



# **RELEASED ITEMS**

**SCIENCE  
GRADE 8**

**Fall 2008**

**MICHIGAN STATE BOARD OF EDUCATION  
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# PART 1

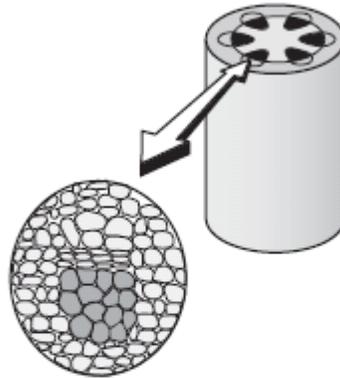
## DIRECTIONS

This test includes both multiple-choice and written-response questions. For the multiple-choice questions, use only a No. 2 pencil to mark your answers. Make a dark mark that completely fills the corresponding circle in your **Answer Document**. If you are not sure of the answer to a question, mark your *best* choice and go on to the next question. If you change an answer, be sure to erase the first mark completely. Mark only one answer for each question.

The written-response questions require you to write sentences or paragraphs in your **Answer Document**. Try to show all that you know about the topics by writing as much as you can in response to the questions you are asked. Make sure you at least attempt to answer each question. Use a No. 2 pencil to record your written responses in the **Answer Document**. Respond only on the lines or in the spaces provided. Make sure the number of the question corresponds to the number in the **Answer Document**.

If you finish early, you may check your work for Part 1 only. Do **NOT** work on Part 2 of this test until you are told to do so.

- 1 Correctly identify descriptors of organism body components in order of complexity starting with the basic unit
- A Chose incorrect order
  - B Correct answer
  - C Chose incorrect order
  - D Chose incorrect order
- 2 Mark sliced a plant's stem into various sections and placed them under a microscope. He noticed that each of the sections had identical cell formations, which created tube-like structures in the stem.

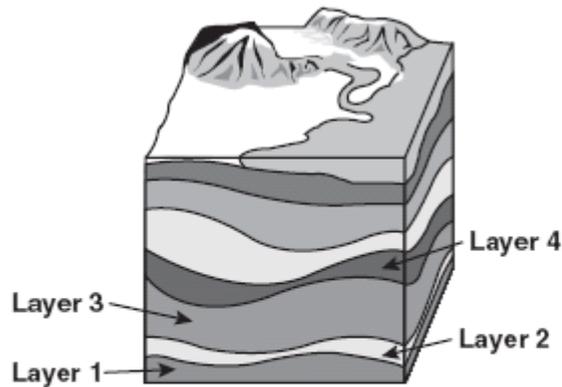


- A specific function of the stem is to
- A absorb minerals from the soil.
  - B transport food and water.
  - C protect against diseases.
  - D capture sunlight for photosynthesis.
- 3 Identify the specific part of a plant seed
- A Chose a non-seed part of a plant
  - B Correct answer
  - C Chose a non-seed part of a plant
  - D Chose an incorrect part of a seed

- 4 Using a description of an investigation on plant seeds, select the correct investigation question.
- A Chose wrong question using a variable not compared in the description
  - B Chose wrong question using a variable held constant across comparison of effects on seeds
  - C Correct answer
  - D Chose wrong question using a concept not listed in the description
- 5 Which is the first thing that would happen if a plant could **NOT** obtain carbon dioxide?
- A It would not be able to reproduce.
  - B It would not be able to make food.
  - C It would not be able to get rid of waste.
  - D It would not be able to absorb minerals.
- 6 Plants can trap light energy and store that energy in the form of
- A water.
  - B carbon dioxide.
  - C sugar.
  - D oxygen.
- 7 Identify the correct interacting relationship between two organisms as described
- A Chose incorrect relationship
  - B Chose incorrect relationship
  - C Correct Answer
  - D Chose incorrect relationship

- 8 Choose the best unit of length for measuring the organism described in an investigation plan.
- A Not the best measurement unit
  - B Not the best measurement unit
  - C Not the best measurement unit
  - D Correct answer
- 9 Kim wanted to determine if certain seeds require sunlight to germinate. She placed one seed in a moist paper towel in the sunlight and another seed in an equally moistened paper towel in a dark closet. The seed in the sunlight germinated but the one in the closet did not. Kim reported to the class that this type of seed needs sunlight in order to germinate.
- Given this information, which of the following would *best* describe an improvement in Kim's experiment that would strengthen her claim?
- A Use many seeds to conduct the experiment.
  - B Start the samples on different days.
  - C Use different amounts of water.
  - D Place the seeds in new locations.
- 10 Which of the following processes will produce igneous rocks?
- A deposition of sediments
  - B volcanic action
  - C earthquake activity
  - D erosion of surface rocks

11 According to the picture below, which layer of sedimentary rock is the oldest?



- A Layer 4
  - B Layer 3
  - C Layer 2
  - D Layer 1
- 12 Which of the following provides the *best* explanation for how the use of oil as a major energy source can cause problems for future generations?
- A Oil is a non-renewable resource.
  - B Oil is composed of carbon atoms.
  - C Oil is used for production of electricity.
  - D Oil is a product of decomposed plants.
- 13 Identify the correct sequence physical property processes through which liquid water moves from one source to be liquid water in another source
- A Correct answer
  - B Chose incorrect process sequence
  - C Chose incorrect process sequence
  - D Chose incorrect process sequence

Use the information below to answer questions 14 through 17.

Scientists discovered a distant body orbiting the Sun in October of 2003. It is the largest object found in orbit around the Sun since the discovery of Neptune in 1846. In 2006, it was given the official name Eris.

- 14 Describe the force of gravity between the Sun and an orbiting planet-like body
- A Incorrect description of gravitation force between the Sun and body
  - B Correct answer
  - C Incorrect description of gravitation force between the Sun and body
  - D Incorrect description of gravitation force between the Sun and body
- 15 Which of the following observations would provide the *best* evidence to support that Eris is **NOT** a star?
- A It has mass, density, and a circumference that can be estimated.
  - B Its light, which has been observed, is reflected from the Sun.
  - C It is found in the Milky Way Galaxy, which includes only our solar system.
  - D Its brightness can be used to help calculate its size and temperature.
- 16 Select the most appropriate description of the body orbiting the Sun that indicates the body could be a planet
- A Incorrectly chose evidence applicable to a star
  - B Incorrectly chose evidence applicable to a star
  - C Correct answer
  - D Chose evidence applicable to either a star or a planet

ANSWER THE FOLLOWING CONSTRUCTED-RESPONSE ITEM IN YOUR ANSWER DOCUMENT.

**17 Constructed Response (3 points)**

If scientists were able to retrieve a rock sample from Eris’s core, they would *most likely* determine the mass, length, and volume of the rock.

- Identify a measurement tool and metric measurement unit used to determine each of these properties. (Complete the table in your answer document for 3 points.)

	Mass	Length	Volume
Metric Measurement Tool			
Metric Measurement Unit			

**NOTHING WRITTEN IN THIS TEST BOOKLET WILL BE SCORED.**

**18** Select the best unit of measurement to use to measure distance within a school building as described

- A** Correct answer
- B** Incorrectly chose a unit of mass
- C** Incorrectly chose a unit for liquid volume
- D** Chose an inappropriate length unit for the scale of the task

**19** Which of the following is an element?

- A** carbon dioxide
- B** salt water
- C** sugar
- D** iron

- 20** Correctly name the general chemical class for a substance obtained from the reaction of 2 elements
- A** Chose wrong class
  - B** Correct answer
  - C** Chose wrong class
  - D** Chose wrong class
- 21** Select the most appropriate list of investigation tools needed to carry out a described physical science investigation
- A** Chose a incomplete set of tools
  - B** Correct answer
  - C** Chose an incomplete set of tools
  - D** Chose an incomplete set of tools
- 22** Based on a description of a science investigation, select the best description of purpose for carrying out the investigation
- A** Selected a purpose not addressed in the investigation description
  - B** Selected a purpose that only studies a qualities of a tool used in the investigation
  - C** Selected a purpose not addressed in the investigation description
  - D** Correct answer

- 23 Which *best* describes the motion of molecules in a solid at extremely low temperatures?
- A bumping together with some room to move
  - B vibrating while closely packed together
  - C moving freely and randomly in a space
  - D sliding around one another and colliding
- 24 Correctly label the type of electrical circuit illustrated
- A Correct answer
  - B Chose an incorrect label
  - C Chose an incorrect label
  - D Chose an incorrect label that is not ordinarily used to describe a circuit
- 25 A battery works by converting which of these to electrical energy?
- A nuclear energy
  - B chemical energy
  - C magnetic energy
  - D light energy
- 26 Correctly identify how a block will move based on the description of forces acting on the block
- A Chose incorrect movement
  - B Correct answer
  - C Chose incorrect movement based on incorrect understanding of force effects
  - D Chose incorrect movement

- 27 Which of the following *best* describes the interaction between two magnets?
- A North poles always repel south poles.
  - B North poles always attract north poles.
  - C As distance between two magnets increases, attraction increases.
  - D As distance between two magnets decreases, attraction increases.
- 28 Correctly identify the physical process by which a magnetic field is generated around a copper wire
- A Correct answer
  - B Chose process that does not induce a magnetic field
  - C Chose a physical change to a wire that does not induce a magnetic field
  - D Chose a process insufficient alone to induce a magnetic field in a wire
- 29 What is the *main* function of simple machines?
- A They slow down movement, making work easier.
  - B They make it easier to do the same amount of work.
  - C They decrease the amount of work needed to be done by increasing force.
  - D They eliminate work completely by providing an object to help do a job.
- 30 When astronauts are outside of the space shuttle, they use microphones and headphones to communicate with each other. The astronauts need microphones and headphones because sound will **NOT** travel through a
- A vacuum.
  - B solid.
  - C gas.
  - D liquid.

# PART 2

## DIRECTIONS

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- 31 Cindy dissected a flowering plant and looked at the stem, roots, leaves, and flower under a microscope. After her observations, Cindy should conclude that all flowering plant structures
- A are not living.
  - B have the same function.
  - C have cells.
  - D are green.

- 32 The following test design was developed by researchers:

**Sleep Study**

1. Select a volunteer to participate in the study.
2. Ask the volunteer to read a short story just before going to sleep.
3. Give the volunteer a multiple-choice test on the short story the following day.
4. Record the test results.

The *greatest* flaw with the experimental design is that

- A the test results were recorded.
  - B the volunteer went to sleep.
  - C the study was done overnight.
  - D only one volunteer participated.
- 33 A snake, a dog, and a bird are all
- A warm-blooded.
  - B cold-blooded.
  - C vertebrates.
  - D invertebrates.

- 34** Identify the main function of a specific plant organ
- A** Correct answer
  - B** Incorrectly associated another plant organ’s function to the specified organ
  - C** Incorrectly chose a process that does not occur in the specified organ
  - D** Chose a process that can not happen in a plant, i.e., breakdown of an element
- 35** Correctly identify the effects of environmental change on selection preference of an organism having different physical appearances
- A** Chose wrong outcome on the organism due to the described selection pressure
  - B** Chose the wrong outcome indicating the environmental change did not effect the organism
  - C** Correct answer
  - D** Chose the wrong outcome indicating the environmental change did not effect the organism
- 36** Chose the statement about an organism that is an observation
- A** Incorrectly chose a conclusion statement
  - B** Incorrectly chose a theoretical statement
  - C** Incorrectly chose a conclusion statement
  - D** Correct answer

- 37** Some insects consume nectar from flowering plants and help the plant by spreading pollen. Which type of relationship between insects and plants does this demonstrate?
- A** parasitic
  - B** competitive
  - C** predator-prey
  - D** mutually beneficial
- 38** Choose the most appropriate reason why biological scientists would be concerned on the negative impact from induction of a non-native species into an existing ecosystem
- A** Incorrectly chose a reason related to the non-adaptation of the non-native species to the new ecosystem
  - B** Correct answer
  - C** Incorrectly chose a reason stating the non-native species would have no effect the on ecosystem
  - D** Incorrectly chose a reason related to economic benefits in the local region served by the ecosystem
- 39** Based on time-series illustrations, correctly indicate the future of water in a pond
- A** Incorrectly chose answer indicating no effect over time
  - B** Incorrectly chose answer indicating lasting water resource
  - C** Incorrectly chose answer indicating transformation of a pond to another type of open water resource
  - D** Correct answer

- 40 According to the food chain, which of the following would be the *most likely* result of the reduction in the lake trout population?

**A Great Lakes Food Chain**

Plankton → Mosquito larvae → Sculpin (a small fish) → Lake trout

- A Sculpin and mosquito larvae populations would both increase.
- B Sculpin and mosquito larvae populations would both decrease.
- C The plankton population would decrease.
- D The sculpin population would increase.

**ANSWER THE FOLLOWING CONSTRUCTED-RESPONSE ITEM IN YOUR ANSWER DOCUMENT.**

- 41 **Constructed Response**  
(3 points)

There are advantages and disadvantages to using the Internet, rather than books or periodicals, as a tool for scientific research.

- Describe one advantage and two disadvantages of using the Internet.

**NOTHING WRITTEN IN THIS TEST BOOKLET WILL BE SCORED.**

- 42 Identify the best source of accurate unbiased information on a factual topic
- A Incorrectly chose a likely biased source of information
  - B Incorrectly chose a likely biased source of information
  - C Correct answer
  - D Incorrectly chose a likely biased source of information
- 43 What information can always be obtained from a topographic map?
- A types of wildlife
  - B elevation
  - C temperature
  - D types of rocks

- 44 Select the best description applicable to replenish Earth's surface water
- A Correct answer
  - B Incorrectly selected a water resource and a process that does not replenish surface water resources
  - C Incorrectly selected a water resource and a process that does not replenish surface water resources
  - D Incorrectly selected a water resource and a process that does not replenish surface water resources
- 45 Which of the following measures would have the *greatest* impact on reducing river pollution in a farm area?
- A planting crops that absorb less water
  - B plowing land earlier in the year
  - C controlling the use of fertilizer
  - D increasing irrigation of crops
- 46 Identify the physical process by which dew forms
- A Chose wrong process
  - B Correct answer
  - C Chose wrong process
  - D Chose wrong process

- 47 The table below compares some characteristics of Venus and Mercury.

**Comparison of Venus and Mercury**

Planet	Average Distance from the Sun (millions of km)	Surface Temperature Range (°C)	Gases in the Atmosphere	Water	Average Circumference of Orbit Around the Sun (millions of km)
Venus	108	55° to 465°	96% Carbon dioxide 3% Nitrogen Other gases	Small amounts of water vapor in the atmosphere	492
Mercury	58	-173° to 427°	Minimal atmosphere	Possible ice deep inside craters	356

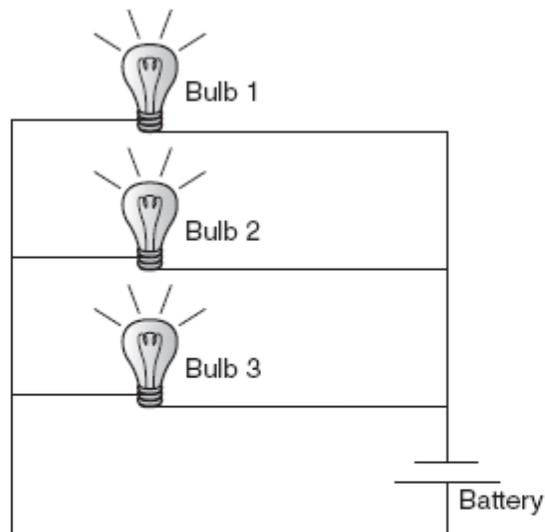
Mercury has a *greater* temperature range than Venus because Mercury

- A is farther from the Sun than Venus.
  - B is a smaller planet than Venus.
  - C may contain ice while Venus does not.
  - D has a minimal atmosphere compared to Venus.
- 48 In Michigan, it is warmer in summer than in winter because in summer
- A Earth is closer to the Sun.
  - B there are fewer clouds.
  - C the Sun's rays hit Michigan more directly.
  - D Michigan is tilted away from the Sun.
- 49 Engineers have recently developed alternative fuels such as ethanol to power vehicles. Ethanol is a fuel that is made from corn or other crops including wheat, barley, and potatoes. E85 is a mixture of 85% ethanol and 15% gasoline.
- The *greatest* environmental advantage to using E85 would be that
- A it has gasoline mixed in it.
  - B it is used to power vehicles.
  - C it is made up mostly of renewable resources.
  - D it is made from crops that require powerful fertilizers.

50 Based on a table of investigation outcomes, select the most appropriate tool used to make the measures listed

- A Chose a tool not related to the investigation or the outcome measure
- B Chose a tool not able to make the measure
- C Correct answer
- D Chose a tool which could make the measure using other tools, very accurate measurement, and calculations

51 Based on the diagram below, if Bulb 3 burned out, what would happen to the other bulbs?



- A Bulbs 1 and 2 would remain lit.
- B Bulb 1 would go out, and Bulb 2 would remain lit.
- C Bulbs 1 and 2 would go out.
- D Bulb 2 would go out, and Bulb 1 would remain lit.

- 52** Correctly identify an example of a specific transformation of 1 type of energy into another type of energy
- A** Chose an incorrect example
  - B** Chose an incorrect example
  - C** Chose an incorrect example
  - D** Correct answer
- 53** Based on a description of a specific investigation's purpose, identify the investigation's hypothesis statement
- A** Selected a hypothesis involving variables not described in the investigation's purpose
  - B** Correct answer
  - C** Selected a hypothesis involving variables not described in the investigation's purpose
  - D** Selected a hypothesis involving variables not described in the investigation's purpose
- 54** Based on a illustration of a juggler using 3 balls, select the correct description of the forces acting on a specified ball in motion
- A** Incorrectly selected a description of force amounts that did not describe the balls movement
  - B** Correct answer
  - C** Incorrectly selected a description by the force amounts would not produce ball movement
  - D** Incorrectly selected a description that force does not effect ball movement

## Scoring Key: Part 1

Item Number	Correct Answer	Standard/ Benchmark	Description
1	B	L.1.m.1	Living things are made entirely of cells
2	B	L.1.m.2	Specialized cells
3	B	L.2.m.2	Life cycles of flowering plants
4	C	C.1.m.1	Ask questions
5	B	L.2.m.3	Plants make and store food
6	C	L.2.m.3	Plants make and store food
7	C	L.5.m.1	Patterns of relationships
8	D	C.1.m.4	Measure in metric
9	A	R.1.m.1	Strengths and weaknesses of claims or data
10	B	E.1.m.2	Rock formation
11	D	E.1.m.4	Geological history of Earth
12	A	E.1.m.5	How technology changes Earth's surface
13	A	E.2.m.2	Paths of water to oceans
14	B	E.4.m.2	Motion of solar system objects
15	B	E.4.m.3	Common observations in the night sky
16	C	E.4.m.3	Common observations in the night sky
17	E	C.1.m.4	Measure in metric
18	A	C.1.m.4	Measure in metric
19	D	P.1.m.2	Appropriate units
20	B	P.1.m.3	Elements, compounds, mixtures
21	B	C.1.m.4	Measure in metric
22	D	C.1.m.2	Conduct investigations
23	B	P.1.m.4	Molecular description of states
24	A	P.1.m.5	Explain circuits
25	B	P.2.m.4	Common energy transformations
26	B	P.3.m.2	Unbalanced forces cause motion
27	D	P.3.m.3	Non-contact forces: electricity, magnetism, gravity
28	A	P.2.m.3	Molecular explanation of changes of state
29	B	P.3.m.5	Use forces to move objects
30	A	P.4.m.1	How sounds travel

## Scoring Key: Part 2

Item Number	Correct Answer	Standard/ Benchmark	Description
31	C	L.1.m.1	Living things are made entirely of cells
32	D	C.1.m.2	Conduct investigations
33	C	L.2.m.1	Classify organisms
34	A	L.2.m.2	Life cycles of flowering plants
35	C	L.4.m.2	How new traits become established; extinction
36	D	L.5.m.1	Patterns of relationships
37	D	L.5.m.3	Population dynamics
38	B	R.1.m.2	Limitations of personal knowledge
39	D	R.1.m.6	Contributions from people with diverse backgrounds
40	D	L.5.m.4	Succession
41	E	R.1.m.2	Limitations of personal knowledge
42	C	E.1.m.1	Surface features on maps
43	B	E.2.m.3	Groundwater
44	A	E.2.m.4	Origins of water pollution
45	C	E.3.m.3	Water cycle
46	B	E.4.m.1	Planets
47	D	E.4.m.2	Motion of solar system objects
48	C	R.1.m.4	Advantages and risks of new technologies
49	C	C.1.m.3	Use scientific tools
50	C	C.1.m.4	Measure in metric
51	A	P.2.m.4	Common energy transformations
52	D	C.1.m.2	Conduct investigations
53	B	P.3.m.2	Unbalanced forces cause motion
54	B	R.1.m.1	Strengths and weaknesses of claims or data