1. Which layer of the atmosphere contains the most water vapor?
   A. troposphere
   B. stratosphere
   C. mesosphere
   D. exosphere

2. Which is the *most likely* cause of tropical storms?
   A. Water runoff from the land fuels storm clouds.
   B. High-pressure air causes storm clouds to form.
   C. Sea breezes close to shore push storm clouds together.
   D. Warm water evaporates, rises quickly, and interacts with a colder air mass.

3. Over a period of several hours, a barometer shows rapidly decreasing air pressure. What type of weather will *most likely* occur next?
   A. clear, sunny weather
   B. rainy weather for days
   C. cloudy, stormy weather
   D. calm, windless weather
4. What causes convection currents to occur on Earth?
   A. cool air rising, warm air sinking
   B. cool air rising, warm air rising
   C. warm air rising, cool air sinking
   D. warm air sinking, cool air sinking

5. Why are scientists concerned with ozone depletion in the upper atmosphere?
   A. because it causes greater levels of ground-level ozone
   B. because it allows ultraviolet radiation to reach Earth’s surface
   C. because it increases the amount of smog in highly populated cities
   D. because it decreases global temperatures by decreasing incoming solar radiation

6. How does the arrangement of the air molecules found in the troposphere compare to the arrangement of those found in the thermosphere?
   A. The air molecules are closer together in the troposphere and are farther apart in the thermosphere.
   B. The air molecules are farther apart in the troposphere and are closer together in the thermosphere.
   C. The number of air molecules is the same in the troposphere as in the thermosphere.
   D. There are fewer air molecules in the troposphere than in the thermosphere.
7. Why do thunderstorms most often occur in the summer months?
   A. The air pressure is higher in the summer months.
   B. Increases in sunlight cause air molecules to contract.
   C. The jet stream forces air upward during the summer months.
   D. Higher temperatures increase the rate of evaporation and convection.

8. What type of weather is **most likely** observed in an area when cirrus clouds are present?
   A. rainy weather
   B. calm weather
   C. foggy weather
   D. stormy weather

9. Earth’s atmosphere is mainly composed of which gases?
   A. hydrogen, helium, oxygen, and argon
   B. nitrogen, oxygen, argon, and carbon dioxide
   C. nitrogen, hydrogen, argon, and carbon dioxide
   D. helium, hydrogen, oxygen, and carbon dioxide
10 In which way are a euglena and a volvox different?
   A  A euglena is an individual cell, while a volvox is a colony of cells.
   B  A euglena uses cilia to move, while a volvox uses flagella to move.
   C  A euglena can make its own food, while a volvox must capture its food.
   D  A euglena only reproduces sexually, while a volvox only reproduces asexually.

11 Which function does the nucleus of a cell perform?
   A  It releases energy for the cell.
   B  It provides structure for the cell.
   C  It controls the activity of the cell.
   D  It forms the boundary of the cell.

12 Which **best** explains why muscle is considered a tissue?
   A  It is connected to bones.
   B  It can move voluntarily or involuntarily.
   C  It interacts with several organ systems.
   D  It is a group of cells working together.
13 What is one way the respiratory system and the circulatory system work together in the human body?

A The circulatory system takes in nutrients, while the respiratory system delivers oxygen.

B The circulatory system takes in water, and the respiratory system takes in carbon dioxide.

C The respiratory system takes in nutrients, while the circulatory system delivers carbon dioxide to the cells of the body.

D The respiratory system takes in oxygen, and the circulatory system delivers the oxygen to the cells of the body.

14 How do a volvox and an amoeba get their food?

A A volvox uses eyespots, and an amoeba uses cilia to find food.

B A volvox uses photosynthesis, and an amoeba surrounds its food.

C A volvox surrounds its food, and an amoeba uses cilia to find food.

D A volvox uses pseudopods to find food, and an amoeba uses photosynthesis.

15 Which statement describes the organization of living organisms?

A All organisms are composed of many cells, which are the basic units of structure but do not perform life functions.

B All organisms are composed of one or more cells, which are the basic units of structure and perform essential life functions.

C All organisms are composed of many cells that have basic units with unique structures and functions.

D All organisms are composed of one or more cells with the same shape and purpose but are not the basic units of structure.
16 How do the digestive system and the circulatory system work together in the human body?
A  The digestive system sends electric messages, while the circulatory system responds to the messages.
B  The digestive system provides structure for the body, while the circulatory system directs the movement.
C  The digestive system removes liquid toxins from the body, while the circulatory system removes solid waste.
D  The digestive system extracts nutrients from food, while the circulatory system transports those nutrients.

17 How is a gamete different from other types of cells in a person’s body?
A  It has no chromosomes.
B  It has half the number of chromosomes.
C  It has twice the number of chromosomes.
D  It has four times the number of chromosomes.

18 A homozygous dominant black angelfish (BB) is crossed with a homozygous recessive gold angelfish (bb). What is the probability their offspring will be gold?
A  0%
B  25%
C  75%
D  100%
19 Person X and person Y both smoked the same brand and amount of cigarettes for 20 years. Person Y develops lung disease while person X does not. Which statement best compares both people?

A The genetic makeup of person X allowed for a higher tolerance to chemicals in tobacco than person Y.
B Person X is a woman and thus more likely to develop lung disease.
C The genetic makeup of person X allowed for a lower tolerance to chemicals in tobacco than person Y.
D Person X is a man and thus more likely to develop lung disease.

20 The offspring of many species of amoeba are genetically identical to their parent, while the offspring of most mammal species are genetically different from their parents. Which most likely explains the genetic differences in the offspring of amoebas and mammals?

A Amoebas reproduce asexually, but mammals reproduce sexually.
B Amoebas reproduce sexually, but mammals reproduce asexually.
C Amoebas reproduce more slowly than mammals.
D Amoebas reproduce faster than mammals.
21 A Punnett square without the genotypes of the parents is shown below.

\[ \begin{array}{cc}
? & ? \\
? & CC \\
? & Cc \\
? & CC \\
? & Cc \\
\end{array} \]

What are the genotypes of the parents?
A Cc, cc
B CC, cc
C Cc, Cc
D CC, Cc

22 How do people determine if a vehicle in which they are sitting is moving?
A by comparing their position to a fixed object inside the vehicle
B by comparing their position to a fixed object outside the vehicle
C by comparing their position to a moving object inside the vehicle
D by comparing their position to a moving object outside the vehicle

23 Two students pull on a rope in opposite directions, each with a force of 100 N. What would most likely happen to the rope if the student on the left increased her force to 125 N?
A The rope would decrease its acceleration to the left.
B The rope would decrease its acceleration to the right.
C The rope would go from motionless to accelerating to the left.
D The rope would go from accelerating to the right to accelerating to the left.
24 The graph below shows John’s trip to school.

Which points on the graph show John returning home because he forgot his book bag?

A between points I and II
B between points II and III
C between points III and IV
D between points IV and V
25 The graphs below show the motion of four different objects.

Graph 1

Graph 2

Graph 3

Graph 4

Which graphs show a point where the objects were motionless over a period of time?

A Graph 1 and Graph 2
B Graph 3 and Graph 4
C Graph 1 and Graph 3
D Graph 2 and Graph 4
26. The diagram below shows four different objects that all start at the same place and move along the same path.

Which **best** describes the motion of these objects?

A. Both Objects 2 and 3 are at a higher elevation than Object 1.
B. Both Objects 1 and 2 are at a lower elevation than Object 4.
C. Object 4 has traveled farther than the other objects.
D. Object 1 has traveled farther than the other objects.

27. Which applied force will cause a glass of water sitting on a countertop to move?

A. a balanced force
B. a frictional force
C. a gravitational force
D. an unbalanced force
28 Which will cause an increase in the mechanical energy of an object?
   A decreasing its kinetic energy
   B increasing its electrical energy
   C increasing its potential energy
   D decreasing its gravitational energy

29 The diagram below shows the path of a marble.

At which position does the marble have the **most** kinetic energy?
   A 1
   B 2
   C 3
   D 4
30 A person enters a room, flips the light switch, and a lamp turns on. What causes the lamp to turn on?

A The circuit is open, and flipping the switch closes the circuit.
B The circuit is closed, and flipping the switch opens the circuit.
C The wires are connected, and flipping the switch disconnects the wires.
D The wires are connected, and flipping the switch disconnects the lamp.
31 This is a diagram of four simple machines.

Which simple machine would most likely be used to move an object over great distances and on a flat surface?

A  R
B  S
C  T
D  U
32. How does the mechanical energy of a rock change as it falls from a mountain?

A. The mechanical energy remains the same because kinetic energy is changed into potential energy.
B. The mechanical energy remains the same because potential energy is changed into kinetic energy.
C. The mechanical energy increases because the kinetic energy is changed into speed, while the potential energy remains the same.
D. The mechanical energy increases because the potential energy is changed into acceleration, while the kinetic energy remains the same.

33. The diagram below shows the path of an object.

The object is placed on point S and released toward point X. At which point will the object have the same amount of potential energy as it does when it is at point S?

A. T
B. U
C. V
D. X
34  How does a wind turbine produce electricity?

A  It releases kinetic energy to the wind.
B  It releases potential energy to the wind.
C  It converts the wind’s kinetic energy to mechanical energy.
D  It converts the wind’s potential energy to mechanical energy.
35 The diagram below shows the motion of a ball while being dropped.

What happens to the energy of the ball from when \( t = 0 \text{ s} \) to when \( t = 5 \text{ s} \)?

A  Potential energy decreases and kinetic energy increases, but the total amount of mechanical energy remains the same.

B  Potential energy increases and kinetic energy decreases, but the total amount of mechanical energy remains the same.

C  Potential energy and kinetic energy both increase, and the total amount of mechanical energy increases.

D  Potential energy and kinetic energy both decrease, and the total amount of mechanical energy decreases.
This is the end of the Grade 7 Science Released Items.

Directions:

1. Look back over your answers for the test questions.

2. Make sure all your answers are entered on the answer sheet. Only what is entered on your answer sheet will be scored.

3. Put all of your papers inside your test book and close the test book.

4. Stay quietly in your seat until your teacher tells you that testing is finished.

5. Remember, teachers are not allowed to discuss items from the test with you, and you are not allowed to discuss with others any of the test questions or information contained within the test.
# Grade 7 Science
## RELEASED Items
### 2018–2019
#### Answer Key

<table>
<thead>
<tr>
<th>Question Number</th>
<th>Question Type</th>
<th>Correct Answer</th>
<th>Percent Correct</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MC</td>
<td>A</td>
<td>65%</td>
<td>7.E.1.1</td>
</tr>
<tr>
<td>2</td>
<td>MC</td>
<td>D</td>
<td>59%</td>
<td>7.E.1.2</td>
</tr>
<tr>
<td>3</td>
<td>MC</td>
<td>C</td>
<td>58%</td>
<td>7.E.1.4</td>
</tr>
<tr>
<td>4</td>
<td>MC</td>
<td>C</td>
<td>66%</td>
<td>7.E.1.5</td>
</tr>
<tr>
<td>5</td>
<td>MC</td>
<td>B</td>
<td>58%</td>
<td>7.E.1.6</td>
</tr>
<tr>
<td>6</td>
<td>MC</td>
<td>A</td>
<td>59%</td>
<td>7.E.1.1</td>
</tr>
<tr>
<td>7</td>
<td>MC</td>
<td>D</td>
<td>63%</td>
<td>7.E.1.2</td>
</tr>
<tr>
<td>8</td>
<td>MC</td>
<td>B</td>
<td>60%</td>
<td>7.E.1.4</td>
</tr>
<tr>
<td>9</td>
<td>MC</td>
<td>B</td>
<td>64%</td>
<td>7.E.1.1</td>
</tr>
<tr>
<td>10</td>
<td>MC</td>
<td>A</td>
<td>42%</td>
<td>7.L.1.1</td>
</tr>
<tr>
<td>11</td>
<td>MC</td>
<td>C</td>
<td>69%</td>
<td>7.L.1.2</td>
</tr>
<tr>
<td>12</td>
<td>MC</td>
<td>D</td>
<td>48%</td>
<td>7.L.1.3</td>
</tr>
<tr>
<td>13</td>
<td>MC</td>
<td>D</td>
<td>67%</td>
<td>7.L.1.4</td>
</tr>
<tr>
<td>14</td>
<td>MC</td>
<td>B</td>
<td>48%</td>
<td>7.L.1.1</td>
</tr>
<tr>
<td>15</td>
<td>MC</td>
<td>B</td>
<td>63%</td>
<td>7.L.1.3</td>
</tr>
<tr>
<td>16</td>
<td>MC</td>
<td>D</td>
<td>79%</td>
<td>7.L.1.4</td>
</tr>
</tbody>
</table>
### Grade 7 Science — Released Items

<table>
<thead>
<tr>
<th>Question Number</th>
<th>Question Type</th>
<th>Correct Answer</th>
<th>Percent Correct</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>MC</td>
<td>B</td>
<td>45%</td>
<td>7.L.2.1</td>
</tr>
<tr>
<td>18</td>
<td>MC</td>
<td>A</td>
<td>53%</td>
<td>7.L.2.2</td>
</tr>
<tr>
<td>19</td>
<td>MC</td>
<td>A</td>
<td>68%</td>
<td>7.L.2.3</td>
</tr>
<tr>
<td>20</td>
<td>MC</td>
<td>A</td>
<td>77%</td>
<td>7.L.2.1</td>
</tr>
<tr>
<td>21</td>
<td>MC</td>
<td>D</td>
<td>76%</td>
<td>7.L.2.2</td>
</tr>
<tr>
<td>22</td>
<td>MC</td>
<td>B</td>
<td>61%</td>
<td>7.P.1.1</td>
</tr>
<tr>
<td>23</td>
<td>MC</td>
<td>C</td>
<td>65%</td>
<td>7.P.1.2</td>
</tr>
<tr>
<td>24</td>
<td>MC</td>
<td>A</td>
<td>70%</td>
<td>7.P.1.3</td>
</tr>
<tr>
<td>25</td>
<td>MC</td>
<td>B</td>
<td>80%</td>
<td>7.P.1.4</td>
</tr>
<tr>
<td>26</td>
<td>MC</td>
<td>C</td>
<td>75%</td>
<td>7.P.1.1</td>
</tr>
<tr>
<td>27</td>
<td>MC</td>
<td>D</td>
<td>77%</td>
<td>7.P.1.2</td>
</tr>
<tr>
<td>28</td>
<td>MC</td>
<td>C</td>
<td>41%</td>
<td>7.P.2.1</td>
</tr>
<tr>
<td>29</td>
<td>MC</td>
<td>C</td>
<td>39%</td>
<td>7.P.2.2</td>
</tr>
<tr>
<td>30</td>
<td>MC</td>
<td>A</td>
<td>32%</td>
<td>7.P.2.3</td>
</tr>
<tr>
<td>31</td>
<td>MC</td>
<td>C</td>
<td>83%</td>
<td>7.P.2.4</td>
</tr>
<tr>
<td>32</td>
<td>MC</td>
<td>B</td>
<td>50%</td>
<td>7.P.2.1</td>
</tr>
<tr>
<td>33</td>
<td>MC</td>
<td>D</td>
<td>70%</td>
<td>7.P.2.2</td>
</tr>
</tbody>
</table>
These released items were administered to students during a previous test administration. This sample set of released items may not reflect the breadth of the standards assessed and/or the range of item difficulty found on the NC Final Exam. Additional information about the NC Final Exam is available in the Assessment Specification for each exam located at http://www.ncpublicschools.org/accountability/common-exams/specifications/.

Percent correct is the percentage of students who answered the item correctly during a previous administration.
Clarifying Objectives Descriptions

Only clarifying objective descriptions addressed by the released items in this document are listed below. A complete list of North Carolina Essential Standards for Science may be reviewed at http://www.ncpublicschools.org/curriculum/science/scos/support-tools/#standards.

7.P.1.1 (Forces and Motion)
Explain how the motion of an object can be described by its position, direction of motion, and speed with respect to some other object.

7.P.1.2 (Forces and Motion)
Explain the effects of balanced and unbalanced forces acting on an object (including friction, gravity and magnets).

7.P.1.3 (Forces and Motion)
Illustrate the motion of an object using a graph to show a change in position over a period of time.

7.P.1.4 (Forces and Motion)
Interpret distance versus time graphs for constant speed and variable motion.

7.P.2.1 (Energy: Conservation and Transfer)
Explain how kinetic and potential energy contribute to the mechanical energy of an object.

7.P.2.2 (Energy: Conservation and Transfer)
Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).

7.P.2.3 (Energy: Conservation and Transfer)
Recognize that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) and electrical circuits require a complete loop through which an electrical current can pass.

7.P.2.4 (Energy: Conservation and Transfer)
Explain how simple machines such as inclined planes, pulleys, levers and wheel and axles are used to create mechanical advantage and increase efficiency.

7.E.1.1 (Earth Systems, Structures and Processes)
Compare the composition, properties and structure of Earth’s atmosphere to include: mixtures of gases and differences in temperature and pressure within layers.

7.E.1.2 (Earth Systems, Structures and Processes)
Explain how the cycling of water in and out of the atmosphere and atmospheric conditions relate to the weather patterns on Earth.
7.E.1.4 (Earth Systems, Structures and Processes)
Predict weather conditions and patterns based on information obtained from: • Weather data collected from direct observations and measurement (wind speed and direction, air temperature, humidity and air pressure) • Weather maps, satellites and radar • Cloud shapes and types and associated elevation

7.E.1.5 (Earth Systems, Structures and Processes)
Explain the influence of convection, global winds and the jet stream on weather and climatic conditions.

7.E.1.6 (Earth Systems, Structures and Processes)
Conclude that the good health of humans requires: monitoring the atmosphere, maintaining air quality and stewardship.

7.L.1.1 (Structures and Functions of Living Organisms)
Compare the structures and life functions of single-celled organisms that carry out all of the basic functions of life including: • Euglena; • Amoeba; • Paramecium; • Volvox

7.L.1.2 (Structures and Functions of Living Organisms)
Compare the structures and functions of plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, chloroplasts, mitochondria, and vacuoles).

7.L.1.3 (Structures and Functions of Living Organisms)
Summarize the hierarchical organization of multi-cellular organisms from cells to tissues to organs to systems to organisms.

7.L.1.4 (Structures and Functions of Living Organisms)
Summarize the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, and excretion) and ways that these systems interact with each other to sustain life.

7.L.2.1 (Evolution and Genetics)
Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).

7.L.2.2 (Evolution and Genetics)
Infer patterns of heredity using information from Punnett squares and pedigree analysis.

7.L.2.3 (Evolution and Genetics)
Explain the impact of the environment and lifestyle choices on biological inheritance (to include common genetic diseases) and survival.