

**Mississippi Academic Assessment Program  
(MAAP)  
Science  
Grade 5  
OTT Answers**

The information for each item, including the performance objective, DOK level, item type, and correct answer, is located in this document. The items appear in the order as shown in the table.

**Note:** The item types are representative of the items that will appear on the Grade 5 science test.

Item Number	Performance Objective	DOK Level	Item Type	Correct Answer
1	E.5.8B.1 Analyze and interpret data from observations and research (e.g., from NASA, NOAA, or the USGS) to explain patterns in the location, movement, and appearance of the moon throughout a month and over the course of a year.	2	Multiple Choice	A
2	E.5.8B.2 Develop and use a model of the Earth-Sun-Moon system to analyze the cyclic patterns of lunar phases, solar and lunar eclipses, and seasons.	2	Technology Enhanced	See Answer Key
3	P.5.5A.1 Obtain and evaluate scientific information to describe basic physical properties of atoms and molecules.	2	Technology Enhanced	See Answer Key
4	E.5.8A.1 Develop and use scaled models of Earth's solar system to demonstrate the size, composition (i.e., rock or gas), location, and order of the planets as they orbit the Sun.	1	Technology Enhanced	See Answer Key
5	E.5.8A.2 Use evidence to argue why the sun appears brighter than other stars.	2	Technology Enhanced	See Answer
6	L.5.3B.3 Design and interpret models of food webs to justify what effects the removal or the addition of a species (i.e., introduced or invasive) would have on a specific population and/or the ecosystem as a whole.	2	Multiple Choice	B
7	L.5.3A.1 Research and communicate the basic process of photosynthesis that is used by plants to convert light energy into chemical energy that can be stored and released to fuel an organism's activities.	2	Multiple Choice	C
8	P.5.5B.3 Investigate how different variables (e.g., temperature change, stirring, particle size, or surface area) affect the rate at which a solute will dissolve.	3	Multiple Choice	A
9	P.5.5C.1 Analyze and communicate the results of chemical changes that result in the formation of new materials (e.g., decaying, burning, rusting, or cooking).	2	Multiple Choice	D
10	P.5.6.5 Predict how a change of force, mass, and/or friction affects the motion of an object to convert potential energy into kinetic energy.	2	Multiple Choice	C
11	(P.5.5B.3) Investigate how different variables (e.g., temperature change, stirring, particle size, or surface area) affect the rate at which a solute will dissolve.	2	Multiple Choice	D
12	(P.5.5B.2) Analyze and interpret data to communicate that the concentration of a solution is determined by the relative amount of solute versus solvent in various mixtures.	3	TE	See Answer Key
13	(E.5.10.1) Collect and organize scientific ideas that individuals and communities can use to conserve Earth's natural resources and systems (e.g., implementing watershed management practices to conserve water resources, utilizing no-till farming to improve soil fertility, reducing emissions to abate air pollution, or recycling to reduce landfill waste).	2	Multiple Choice	D

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14	(E.5.8A.3) Describe how constellations appear to move from Earth's perspective throughout the seasons (e.g., Ursa Major, Ursa Minor, and Orion).	3	Multiple Choice	B
15	(E.5.8B.3) Develop and use models to explain the factors (e.g., tilt, revolution, and angle of sunlight) that result in Earth's seasonal changes.	3	Technology Enhanced	See Answer Key
16	(L.5.3B.1) Obtain and evaluate scientific information regarding the characteristics of different ecosystems and the organisms they support (e.g., salt and fresh water, deserts, grasslands, forests, rain forests, or polar tundra lands).	3	Multiple Choice	D
17	(L.5.3B.2) Develop and use a food chain model to classify organisms as producers, consumers, or decomposers. Trace the energy flow to explain how each group of organisms obtains energy.	2	Technology Enhanced	See Answer Key
18	(L.5.3B.3) Design and interpret models of food webs to justify what effects the removal or the addition of a species (i.e., introduced or invasive) would have on a specific population and/or the ecosystem as a whole.	2	Multiple Choice	D
19	(P.5.5A.2) Collect, analyze, and interpret data from measurements of the physical properties of solids, liquids, and gases (e.g., volume, shape, movement, and spacing of particles).	2	Multiple Choice	B
20	(P.5.5A.4) Make and test predictions about how the density of an object affects whether the object sinks or floats when placed in a liquid.	2	Technology Enhanced	See Answer Key
21	(P.5.5A.5) Design a vessel that can safely transport a dense substance (e.g., syrup, coins, marbles) through water at various distances and under variable conditions. Use an engineering design process to define the problem, design, construct, evaluate, and improve the vessel.*	3	Multiple Choice	C
22	(P.5.5B.2) Analyze and interpret data to communicate that the concentration of a solution is determined by the relative amount of solute versus solvent in various mixtures.	2	Multiple Choice	B
23	(P.5.5B.4) Design an effective system (e.g., sifting, filtration, evaporation, magnetic attraction, or floatation) for separating various mixtures. Use an engineering design process to define the problem, design, construct, evaluate, and improve the system.*	2	Multiple Choice	A
24	(P.5.6.2) Predict the future motion of various objects based on past observation and measurement of position, direction, and speed.	2	Multiple Choice	D
25	(P.5.6.4) Plan and conduct scientific investigations to test the effects of balanced and unbalanced forces on the speed and/or direction of objects in motion.	2	Technology Enhanced	See Answer Key

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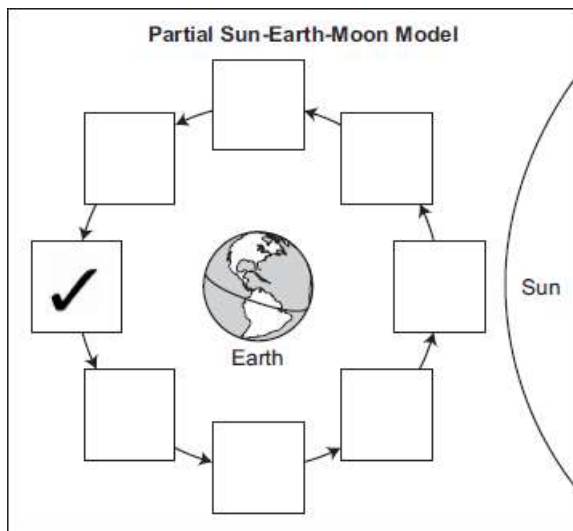
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<b>Item Number</b>	<b>Performance Objective</b>	<b>DOK Level</b>	<b>Item Type</b>	<b>Correct Answer</b>
26	(E.5.10.1) Collect and organize scientific ideas that individuals and communities can use to conserve Earth's natural resources and systems (e.g., implementing watershed management practices to conserve water resources, utilizing no-till farming to improve soil fertility, reducing emissions to abate air pollution, or recycling to reduce landfill waste).	2	Multiple Choice	C,E
27	(E.5.8B.2) Develop and use a model of the Earth-Sun-Moon system to analyze the cyclic patterns of lunar phases, solar and lunar eclipses, and seasons.	2	Constructed Response	See Answer Key
28	(P.5.5C.2) Analyze and communicate the results of physical changes to a substance that results in a reversible change (e.g., changes in states of matter with the addition or removal of energy, changes in size or shape, or combining/separating mixtures or solutions).	2	Technology Enhanced	See Answer Key
29	(L.5.3A.2) Analyze environments that do not receive direct sunlight and devise explanations as to how photosynthesis occurs, either naturally or artificially.	2	Multiple Choice	A
30	(P.5.6.1) Obtain and communicate information describing gravity's effect on an object.	1	Multiple Choice	C
31	(E.5.10.2) Design a process for better preparing communities to withstand manmade or natural disasters (e.g., removing oil from water or soil, systems that reduce the impact of floods, structures that resist hurricane forces). Use an engineering design process to define the problem, design, construct, evaluate, and improve the disaster plan.*	2	Multiple Choice	B
32	(L.5.3B.4) Communicate scientific or technical information that explains human positions in food webs and our potential impacts on these systems.	2	Multiple Choice	B
33	(P.5.5C.2) Analyze and communicate the results of physical changes to a substance that results in a reversible change (e.g., changes in states of matter with the addition or removal of energy, changes in size or shape, or combining/separating mixtures or solutions).	2	Technology Enhanced	See Answer Key
34	(P.5.8B.4) Obtain information and analyze how our understanding of the solar system has evolved over time (e.g., Earth-centered model of Aristotle and Ptolemy compared to the Sun-centered model of Copernicus and Galileo).	2	Technology Enhanced	See Answer Key
35	(P.5.6.1) Obtain and communicate information describing gravity's effect on an object.	2	Technology Enhanced	See Answer Key
36	(P.5.5B.1) Obtain and evaluate scientific information to describe what happens to the properties of substances in mixtures and solutions.	2	Technology Enhanced	See Answer Key

37	(E.5.8A.4) Construct scientific arguments to support claims about the importance of astronomy in navigation and exploration, including the use of telescopes, compasses, and star charts.	2	Multiple Choice	B
38	(P.5.5A.3) Analyze matter through observations and measurements to classify materials (e.g., powders, metals, minerals, or liquids) based on their properties (e.g., color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, solubility, or density).	2	Technology Enhanced	See Answer Key
39	(P.5.5C.3) Analyze and interpret data to support claims that when two substances are mixed, the total weight of matter is conserved.	2	Multiple Choice	B
40	(P.5.6.3) Develop and use models to explain how the amount or type of force, both contact and non-contact, affects the motion of an object.	2	Technology Enhanced	See Answer Key

### OTT Grade 5 Technology Enhanced Answer Key

#### Item Number 2



#### Item Number 3

##### Properties of Particles

	Atom	Molecule
particles held together by bonding		✓
smallest particle of an element with properties of that element	✓	
composed of more than one particle	✓	✓

or

### Properties of Particles

	Atom	Molecule
particles held together by bonding		✓
smallest particle of an element with properties of that element	✓	
composed of more than one particle		✓

**Note:** A molecule is composed of more than one particle, so this is a correct answer for this chart. However, this statement could also apply to an atom if the student understands that atoms are composed of particles called protons, neutrons, and electrons. Knowing the particles that compose an atom is not required for this performance objective but could be considered a correct answer.

### Item Number 4

**Part A:** Write the information into the correct position in the data table.

#### Outer Planet Information

Planet	Distance from Sun (millions of km)
Jupiter	778.3
	1,427.0
	2,871.0
	4,497.1

Uranus	Neptune	Saturn
2,871.0	778.3	4,497.1

**Part B:** Circle two words that correctly identify properties of these planets.

rocky

gaseous

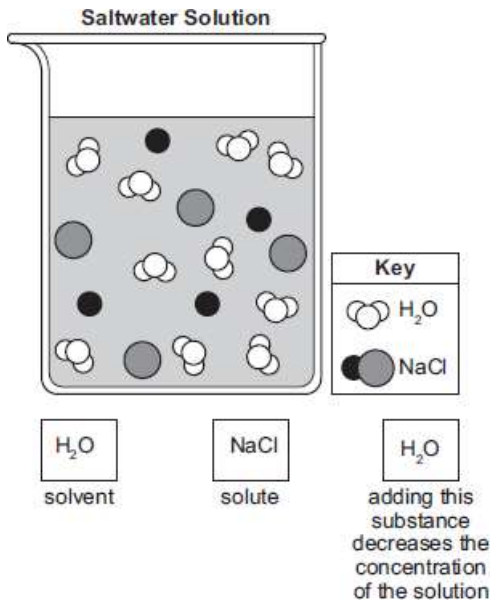
large

small

### Item Number 5

The Sun appears ( dimmer / brighter ) than the other stars because it is ( closer to Earth / farther from Earth / larger / smaller ) than the other stars.

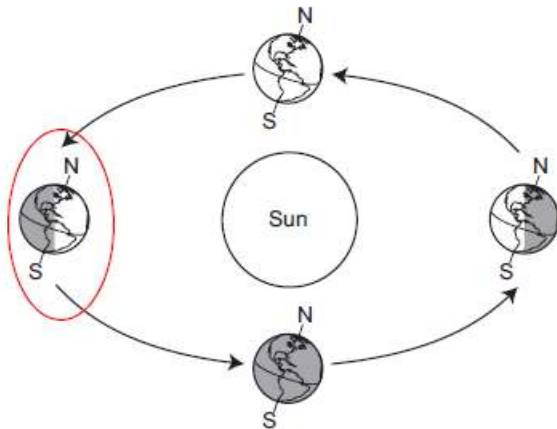
**Item Number 12**



**Item Number 15**

The model shows the position of Earth around the Sun at different times.

**Part A:** Circle the position of Earth that represents summer in the Northern Hemisphere.

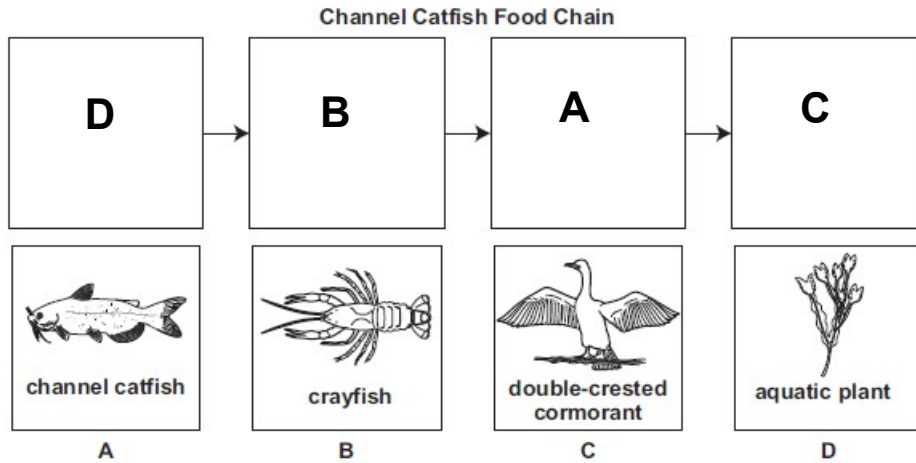


**Part B:** Complete the chart by marking **three** factors that can be observed in this model to help understand seasons.

	Helps Understand Seasons
distance between Earth and Sun	
tilt of Earth on its axis	✓
location of Earth in its orbit	✓
amount of heat produced by the Sun	
angle of sunlight reaching the surface of Earth	✓
speed of Earth in its orbit	

**Item Number 17**

Part A: Write the letter below each organism in the boxes to complete the food chain.



Part B: Complete the chart by classifying each organism as a producer or as a consumer.

	Producer	Consumer
channel catfish		✓
crayfish		✓
double-crested cormorant		✓
aquatic plant	✓	

**Item Number 20**

Block	Mass	Sink	Float
J	1 kg		✓
K	3 kg		✓
L	5 kg	✓	
M	7 kg	✓	

### Item Number 25

Part A: Circle one claim that explains the forces that cause the wagon to move.

#### Claim

A balanced force is needed to move the wagon.

An unbalanced force is needed to move the wagon.

Part B: Select one plan that will result in the most motion of the wagon.

#### Plan

One student pulls the wagon forward while the other student pushes sideways on the wagon.

One student pulls the wagon forward while the other student pushes the wagon in the opposite direction.

One student pushes the wagon forward while the other student pulls the wagon forward.

One student pushes the wagon forward while the other student pulls the wagon upward from the back of the wagon.

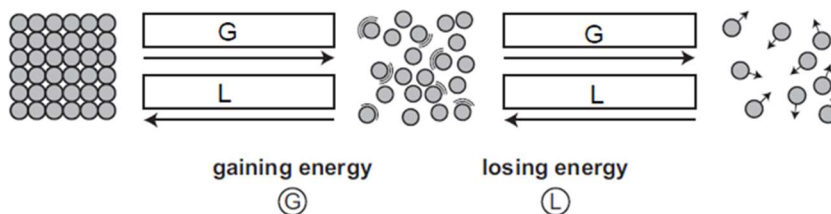
### Item Number 27 - Answer

Location: 4

### Item Number 28 - Answer

The substance changed from a (solid/ liquid / gas ) to a ( solid (liquid)/ gas ) because the substance (absorbed energy/ released energy / mixed with the air ).

### Item Number 33 - Answer



### Item Number 34 – Answer

1st: Earth is the center of the universe.

2nd: Earth is just one planet orbiting one star in a vast universe.

3rd: The Sun is the center of the solar system.



**Item Number 35 - Answer**

Gravity  each moon  the center of the planet.

Planet 1 is less massive than planet 2 and therefore has  gravity than planet 2.

**Item Number 36 – Answer**

**Part A:**

	Mixture	Solution
One substance dissolves into another when combined; one substance is distributed evenly into another substance; each particle is not visible.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Two or more substances keep their individual properties when combined; no chemical reaction occurs; each part is visible.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Part B:**

Mixture	Solution
cereal and milk salad	air salt water

**Item Number 38 – Answer**

**Part A:**

Vegetable oil will .

**Part B:**

Container 1 had  in it.

Container 2 had  in it.

Container 3 had  in it.

**Item Number 40 – Answer**

**Part A:** Use the drop-down menus to compare the forces acting on the boxes.

force will be needed to move box 1 than box 2.

**Part B:**

**A.** friction and applied