To the Teacher

Macmillan/McGraw-Hill Standards Test Preparation for TCAP is designed to familiarize students with standardized testing and to review the concepts covered in the Tennessee Science Standards.

About This Book

The test items in this book will accustom students in a grade-appropriate manner with standardized testing in preparation for the Tennessee Comprehensive Assessment Program (TCAP). Each test item is correlated to a specific State Performance Indicator (SPI), or Grade Level Expectation (GLE) in the case of Grades 1 and 2.

- **Correlation Charts:** The first correlation chart illustrates how the SPIs or GLEs covered in this book align with lessons in Macmillan/McGraw-Hill *Tennessee Science A Closer Look*. The second chart illustrates how the SPIs or GLEs align with Macmillan/McGraw-Hill *Key Concept Cards* and other materials that can be used for intervention if test results indicate that students are having difficulty with particular SPIs or GLEs.

- **Diagnostic Tests:** Two Diagnostic Tests, which can be used as pretests or posttests, are provided. The Diagnostic Tests are designed to simulate the statewide TCAP tests that students will be taking. Each Diagnostic Test consists of multiple-choice questions that cover SPIs or GLEs spanning all 12 Conceptual Strands in Life Science, Earth and Space Science, and Physical Science. Inquiry and Technology & Engineering SPIs or GLEs are embedded within each test.

- **Standards Tests:** These practice tests give students the opportunity to answer questions that focus on each of the Conceptual Strands of the Tennessee Science Standards. One test is provided for each of the 12 Life Science, Earth and Space Science, and Physical Science Conceptual Strands. Inquiry and Technology & Engineering SPIs or GLEs are embedded within each test. These tests can also be used as pretests and posttests, or as homework assignments or extra practice.
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Directions: On your answer sheet, mark the correct answer.

1. Which is true about nonrenewable resources?
   A. They can be easily replaced.
   B. They are always found deep underground.
   C. They do not cause pollution.
   D. They cannot be easily replaced.

2. Iron filings were sprinkled around a magnet.
   Where is the magnetic attraction strongest?
   F. 1
   G. 2
   H. 3
   J. 4

3. In a series circuit, the electric current
   A. has many paths
   B. has one path
   C. only flows to a light bulb
   D. only travels away from a battery
4. Look at the picture below.

What type of behavior is the plant exhibiting?

F. migration  
G. tropism  
H. hibernation  
J. geotropism

5. Heat is the movement of

A. energy  
B. matter  
C. ice  
D. liquid
6. Look at the picture of a plant cell.

Green plants use certain cell parts to make their own food. Which best describes why animals cannot make their own food?

F. Animal cells do not have chloroplasts.
G. Animal cells do not have vacuoles.
H. Animal cells do not have cytoplasm.
J. Animal cells do not have cell walls.

7. Erin drove from Memphis to Johnson City in 9 hours. What information does she need in order to calculate her speed?

A. mass
B. distance
C. velocity
D. acceleration
8. Which causes water to evaporate?
   F. heat  
   G. darkness  
   H. cold  
   J. humidity

9. Which is an example of a mineral resource?
   A. water  
   B. oxygen  
   C. wood  
   D. zinc

10. A force can cause an object to
    F. speed up or slow down  
    G. change its state of matter  
    H. go through a chemical reaction  
    J. get older or younger

11. Suppose that a nonpoisonous insect looks just like a poisonous insect in the same habitat. This nonpoisonous insect uses
    A. hibernation  
    B. camouflage  
    C. migration  
    D. mimicry

12. Which of these most likely can cause a delta to form?
    F. deposition by wind  
    G. weathering  
    H. erosion by wind  
    J. deposition by water
13. Glass, water, and clear plastic allow most light to pass through them easily. Which word best describes these objects?

A. translucent  
B. refractive  
C. transparent  
D. opaque

14. Which thermometer shows the air temperature that would best melt ice?

A. thermometer A  
B. thermometer B  
C. thermometer C  
D. thermometer D

15. The revolution of the Moon around Earth causes

A. day and night  
B. the lunar phases  
C. the water cycle  
D. weather
16. Which is a characteristic of complete metamorphosis?

F. The young organism looks similar to the adult.
G. The nymph stage looks similar to the adult.
H. The young organism looks different from the adult.
J. The nymph stage looks different from the adult.

17. Which best describes what happens when light reaches translucent materials?

A. All of the light passes through.
B. Most of the light passes through and some is reflected.
C. The light is refracted at a 90° angle.
D. Some light passes through and some light is absorbed.

18. Which shows the proper order of the Moon’s phases?

F. third-quarter moon → new-moon → full-moon → first-quarter moon
G. new-moon → first-quarter moon → full-moon → third-quarter moon
H. new-moon → first-quarter moon → third-quarter moon → full-moon
J. full-moon → first-quarter moon → third-quarter moon → new-moon

19. The average condition of the atmosphere in a region over time is called

A. weather
B. climate
C. a front
D. humidity

20. What type of material reflects or absorbs all the light that strikes it?

F. concave
G. transparent
H. translucent
J. opaque
21 Which describes the struggle among living things to get the things they need to survive?

A  cooperation  
B  competition  
C  mutualism  
D  fertilization  

22 What can happen to living things when their habitat suddenly changes?

F  They can become extinct.  
G  They can change their body shape.  
H  They can make food from sunlight.  
J  They can eat rocks and soil.

23 As water particles at the surface of a lake begin to move faster and farther apart, what takes place?

A  condensation  
B  evaporation  
C  precipitation  
D  runoff

24 Caleb completed a 300-meter race. What is needed to calculate his speed?

F  his acceleration  
G  his velocity  
H  his mass  
J  his time

25 As electricity passes through the filament in a light bulb, it is changed into

A  heat and light  
B  light only  
C  heat only  
D  chemical energy
26 Clouds form during which stage of the water cycle?

- F evaporation
- G condensation
- H precipitation
- J transpiration

27 Which is a reason that an animal might become endangered?

- A The animal hibernates.
- B Its habitat is getting smaller.
- C The plant it eats grows faster.
- D The animal migrates to a larger habitat.

28 Marcel is able to observe the parts of a cell by using which instrument?

- F a telescope
- G a barometer
- H a microscope
- J an anemometer

29 Which is an example of a physical change?

- A rusting iron
- B burning paper
- C melting an ice cube
- D building a bonfire

30 Toby rolled a ball across a carpeted floor. Soon, the ball stopped. What most likely caused the ball to stop?

- F gravity
- G magnetism
- H condensation
- J friction
31 What tool would you use to measure an object’s length?

A thermometer  
B spring scale  
C beaker  
D ruler

32 What is a large mass of ice and rock that moves across the land called?

F an iceberg  
G a glacier  
H erosion  
J an ice cap

33 Look at the pictures below.

What do these pictures represent?

A fertilization  
B complete metamorphosis  
C incomplete metamorphosis  
D competition
34 Eva has a block of wood. She would like to measure its mass. Which tool would best help her with this task?

F a tape measure
G a balance
H a meterstick
J a graduated cylinder

35 To determine motion, you have to compare the movement of an object to

A a fixed reference point
B a moving reference point
C a similarly moving object
D an object on the horizon

36 Which of the following is equivalent to 32° F?

F 0° C
G 100° C
H 212° C
J 180° C

37 Examine the path of the light beam below.

How is this surface affecting the beam of light?

A The surface is reflecting the beam.
B The surface is refracting the beam.
C The surface is absorbing the beam.
D The surface is not affecting the beam.
38. An area is described as having at least 75 centimeters of rain a year, warm summers, and cold winters. This description is called the area’s

F weather  
G climate  
H humidity  
J water cycle

39. During the moon phase cycle, part of the Moon is in shadow because

A the Sun has set on Earth  
B Earth is casting a shadow on that part of the Moon  
C we can only see a fraction of the Moon that is lit by the Sun  
D the Moon is not producing light from that part

40. Sylvia did an experiment with an electromagnet. Below is the data she collected.

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What can you infer from the data in this table?

F Thirty coils will hold 50 paperclips.  
G Using more coils increases the strength of the electromagnet.  
H Fifteen coils hold twice as many paper clips as 10 coils.  
J The more coils, the fewer paper clips the electromagnet will hold.

41. Jada is standing on a sidewalk when her friend Miyako rides past on her skateboard. What is true about this motion?

A Jada is moving relative to Earth.  
B Miyako is moving relative to Earth.  
C Neither girl is moving relative to Earth.  
D Both girls are moving relative to Earth.
42 Look at the picture of a circuit.

What conclusion can you correctly draw?

F  The bulb is connected to the battery.
G  This is not a complete circuit.
H  The bulb will not light.
J  The battery is dead.

43 A certain species of bird no longer exists. What most likely explains how this happened?

A  Plants in the area stopped growing.
B  Most of the worms in the soil died.
C  The birds could not make more of their kind.
D  Foxes were introduced into the area.
44 Look at the diagram of a food web in a salt marsh. It shows the feeding relationships of some of the organisms that live in the marsh.

What is the role of the marsh hawk in this food web?

- F scavenger
- G carnivore
- H producer
- J herbivore

45 What provides the energy for the water cycle?

- A Earth
- B the Sun
- C gravity
- D evaporation

46 Which life process is needed for the survival of a species?

- F digestion
- G respiration
- H reproduction
- J circulation
47. In the 1800s, rabbits were brought to Australia. Very few animals ate the rabbits. What most likely happened as a result?

A. The rabbit population grew and the plant population grew.
B. The rabbit population got smaller and the plant population grew.
C. The rabbit population grew and the plant population got smaller.
D. The populations of other animals that eat plants grew.

48. Why does a compass point to the north?

F. The needle is a magnet and it aligns itself with Earth’s magnetic field.
G. Earth is a magnet that attracts all metal objects to the north.
H. Earth’s South Pole does not have a magnetic pull.
J. All magnets have a north and south pole.

49. Where does the energy for most ecosystems come from?

A. producers
B. decomposers
C. herbivores
D. the Sun

50. High-speed maglev trains (magnetic levitation trains) are propelled by the interaction of magnetism and

F. sound
G. light
H. electricity
J. heat
Directions: On your answer sheet, mark the correct answer.

1. Which pair of structures is found in both plant and animal cells?
   A. nucleus and chloroplast
   B. cell membrane and cell wall
   C. nucleus and cell membrane
   D. cell wall and chloroplast

2. Green plants use certain cell parts to make their own food. Which best describes why animals cannot make their own food?
   F. Animal cells do not contain chlorophyll.
   G. Animals do not use water.
   H. Animals need more energy to survive.
   J. Animals do not receive sunlight.

3. What is correct about the cell wall?
   A. It is found in both plant and animal cells.
   B. It is made of chlorophyll.
   C. It protects the cell.
   D. It replaces the cell membrane.

4. All cells are enclosed by the
   F. cell wall
   G. cell membrane
   H. vacuole
   J. nucleus

5. Food, water, and wastes are stored in which cell structure?
   A. vacuole
   B. chloroplast
   C. mitochondrion
   D. nucleus
Directions: On your answer sheet, mark the correct answer.

1. An insect has the same color as the leaf on a tree. This makes it difficult for predators to see the insect easily. This is an example of
   A. hibernation
   B. migration
   C. mimicry
   D. camouflage

2. What term describes the interaction between organisms that struggle to get the things they need to survive?
   F. predation
   G. competition
   H. cooperation
   J. interdependence

3. Living things that catch, kill, and eat other living things are called
   A. prey
   B. herbivores
   C. decomposers
   D. predators

4. Which statement about predators is correct?
   F. Predators help increase the size of prey populations.
   G. Predators help maintain balance in an ecosystem.
   H. When predators are absent, prey species disappear.
   J. All predators are herbivores.
When rabbits were introduced to Australia in the mid-1800s, they had few predators. What was a likely outcome of that introduction?

A  The rabbit population decreased very quickly because they could not find food.
B  The rabbits consumed plants that other animals depended on in the ecosystem.
C  More predators moved into the ecosystem.
D  More predators moved out of the ecosystem.
Directions: On your answer sheet, mark the correct answer.

1. An organism that only eats plants is best described as a(n)
   - A omnivore
   - B carnivore
   - C decomposer
   - D herbivore

2. What is the correct order, from bottom to top, of the feeding levels in an energy pyramid?
   - F producers → herbivores → carnivores
   - G producers → carnivores → herbivores
   - H producers → decomposers → carnivores
   - J carnivores → herbivores → producers

3. Look at the food web below.

What will most likely happen if the fish population decreases?
   - A The penguin population will decrease.
   - B The whale population will decrease.
   - C The seal population will decrease.
   - D The shrimp population will decrease.
4 Look at the diagram of a food web in a salt marsh. It illustrates the feeding relationships of some of the organisms that live in the marsh.

What is the role of the marsh hawk in this food web?

F scavenger  
G predator  
H producer  
J decomposer

5 Look at the energy pyramid below.

Which is true?

A The number of organisms at each level decreases because there is less energy available.  
B There is more energy available at higher levels of the pyramid.  
C There is no difference between the number of organisms at the top and at the bottom because the available energy does not change.  
D Organisms at the higher levels receive more energy than the organisms at lower levels.
Directions: On your answer sheet, mark the correct answer.

1 Which statement about reproduction and the survival of a species is correct?

A A species that reproduces every year has a good chance of surviving.
B If a species reproduces too much, it is in danger of becoming extinct.
C A species that reproduces only once or twice in ten years has a good chance of surviving.
D If a population reproduces slowly, it will be better able to adapt to changes in an ecosystem.

2 A certain species of fish no longer exists. What is the most likely explanation for how this happened?

F The water in the river stopped flowing.
G One of their food sources went extinct.
H The fish was not successful at reproducing.
J Sharks were introduced into the area.

3 Of all the life processes of an organism, which is essential for the survival of a species?

A reproduction
B growth and development
C removing waste products
D finding food

4 Which statement most likely explains why a species no longer exists?

F The reproduction rate of the species increased.
G There were severe storms in the area in which the species lived.
H The species was not successful at adapting to changes in its environment.
J Wolves were introduced into the area in which the species lived.
5 Look at the organisms in the diagram below.

Each organism produces large numbers of offspring when it reproduces. Which statement correctly explains why?

A. These organisms reproduce only once every five years.
B. This reproductive strategy increases the chances of their species surviving.
C. The organisms have enough water.
D. There is no relationship between number of offspring and species survival.

6 Which is a characteristic of incomplete metamorphosis?

F. The organism has a larval stage in which its appearance is very different from the adult.
G. The nymph develops inside a pupa.
H. After hatching from an egg, the nymph goes through a series of molts.
J. After the adult produces eggs, larvae develop inside a pupa.
7. Look at the pictures below.

What is the correct order for the development of a butterfly?

A. W → Z → X → Y
B. X → Z → Y → W
C. Y → Z → X → W
D. Z → X → Y → W

8. Examine the illustrations in question 7. Which letter shows the larva stage in the butterfly’s life cycle?

F. W
G. X
H. Y
J. Z

9. Which insects undergo incomplete metamorphosis?

A. butterflies, beetles, flies
B. grasshoppers, butterflies, termites
C. termites, butterflies, dragonflies
D. termites, praying mantises, dragonflies
Look at the drawing below.

What stage of metamorphosis is shown above?

F  nymph
G  larva
H  pupa
J  adult
Directions: On your answer sheet, mark the correct answer.

1 Which adaptation is most useful in a polar region?

A long, thin legs
B a thick layer of fat
C good eyesight
D good hearing

2 Salmon have strong muscles in their tail for swimming in fast-moving water. Where would you expect to find salmon?

F the deep ocean
G a wetland
H a river
J a small pond or lake

3 Geese fly south for the winter. Bats hibernate in caves. These are both examples of

A learned behaviors
B camouflage
C behavioral adaptations
D competition
4 Look at the diagram of a plant below.

What tropisms is this organism responding to?

F The stem of the seedling is growing toward the sunlight. The roots of the seedling are growing toward gravity.
G The stem of the seedling is growing toward gravity. The roots of the seedling are growing toward water.
H The stem of the seedling is growing toward water. The roots of the seedling are growing toward gravity.
J The stem and roots of the seedling are growing toward sunlight.

5 A desert is a sandy, rocky biome with very little rainfall. Based on this information, which adaptation would benefit a desert plant?

A thick, waxy leaves
B large, thin leaves
C shallow roots
D a tall, woody stem

6 Suppose an ecosystem changes, and one kind of organism cannot adapt to the change. This organism is most likely to

F migrate
G produce more offspring, which may be able to adapt
H become extinct
J change the ecosystem to the way it was

SPI 0407.5.1
SPI 0407.5.2
7. In 1914, the last passenger pigeon in existence died. What can you conclude about this animal?
   A. The passenger pigeon is camouflaged so well that it cannot be found.
   B. All passenger pigeons are gone forever.
   C. There are only a few passenger pigeons left in the world.
   D. The passenger pigeon migrated to a place where it cannot be found.

8. The process by which a species passes out of existence is known as
   F. complete metamorphosis
   G. endangerment
   H. extinction
   J. predation

9. Which can cause organisms to become endangered?
   A. protection
   B. habitat destruction
   C. an increase in reproduction
   D. metamorphosis

10. Which is an extinct species?
   F. Bengal tiger
   G. common pigeon
   H. Teleoceras
   J. African elephant
Directions: On your answer sheet, mark the correct answer.

1. Look at the picture of the Moon below.

Based on the phases of the Moon, what will it look like in one month?

A. It will be look the same.
B. It will be a third-quarter moon.
C. It will not be visible.
D. It will be a full moon.

2. Refer to the illustration in question 1. Which phase of the Moon does it show?

F. crescent
G. new
H. full
J. gibbous

3. Which of the following shows a correct sequence of moon phases?

A. new moon → first-quarter moon → full moon → third-quarter moon
B. new moon → first-quarter moon → third-quarter moon → full moon
C. crescent moon → gibbous moon → new moon → full moon
D. full moon → crescent moon → gibbous moon → new moon
4 Look at the picture below.

During which part of the Moon’s orbit around Earth will people see a full moon?

F when the Moon is farthest from the Sun
G when the Moon is nearest to the Sun
H when the Moon is the same distance from the Sun and Earth
J when the Sun, Moon, and Earth are lined up

5 Ariel wants to use her binoculars to study the Moon’s surface. During which phase of the Moon would it be impossible for her to do this?

A full moon
B crescent moon
C new moon
D gibbous moon

6 The Moon’s phases are caused by

F Earth’s revolution around the Sun
G the Moon’s revolution around Earth
H changes in the light from the Sun
J changes in the light produced by the Moon

7 Which statement about the Moon’s phases is true?

A The phases are caused by Earth’s shadow on the Moon.
B As the Moon orbits Earth, it reflects the Sun’s light differently, producing the phases.
C Half of the Moon is always lit by the Sun.
D Different parts of the Moon produce light at different times during the moon phase cycle.
8. How many days are required for the Moon’s orbit of Earth?

- F 10
- G 29
- H 100
- J 365

9. Which is true about the movements of the Moon and Earth?

- A The Moon revolves around Earth and the Sun revolves around Earth.
- B Earth revolves around the Moon and the Sun.
- C The Moon revolves around Earth and Earth revolves around the Sun.
- D Earth revolves around the Moon and the Sun revolves around Earth.

10. The Moon appears to shine in the sky because

- F it reflects the light produced by Earth
- G it reflects the light people produce on Earth
- H it reflects the light from the Sun
- J it produces its own light
Standard 7
Earth

Directions: On your answer sheet, mark the correct answer.

1 Which landform is shaped mostly through erosion by water?
   A a canyon
   B a sand dune
   C a delta
   D an island

2 What is the best definition of weathering?
   F Weathering occurs when moving water, ice, or wind moves rocks and soil to other places.
   G Weathering is the only cause of changes in Earth’s rocky surface over billions of years.
   H Weathering is when water, ice, and wind break down rock into smaller and smaller pieces.
   J Weathering is another term for mountain building.

3 All of these may cause erosion except
   A sunlight
   B water
   C wind
   D ice

4 Which event causes a slow change to occur on Earth’s surface?
   F a landslide
   G an earthquake
   H a glacier
   J a flash flood
5 Which of the following is an effect of erosion?
A Rocks are formed.
B Soil is formed.
C Rocks are transported to new places.
D Rocks are broken down where they are exposed to the outdoors.

6 Which material is an example of a mineral resource?
F gold
G plastic
H wood
J water

7 Tennessee is one of the leading producers of
A soil
B compost
C zinc
D gold

8 Most of the energy we use is produced using
F fossil fuels
G sunlight
H electricity
J trees

9 What is one way to help conserve Earth’s nonrenewable resources?
A cut down more trees
B use more water
C reduce the use of fossil fuels
D drain wetlands
10. Which of the following is an Earth material used to solve a human problem?

F. marble  
G. concrete  
H. brick  
J. plastic

SPI 0407.T/E.I, 0407.7.2
Directions: On your answer sheet, mark the correct answer.

1. Which best explains precipitation?
   - A. Water vapor cools and changes into a liquid.
   - B. Water falls from clouds to the surface of Earth.
   - C. Water vapor rises into the atmosphere.
   - D. Water cools and turns into ice.

2. Which of the following statements is true?
   - F. Most of Earth’s water is in the form of water vapor.
   - G. Ice cannot exist in the upper atmosphere.
   - H. Earth has been recycling the same water for billions of years.
   - J. Rain is the only form of precipitation that falls from clouds.

3. What role does the Sun play in the water cycle?
   - A. It provides energy for the cycle.
   - B. It causes the clouds to rain.
   - C. It causes a warm front to move in.
   - D. It melts ice.

4. What is the correct order of the water cycle?
   - F. water evaporates → precipitation falls → water condenses
   - G. water evaporates → water condenses → precipitation falls
   - H. precipitation falls → water condenses → water evaporates
   - J. water condenses → water evaporates → precipitation falls
5. Look at the diagram below.

What happens in step 1 of this diagram?

A. precipitation
B. water cycle
C. condensation
D. evaporation

6. What is the most important factor in determining climate at a given location?

F. altitude
G. mountains
H. latitude
J. if the water cycle occurs there

7. Which human activity can influence climate?

A. finding fossils
B. destroying forests
C. starting a business
D. building bridges
8. The day-to-day conditions of the atmosphere are known as
   F. climate
   G. weather
   H. global winds
   J. precipitation

9. Which of the following does not determine a region's climate?
   A. distance from water
   B. the plants growing there
   C. global winds
   D. mountains

10. Seasonal climate changes are the result of
    F. Earth's tilt and revolution around the Sun
    G. the coming and going of ice ages
    H. the formation of sunspots
    J. Earth's rotation on its axis
Directions: On your answer sheet, mark the correct answer.

1. Kareem has a block of wood. He would like to measure its mass. Which tool should he use?
   - A  a tape measure
   - B  a pan balance
   - C  a yardstick
   - D  a graduated cylinder

2. Which tool would best measure the volume of sediment in a water sample?
   - F  a meterstick
   - G  a pan balance
   - H  a graduated cylinder
   - J  a thermometer

3. The temperature of water is measured using
   - A  a graduated cylinder
   - B  a thermometer
   - C  a pan balance
   - D  a spring scale

4. Polly is designing an experiment using wood sticks. She needs to measure the length of each stick. Which tool should Polly use to make these measurements?
   - F  a meterstick
   - G  a graduated cylinder
   - H  a spring scale
   - J  a pan balance
5. How can you measure the volume of a solid with an irregular shape?

A. Measure and multiply the solid’s length times its width times its height.
B. Place the solid on a pan balance.
C. Place the solid in a graduated cylinder and read the level of the solid’s top.
D. Place the solid in a graduated cylinder with water and measure the rise in water level.

6. The l unit used to measure volume is the

F. liter
G. newton
H. kilogram
J. millimeter

7. The kilogram and gram are units of

A. volume
B. mass
C. length
D. speed

8. What is the boiling point of water?

F. 212°C
G. 180°C
H. 100°C
J. 0°C
Which tool measures temperature?

A thermometer  B barometer  C pan balance  D beaker

One liter is equal to

F 10 milliliters  G 100 milliliters  H 1,000 milliliters  J 1/100 milliliters

Which of the following is not a sign of a physical change?

A change of shape  B change of state  C change of material  D change in texture

What is the term for changing from a gas to a liquid?

F melting  G evaporating  H condensation  J freezing
13 Janet noticed droplets of water on a spider web one morning. She saw on the morning news that it was cool and dry the night before. Which best describes Janet’s observations?

A  Water vapor from the air condenses on the web, forming water droplets.
B  It had rained the night before, but the weather reporter gave the wrong news.
C  Water from nearby trees leaked out onto the web.
D  Water from the ground evaporated on the web.

14 What is the effect of sweating on a hot day?

F  The evaporation of sweat cools your skin.
G  Sweat protects your skin from the Sun’s light.
H  Sweat makes you think you are in a pool of cool water.
J  No one knows.

15 An ice cube is removed from a freezer and placed on a table. Why does it melt?

A  The darkness of the freezer keeps it solid.
B  It will only melt if it wants to.
C  It is too warm outside the freezer.
D  It is too cold outside the freezer.
**Directions:** On your answer sheet, mark the correct answer.

1. Wayne’s hands are cold. Which is the best way for Wayne to warm his hands?

   A. Hold them above his head.
   B. Shake them in the air.
   C. Spread his fingers far apart.
   D. Rub them together.

2. Heat is

   F. the movement of energy
   G. stored energy found in fuels
   H. the temperature of a material
   J. the same as light energy

3. The Sun provides Earth with

   A. radiant energy
   B. chemical energy
   C. electrical energy
   D. magnetic energy

4. Gasoline is an example of which form of energy?

   F. electrical
   G. light
   H. chemical
   J. radiant
5 What energy conversion is involved in the operation of a toaster?

A  electrical energy to heat
B  electrical energy to light energy
C  chemical energy to heat
D  light energy to heat

6 Sharon wants to conduct an experiment in which she turns white light into colored light. Which tool should she use?

F  a mirror
G  a prism
H  a convex lens
J  a concave lens

7 Which best explains why objects can be seen?

A  Objects reflect light.
B  Light shines on objects.
C  Objects are made of matter.
D  Light refracts off objects.

8 An object that absorbs all colors of light and does not reflect any appears

F  blue
G  black
H  white
J  green

9 When light passes from water onto air, the light rays are

A  unchanged
B  reflected
C  refracted
D  stopped
10. A surface that absorbs all colors of light except red will appear
   F. black  
   G. white  
   H. green  
   J. red

11. What happens when light strikes opaque materials?
   A. All of the light passes through.  
   B. Most of the light passes through and some is reflected.  
   C. All of the light is absorbed or reflected.  
   D. Some light passes through and some light is absorbed.

12. Glass, water, and clear plastic allow most light to pass through. Which word best describes these objects?
   F. transparent  
   G. refractive  
   H. translucent  
   J. opaque

13. What happens when light strikes a clear glass window?
   A. Most of it bounces off and some of it passes through.  
   B. All of it is reflected.  
   C. Most of it passes through but is bent in many different directions.  
   D. Most of it passes through unbent.

14. What kind of material is wood?
   F. transparent  
   G. translucent  
   H. opaque  
   J. reflective
15  The roof of a house does not let any light through. The roof is made of materials that are

A  transparent
B  opaque
C  translucent
D  electromagnetic
Directions: On your answer sheet, mark the correct answer.

1. A place or object that is considered to be fixed so that the movement of another object can be determined is called a(n)
   
   A) inertial set
   B) frame of reference
   C) force
   D) background

2. To an observer in outer space, what is true about your motion?
   
   F) You are moving around the Sun.
   G) You are not moving at all.
   H) You are moving around the Moon.
   J) You stop and start moving.

3. An object’s motion depends on the observer’s
   
   A) mass
   B) velocity
   C) frame of reference
   D) inertia

4. Angelina is standing on a sidewalk when her friend Paolo rides past on his roller skates. What is true about this motion?
   
   F) Angelina is moving relative to Earth.
   G) Paolo is moving relative to Earth.
   H) Neither person is moving relative to Earth.
   J) Both people are moving relative to Earth.
5 Which of the following words would not be used to describe an object’s position?

A above  
B beside  
C decrease  
D across

6 Ryan kicked a ball across a grassy field. Soon, the ball stopped. What caused the ball to stop?

F friction  
G magnetism  
H condensation  
J gravity

7 Karim rides his bike to school every day. On windy days, it is harder for him to ride his bike. Why does Karim have a hard time riding his bike on windy days?

A The wind pushes the bike forward to help it accelerate.  
B The wind works against the force of pedaling.  
C Pedaling provides friction that makes the bike stay on the road.  
D Pedaling on a bumpy surface is more difficult than pedaling on a smooth surface.
Anna rolled a ten-pound bowling ball over the surfaces in the graph below. The graph shows how far the ball rolled over each surface.

What conclusion can Anna draw?

F  The heavier the bowling ball, the farther it will roll.
G  The lighter the bowling ball, the farther it will roll.
H  The less friction, the farther the ball will roll.
J  The more friction, the farther the ball will roll.

What question is Anna trying to answer according to the graph in question 8?

A  What effect does surface texture have on a bowling ball?
B  What effect does weight have on a bowling ball?
C  What effect does temperature have on a bowling ball?
D  What effect does surface area have on a bowling ball?

Cars often skid on icy roads. Why?

F  The smooth surface of the ice increases the friction between the car's tires and the road.
G  The smooth surface of the ice reduces the friction between the car's tires and the road.
H  People drive faster in icy weather.
J  There is less traffic on icy roads.
11. A marble rolls at a speed of 2 centimeters per second. If the speed remains constant, how far will the marble travel in 18 seconds?

A. 9 centimeters  
B. 18 centimeters  
C. 36 centimeters  
D. 180 centimeters

12. What is speed?

F. how fast an object travels  
G. how fast an object travels most of the time  
H. how fast an object's position changes during a minute  
J. how fast an object's position changes during a certain amount of time

13. Look at the graph below.

According to this graph, which car traveled at about 5 meters per second?

A. car 1  
B. car 2  
C. car 3  
D. none of the cars
14 Using the graph in question 13, which car was fastest?

F  car 1
G  car 2
H  car 3
J  none of the cars

15 If a train travels five kilometers in ten minutes, how fast is it going?

A  3 kilometers per hour
B  6 kilometers per hour
C  30 kilometers per hour
D  60 kilometers per hour
Directions: On your answer sheet, mark the correct answer.

1. Which is a magnet?
   A. a paper clip
   B. an iron bar
   C. Earth
   D. a penny

2. Which of the following statements is true?
   F. Magnetic fields can pass through paper.
   G. Magnets always point north.
   H. Magnetic force increases with distance from the magnet.
   J. Some magnets have only one pole.

3. Opposite magnetic poles
   A. attract each other
   B. repel each other
   C. push on each other
   D. do not affect each other

4. Look at the bar magnet.

What would be attracted to the south pole of this magnet?

F. the north pole of another magnet
G. the south pole of another magnet
H. the north or south pole of another magnet
J. any part of another magnet
Barney conducted an experiment with magnets. He classified the following three items together: a paper clip, a nail, and a staple. What do these items have in common?

A  They are all nonmetals.
B  They are all attracted to a magnet.
C  They are all repelled by a magnet.
D  They are all magnets.

What is the metal center of an electromagnet called?

F  the current
G  the wire
H  the coil
J  the core

What does a loudspeaker use to turn electric energy into sound?

A  a permanent magnet
B  an extension cord
C  an electromagnet
D  a series circuit

What is needed to make a simple electromagnet?

F  sound
G  wire
H  magnets
J  light energy
Gavin did an experiment with an electromagnet. The chart shows the data he collected.

<table>
<thead>
<tr>
<th>Number of Coils</th>
<th>Number of Paper Clips Held</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td>18</td>
<td>33</td>
</tr>
</tbody>
</table>

What can you infer from this chart?

A  Twenty coils will hold 40 paper clips.
B  Increasing the number of coils decreased the strength of the electromagnet.
C  The fewer the number of coils, the less strength the electromagnet has.
D  Gavin did not conduct enough trials in her experiment.

What would increase the strength of an electromagnet?

F  increasing the amount of current flowing through the wire
G  inserting a wooden core inside the coil
H  changing the direction of the current
J  decreasing the number of coils of wire
11 A student made the circuit in the picture.

What does the student need to add to the circuit to make it work?

A another bulb
B another wire
C another battery
D a switch

12 What would happen if you took one bulb out of a series circuit?

F The circuit would be closed.
G It would not change the circuit.
H You would create a short circuit.
J None of the other bulbs would light.
13. In a series circuit, the electric current

A. has many paths.
B. has one path.
C. only flows to the light bulb.
D. only travels away from the battery.

14. Look at the items below.

What additional item is needed to make an electrical circuit?

F. electrical outlet
G. switch
H. wires
J. iron nail

15. Mr. Ito has a string of holiday lights that are connected in parallel.
What is true about these lights?

A. If one light on the string goes out, all the others will remain lighted.
B. If one light goes out, all the lights on the string will go out.
C. If one light goes out, the circuit will remain closed.
D. There is only one path for electric current to flow.
Directions: On your answer sheet, mark the correct answer.

1. What is true about renewable resources?
   - A They cannot be easily replaced.
   - B They can be replaced within your life span.
   - C They can become nonrenewable resources.
   - D They cannot produce energy.

2. Cecilia wants to know how an animal’s exterior coloring affects its chances of survival. Which of the following would not help her answer this question?
   - F Observe how the animal reacts to predators.
   - G Experiment with different foods to find out what the animal eats.
   - H Place the animal in a new environment and observe how it reacts.
   - J Research the animal’s life cycle using the Internet or reference materials.
3  Look at the drawing below.

Battery cell  Light bulbs  Wires

What could you make using the items shown in the drawing?

A  a series circuit  
B  a parallel circuit  
C  an accurate compass  
D  a powerful electromagnet

SPI 0407.12.3
4. Which sentence best describes how birds survive when the weather gets cold?

F. They migrate to a cooler climate.
G. They hibernate in their nests.
H. They grow more feathers for the winter.
J. They migrate to a warmer climate.

5. Which of the following is a form of chemical energy?

A. heat produced by the Sun
B. light produced by the Sun
C. fossil fuels
D. water

6. This chart compares the length of different kinds of cells.

<table>
<thead>
<tr>
<th>Cell</th>
<th>Length (in Micrometers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>bacterium</td>
<td>1</td>
</tr>
<tr>
<td>animal cell</td>
<td>10</td>
</tr>
<tr>
<td>plant cell</td>
<td>100</td>
</tr>
</tbody>
</table>

What tool has enabled scientists to view these different kinds of cells?

F. telescope
G. pan balance
H. microscope
J. hand lens
7. A train can travel at 500 kilometers per hour. A plane can travel at 1,100 kilometers per hour. Which would travel farther in 5 minutes?

A. the plane  
B. the train  
C. They travel the same distance  
D. You cannot tell from this information

8. Rocket fuel and gasoline are forms of

F. chemical energy  
G. sound energy  
H. light energy  
J. magnetic energy

9. What is the zinc mined in Tennessee used to produce?

A. Coating on metal that resists rust  
B. Tennessee marble  
C. fossil fuels  
D. compost

10. Cecil, Effie, and Tien are racing scooters on a flat playground. The playground is 100 meters wide. Effie crosses the playground in 15 seconds. Tien crosses the playground in 14 seconds. Cecil crosses the playground in 16 seconds. Who was the fastest?

F. Cecil  
G. Effie  
H. Tien  
J. They all had the same speed
Look at the drawing of two foxes.

Fennec fox

Arctic fox

Each fox pictured above is adapted to its environment. Which statement about these animals is correct?

A. The thin body of the fennec fox helps it live in a cold environment.
B. The thick fur of the Arctic fox helps it live in a warm environment.
C. The large ears of the fennec fox help it release heat.
D. The large ears of the Arctic fox help it stay warm.
12. Look at the picture of an electromagnet.

The strength of this electromagnet can be increased by

- F  increasing the number of coils in the wire
- G  decreasing the number of coils in the wire
- H  decreasing the amount of current
- J  adding a light bulb and switch

13. Fran is standing on a sidewalk when her friend Blanca rides past on her bicycle. What is true about the Blanca’s motion?

- A  Fran is moving relative to the sidewalk.
- B  Blanca is moving relative to Fran.
- C  Blanca is moving relative to her bicycle.
- D  Both girls are moving relative to the sidewalk.

14. Which is the correct unit for measuring mass?

- F  meters
- G  kilograms
- H  liters
- J  degrees
15 We observe the Moon’s phases because of

A Earth’s rotation on its axis
B Earth’s revolution around the Sun
C the Moon’s revolution around Earth
D changes in the amount of light produced by the Moon

16 Look at the picture below.

What stage of complete metamorphosis can you see?

F pupa
G cocoon
H nymph
J larva
17. What is the most likely explanation of why roadways are often made of dark-colored materials?

A. Dark-colored materials are less expensive.
B. Dark-colored materials reduce the refraction of sunlight.
C. Dark-colored materials reduce the reflection of sunlight.
D. Dark-colored materials provide a smoother surface for driving.

18. Which statement about the Moon is correct?

F. A full moon follows the third-quarter moon.
G. There are several lunar eclipses each year.
H. Earth revolves around the Moon in just over 29 days.
J. The first-quarter moon follows the new moon.

19. An area is described as having less than 25 centimeters of rain and snow per year with an average temperature of 15°C. This describes the area’s

A. weather
B. climate
C. habitat
D. water cycle

20. Mr. Khouri wants to change the windows in his office so that he will have more privacy but still receive sunlight. What type of material would be best to use?

F. transparent plastic
G. bricks
H. translucent glass
J. thin paper
21 Frogs are placed in an ecosystem where they have no natural predators. What will most likely happen as a result?

A The frogs will overpopulate the ecosystem.
B The frogs will have fewer offspring.
C The ecosystem will produce more resources.
D The ecosystem will not change.

22 Suppose the river in an ecosystem dries up. One type of organism cannot adapt to this change. This organism is most likely to

F continue to live as though the river still flowed.
G become extinct in that ecosystem.
H hibernate until the river returns.
J change the ecosystem to the way it used to be.
23 The steps of the water cycle in winter in a region with cold winters are shown below.

The steps are not in the correct order. Which of the following represents the correct order?

A  M, K, L, J  
B  L, K, M, J  
C  K, J, M, L  
D  M, J, L, K 

24 An electromagnet is brought near a pile of paper clips but nothing happens. Why?

F  The electromagnet does not have current flowing.  
G  The paper clips are only attracted to real magnets.  
H  The paper clips are too close to the electromagnet.  
J  The electromagnet does not attract metal objects.
25 Applying a silver coating to the smooth surface of glass will cause light striking the surface to be

A reflected
B refracted
C diffracted
D changed into electricity

26 What happens to runoff?

F It gathers in lakes and rivers.
G It soaks into concrete and other pavement.
H It becomes precipitation.
J It is refracted.

27 The Tasmanian tiger was declared extinct in 1936. What does this tell you about the animal?

A The Tasmanian tiger is well adapted to its environment.
B The Tasmanian tiger is too well hidden to be found today.
C Only a few Tasmanian tigers are left in the world.
D All Tasmanian tigers are gone forever.
28 In a study of erosion, scientists recorded the height of a hill between the years 1985 and 2005. Their data are shown below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Height in Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>110.6</td>
</tr>
<tr>
<td>1990</td>
<td>110.1</td>
</tr>
<tr>
<td>1995</td>
<td>109.8</td>
</tr>
<tr>
<td>2000</td>
<td>109.6</td>
</tr>
<tr>
<td>2005</td>
<td>108.3</td>
</tr>
</tbody>
</table>

Which would best show how the height of the hill changed over time?

F a line graph  
G a Venn diagram  
H a pie chart  
J a flow chart

29 Armando left a glass of water on a countertop. Three days later, the water was gone. Which best describes what happened?

A The water changed to air.  
B The water evaporated.  
C The water froze.  
D The water condensed.

30 A force that opposes motion on a surface is

F acceleration  
G friction  
H velocity  
J gravity
31. A solid changes to a liquid by

A. evaporating
B. freezing
C. melting
D. condensing

32. Weathering and erosion by water can produce which landform?

F. mountain
G. plain
H. canyon
J. island

33. Which statement about incomplete metamorphosis is true?

A. An egg hatches from a nymph.
B. The nymph looks nothing like the adult.
C. There may be several nymph stages.
D. The larval and pupa stages look similar.

34. Henry wants to set up a weather station at his school. Which set of instruments would be most helpful for this purpose?

F. barometer, thermometer, microscope
G. thermometer, barometer, rain gauge
H. rain gauge, microscope, telescope
J. microscope, thermometer, anemometer

35. The tendency of an object at rest to stay at rest, or the tendency of an object in motion to stay in motion is called

A. gravity
B. acceleration
C. velocity
D. inertia
36. Caroline wants to find the volume of a block of wood. To do so, she should

F. multiply length times width times height
G. float the block of wood in water
H. multiply length times width
J. find the sum of length, width, and height

37. Which best describes why people see grass as green?

A. The grass reflects only green light.
B. The grass absorbs green light from the Sun.
C. Only green light is refracted by the grass.
D. The grass does not allow green light to escape.

38. Oliver wants to measure the mass of a piece of iron. What tool should he use?

F. [Scales]
G. [Graduated Cylinder]
H. [Ruler]
J. [Thermometer]
39  Which moon phase immediately follows a new moon?

A  crescent moon  
B  gibbous moon 
C  full moon 
D  third-quarter moon

40  Which will not allow electrical current to flow?

F  a closed circuit 
G  an open circuit 
H  a series circuit 
J  a parallel circuit

41  Pei is sitting on a train that is stopped. On one side of her train there is a station. On the other side of her train is another train. When Pei looks at the other train, she appears to be moving backward. When she looks at the station, she does not appear to be moving. How might Pei explain this situation?

A  The train next to hers is moving forward. 
B  Both her train and the one next to it are moving forward. 
C  Both her train and the one next to it are moving backward. 
D  The two trains are moving at different speeds.

42  Which tool would you use to measure very small salt crystals?

F  pan balance 
G  beaker 
H  microscope 
J  telescope
43 Which most likely explains why a species no longer exists?

A The species had too many offspring.
B There was a drought in one area in which the species lived.
C The species did not have many offspring.
D The offspring had plenty of resources.

44 When like poles of a magnet are brought close together, the poles

F attract each other
G repel each other
H combine with each other
J do not interact

45 A population of deer depends on a steady supply of food. What is most likely to happen to the population if the food supply decreases?

A Nothing will happen.
B The deer will compete for food.
C The deer will help each other find food.
D The deer will go extinct.

46 Which is the correct sequence of phases of the Moon?

F new moon → full moon → first-quarter moon → last-quarter moon
G first-quarter moon → new moon → full moon → last-quarter moon
H new moon → first-quarter moon → full moon → last-quarter moon
J last-quarter moon → full moon → first-quarter moon → new moon

47 Which life process ensures the survival of a species?

A reproduction
B respiration
C excretion
D growth
48 A new species of beetle is introduced in an ecosystem where it has no natural predators. What is the best prediction a scientist can make about what might happen in the ecosystem?

F  The beetles will hibernate and not appear for years.
G  The beetles may overpopulate the ecosystem.
H  Birds and reptiles will disappear from the ecosystem.
J  All consumers in the ecosystem will starve.

49 Look at the drawing of an electromagnet.

Which would not increase the strength of this electromagnet?

A  increasing the current
B  adding more coils of wire
C  wrapping the wire around a larger iron bar
D  aligning the electromagnet with Earth’s magnetic field
50 How does an omnivore get energy to live?

F from plants only
G from animals only
H from plants and animals
J directly from the Sun
1. A B C D
2. F G H J
3. A B C D
4. F G H J
5. A B C D
6. F G H J
7. A B C D
8. F G H J
9. A B C D
10. F G H J
11. A B C D
12. F G H J
13. A B C D
14. F G H J
15. A B C D
16. F G H J
17. A B C D
18. F G H J
19. A B C D
20. F G H J
21. A B C D
22. F G H J
23. A B C D
24. F G H J
25. A B C D
26. F G H J
27. A B C D
28. F G H J
29. A B C D
30. F G H J
31. A B C D
32. F G H J
33. A B C D
34. F G H J
35. A B C D
36. F G H J
37. A B C D
38. F G H J
39. A B C D
40. F G H J
41. A B C D
42. F G H J
43. A B C D
44. F G H J
45. A B C D
46. F G H J
47. A B C D
48. F G H J
49. A B C D
50. F G H J
51. A B C D
52. F G H J
53. A B C D
54. F G H J
55. A B C D
56. F G H J
57. A B C D
58. F G H J
59. A B C D
60. F G H J