Functional Independence
Spring 2011

Science

Item Descriptors

Grade 11

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MICHIGAN STATE BOARD OF EDUCATION

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**DIRECTIONS:** Read each question. Choose the **BEST** answer for each question.
NOTE: For each item listed throughout this booklet, the first statement is a summary of the Michigan Extended Benchmark (EB) and the second statement or problem is the descriptor for the item’s stem or question.

1. **R.RO.FI.EB.II.1.h.1a**: Evaluate a plan based on the strengths and weaknesses of claims, arguments, or data
   
   Identify the best science reference to evaluate a product opinion
   
   A. correct, identified the best scientific reference
   
   B. selected a reference that does not offer a scientific reference
   
   C. selected a reference that does not necessarily provide unbiased scientific information

2. **C-CN.FI.EB.I.1.m.3ADDh**: Identify and/or use tools and equipment appropriate to scientific investigations
   
   Read a measurement using a scientific tool and predict a possible consequence based on the measured value
   
   A. correct, identified a likely consequence
   
   B. selected a consequence contrary to the interpretation of the physical measurement provided by the tool
   
   C. selected a consequence not related to the interpretation of the physical measurement provided by the tool
<table>
<thead>
<tr>
<th>3</th>
<th>L.OR.FI.EB.III.2.h.3a:</th>
<th>5</th>
<th>L.CE.FI.EB.III.1.h.1a:</th>
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<tbody>
<tr>
<td><strong>Explain why plants and animals store food</strong></td>
<td><strong>Recognize that multi-cellular organisms grow and reproduce</strong></td>
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<tr>
<td>Recognize a survival benefit for an organism's ability to store food</td>
<td>Recognize the meaning of reproductive fertilization</td>
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<tr>
<td>A selected an incorrect statement that makes the ability of the organism to store food irrelevant</td>
<td>A selected an incorrect statement based on specified multicellular body parts</td>
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<tr>
<td>B selected an incorrect statement that makes the consumption of food irrelevant</td>
<td>B selected a statement that applies to asexual reproduction</td>
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<td>C correct, identified the benefit from stored food when an organism is unable to consume food</td>
<td>C correct, identified the process by which fertilization occurs</td>
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<tr>
<th>4</th>
<th>L.CE.FI.EB.III.1.h.1a:</th>
<th>6</th>
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<tr>
<td><strong>Recognize that multi-cellular organisms grow and reproduce</strong></td>
<td><strong>Compare and/or classify organisms in major groups based on their structure</strong></td>
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<td>Recognize how an embryo primarily increases in size due to cell growth</td>
<td>Given pictures of three different animals, each from a different animal class, recognize the animal that is a member of the specified class</td>
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<tr>
<td>A correct, identified how cells primarily contribute to embryonic growth</td>
<td>A selected an animal not a member of the specified class</td>
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<tr>
<td>B selected a type of cell growth that is not the primary form of growth in an embryo</td>
<td>B correct, identified the animal that is a member of the specified class</td>
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<tr>
<td>C selected a form of cell differentiation, which is not a primary growth factor</td>
<td>C selected an animal not a member of the specified class</td>
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</tbody>
</table>
7  **L.OR.FI.EB.III.2.h.2a:** Identify the life cycle of an organism associated with human disease

Recognize how injection of a vaccine promotes health

A  selected a false statement regarding how a vaccine promotes health

B  selected a false statement regarding the benefits from vaccines

C  correct, identified how a vaccine protects against infectious disease

8  **L.OR.FI.EB.III.2.h.4a:** Recognize how living things maintain a healthy balance

Recognize the health-maintenance function of a specified cell type

A  correct, identified the function of the specified cell type for maintaining health

B  selected a body process that is not a specialized function of the specified cells

C  selected a body process that is not a specialized function of the specified cells

9  **L.OR.FI.EB.III.2.h.1a:** Compare and/or classify organisms in major groups based on their structure

Given a picture of an animal, recognize its class and then select the animal within the same class among three different animal class choices

A  selected an animal not of the same class as the given animal

B  selected an animal not of the same class as the given animal

C  correct, identified the animal that is a member in the same class as the given animal

10  **L.OR.FI.EB.III.2.h.1a:** Compare and/or classify organisms in major groups based on their structure

Recognize an example plant that is a member of a specified class

A  selected an incorrect plant example

B  correct, selected a plant example of the specified class

C  selected an incorrect plant example
11 L.OR.FI.EB.III.2.h.4a: Recognize how living things maintain a healthy balance
Recognize which result of a blood test indicates a specified disease condition
A selected a result that does not indicate presence or absence of infection
B selected a result that does not indicate presence or absence of infection
C correct, identified the blood test result that indicates presence of an infection

12 L.OR.FI.EB.III.2.h.1a: Compare and/or classify organisms in major groups based on their structure
Recognize an example animal that is a member of a specified class
A selected an incorrect animal example
B correct, selected an animal example of the specified class
C selected an incorrect animal example

13 L.EC.FI.EB.III.5.h.2a: Identify and/or explain that energy flows through familiar ecosystems
Identify the described role of organisms in a food chain
A selected a role in a food chain that was not described
B selected a role in a food chain that was not described
C correct, identified the described role of organisms in a food chain

14 L.EC.FI.EB.III.5.h.3a: Identify and/or describe general factors that influence population size
Identify an organism’s population change that could likely occur in an ecosystem after a specified change to another organism population
A correct, selected the likely population change after the specified change
B selected an unlikely subsequent population change
C selected an unlikely subsequent population change
15 L.EC.FI.EB.III.5.h.3a: Identify and/or describe general factors that influence population size

Identify a reasonable basis for removal of a given animal from the endangered species list

A selected a basis that could further threaten the given endangered animal's population size

B selected a basis that could further threaten the given endangered animal's population size

C correctly identified a reasonable basis for removal of the example animal from the endangered species list

16 L.EC.FI.EB.III.5.h.4a: Describe responses of an ecosystem to events that cause it to change

Predict the population change likely to occur to prey organisms after a specified event occurred to all predator organisms in a food chain

A selected a change in prey population unlikely to occur

B correct, selected the immediate effect on the prey's population level

C selected a prey population change unlikely to occur

17 P.ME.FI.EB.IV.1.m.4ADDh: Describe the arrangement and motion of molecules in solids, liquids, and gases

Recognize the effect on the freezing point of the solution of dissolving a specified compound into water

A selected the opposite effect on the freezing point after adding the compound

B correct, identified the effect the compound had on the freezing point of the solution

C selected the wrong effect on the freezing point of the solution after adding the compound

18 P.ME.FI.EB.IV.1.m.4ADDh: Describe the arrangement and motion of molecules in solids, liquids, and gases

Identify the reason for space left between solid sections of road surfaces

A selected an incorrect reason for leaving space

B selected an incorrect reason for leaving space

C correct, identified the reason that space is necessary
19 P.ME.FI.EB.IV.1.h.1a: Identify the risks and benefits of using common household and agricultural materials

Recognize the need for including warning labels on household products

A correct, identified a valid reason for the use of warning labels

B selected an unfounded reason for the use of warning labels

C selected an unfounded reason for the use of warning labels

20 P.ME.FI.EB.IV.1.h.4a: Identify and/or explore how current is controlled in simple and parallel circuits

Recognize the control of current flow based on the description of a circuit

A selected the wrong circuit description for the corresponding current flow

B correct, identified the circuit description for the intended current flow

C selected the wrong circuit description for the corresponding current flow

21 P.ME.FI.EB.IV.1.h.3a: Identify the structural parts and electrical charges of atoms

Recognize the relationship between charged atomic particles

A selected the opposite relationship between two identically charged particles

B correct, identified the relationship between two differently charged atomic particles

C selected the opposite relationship between two identically charged particles

22 P.ME.FI.EB.IV.1.h.4a: Identify and/or explore how current is controlled in simple and parallel circuits

Given a simple electric circuit diagram, identify the action needed to enable the circuit to work

A selected an action that does not appear necessary in order for the circuit to work

B selected an action that does not appear necessary in order for the circuit to work

C correct, identified the action required for the circuit to work by establishing current flow
23  **P.ME.FI.EB.IV.1.h.3a:** Identify the structural parts and electrical charges of atoms

   Recognize the location of subatomic particles in an atom

   **A** selected a particle not in the specified atomic location

   **B** selected a particle not in the specified atomic location

   **C** correct, identified the correct location of the subatomic particle

24  **P.CM.FI.EB.IV.2.m.1ADDh:** Describe common physical changes in matter

   Recognize the correct process for a change of state for a specified substance in a specified situation

   **A** selected the incorrect process for the change of state

   **B** selected the incorrect process for the change of state

   **C** correct, selected the change of state process described

25  **P.CM.FI.EB.IV.2.h.4a:** Identify common energy transformations in everyday situations

   Recognize the energy transformation process that occurs in the specified situation

   **A** selected an incorrect energy transformation process

   **B** selected an incorrect energy transformation process

   **C** correct, identified the energy transformation that occurred in the specified situation

26  **P.CM.FI.EB.IV.2.h.4a:** Identify common energy transformations in everyday situations

   Recognize that energy is neither lost nor produced by an energy transformation

   **A** selected that an energy transformation always produces a gain or loss of energy

   **B** correct, selected that the amount of energy remains constant although an energy transformation occurred

   **C** selected that an energy transformation sometimes produces a gain or loss of energy
27 P.MO.FI.EB.IV.3.m.3ADDh: Identify and/or describe the non-contact forces exerted by magnets and gravity

Identify which of three non-contact forces attracts matter to a specified location

A selected a non-contact force that does not attract matter as specified
B selected a non-contact force that does not attract matter as specified
C correct, identified the non-contact force that attracts matter to the specified location

28 C.CN.FI.EB.I.1.m.3ADDh: Identify and/or use tools and equipment appropriate to scientific investigations

Identify the direction toward which a compass needle points

A selected an incorrect description
B selected an incorrect description
C correct, selected the direction toward which a compass needle points

29 P.MO.FI.EB.IV.3.m.3ADDh: Identify and/or describe the non-contact forces exerted by magnets and gravity

Recognize a planet's characteristic that produces a non-contact force

A correct, identified the planet's non-contact force that attracts object from space
B selected a planet characteristic that is not a force
C selected a planet characteristic that is not a force

30 P.WV.FI.EB.IV.4.m.4ADDh: Identify and/or describe ways in which light interacts with matter

Recognize the relationship between the absorption of light energy and the color of matter

A selected a color that does not absorb the most light energy
B selected a color that does not absorb the most light energy
C correct, selected the color of matter that absorbs the most light energy
31 P.WV.FI.EB.IV.4.h.3a: Identify properties of waves

Recognize how the pitch of a sound from a moving object changes as the sounding object moves past a stationary person

A selected that the sound has no volume

B correct, recognized that the person would hear a sound that changes in pitch

C selected that the pitch of the sound heard does not change as the object moves past

32 P.WV.FI.EB.IV.4.h.3a: Identify properties of waves

Recognize which characteristic of a transverse wave remained constant across three graphical wave illustrations

A selected a wave characteristic that changed across the three illustrations

B selected a wave characteristic that changed across the three illustrations

C correct, selected the wave characteristic that remained constant for each wave illustration

33 E.GE.FI.EB.V1.h.4a: Identify and design a plan to conserve and/or recycle at home, work, or school

Recognize which type of light source is expected to most efficiently use electricity

A selected a light source that does not have an efficient design for use of electricity

B correct, identified the light source that has an efficient design for using electricity

C selected a light source that does not have an efficient design for use of electricity

34 E.GE.FI.EB.V1.m.1ADDh: Identify and/or describe major features of the earth's surface using maps

Recognize the name of a specified Great Lake from a map of all the Great Lakes

A selected the name of a different Great Lake

B selected the name of a different Great Lake

C correct, identified the name of the specified Great Lake from a map of all the Great Lakes
35 E.GE.FI.EB.IV.1.h.1a: Identify and/or describe surface features caused by the Ice Age

Recognize the specified land form based on description

A correct, identified the described land form
B selected a land form that does not match the description
C selected a land form that does not match the description

36 E.GE.FI.EB.V.1.e.2ADDh: Identify and/or describe types of earth materials and their uses

Recognize which of three soil types through which water most readily flows

A selected a soil type not having the best water flow-through rate
B correct, identified the soil type having the best water flow-through rate
C selected a soil type not having the best water flow-through rate

37 E.GE.FI.EB.V.1.m.4ADDh: Identify and/or explain how rocks and fossils help us understand the history of the earth

Understand how to interpret fossil evidence

A concluded that an organism exists today based on fossil evidence
B correct, used the evidence to conclude that the fossilized organism was once present in a specified location
C concluded that a population of the organism was once present beyond the area in which a single organism fossil was found
38  **E.HY.FI.EB.V.2.h.2a:** Identify and/or describe how human activities affect the quality of water

Recognize a possible problem associated with discharge of water, used for industry, into surface water sources

A  correct, realized that the discharge of industrial water into fresh water sources may harm water later used for consumption

B  selected that industrial water discharged into surface water sources would necessarily be filtered

C  selected that industrial water discharged into surface water sources could benefit organisms that live in the water

39  **E.HY.FI.EB.V.2.m.2ADDh:** Describe how surface water in Michigan reaches the ocean and returns

Recognize flow pathways by which a specified form of water becomes another form of water in the environment

A  selected only one of the two possible water pathways

B  correct, selected the two pathways water flows from one form to another form

C  selected only one of the two possible water pathways

40  **R.RO.FI.EB.II.1.h.6a:** Develop an awareness of and sensitivity to the natural world

Recognize the reason, among the three provided, that has a realistic basis to explain the observed change in wild animal behavior

A  selected a reason that can apply to some animal types; however, there is no past evidence for this long-time-present stimulus having the observed effect

B  correct, this reason could have realistic basis if existing controls on animal population have been removed or people are expanding towns into existing animal habitat

C  selected a reason for which there is no past evidence that large predators are a stimulus for this observed effect on other animals
41 E.AW.FI.EB.V.3.h.3a: Identify and/or use weather information from a variety of sources
Recognize the severe storm that forms over land
A correct, identified the severe storm that forms over land
B selected a type of severe storm that forms over water
C selected a large displacement of water that can damage Earth surface, life, and properties

42 E.AW.FI.EB.V.3.e.3ADDh: Identify and explain appropriate safety precautions during severe weather
Using a table, select data that answers the question
A selected wrong information from the table
B selected wrong information from the table
C correct, selected the correct data from the table

43 E.SS.FI.EB.V.4.h.4a: Investigate current events through print media (books and newspapers) and the Internet
Match the provided drawing representing a historical event in science and technology, to its description in text
A selected an important historical event that does not match the drawing
B correct, matched the drawing to the description of the event
C selected an important historical event that does not match the drawing

44 E.HY.FI.EB.V.2.e.1ADDh: Identify safety precautions with the three states of water
Identify which water temperature is safest for the specified use
A selected a water temperature that is not safest for the specified use
B correct, identified the safest of the three water temperatures for its specified use
C selected a water temperature that is not safest for the specified use
45  **E.AW.FI.EB.V.3.m.1ADDh:**
Identify the uses of weather tools, such as thermometers, rain gauges, and weather maps

Identify the best conditions for collecting data using a specified weather tool

A  selected a condition under which the measurement tool will not work

B  correct, selected the condition under which the measurement tool will work accurately

C  selected a condition that could underestimate the measurement of the weather data