meap™

Michigan Educational Assessment Program

RELEASED ITEMS

SCIENCE
GRADE 8

Fall 2007

MICHIGAN STATE BOARD OF EDUCATION
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PART 1

DIRECTIONS

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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 multiple-choice 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. Remember, mark only one answer for each question.

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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.

If you do not understand any of these directions, please raise your hand.

You may now begin.

1 Classification of organisms using a common characteristic

A Chose characteristic that classified some, not all, animals

B Chose a characteristic that classified one, not all, animals

C Correct

D Chose a characteristic not found in any animal provided

2 Identify a product from photosynthesis

A Selected a chemical not involved with photosynthesis

B Selected a reactant for photosynthesis

C Correct

D Selected a reactant for photosynthesis

3 Many lizards that live in Arizona are unable to live in Michigan. Which of the following reasons best describes why Arizona lizards have difficulty surviving in Michigan?

A ability to live both on land and in the water

B inability to live where temperatures are lower than 30°F (−1.1°C)

C ability to live where temperatures are above 100°F (37.8°C)

D inability to live where there is no water

4 Selecting most appropriate source for specific information

A Selected information that is likely biased

B Selected information that is likely biased

C Correct

D Selected a single case study from a popular magazine

5 Develop appropriate research question for fossil comparison

A Question not directed to the comparison task

B Question not directed to the comparison task

C Correct

D Question not directed to the comparison task

6 Which of the following is true of any food web?

A Producers acquire energy directly from the consumers.

B Consumers acquire energy indirectly from the Sun.

C Decomposers acquire energy directly from the Sun.

D Producers acquire energy indirectly from the decomposers.

7 Understand forces on a object that is increasing speed

A Incorrectly described relationship among opposing forces

B Correct

C Chose irrelevant relationship between force and mass

D Chose irrelevant relationship of a constant force on object

8 Explain difference in float depth of object in salt vs. fresh water

A Correct

B Chose untrue statement of effect of a force in fresh water

C Chose untrue statement of effect of a force in fresh water

D Chose untrue statement of effect of a force in salt water

9 During thermal expansion, individual molecules

A rotate.

B move faster.

C move slower.

D do not change speed or direction.

10 Indentify way to distinguish between 2 like-appearing metals

A Chose a measure insufficient to distinguish 2 metals

B Chose a measure insufficient to distinguish 2 metals

C Correct

D Chose a measure insufficient to distinguish 2 metals

11 When a light bulb is lit, electrical energy is transformed into

A light and heat energy.

B heat and nuclear energy.

C light and mechanical energy.

D mechanical and magnetic energy.

12 Explain forces for 2 contacting objects when objects are at rest

A Chose wrong explanation of forces for this situation

B Chose wrong explanation of forces for this situation

C Chose wrong explanation of forces for this situation

D Correct

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

13 Constructed Response (3 points)

An insect causing crop damage was the main food source for a native bird population. These birds were not eating enough insects to prevent crop damage. Farmers decided to introduce a non-native bird species to help control the insects.

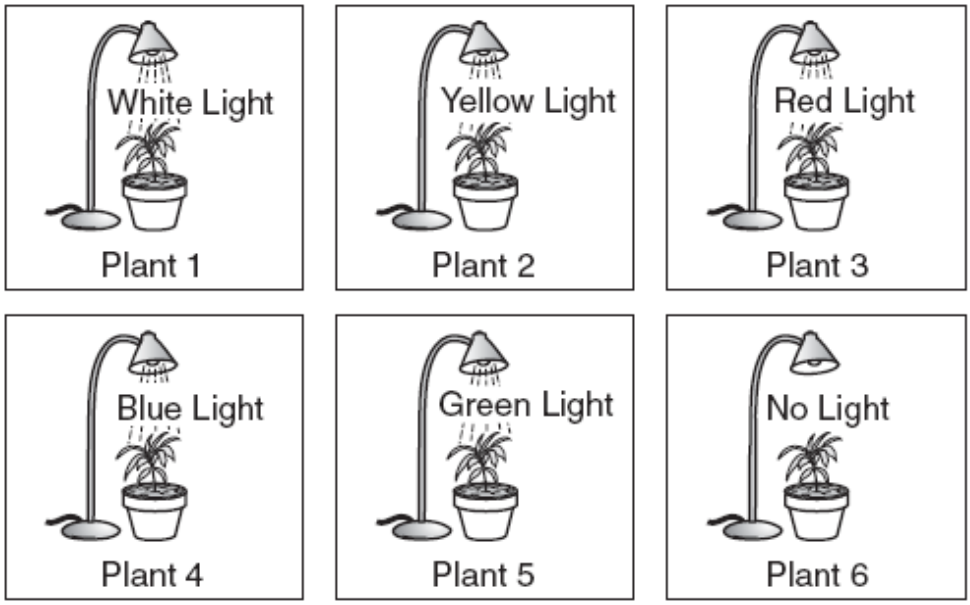
- Explain the effect this would most likely have on the insects causing crop damage.
- Explain the effect this would most likely have on the native bird population.
- What advantage does introducing non-native animals have over the use of chemical pesticides?

NOTHING WRITTEN IN THIS TEST BOOKLET WILL BE SCORED.

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

14

PLANT EXPERIMENT



Time of Experiment: 3 Weeks

Constructed Response (3 points)

A student sets up an experiment to determine the effect of light color on similar potted, green-leafed plants, as shown above.

Based on the diagrams:

- Why should all of the potted plants in the experiment be similar?
- Write a reasonable hypothesis based on the question being investigated.
- What is the purpose of Plant 6 receiving no light?

NOTHING WRITTEN IN THIS TEST BOOKLET WILL BE SCORED.

15 Recognize a procedure to make a magnetic field around a wire

A Correct

B Selected an irrelevant procedure for magnetic induction

C Selected an irrelevant procedure for magnetic induction

D Selected an insufficient procedure for magnetic induction

16 Name of water reservoir after water soaks into the ground

A Correct

B Chose wrong name

C Chose wrong name, a non-reservoir of water

D Chose wrong name, a non-reservoir of water

Use the information below to answer questions 17 through 20.

Zebra mussels arrived in Lake St. Clair, near Detroit, by accident. Mussels are in the same family as oysters, and they form hard, protective outer shells. Scientists believe zebra mussels were transported by large ships from Europe and spread rapidly throughout the Great Lakes. They consume large quantities of tiny plants and animals and have a high reproductive rate.

17 Within the Great Lakes ecosystem, scientists refer to the zebra mussel as a

A parasite.

B producer.

C non-native species.

D single-celled organism.

18 Zebra mussels reproduce and spread quickly, reducing food resources and crowding native species. This results in

A an increase in native producer populations.

B a decrease in native consumer populations.

C higher reproductive rates for native species.

D mutually beneficial relationships with native species.

19 The zebra mussel would *best* be classified as a(n)

A mammal.

B producer.

C amphibian.

D invertebrate.

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

20 Constructed Response (3 points)

One predator of the zebra mussel is a fish called the pumpkinseed. One possible way of controlling the amount of zebra mussels would be to introduce more pumpkinseed fish in some areas affected by the zebra mussels.

- Develop a hypothesis that a scientist should use as an argument in favor of introducing pumpkinseed fish into areas affected by zebra mussels.
- Describe one risk involved with introducing more pumpkinseed fish into the affected area.
- Describe one benefit involved with introducing more pumpkinseed fish into the affected area.

NOTHING WRITTEN IN THIS TEST BOOKLET WILL BE SCORED.

21 Understand why snow is present at higher elevations

A Selected reason as due to physical location

B Selected reason unrelated to atmosphere location

C Correct

D Selected reason unrelated to atmosphere location

22 Fog can occur when

A cool rain falls on warmer ground.

B air pressure increases and water vapor decreases.

C relative humidity decreases and dew point decreases.

D moist air passes over cooler ground causing condensation.

23 Which characteristic of Earth is *most* responsible for our seasons?

A Earth's gravitational pull on the moon

B Earth's rotation

C Earth's mass

D Earth's tilt on its axis

24 Information from fossils about Earth's history

A Chose misconception about life on Earth

B Chose misconception about life earliest forms

C Correct

D Chose misconception about Earth's environment

PART 2

DIRECTIONS

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You may now begin Part 2.

25 On a hot day, a glass containing ice water slowly collects liquid on the outside of the glass. Which *best* explains where this liquid came from?

A Air molecules outside of the glass turned to liquid on the outside surface of the glass.

B Water from the inside of the glass seeped to the outside of the glass.

C Water vapor from the air outside of the glass condensed on the outside surface of the glass.

D Water from both inside the glass and the air collected on the outside of the glass.

26 Apparent movement of stars in the night sky

A Correct

B Chose wrong basis for nightly star movement

C Chose reason for blocked view unrelated to daily patterns

D Chose wrong basis for nightly star movement

27 Best understand main reason for changes in air moisture levels

A Selected condition remotely related to moisture change

B Selected atmosphere composition unrelated to moisture

C Correct

D Selected condition remotely related to moisture change

28 Identify how a specific liquid water occurs from air water vapor

A Correct

B Chose process that produces the opposite effect

C Chose process for water in a different state of matter

D Chose a different process for water from the atmosphere

29 Select the best source for valid and reliable science information

A Chose a source that could be biased

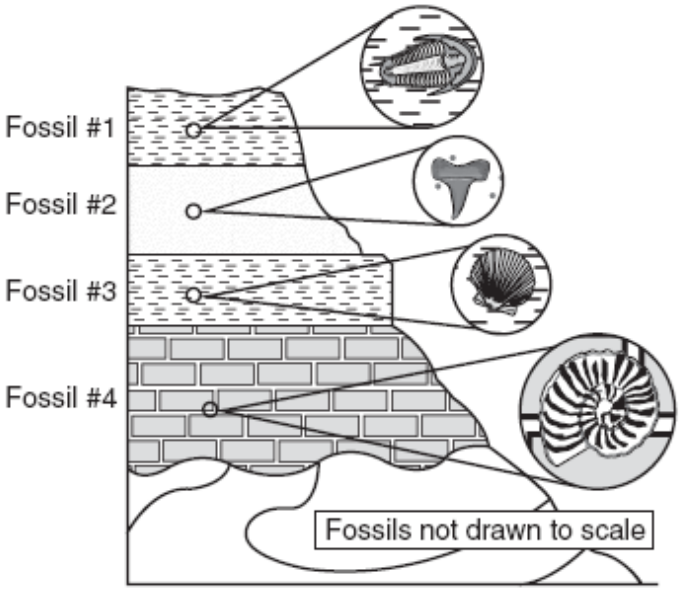
B Chose source of popular & incomplete information

C Chose a source that could be biased

D Correct

30 The diagram below shows exposed rock layers. Each rock layer contains a fossil of a different organism.

Fossil Layers



Which fossil *most likely* represents the oldest form of life?

A Fossil #1

B Fossil #2

C Fossil #3

D Fossil #4

31 Four students work in a group to learn how rocks are formed. The teacher gives each of them a blue crayon and a red crayon and tells them to follow the steps on the board, as shown below.

Exercise–How Rocks Are Formed

Step	Activity
1	Break up the red and blue crayons into tiny pieces.
2	Put the pieces in your hand and squeeze them together to form a red-and-blue-speckled slab.
3	Place the slab in a beaker, and place the beaker on a hot plate to melt the slab.
4	Place the beaker with the melted slab into a bucket of ice to cool it down.

Which step *best* represents how a sedimentary rock is formed?

A Step 1

B Step 2

C Step 3

D Step 4

32 Recognize the observations made by use a given science tool

A The given tool unable to make this observation

B Chose a theory partially related to use of the tool

C Correct

D Chose a research conclusion not related to use of tool

33 Understand how some sounds can be made

A Chose the name a specific set of sound frequencies

B Correct

C Chose a type of sound effect

D Chose an applied use of sound energy

34 Joe determined the mass of four rock samples. Then, he put each rock sample in a cup of vinegar for three days. The table below represents the data he collected during his investigation.

Rock Sample Data

Rock Sample	Mass of Rock Before Immersion in Vinegar (g)	Mass of Rock After Immersion in Vinegar (g)	Observations
1	10	10	no change
2	20	20	no change
3	15	10	some bubbles
4	15	5	many bubbles

Which of the following can be concluded from the table above?

A Rocks 1 and 2 are the same type of rock.

B Rock 4 is a sedimentary rock.

C Rocks 3 and 4 are chemically changed.

D Rocks 1, 2, 3, and 4 are the same type.

35 Which unit can be used to describe volume?

A centimeter (cm)

B milliliter (mL)

C meter (m)

D gram (g)

36 Recognize an example of biological chemical change

A Correct

B Chose a physical change process

C Chose a physical change process

D Chose a physical change process

37 Choose the element for a list of substances

A Chose a molecule

B Chose a molecular mixture

C Chose a molecule

D Correct

38 What is the *main* reason for clearly recording the procedures for an experiment?

A so the experiment can be modified

B so the experiment can be connected

C so the experiment can be repeated

D so the experiment can be summarized

Use the information below to answer questions 39 through 42.

Mr. Jones' eighth grade class is studying physical and chemical changes. Each group of students is given safety goggles, a lab apron, two 3- by 5-inch colored index cards, a match, and a cup of bleach. Using the supplies given, one piece of paper must undergo a chemical change and the other must undergo a physical change.

39 Group 1 predicts that folding an index card into a different shape will result in a chemical change. Which step of the scientific process is this?

A experiment

B observation

C hypothesis

D conclusion

40 All groups fold the index cards and burn them carefully over the sinks at the same time. How does this burning affect the atmosphere inside the classroom?

A Water vapor in the air decreases.

B Air temperature decreases.

C Oxygen levels increase.

D Carbon dioxide levels increase.

41 A physical change could best be demonstrated by

A burning the index card.

B leaving the index card unchanged.

C cutting the index card in half.

D bleaching the index card.

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

42 Constructed Response (3 points)

- List the steps of a procedure the student groups could use to demonstrate a chemical change in the paper using the supplies provided.
- Describe one observation students could make about a chemical change that is different from an observation about a physical change.

NOTHING WRITTEN IN THIS TEST BOOKLET WILL BE SCORED.

43 Understand day time and days per year due to Earth's rotation

A Chose incorrect on length of day, correct on days per year

B Correct

C Chose incorrect on length of day, incorrect on days per year

D Chose correct on length of day, incorrect on days per year

44 Identify a type of relation between animals in an ecosystem

A Chose the opposite relationship

B Correct

C Chose a relationship irrelevant to that described

D Chose a relationship not possible based on description

45 Note most important function of specific specialized plant cells

A Chose process that all cells carry out

B Chose process that other special plant cells also carry out

C Correct

D Chose a plant benefit irrelevant to specific cell processes

46 Indentify the best method to gather evidence on evolution

A This past evidence does not exist, it is only modeled

B This method to gather evidence is not available

C Correct

D This process no longer occurs

47 During a scientific investigation, when should measurements be recorded?

A when forming a hypothesis

B when designing an experiment

C when communicating results

D when gathering data

48 Use evolutionary theory to explain trait disappearance

A Unfounded and speculative application

B Correct

C Unfounded and speculative application

D Application of incorrect theory; passing on acquired traits

49 Which of the following *best* describes what happens when salt is dissolved in pure water?

A two elements are combined to make a compound

B two elements and a compound combine to make a mixture

C two compounds are combined to make an element

D two compounds are combined to make a mixture

50 In a plant, what is the *main* function of a flower?

A protection

B photosynthesis

C germination

D reproduction

Scoring Key: Part 1

Item Number	Correct Answer	Standard / Benchmark	Description
1	C	L.2.m.1	Classify organisms
2	C	L.2.m.3	Plants make and store food
3	B	L.3.m.2	Contributions from heredity and environment
4	C	R.1.m.2	Limitations of personal knowledge
5	C	L.4.m.1	Evolutionary relationships
6	B	L.5.m.2	Energy from sunlight
7	B	P.3.m.2	Unbalanced forces cause motion
8	A	P.1.m.1	Density
9	B	P.2.m.3	Molecular explanation of changes of state
10	C	P.1.m.1	Density
11	A	P.2.m.4	Common energy transformations
12	D	P.3.m.2	Unbalanced forces cause motion
13	E	R.1.m.5	Awareness and sensitivity to natural world
14	E	C.1.m.2	Conduct investigations
15	A	P.3.m.4	Electromagnetism
16	A	E.2.m.3	Groundwater
17	C	L.5.m.3	Population dynamics
18	B	L.5.m.3	Population dynamics
19	D	L.2.m.1	Classify organisms
20	E	R.1.m.5	Awareness and sensitivity to natural world
21	C	E.3.m.2	Characteristics of the atmosphere
22	D	E.3.m.3	Water cycle
23	D	E.4.m.2	Motion of solar system objects
24	C	E.1.m.4	Geological history of Earth
25	C	E.3.m.2	Characteristics of the atmosphere
26	A	E.4.m.3	Common observations in the night sky
27	C	E.3.m.3	Water cycle
28	A	E.3.m.3	Water cycle

Scoring Key: Part 2

Item Number	Correct Answer	Standard / Benchmark	Description
29	C	C.1.m.5	Use sources of information
30	D	E.1.m.4	Geological history of Earth
31	B	E.1.m.2	Rock formation
32	C	C.1.m.3	Use scientific tools
33	B	P.4.m.5	Vibrating objects
34	C	P.2.m.2	Common chemical changes
35	B	C.1.m.4	Measure in metric
36	A	P.2.m.2	Common chemical changes
37	D	P.1.m.3	Elements, compounds, mixtures
38	C	C.1.m.2	Conduct investigations
39	C	C.1.m.2	Conduct investigations
40	D	P.2.m.2	Common chemical changes
41	C	P.2.m.1	Common physical changes
42	E	C.1.m.2	Conduct investigations
43	B	E.4.m.2	Motion of solar system objects
44	B	L.5.m.1	Patterns of relationships
45	C	L.1.m.2	Specialized cells
46	C	L.4.m.1	Evolutionary relationships
47	D	C.1.m.2	Conduct investigations
48	B	L.4.m.2	How new traits become established; extinction
49	D	P.1.m.3	Elements, compounds, mixtures
50	D	L.2.m.2	Life cycles of flowering plants