animals and plants that fourth graders have experienced.
- A student was comparing a bird and a gerbil. He noticed...
- Compare the leaf structures of the bean seed and corn seed sprouts. How are they different?
- Compare the structures for movement of an insect to the structures for movement of a fish; compare the leaf structures of a sprouted bean seed to the leaf structures of a corn seed.

Item Specification

- a. Sort or group organisms based on their structural characteristics (e.g., number of legs, body covering, leaves or needles).
- b. Group familiar animals according to characteristics that are similar (e.g., lays eggs vs. live birth, breathes through lungs vs. gills, scales vs. feathers, four legs vs. two legs, wings vs. legs for primary locomotion).
- c. Explain how an animal uses its particular type of body structures (e.g., webbed feet for moving in water, color pattern for hiding from predators).
- d. Describe the functions of the primary structures of flowering plants/fruit trees (i.e., leaves make food, roots take in water and nutrients and anchor plant in place, stem or trunk provide support and transport water and nutrients through the plant, flowers and seeds are for reproduction.).
- e. Know that plants and animals may use different structures to perform the same functions (e.g., for defense animals use different structures, such as claws, coloration, scales, spines, teeth).
- f. Relate structures of animals to food source (e.g., beak shape in birds or teeth shape in mammals are related to obtaining and chewing specific kinds of food.) Distinctions between functions of structures MUST BE common and distinctive.

State Assessment Practice Item

Which **best** describes the function of a tree trunk?

- A) to gather sunlight and make food for the tree
- B) to find water in the soil and anchor the tree in place
- C) X to carry water to the leaves and give support to the tree
- D) to grow flowers and the seeds needed to make new trees

Question Id: 32381, Standard 3 "Life Science", Benchmark 1 "1", Indicator "1", Sub Indicator "1"

	3. Life						

▲ S.4.3.1.2

The student compares basic needs of different organisms in their environment.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Mid Level Knowledge Questions

Instructional Examples

- Only use animals and plants that fourth graders have experienced (in real life or through contact with familiar media, curriculum, and children's materials).
- Plants and animals both need ______ to live.
- Compare the basic needs of an animal to the basic needs of a plant.

Item Specification

- a. Identify the basic needs of animals as air, water, and food/energy, habitat/living space/territory.
- b. Relate the basic needs of a specific animal to a specific type of environment (i.e., freshwater, marine, desert, polar, forest, or meadow/grassland/prairie) in which those basic needs are met.
- c. Identify the basic needs of plants as sunlight, air, and water and relate the basic needs of a specific plant to a specific type of environment (e.g., cactus, palm tree, fir tree).

State Assessment Practice Item

A girl is studying an animal that lives in a hot, humid area with plenty of shade. In which environment does the animal **most likely** live?

- A) arctic
- B) prairie
- C) desert
- D) X rain forest

Question Id: 32394, Standard 3 "Life Science", Benchmark 1 "1", Indicator "2", Sub Indicator "2"

		3. Life					

▲ S.4.3.2.1

The student compares, contrasts, and asks questions about life cycles of various organisms.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Mid Level Process Questions

Instructional Examples

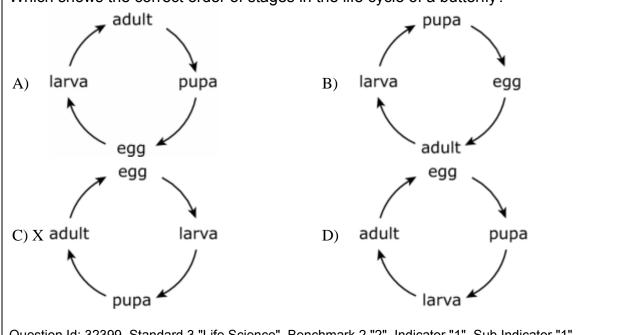
- Limit life cycles to those of humans, plants, butterflies, and frogs.
- Which is the correct order of the life cycle of an insect (butterfly)?
- What is the beginning stage of the life cycle of a plant?
- Plant a seed; observe and record its growth; observe and record the changes of an insect as it develops from birth to adult.

Item Specification

- a. Know the environmental factors that affect the continuity of the life cycle of organisms.
- b. Given labeled pictures, arrange in sequence the stages (or identify the missing, or next stage) in the life cycles of frogs or butterflies.
- c. Know that some organisms go through metamorphosis during their life cycle and some do not (e.g., human babies have the same basic body form as adult humans; frogs do not).
- d. Given labeled pictures, arrange in sequence the stages in the life cycles of plants.

State Assessment Practice Item

Which shows the correct order of stages in the life cycle of a butterfly?



Question Id: 32399, Standard 3 "Life Science", Benchmark 2 "2", Indicator "1", Sub Indicator "1"

3. Life			
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▲ S.4.4.1.1

The student collects, observes properties, and classifies a variety of earth materials in his/her environment.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Mid Level Process Questions

Instructional Examples

- Use earth materials that are FAMILIAR to fourth grade students.
- Fourth graders collected leaves from the playground. Which properties best describe the leaves?
- A student made groups of rocks based on the property of color. Which best shows how the student classified his rocks?
- Bring in samples of earth materials from his/her surroundings to observe color, texture, and other physical properties, and observe and classify rocks, soil, sand, and water.

Item Specification

- a. Understand that earth materials are unprocessed objects or materials found naturally occurring in the earth including rocks and minerals (e.g., marble, limestone, flint, sandstone, quartz), metals from ores (i.e., gold, silver, copper), and oil, coal, water, soils, clay, silt, humus, sand, and fossils. DO NOT include living organisms and immediate or direct derivatives as examples of earth materials (e.g., wood, bones, nests, plant oils, etc.).
- B. Group or sort earth materials based on observations or tests of the properties of those materials (e.g., color, shape, size, texture, reflectivity, transparency).
 Provide the materials or objects and the observed properties. Students then classify materials or objects based on the properties given.
- c. Group or sort earth materials based on how the materials are useful (e.g., building materials, sources of fuel, used for growing plants).
- d. Group or sort earth materials or objects based on more than one property.
- e. DO NOT assess specific properties of types of soils (not state assessable in S.4.4.1.2).

State Assessment Practice Item

Which list contains three earth materials found in nature?

- A) X a gold nugget, wet clay, brown gravel
- B) a black rock, a rubber eraser, dry mud
- C) a green rock, beach sand, an old tin can
- D) a piece of sandstone, a plastic ball, a wooden stick

Question Id: 32424, Standard 4 "Earth and Space Science", Benchmark 1 "1", Indicator "1", Sub Indicator "1"

4. Earth/Space		
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▲ S.4.4.1.3

The student describes *properties* of water and process of the water cycle.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Knowledge Questions

Instructional Examples

- Observes a water drop using a hand lens to notice shape of the drop (surface tension) and that water is a transparent, odorless, colorless liquid.
- Makes a diagram of the water cycle to show processes of evaporation, condensation, and precipitation.
- Relates the water cycle to observations of weather. Example: forms of precipitation.

Item Specification

- a. Do not test surface tension.
- b. Test the properties of water (transparent, odorless, colorless).
- c. Identifies the different physical states of water in the water cycle (i.e., solid, liquid, and gas).
- d. The sun is the main source of energy that drives the water cycle.
- e. Identify and describe the four main processes in the water cycle (i.e., evaporation, condensation, precipitation and collection/runoff) and locate where each occurs on a diagram of the water cycle.
- f. Recognize evidence of different processes in the water cycle (e.g., clouds are evidence of condensation, puddles drying up are evidence of evaporation, streams and rivers
- g. are evidence of collection/runoff).
- h. Understands how temperature affects the processes in the water cycle (e.g., warmer temperatures are usually associated with increased rates of evaporation, and colder temperatures with the formation of ice and with precipitation in the form of rain, snow, sleet, and hail).
- i. Recognize the different forms of precipitation, including sleet, snow, hail, rain.
- j. Most precipitation is eventually collected as runoff and ends up in lakes, oceans, or as groundwater.

State Assessment Practice Item

**This indicator is new or has been altered to warrant writing new assessment questions. A released sample item will be added to this flipchart when available.

	4.					
	Earth/Space					
KSDE September 2007						

▲ S.4.4.2.3

The student discusses that the sun provides light and heat (electromagnetic radiation) to maintain the temperature of the earth.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Low Level Knowledge Questions

Instructional Examples

- Do not use the term "electromagnetic radiation" on the test.
- Show why it seems cooler when the sun goes behind a cloud, and/or have the students investigate why it is cooler in the shade versus direct sunlight.
- Which child is playing in the **coolest** area?
- Four thermometers were placed in different locations around the school. The temperature from each was collected at 1:00pm. Where was the temperature warmest (highest)?
- Discuss why it seems cooler when the sun goes behind a cloud, and then investigate why it is cooler in the shade versus direct sunlight.

Item Specification

- a. Understand that the Sun is the main source of energy for Earth, and Earth receives this energy in the form of light and heat. (DO NOT use the term *electromagnetic*.)
- b. Explain what would happen on Earth (in terms of temperature and amount of light) if the amount of heat and light that Earth receives from the sun suddenly increased or decreased.
- c. Explain why it is cooler in the shade than in sunlight and why it is darker and cooler at night than in daytime. (DO NOT include length of shadows.)
- d. Choose the location with the highest or lowest temperature based on a picture of someone measuring temperatures at locations subjected to different intensities of sunlight (e.g., sun behind cloud, under shade of tree, at night). Example of scenario: Measure the temperature of jars of water after sitting in different exposures to sunlight.

State Assessment Practice Item

Why is it darker and usually cooler at night than during the day?

- A) because it is usually cloudier at night
- B) because the sun is blocked by the moon at night
- C) because Earth does not produce as much heat at night
- D) X because part of Earth is turned away from the sun at night

Question Id: 32454, Standard 4 "Earth and Space Science", Benchmark 2 "2", Indicator "3", Sub Indicator "3"

	4.				
	Earth/Space				
KSDE September 2007					

▲ S.4.4.3.1

The student describes changes in the surface of the earth.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Knowledge Questions

Instructional Examples

- Use examples from the environment in Kansas.
- What change shows erosion on a hill?
- There is a bare slope on the playground. When it rains the soil washes down the slope. What could be done to stop the erosion of the slope?
- Observe erosion at a study site.

Item Specification

- a. Only assess changes caused by wind and water.
- b. Understand that erosion is the removal of earth material from a location by natural forces.
- c. Identify moving water and wind as the primary causes of erosion.
- d. Understand the interaction between the type of erosion and the landform resulting from that erosion (e.g., river valley/canyon, sand dunes, riverbank, cliffs, shoreline erosion).
- e. Describe the importance of slope and vegetation on the rate of erosion.
- f. Describe ways that erosion can be an environmental problem.
- g. Describe things that could be done to prevent erosion (e.g. planting, covering, and walls or other structures to retain soil).

State Assessment Practice Item

Which is a **not** a cause of erosion?

- A) heavy rains
- B) strong winds
- C) X bright sunlight
- D) digging animals

Question Id: 32473, Standard 4 "Earth and Space Science", Benchmark 3 "3", Indicator "1", Sub Indicator "1"

	4. Earth/Sp					
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▲ S.4.4.3.2

The student observes, describes, and records daily and seasonal weather changes.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Low Level Process Questions

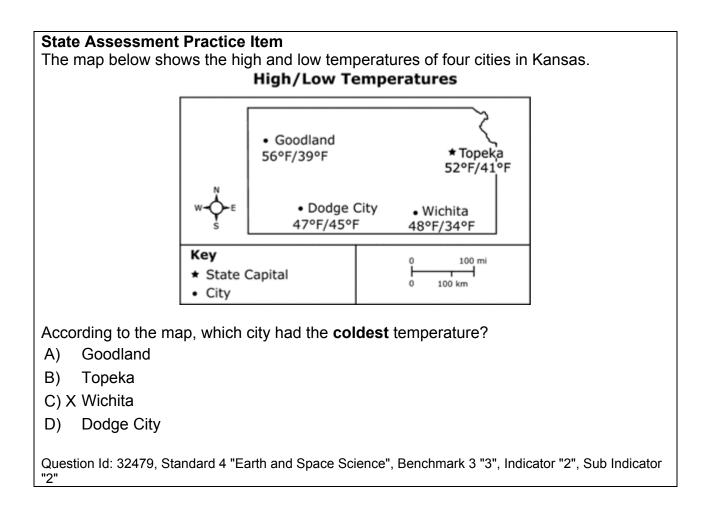
Instructional Examples

- Use Kansas weather patterns.
- Do not use barometers, dew point, wind chill, humidity, atmospheric pressure, or wind sheer.
- What are the best tools to use when collecting data about rainfall and temperature?
- What is the best way to tell someone what the weather in Kansas is like in the winter?
- Record weather observations using simple instruments (metric rain gauge, Celsius thermometer, etc.).

Item Specification

- a. Identify appropriate tools used to collect weather data. (i.e., rain gauge, thermometer, and weather vane or wind sock used to determine rainfall, temperature, and wind direction).
- b. Describe daily changes in temperature.
- c. Read and describe weather conditions based on data presented in simple weather maps that include temperature, wind speed, and type of precipitation. (DO NOT include fronts, pressure, isobars, etc.)
- d. Describe seasonal changes in terms of both temperature and type of precipitation.
- e. Understand why weather observations over time should be done under the same conditions if they are to be compared (e.g., time of day, location, type of equipment).

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▲ S.4.5.1.1

The student identifies a simple design problem (designs a plan, implements the plan, evaluates the results, makes changes to improve the product, and communicates the results).

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Low Level Process Questions

Instructional Examples

- Only use technology that is understood by a fourth grade student in Kansas.
- A student designed an experiment to test what makes a whirlybird (helicopter) fall faster. Which would affect how fast the whirlybird falls?
- A student worked to design an airplane that flies the farthest. She made the first one out of notebook paper. It did not fly very far. She made the second airplane using heavy construction paper, paperclips for weight, and folded the plane differently. It flew a long way. How can she test what made the second plane fly farther than the first airplane?
- Try different kinds of tools for making the biggest bubbles or the longest lasting bubbles.
- Design and fly a paper airplane that makes one loop before landing.

Item Specification

- a. Identifies and states a design problem. (e.g., Which of these questions was the investigation designed to solve? Which of these states a design problem?)
- b. Chooses the best design from alternatives. (e.g., Which of these is the best design plan for a tree house ladder?)
- c. Chooses the most appropriate material for a design. (e.g., Which material is the best/safest to use for the rungs of a tree house ladder?)
- d. Explain the reason for a feature of a common design. (e.g., Why are door knobs on the edge of the door? Why do cups have handles, but glasses don't?)
- e. Choose the most important characteristics for a material or part that is to perform a particular function in a design. (The most important properties of the material from which bicycle tires are made are...strength and flexibility.)
- f. Evaluate the results of testing a design (identifying what did and did not work well).
- g. Describe changes to a design to improve the product based on the results of testing.
- h. Items should assess the design process as much as possible and the physical science aspects of the design as little as possible.

				5. Sci. & Tech.		
KSDE September 2007						

State Assessment Practice Item The picture below shows a common design for a coffee cup.



Why do most coffee cups have handles, but most drinking glasses do not?

A) Coffee cups are heavier than glasses.

B) X Coffee cups are often used for hot drinks.

C) Coffee cups are too big around to hold onto.

D) Coffee cups are easier to tip over than glasses.

Question Id: 32490, Standard 5 "Science and Technology", Benchmark 1 "1", Indicator "1", Sub Indicator "1"

		5.			
		Sci. & Tech.			
KSDE September 2007					

▲ S.4.6.1.1

The student discusses the nutritional value of various foods and their contribution to health.

Official Test Specifications

- Multiple Choice
- Pictures
- Short Passages
- Do not use proper names
- Low Level Knowledge Questions

Instructional Examples

- Ask questions about the nutritional information found on food labels.
- Discuss healthy foods.
- Describe a healthy snack, breakfast, lunch, and supper.
- Which snack is the best healthy choice?
- The 4th grade class is planning a healthy snack for their reading party. Which is the healthiest choice?
- Read and compare nutrition information found on labels; discuss healthy foods; make a healthy snack.

Item Specification

- a. Identify types of foods that make up a healthy diet and types of food that should be avoided in large amounts.
- b. Choose the healthiest menu from a list of choices. Design a healthy menu from a list of foods.
- c. Analyze the ingredients label of a food product and explain the relationship of the data for calories, fat, cholesterol, carbohydrates, and protein to personal health.
- d. Choose the healthiest food from a group by comparing ingredients labels to determine the best food choice. (Provide the student with the criteria the decision should be based on to determine the "best.")
- e. Relate appropriate calorie intake to activity level. (Everyone needs a basic amount of calories every day to maintain health.)
- f. Know that some foods contain more calcium and iron than others and that these minerals are needed for healthy bodies (i.e., calcium for bones, iron for blood).
- g. Know that good or bad nutrition choices have immediate effects (e.g., low energy level from skipping breakfast) and long-term effects (e.g., susceptibility to disease, obesity).
- f. DO NOT assess knowledge of specific requirements of any specific nutrient such as vitamins or minerals.

State Assessment Practice Item

Which breakfast is **best** for a person's health?

- A) fried eggs, bacon, soda
- B) toast, butter, hot chocolate
- C) X oatmeal, banana, low fat milk
- D) doughnut, whole milk, sausage

Question Id: 32516, Standard 6 "Science in Personal and Environmental Perspectives", Benchmark 1 "1", Indicator "3", Sub Indicator "3"

6. Perspectives