

A

Student Name _____

School Name _____

LSS/LEA 24 Name _____



Grade 8
MISA

Practice Test

Last Name										First Name										MI
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z

School Use Only

F SASID									
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

C

Place the
Student ID Label Here

D

Gender

Female Male

E

Date of Birth

Day		Month	Year	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	Jan	0	0
1	1	Feb	1	1
2	2	Mar	2	2
3	3	Apr	3	3
4	4	May	4	4
5	5	Jun	5	5
6	6	Jul	6	6
7	7	Aug	7	7
8	8	Sep	8	8
9	9	Oct	9	9
<input type="radio"/>	<input type="radio"/>	Nov	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	Dec	<input type="radio"/>	<input type="radio"/>

Section 1

Directions:

Today you are going to take Section 1 of the MISA Practice Test.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your test book. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely.

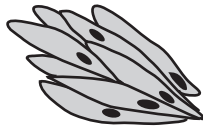
Some of the questions will ask you to write a response. Write your response in the space provided in your test book. Be sure to keep your response within the space provided. Only responses written within the space provided will be scored.

If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this Section ONLY. Do not go past the stop sign.

As the students continued their research, they found evidence that indicated that humans and other complex organisms have many cells that are found in only one system of an organism's body. Their research also stated that it is estimated that on average 37.2 trillion cells compose a human body. Some of these cells are intestinal cells, heart muscle cells, and nerve cells. These cell types are shown in the diagram below.



Intestinal
Cell



Heart
Muscle Cell



Nerve Cell

The students also found that researchers are trying to determine the number of different cell types there are in the human body. Until recently, scientific evidence supported the claim that the human body has approximately 200 cell types, each with a unique function. Researchers are now analyzing the different cell types and have found that there are many more types than previously thought.

1 During the microscope investigation, the students observed the amoeba and euglena.

The observations on the amoeba and euglena provide evidence that

- Ⓐ cells are a part of tissues
- Ⓑ cells rely on other cells for survival
- Ⓒ living things can be composed of one cell
- Ⓓ water and oxygen are used by the cell to produce energy

2 During the microscope investigation, the students observed cells.

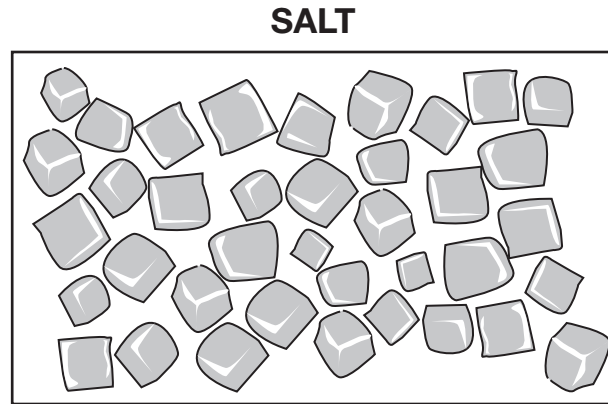
Evidence from the investigation supports the classification of humans and onions as

- Ⓐ unicellular organisms that have cells for different tissues
- Ⓑ unicellular organisms that have cells that work independently
- Ⓒ multicellular organisms that have different types of cells with specialized functions ●
- Ⓓ multicellular organisms that have cells that use the same organelle for protection and structure

PLEASE DO NOT WRITE IN THIS AREA

○○○○○○○○○○○○○○○○○○○○○○○○○○○○○○
 SERIAL #

- 3 The students continued using the microscope and compared table salt to the onion cells they previously observed. A diagram of the table salt is shown below.



Using observations from their investigation, the students classified the salt as

- (A) living, because the salt has cells
 - (B) living, because the salt has atoms
 - (C) nonliving, because the salt lacks cells
 - (D) nonliving, because the salt lacks atoms
- 4 The students' research indicated that heart muscle cells are only one type of cell in the circulatory system and that the circulatory system is composed of several organs working together.

Which other circulatory system organ works directly with the heart to ensure other body tissues receive oxygen?

- (A) brain
- (B) kidneys
- (C) lung nodules
- (D) blood vessels

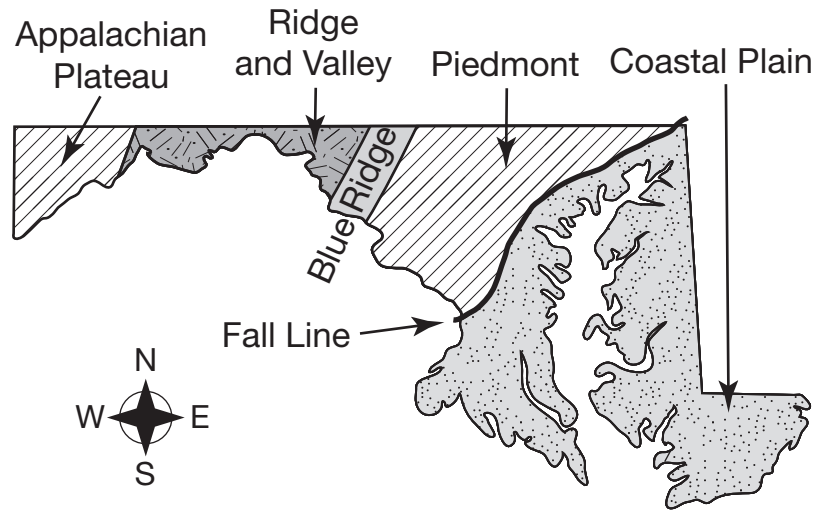
6 The students found that intestinal cells are part of an organ in the digestive system.




Use evidence to explain how the intestinal cells help the intestines work within the digestive system. In your explanation, be sure to include

- the role of the intestines in the digestive system
- the interacting components in the intestines

The research stated that groundwater makes up about 30% of the fresh water found on Earth. One of the primary sources of groundwater is water that soaks into the ground after rain falls and snow melts. Another source is water that seeps deep into the ground from the bottoms of rivers and lakes. Once the water has moved into the ground, it will stay in crevices in fractured rock or pool in wells and aquifers. In Maryland, the type of rock found in a given region determines how the groundwater is stored. West of the fall line shown on the map below, water is found primarily in wells that form in rock fractures. East of the fall line, groundwater is found in aquifers, wells, and sediment.

LOCATIONS OF MARYLAND ROCK TYPES



LEGEND	
	= Sand and gravel
	= Limestone
	= Fractured rock

7 The students used their model to better understand how water moves through the water cycle.

Which phenomenon causes precipitation to reach Earth?

- Ⓐ solar energy
- Ⓑ magnetic force
- Ⓒ potential energy
- Ⓓ gravitational force

9 After constructing their model, the students found that water is stored in many different water systems.

Which water systems store liquid water after it falls as precipitation?

Select all that apply.

- (A) aquifers
- (B) atmosphere
- (C) clouds
- (D) lakes
- (E) wells

10 The students found that in Maryland some aquifers exist beneath the Ridge and Valley region.

Aquifers form in this region of the state because limestone is

- (A) porous and composed of sediment
- (B) volcanic and composed of cooled magma
- (C) nonporous and composed of folded metamorphic rock
- (D) sedimentary and composed of crystallized igneous rock

12 The students found that some of the locations on the Maryland groundwater map currently have above normal water levels. However, these locations have also experienced periods of drought in the past five years.

Use evidence to explain how water can be depleted and refilled in such a short period of time.



Section 2

Directions:

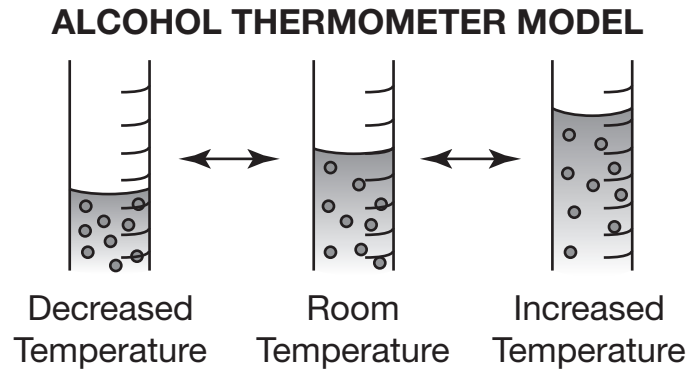
Today you are going to take Section 2 of the MISA Practice Test.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your test book. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely.

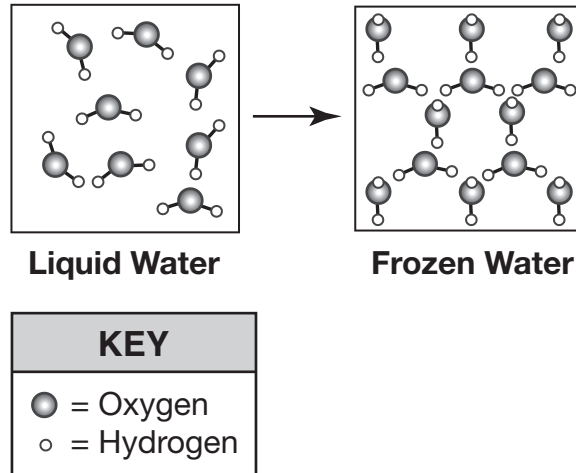
Some of the questions will ask you to write a response. Write your response in the space provided in your test book. Be sure to keep your response within the space provided. Only responses written within the space provided will be scored.

If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this Section ONLY. Do not go past the stop sign.

In the sugar and water investigation, the students observed that the liquid inside the thermometers moved when exposed to different temperatures. They researched thermometers and found that most are filled with alcohol (C_2H_6O). When a thermometer is exposed to warmer temperatures, the liquid inside expands. A thermometer's glass tube is not flexible, so the liquid expands vertically and rises up the tube. The students constructed a model, shown below, to illustrate how molecules of liquid in a thermometer move.



- 1 The students found that the volume of water increased when it froze. They constructed a model of liquid and frozen water, shown below, to illustrate how phase affects water molecule arrangement.



The volume of water increases when water freezes because

- (A) water molecules have a low density
 - (B) the components of a water molecule increase in mass
 - (C) the arrangement of the molecules in the water changes
 - (D) water molecules are composed of atoms from different elements
- 2 The students used the models to better understand the structure of table sugar.

Table sugar is composed of

- (A) carbon dioxide (CO₂) and water (H₂O) atoms
- (B) carbon (C), hydrogen (H), and oxygen (O) atoms
- (C) carbon dioxide (CO₂) and water (H₂O) molecules
- (D) carbon (C), hydrogen (H), and oxygen (O) molecules

5 In the thermometer model, the liquid expanded because

- Ⓐ the chemical energy of a liquid's molecules changes proportionally to the change in phase
- Ⓑ the potential energy of a liquid's molecules changes proportionally to the change in volume
- Ⓒ the potential energy of a liquid's molecules changes proportionally to the change in temperature
- Ⓓ the average kinetic energy of a liquid's molecules changes proportionally to the change in temperature



Section 2

6 Use evidence from the investigation to explain what causes water to change phases. In your explanation be sure to include

- the transfer of energy
- the molecular structure



PLEASE DO NOT WRITE IN THIS AREA



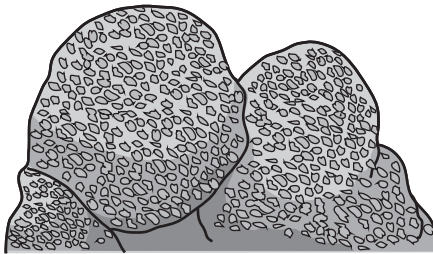
SERIAL #



Read all of the information. Use the information to answer the questions.

After a school trip to an aquarium, students from a science class researched some of the organisms that live in coral reef ecosystems. The students' research indicated that coral reefs are made up of small organisms called corals and each individual coral is called a polyp. Corals secrete calcium carbonate to form an exoskeleton, and as the corals die off, these exoskeletons build up and form a limestone foundation. New corals attach themselves to the limestone foundation and slowly form coral reefs. A diagram of a colony of corals and a coral polyp is shown below.

Coral Colony



Coral Polyp



The students' research indicated that climate change is causing ocean temperatures to rise. These rising temperatures are making the ocean unlivable for coral reefs. Corals are sensitive to water temperature, and when water temperatures change beyond a livable range, the corals become stressed. This stress causes the corals to shed photosynthetic algae and other microorganisms that live on the corals. This shedding of organisms causes the corals to turn white in an event known as bleaching. When water temperatures return to a livable range, many coral reefs have been destroyed by the bleaching and do not recover. A recent study stated that corals that are able to store larger energy reserves in the form of fat in their cells and are able to partner with multiple species of algae have a greater likelihood of recovering from bleaching events. Certain coral species are able to store more energy in their cells than other species, but even corals of the same species vary in their ability to store energy.

- 8 The students' research indicated that one species of coral has 28 chromosomes.

Which table best describes the most likely number of chromosomes in coral parents and offspring during sexual reproduction?

(A)

Number of Chromosomes in Each Parent	Number of Chromosomes Provided by Parent 1	Number of Chromosomes Provided by Parent 2	Number of Chromosomes in Each Offspring
28	28	28	28

(B)

Number of Chromosomes in Each Parent	Number of Chromosomes Provided by Parent 1	Number of Chromosomes Provided by Parent 2	Number of Chromosomes in Each Offspring
56	28	28	56

(C)

Number of Chromosomes in Each Parent	Number of Chromosomes Provided by Parent 1	Number of Chromosomes Provided by Parent 2	Number of Chromosomes in Each Offspring
28	14	14	28

(D)

Number of Chromosomes in Each Parent	Number of Chromosomes Provided by Parent 1	Number of Chromosomes Provided by Parent 2	Number of Chromosomes in Each Offspring
7	14	14	28

11 Part 1

The research indicated that there are coral species that live much deeper in the ocean and prefer to live in cool water below 19 degrees Celsius ($^{\circ}\text{C}$).

If a cool-water coral species were moved to a shallow reef near the equator, the corals would most likely

- (A) survive in the warmer water
- (B) adapt to the warmer water
- (C) reproduce in the warmer water
- (D) become bleached in the warmer water

Part 2

According to the students' research, which are the most likely effects to coral populations if ocean temperatures continue to increase?

● **Select all that apply.**

- (A) a population increase
- (B) a population decrease
- (C) a lower chance of survival
- (D) a greater chance of survival
- (E) a decrease in genetic variation
- (F) an increase in genetic variation

Use evidence to explain why corals use this method of reproduction to produce offspring to form new reef colonies.



Section 3

Directions:

Today you are going to take Section 3 of the MISA Practice Test.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your test book. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely.




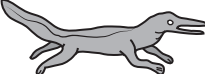
Some of the questions will ask you to write a response. Write your response in the space provided in your test book. Be sure to keep your response within the space provided. Only responses written within the space provided will be scored.

If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this Section ONLY. Do not go past the stop sign.

The students used the fossil evidence map to observe the locations of the strata in which four different fossil types were found. The fossils are at least 250 million years old.

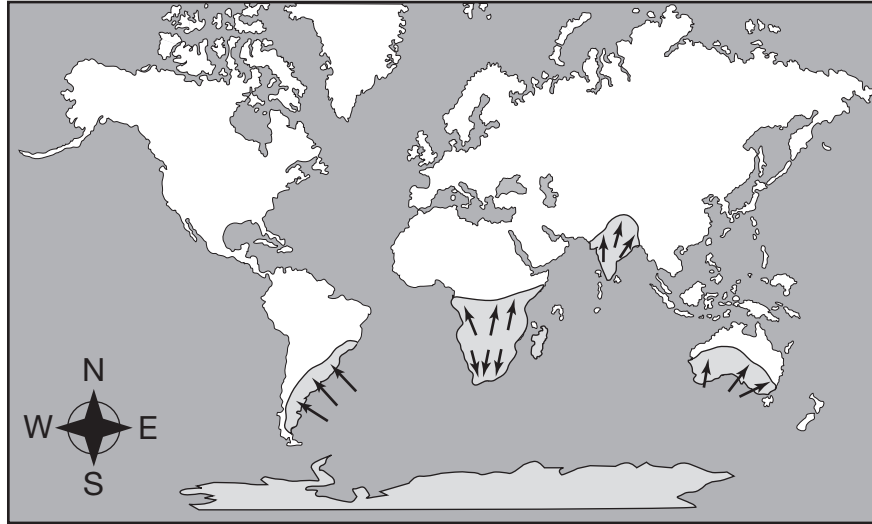
FOSSIL EVIDENCE MAP





LEGEND	
■ = <i>Glossopteris</i>	
□ = <i>Cynognathus</i>	
■ = <i>Lystrosaurus</i>	
■ = <i>Mesosaurus</i>	

The students observed the glacier evidence map to determine where glaciers existed in the Southern Hemisphere and the direction the glaciers moved.

GLACIER EVIDENCE MAP



LEGEND	
	= Signs of glaciers
	= Direction of glacial scratches


The students' research indicated that the mid-Atlantic ridge data are based on sediment samples taken from different locations on both sides of the ridge. The data from the mid-Atlantic ridge and a map of where the data were obtained are shown as follows.

MID-ATLANTIC RIDGE DATA

Site	Distance from Ridge (kilometers)	Age of Sediment (millions of years)	Direction from Ridge
A	1,303	67	West
B	1,010	49	West
C	745	40	West
D	422	24	West
E	221	11	West
F	506	26	East
G	718	33	East

MAP OF ATLANTIC OCEAN



LEGEND	
	= Area of mid-Atlantic ridge data

PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

- 1 The students found that scientists used the data from the mid-Atlantic ridge to support the claim that continent shape and location change over time due to tectonic plate movement.**

Which data best supports this claim?

- (A) the rate at which the plates are moving near the ridge
- (B) the age of the sediment and its distance from the ridge
- (C) the amount of sediment and its direction from the ridge
- (D) the direction in which the plates are moving near the ridge

- 2 The students' research indicated that *Lystrosaurus* was a slow-moving, plant-eating reptile that lived over 250 million years ago.**

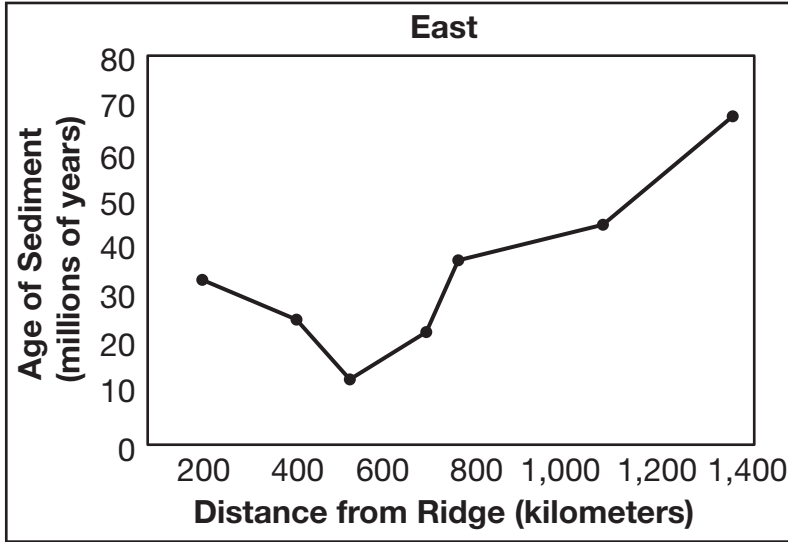
The supporting evidence that *Lystrosaurus* inhabited a single landmass that broke apart is that fossils of *Lystrosaurus* are found

- (A) on different landmasses
- (B) on glacial ice shelves
- (C) in seafloor trenches
- (D) in the oceanic crust

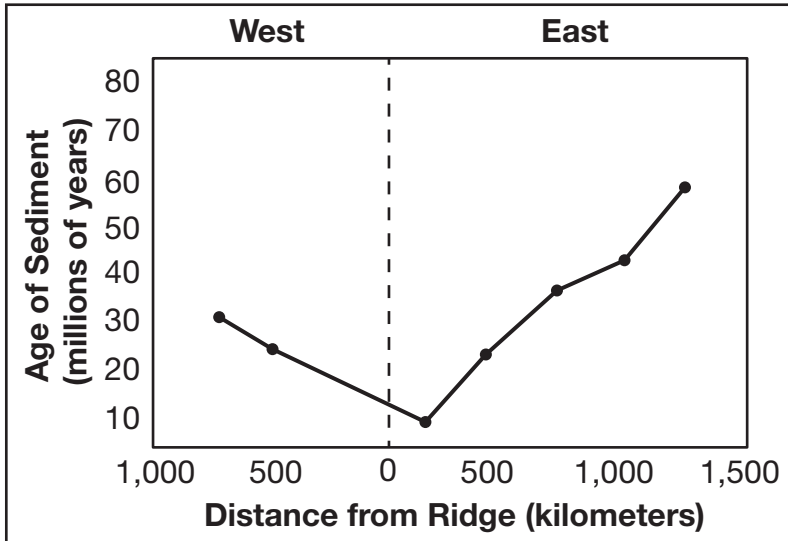
3 The students found that the mid-Atlantic ridge data were used to support a scientist’s claim that new crust forms at ridges.

Which graph best represents the mid-Atlantic ridge data?

(A)



(B)



4 After examining the tectonic plate maps, the students determined where the plate boundaries exist on Earth.

Some mountain ranges occur along plate boundaries.

Future plate movement will most likely result in these mountains

- (A) staying the same size because the plates slide past one another
- (B) decreasing in size because the plates will slide past one another
- (C) increasing in size because the plates will collide with one another
- (D) staying the same size because the plates separate from one another

5 A student observed the plate boundary map and found that active volcanoes form where two plates currently meet. The student stated that extinct volcanoes are likely found where plates met in the past and wanted to determine if the past eruptions of the extinct volcanoes could be used as evidence of plate motion.

Which evidence found in and around extinct volcanoes would best support the concept of plate motion?

- (A) lava fields forming near coastlines on different continents
- (B) lava fields forming near mountain ranges on different continents
- (C) a large volume of ash appearing in different rock strata on different continents
- (D) a large volume of ash appearing in the same rock strata on different continents

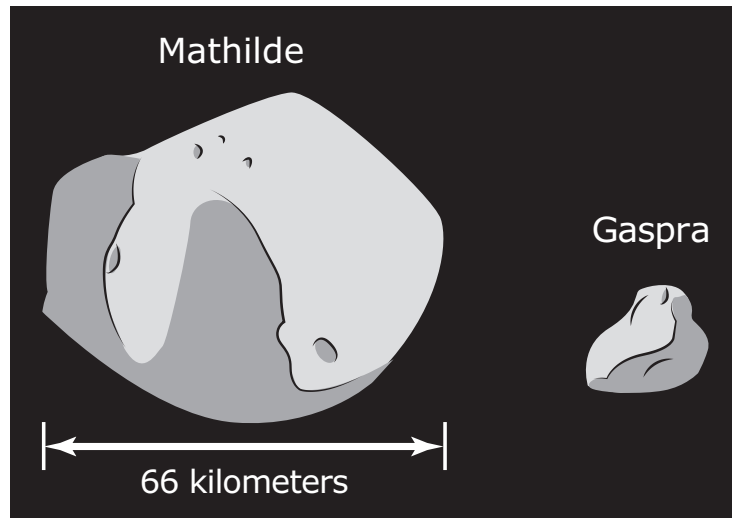
Read all of the information. Use the information to answer the questions.

While researching information for a science project, several students found a news article from the National Aeronautics and Space Administration (NASA) regarding the Asteroid Redirect Mission (ARM). The focus of this mission is to develop a first-ever robotic mission to visit a large near-Earth asteroid, collect a multi-ton boulder from its surface, and redirect the boulder into a stable orbit around the moon.

The students continued to research these asteroids and found the data listed below.

- Asteroids are pieces of rock or metal floating through space.
- In our solar system, there is a large concentration of asteroids in the asteroid belt, an area between Mars and Jupiter.
- Scientists estimate that millions of asteroids are found in this area.
- Some of these asteroids are large, but many are small.
- Scientists think that many asteroids were formed by collisions between other asteroids, moons, and planets.

The research indicated that asteroids range in size from small rocks to massive boulders that may be hundreds of kilometers wide. The diagram below shows two asteroids from our solar system. The table displays data on several other asteroids in the asteroid belt.



ASTEROIDS IN THE ASTEROID BELT

Asteroid Number	Asteroid Name	Diameter (kilometers)	Mass (10^{15} kilograms)
3	Juno	234	20,000
4	Vesta	569	259,000
45	Eugenia	215	6,100
253	Mathilde	66	103.3
951	Gaspra	19	10
4979	Otawara	5.5	0.2
6489	Golevka	1.4	0.00021
25143	Itokawa	0.05	0.000035

"We measured a force of about one ounce (28 grams)¹ acting on an asteroid that weighs 460 billion pounds (208 billion kilograms)," Chesley explained. That means that a force equal to about the weight of a strawberry can change the course of an asteroid that is longer than five football fields!

While no large asteroids appear on track to hit Earth, the Yarkovsky effect's ability to predict asteroids' paths could help scientists be more certain and give them some of the information necessary to stop a collision.

"A Force with the Power to Move an Asteroid" – Sarah Ives, © 2004, nationalgeographic.com

¹(28 grams) approximately 0.27 newton



7 After researching the orbits of asteroids in the solar system, students explained that in order for asteroids in the asteroid belt to remain in orbit,

- (A) Earth must exert a strong gravitational force toward the center of the solar system
- (B) the sun must exert a strong gravitational force toward the center of the solar system
- (C) Earth must exert a strong gravitational force away from the center of the solar system
- (D) the sun must exert a strong gravitational force away from the center of the solar system

8 The students used evidence to present an argument that scientists should launch an unmanned spacecraft to prevent a collision between an asteroid and Earth’s moon.

In order for the spacecraft to prevent the asteroid from colliding with the moon, the spacecraft would most likely

- (A) have a smaller mass than the mass of the asteroid
- (B) have enough force to knock the asteroid off course
- (C) reduce its speed to match the speed of the asteroid
- (D) spin in a forward direction to alter the orbit of the asteroid

PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

- 9 Evidence indicates that some asteroids have moons that are held in orbit by a gravitational attraction between the moon and the asteroid.

Which table correctly sequences the asteroids in order of the gravitational attraction exerted by each asteroid?

(A)

Weakest Gravitational Attraction	→	→	→	Strongest Gravitational Attraction
Eugenia	Gaspra	Juno	Mathilde	Otawara

(B)

Weakest Gravitational Attraction	→	→	→	Strongest Gravitational Attraction
Otawara	Mathilde	Juno	Gaspra	Eugenia

(C)

Weakest Gravitational Attraction	→	→	→	Strongest Gravitational Attraction
Juno	Eugenia	Gaspra	Otawara	Mathilde

(D)

Weakest Gravitational Attraction	→	→	→	Strongest Gravitational Attraction
Otawara	Gaspra	Mathilde	Eugenia	Juno

10 Part 1

Data from the students' research indicated that some asteroids are orbited by other asteroids.

Which asteroid would most likely be orbited by other asteroids?

- (A) Itokawa
- (B) Juno
- (C) Mathilde
- (D) Vesta

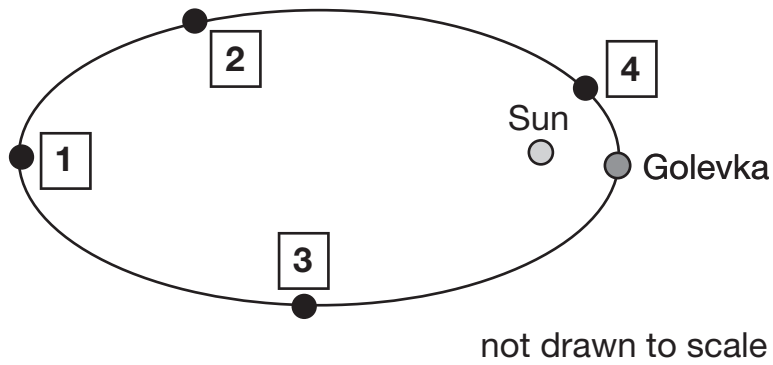
Part 2

The explanation that best describes why one asteroid would orbit another asteroid is that the asteroid being orbited has a large

- (A) mass, which results in a strong gravitational force
- (B) metallic core, which results in a strong magnetic field
- (C) diameter, which results in a strong gravitational force
- (D) amount of iron, which results in a strong magnetic field



11 Based on the evidence from the research, at which point in Golevka's orbit would the Yarkovsky effect be the weakest?



- (A) 1
- (B) 2
- (C) 3
- (D) 4

- 12 Asteroids orbit other asteroids similarly to moons orbiting a planet. The table below identifies the mass of Earth and Jupiter and the number of moons for each planet.

MASS OF CELESTIAL OBJECTS

Celestial Object	Mass (10^{24} kilograms)	Number of Moons
Earth	5.97	1
Jupiter	1898.00	67





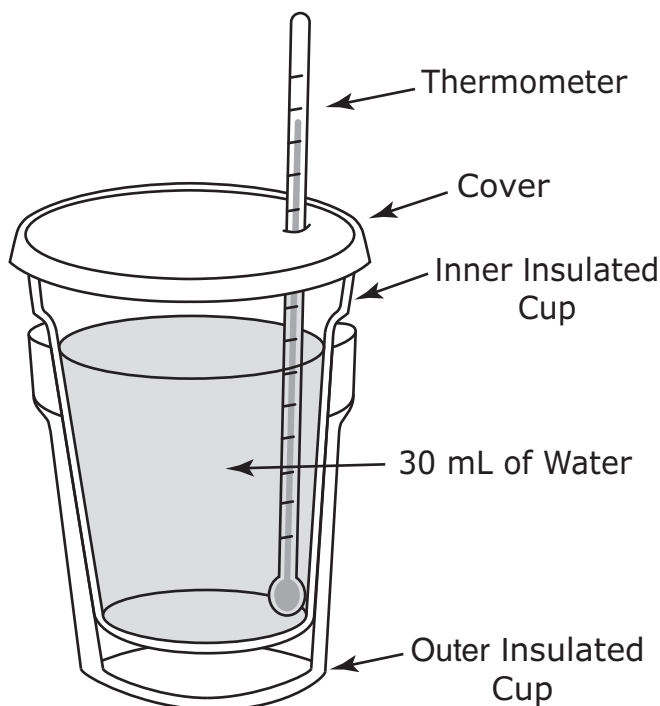
You have come to the end of Section 3 of the test. Review your answers from Section 3 only.



Read all of the information. Use the information to answer the questions.

A student observed a cooking demonstration at a grocery store using pans made of different metals and decided to research how different materials transfer thermal energy. The student placed one insulated cup into another insulated cup, poured 30 milliliters (mL) of water at 20 degrees Celsius into the inner cup, and covered the cup. Finally, a hole was made in the cover and a thermometer was placed in the hole. The student then obtained four 20-gram cubes of different metal types.

THERMAL ENERGY TRANSFER DEVICE



One of the metal cubes was heated to 100°C with the assistance of an adult and then placed into the cup, which was covered again. The student observed the thermometer until the temperature no longer changed and recorded the final temperature of the water. The process was repeated for the other three metal samples and the results of the investigation were recorded.

1 Which statements best describe the purpose of the design of the investigational device?

Select all that apply.

- (A) The design allows the thermometer to be moved so the temperature can be measured.
- (B) The design maximizes the thermal energy transferred from the water to the metal.
- (C) The design minimizes the thermal energy transferred to the outside environment.
- (D) The design provides the initial thermal energy for the metal samples.
- (E) The design ensures the metal-water device is a closed system.

2 Which property of the metals used in the investigation is most likely the reason the student chose to use metal cubes?

- (A) large mass
- (B) small volume
- (C) low malleability
- (D) high conductivity

3 What is the most likely reason the student waited until the temperature no longer changed to record the data?

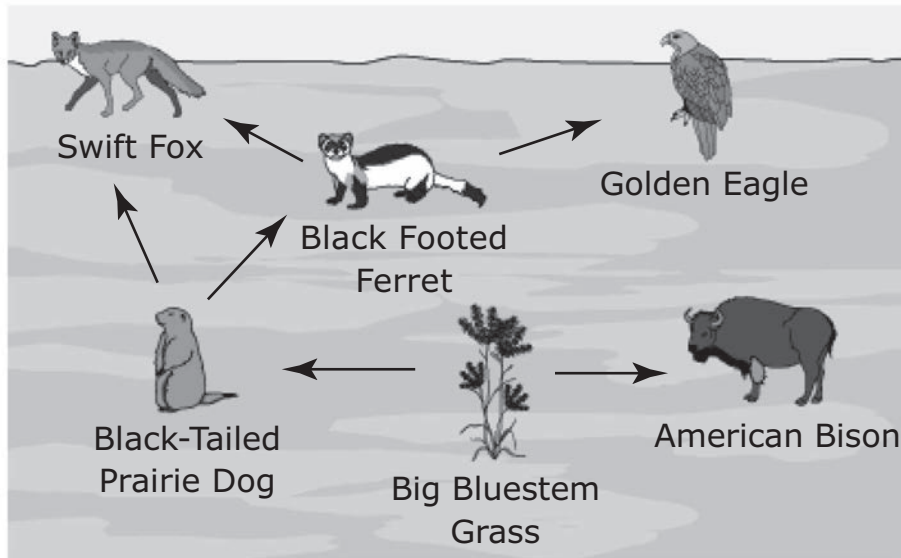
- (A) to make sure that the water did not start to boil
- (B) to have time to calculate the change in temperature
- (C) to allow the transfer of thermal energy to be complete
- (D) to observe that the temperature of the water was affected by the metal cube

6 A student claimed that thermal energy was transferred from the water to the metal in the investigation.

Use evidence from the investigation to refute or support this claim.

Read all of the information. Use the information to answer the questions.

During a visit to the Maryland Zoo, a group of students observed a colony of black-tailed prairie dogs. The students decided to research prairie dogs and the North American prairie ecosystem in which they live. The students found a food web, shown below, that illustrated relationships between several organisms in the prairie ecosystem.



PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

The students wanted to understand how the availability of resources affects population size. The students used a computer simulation, changed the number of ferrets in a prairie ecosystem and observed the population changes for three different animals and one plant. The simulation collects data every two years. The students studied an eight-year period and completed the data tables shown.

INITIAL FERRET POPULATION 20

Species	Initial Population	Population after 2 years	Population after 4 years	Population after 6 years	Population after 8 years
Grass (kilograms)	4000	2000	500	1000	5000
Prairie Dogs	25000	31000	8000	4000	11000
Ferrets	20	25	35	15	15
Foxes	10	4	4	3	2

INITIAL FERRET POPULATION 80

Species	Initial Population	Population after 2 years	Population after 4 years	Population after 6 years	Population after 8 years
Grass (kilograms)	4000	4000	4000	4000	4000
Prairie Dogs	25000	25000	25000	25000	25000
Ferrets	80	80	80	80	80
Foxes	10	10	10	10	10

INITIAL FERRET POPULATION 140

Species	Initial Population	Population after 2 years	Population after 4 years	Population after 6 years	Population after 8 years
Grass (kilograms)	4000	5100	4900	2800	3900
Prairie Dogs	25000	21000	28000	26000	22500
Ferrets	140	75	75	90	75
Foxes	10	11	10	10	10

PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

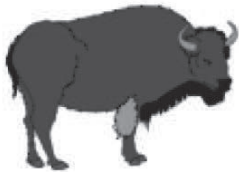
The students researched other animals in the prairie that are not predators of prairie dogs to consider other types of interactions. The students organized the research into a diagram, shown below, and used it to identify these interactions as competitive or mutually beneficial to the prairie dogs in the prairie ecosystem.

SPECIES THAT HAVE RELATIONSHIPS WITH PRAIRIE DOGS



Grasshopper

- eat the shorter grass that the prairie dogs also like
- eaten by birds like burrowing owls
- reproduce in large numbers
- are active in warmer months/inactive in winter months



American Bison

- eat the same type of grass as the prairie dogs
- eat the taller grass that has less nutrients than the shorter grass
- fertilize the soil with dung which helps grass grow
- roll in the dirt mounds created by prairie dogs digging tunnels to help keep biting flies away
- produce one calf each year



Burrowing Owl

- live underground in burrows that have been dug out and abandoned by prairie dogs
- eat grasshoppers
- produce 3–12 hatchlings a year
- are active in the daytime, unlike other types of owls
- may collect bison dung around burrows when nesting

8 The prairie food web diagram illustrates interactions among organisms that live in the prairie ecosystem.

Which statement best describes the sources of energy for the producers and consumers in the food web?

- (A) Consumers and producers both obtain energy from decomposers.
- (B) Consumers gain energy from the sun, while producers obtain energy by eating other organisms.
- (C) Producers obtain energy from living organisms, while consumers obtain energy from the nonliving parts of the ecosystem.
- (D) Producers use the sun and nonliving parts of the ecosystem to generate energy, while consumers gain energy from other living organisms.



9 The prairie food web diagram illustrates interactions among organisms that live in the prairie ecosystem.

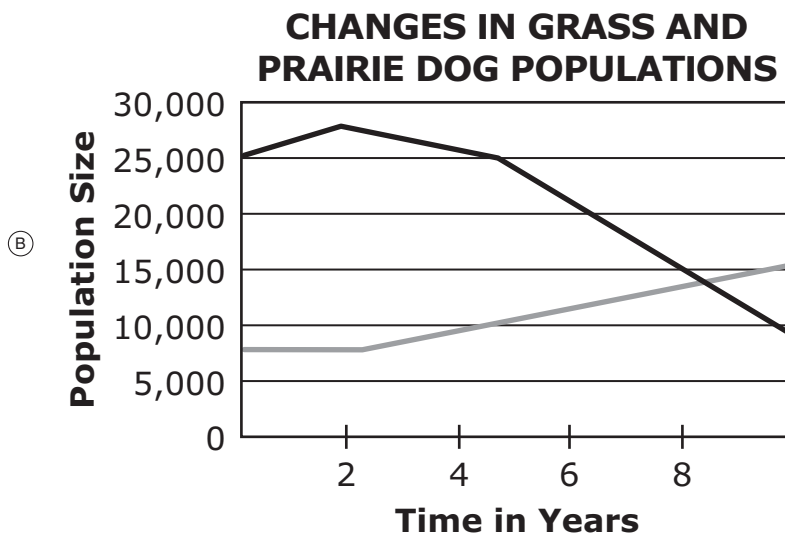
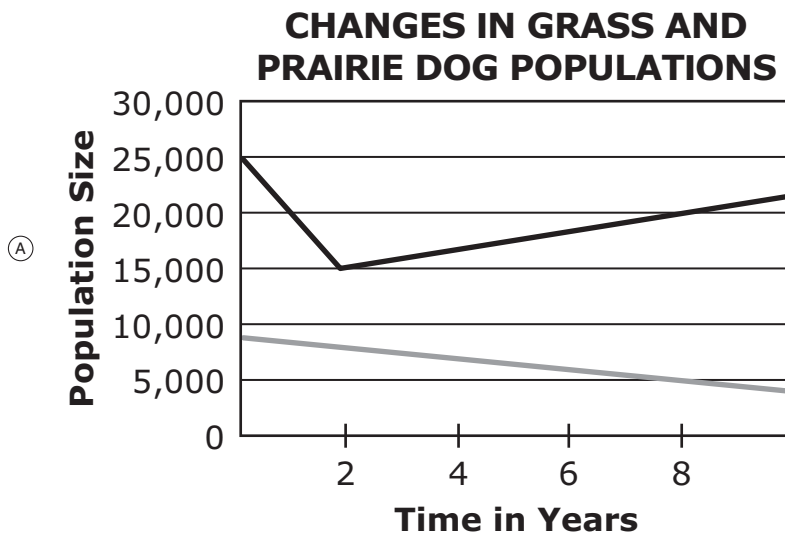
The arrows in the food web represent

- (A) the movement of one organism into the territory of another organism
- (B) the transfer of energy from one organism to another
- (C) a parasitic interaction between two organisms
- (D) a genetic similarity between two organisms

10 The research stated that the prairie dog and ferret interact with one another in the prairie ecosystem.

Which graph best represents the changes in the amount of grass and prairie dog population when the initial number of ferrets in the ecosystem was 140?

KEY	
	= Tons of grass
	= Prairie dogs
1 ton = 907.185 kilograms	



11 The prairie organisms' interactions illustrate the interactions that occur among three different organisms and the prairie dog.

The interaction between the prairie dog and the grasshopper is

- Ⓐ competitive because the prairie dog consumes the same resources as the grasshopper
- Ⓑ parasitic because the prairie dog has nutrients taken from it by the grasshopper
- Ⓒ mutualistic because the prairie dog receives resources from the grasshopper
- Ⓓ predatory because the prairie dog tracks and hunts the grasshopper

12 The three prairie food web resources illustrate the interactions among organisms in the prairie ecosystem.

Describe how the prairie dog and bison populations will most likely change if a severe drought were to occur for a four-year period. In your description, be sure to include

- the cause of any changes to the populations
- the movement of energy within the ecosystem
- the interactions among the organisms

Lined writing area with 20 horizontal lines.



PLEASE DO NOT WRITE IN THIS AREA

Serial number input field consisting of a square box followed by 20 circles.

SERIAL #



You have come to the end of Section 4 of the test. Review your answers from Section 4 only.



MICAP

Maryland Comprehensive
Assessment Program

Grade 8
MISA
Practice Test

