

2010

FCAT

Florida Comprehensive Assessment Test®

# Grade 5 FCAT Science Sample Answers

This book contains the answers to the FCAT Science sample test questions. It also gives the Sunshine State Standards benchmark assessed by each item on the sample test. For multiple-choice items, the reason an answer choice is incorrect (distractor rationale) is provided. Multiple-choice items are scored by awarding one point for each correct answer.

The intent of these sample test materials is to orient teachers and students to the types of questions on FCAT tests. By using these materials, students will become familiar with the types of items and response formats that they will see on the actual test. The sample test materials are not intended to demonstrate the length of the actual test, nor should student responses be used as an indicator of student performance on the actual test. Additional information about test items can be found in the *FCAT Test Item Specifications* at <http://fcat.fldoe.org/fcatis01.asp> and previously released FCAT tests at <http://fcat.fldoe.org/fcatrelease.asp>.

**1 The correct answer is D (sound).**

Strand: B—Energy

Benchmark: SC.B.1.2.2 The student recognizes various forms of energy (e.g., heat, light, and electricity). Also assesses SC.B.1.2.3 The student knows that most things that emit light also emit heat. SC.B.1.2.4 The student knows the many ways in which energy can be transformed from one type to another. SC.B.1.2.5 The student knows that various forms of energy (e.g., mechanical, chemical, electrical, magnetic, nuclear, and radiant) can be measured in ways that make it possible to determine the amount of energy that is transformed. SC.B.1.2.6 The student knows ways that heat can move from one object to another.

An understanding of types of energy is needed to answer this question. Sound is a form of energy that travels in waves. When the bell vibrates, it produces sound waves.

**Distractor Rationale**

- A. Chemical energy is stored in compounds and can be released as compounds react. The vibration of the bell does not involve chemical energy.
- B. Heat is a form of energy that can be produced by movement, but the vibrations of the bell did not transmit a message in the form of heat energy.
- C. Light is a form of energy that travels in waves, but light energy is not released by the vibration of the bell.

**2** The correct answer is G (new moon).

Strand: E—Earth and Space

Benchmark: SC.E.1.2.2 The student knows that the combination of the Earth's movement and the moon's own orbit around the Earth results in the appearance of cyclical phases of the moon.

An understanding of moon phases is needed to answer this question. The picture shows a model of the Moon between Earth and the Sun; therefore, the lit side of the Moon is facing away from an observer on Earth. This arrangement is seen as a new moon.

**Distractor Rationale**

- F. A full moon would be seen if Earth were in the middle position of this model (between the Moon and the Sun), so that the entire lit side of the Moon could be seen by an observer on Earth.
- H. A first-quarter moon would be seen if the Moon were to the side of Earth (forming a right angle of Sun-Earth-Moon) in this model, so that only half of the lit side could be seen by an observer on Earth.
- I. A third-quarter moon would be seen if the Moon were to the side of Earth (forming a right angle of Sun-Earth-Moon) in this model, so that only half of the lit side could be seen by an observer on Earth.

**3 The correct answer is B (June).**

Strand: E—Earth and Space

Benchmark: SC.E.1.2.1 The student knows that the tilt of the Earth on its own axis as it rotates and revolves around the sun causes changes in season, length of day, and energy available.

An understanding of the relationship between the movement of Earth and the seasons is needed to answer this question. Because Earth's axis is tilted, the amount and intensity of direct sunlight reaching a given location changes as Earth revolves around the Sun. The Northern Hemisphere receives more direct sunlight for a longer period of time in the summer when the hemisphere is tilted toward the Sun. The summer solstice, which occurs in June, is the day with the greatest amount of direct sunlight in the Northern Hemisphere.

**Distractor Rationale**

- A. In March the Northern Hemisphere is tilted neither toward nor away from the Sun. The spring equinox occurs in March in the Northern Hemisphere.
- C. In September the Northern Hemisphere is tilted neither toward nor away from the Sun. The autumnal equinox occurs in September in the Northern Hemisphere.
- D. The Northern Hemisphere receives the least direct sunlight in December. The winter solstice occurs in December in the Northern Hemisphere, when it is tilted away from the Sun.

**4** The correct answer is I (50 mL graduated cylinder).

Strand: A—The Nature of Matter

Benchmark: SC.A.1.2.1 The student determines that the properties of materials (e.g., density and volume) can be compared and measured (e.g., using rulers, balances, and thermometers).

Understanding the use of appropriate laboratory equipment and precision of measurement is needed to answer this question. It is important to use correctly calibrated equipment in the appropriate size for a specific measurement. To measure exactly 20 mL of water, the best choice is a graduated cylinder with a total volume near the desired measurement.

**Distractor Rationale**

- F.** A 250 mL beaker is too large to measure 20 mL accurately. The desired volume is likely to be below the first marked measurement. The graduations (markings) on a beaker are not precise.
- G.** A 2 mL dropper would not measure 20 mL accurately because the volume is not marked on the dropper. Using the dropper would also require several refills.
- H.** A 30 mL test tube is an appropriate volume, but test tubes do not have volume markings and would not accurately measure 20 mL.

- 5** The correct answer is C (where there is plenty of water available).

Strand: G—How Living Things Interact with Their Environment

Benchmark: SC.G.1.2.2 The student knows that living things compete in a climatic region with other living things and that structural adaptations make them fit for an environment.

An understanding of the relationship between plant adaptations and water loss is needed to answer this question. The waxy layer reduces evaporation from the leaves, which is important in areas where water is limited or where evaporation rates would otherwise be high. A plant without the adaptation of waxy leaves would most likely be found in areas where water loss is not a particular threat.

**Distractor Rationale**

- A. Plants without waxy leaves may not grow successfully where it is very cold at night. Being very cold at night does not mean that overall evaporation rates would be low. Deserts, for instance, may have hot days and cold nights.
- B. Plants without waxy leaves would not grow successfully where it is very hot during the day. Areas that are very hot during the day will have high rates of evaporation and, therefore, be likely to have plants with thick, waxy layers on their leaves.
- D. Plants without waxy leaves would not grow successfully where there is very little water available. Plants in dry areas are likely to be adapted to limit water loss by having thick, waxy layers on their leaves.

**6 The correct answer is H (the function of the animal cell).**

Strand: F—Processes of Life

Benchmark: SC.F.1.2.4 The student knows that similar cells form different kinds of structures.

An understanding of the relationship between structure and function in animal cells is needed to answer this question. The cells shown are all found in animals, but the three types have different shapes as a result of their different functions. Nerve cells transmit electrical impulses; muscle cells contract; and red blood cells transport oxygen as they move through narrow vessels.

**Distractor Rationale**

- F. The age of the animal may affect the function of individual cells but does not determine the shape of entire types of cells.
- G. Although an animal's diet is related to the shape of its teeth, what the animal eats for food does not determine the shape of different types of cells.
- I. Whether the animal is male or female does not determine the shape of different types of body cells. Both male and female animals have all three of these types of cells.

**7** The correct answer is B (energy).

Strand: G—How Living Things Interact with Their Environment

Benchmark: SC.G.1.2.5 The student knows that animals eat plants or other animals to acquire the energy they need for survival.

Knowledge that animals receive energy from the food they eat is needed to answer this question. Plants use energy from sunlight to convert carbon dioxide and water into food (stored energy) and oxygen. In the Everglades ecosystem described, the deer are primary consumers that eat grass, obtaining that stored energy.

**Distractor Rationale**

- A. The grass does not provide enough water to satisfy the deer's needs. Water is used by the plant during photosynthesis.
- C. The grass does not provide sunlight to the deer. Sunlight is necessary to provide energy for photosynthesis by the grass.
- D. The grass does not provide carbon dioxide to the deer. Carbon dioxide is used by grass for photosynthesis and is present in the atmosphere. Grass releases oxygen as a product of this process.

**8** The correct answer is F (friction).

Strand: C—Force and Motion

Benchmark: SC.C.2.2.4 The student knows that the motion of an object is determined by the overall effect of all of the forces acting on the object. Also assesses SC.C.2.2.2 The student knows that an object may move in a straight line at a constant speed, speed up, slow down, or change direction dependent on net force acting on the object. SC.C.2.2.3 The student knows that the more massive an object is, the less effect a given force has.

An understanding of the relationship between forces is needed to answer this question. When the board is turned upside down, the nail will only stay in place if the forces are balanced. Gravity is pulling the nail down, and friction is acting in the opposite direction.

**Distractor Rationale**

- G. Gravity is pulling the nail down as it hangs upside down in the board. This would tend to pull the nail out of the board rather than keep it in place.
- H. Although the nail may be magnetic, there are no magnetic attractions in the situation given.
- I. Weight does not act to keep the nail in place in the board. The weight of the nail is the measurement of the force due to gravity on the mass of the nail.

**9** The correct answer is C (water dripping).

Strand: D—Processes that Shape the Earth

Benchmark: SC.D.1.2.4 The student knows that the surface of the Earth is in a continuous state of change as waves, weather, and shifts of the land constantly change and produce many new features. Also assesses SC.D.1.2.1 The student knows that larger rocks can be broken down into smaller rocks, which in turn can be broken down to combine with organic material to form soil. SC.D.1.2.2 The student knows that 75 percent of the surface of the Earth is covered by water. SC.D.1.2.5 The student knows that some changes in the Earth’s surface are due to slow processes and some changes are due to rapid processes.

Knowledge of the processes that produce caves and cave formations is needed to answer this question. Groundwater carrying dissolved minerals deposits the minerals as it drips from the ceiling of the cave. Over time the minerals build up to produce stalactites and other formations.

**Distractor Rationale**

- A. Stalactites are not formed by the action of earthquakes. Earthquakes cause movement of rock. This may cause stalactites to fall from the ceiling of a cave.
- B. Stalactites are not formed by wind erosion. Because caves are subsurface features, there is too little airflow to cause wind erosion.
- D. Animal burrowing is not a significant factor in the formation of stalactites.

- 10** The correct answer is F (Planets in other galaxies are too far away).

Strand: E—Earth and Space

Benchmark: SC.E.2.2.1 The student knows that, in addition to the sun, there are many other stars that are far away.

An understanding of the distances involved in space travel is needed to answer this question. After the Sun, the closest star to Earth is 4.2 light-years away. The closest galaxy is thousands of light-years away.

**Distractor Rationale**

- G. Gravity attracts all objects to one another, regardless of location. Planets in other galaxies have gravity.
- H. Temperature conditions on planets in other galaxies are unknown but probably range from very cold to very hot, with hospitable temperatures in between.
- I. The absence of solid landing surfaces might make landing difficult but would not prevent travel to a planet in another galaxy.

- 11** The correct answer is B (the process of photosynthesis).

Strand: G—How Living Things Interact with Their Environment

Benchmark: SC.G.1.2.3 The student knows that green plants use carbon dioxide, water, and sunlight energy to turn minerals and nutrients into food for growth, maintenance, and reproduction.

An understanding of the process of photosynthesis is needed to answer this question. Plants use sunlight as an energy source to convert carbon dioxide and water into food. The bubbles observed on the leaves are bubbles of oxygen released during this process.

**Distractor Rationale**

- A. Evaporation does not cause air bubbles to form on the leaves. Water from the goldfish bowl is converted to water vapor by the process of evaporation.
- C. Air bubbles are not formed on leaves because goldfish breathe on the plants. Although goldfish use oxygen and release carbon dioxide, they do not breathe out bubbles of gas.
- D. An increase in water temperature will not result in the formation of air bubbles on the leaves. Because the goldfish bowl was placed in direct sunlight, the water temperature would increase; however, this does not cause the formation of bubbles of gas on the leaves of the underwater plants.

**12** The correct answer is H (which type of bread is gone first).

Strand: H—The Nature of Science

Benchmark: SC.H.1.2.1 The student knows that it is important to keep accurate records and descriptions to provide information and clues on causes of discrepancies in repeated experiments.

An understanding of using science processes when making observations and collecting data to verify a hypothesis is needed to answer this question. Three different types of bread are provided in equal amounts. Arnella is making observations to determine which type of bread the robins like to eat. To do this, she needs to observe which type is the first to be eaten entirely.

**Distractor Rationale**

- F. When the robins come to eat is a variable, but it does not provide information about their preferences for a particular type of bread.
- G. How many robins come to eat is a variable that may affect how quickly the bread is eaten, but it does not provide information about preference for a particular type of bread.
- I. How long until all the bread is gone is a variable that can be used to answer a different question (for example, “How quickly do robins eat 30 grams of bread?”), but it does not provide information about the robins’ preference for a particular type of bread.

**13** The correct answer is B (Bobcat).

Strand: F—Processes of Life

Benchmark: SC.F.1.2.3 The student knows that living things are different but share similar structures.

An understanding of the relationship between diet and adaptations is needed to answer this question. Animals with similar diets generally have similar teeth. Based on the information in the chart, the Florida panther is a carnivore, as is the bobcat. They both have teeth adapted for grabbing and tearing.

**Distractor Rationale**

- A. The black bear is an omnivore that eats nuts, acorns, and insects. It has a variety of teeth adapted for crushing and chewing as well as cutting and tearing.
- C. A cow is a grazing animal that eats corn, grass, and hay. It has teeth adapted for chewing and grinding.
- D. A raccoon is an omnivore that eats fruit, acorns, frogs, and fish. It has a variety of teeth for crushing and chewing as well as cutting and tearing.





**FLORIDA DEPARTMENT OF EDUCATION**  
**www.fldoe.org**

**Copyright Statement for This Office of Assessment Publication**

Authorization for reproduction of this document is hereby granted to persons acting in an official capacity within the Uniform System of Public K–12 Schools as defined in Section 1000.01(4), Florida Statutes. The copyright notice at the bottom of this page must be included in all copies.

All trademarks and trade names found in this publication are the property of their respective owners and are not associated with the publishers of this publication.

This publication is provided by the Florida Department of Education to Florida public schools free of charge and is not intended for resale.

Permission is NOT granted for distribution or reproduction outside of the Uniform System of Public K–12 Schools or for commercial distribution of the copyrighted materials without written authorization from the Florida Department of Education. Questions regarding use of these copyrighted materials should be sent to the following:

The Administrator  
Office of Assessment  
Florida Department of Education  
Tallahassee, Florida 32399-0400



FL00001743

Copyright © 2009  
State of Florida  
Department of State



The Florida Department of Education and its test contractors currently employ strategies to protect the environment in the production and destruction of FCAT materials. The Department encourages schools and districts to recycle non-secure FCAT interpretive publications after use.