LOUISIANA DEPARTMENT OF EDUCATION

Office of Assessments, Analytics, and Accountability

LEAP Released Item Guide for Science Grade 4

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Purpose

The LEAP released item guide is intended to be used as an instructional tool and not to predict performance on the summative test. These items are meant to help teachers better understand how the achievement level descriptors are used in creating assessment questions.

How to Use and Not Use

The recommendations and cautions that follow are meant to help teachers better understand the achievement level descriptors and help administrators better understand what should and should not be done with the released items.

How to Use

- Learn how achievement level descriptors work with the dimensions in an item;
- Provide guidance when selecting assessment items in terms of rigor, content, and item types

How Not to Use

- Avoid prioritizing the PEs used in the released items because they do not represent all of the content eligible for the operational test;
- Avoid limiting instructional strategies to the released items (creating instructional sets using only the PEs found in the document);
- Do not use only the stimulus materials provided in the released items for classroom instruction;
- Avoid creating assessment items that mirror the released items;
- Avoid designing instructional tasks and sets based on only one PE.

Assessment Design

Supporting Science Instruction

The LEAP tests will assess students' understanding of the LSS for Science, reflecting the multiple dimensions of the standards.

Apply content knowledge and skills (Disciplinary Core Idea, DCI)

On the LEAP test, students answer questions which require content knowledge and skills aligned to PE bundles (groupings of PEs) and the corresponding DCIs.

Investigate, evaluate, and reason scientifically (Science and Engineering Practice, SEP)

On the LEAP test, students do more than answer recall questions about science; they apply the practices, or behaviors, of scientists and engineers to investigate each real-world phenomenon and design solutions to problems.

Connect ideas across disciplines (Crosscutting Concept, CCC)

On the LEAP test, sets of questions assess student application of knowledge across the domains of science for a comprehensive picture of student readiness for their next grade or course in science.

Set Based Design

The grade 4 tests include item sets and standalone items.

Item Sets

Item sets consist of four items that have a common stimulus. There are two one-point items and two two-point items in each item set on the LEAP test. For three of the item sets, one of the two-point items will be a Constructed Response item. In the released item sets, there may be more than four items or fewer than four items with a common stimulus.

Standalone Items

Standalone items are one-point or two-point items that do not share a stimulus with other items.

Achievement-Level Definitions

Achievement-level definitions briefly describe the expectations for student performance at each of Louisiana's five achievement levels:

- Advanced: Students performing at this level have **exceeded** college and career readiness expectations and are well prepared for the next level of study in this content area.
- Mastery: Students performing at this level have **met** college and career readiness expectations and are prepared for the next level of study in this content area.
- Basic: Students performing at this level have **nearly met** college and career readiness expectations and may need additional support to be fully prepared for the next level of study in this content area.
- Approaching Basic: Students performing at this level have **partially met** college and career readiness expectations and will need much support to be prepared for the next level of study in this content area.
- Unsatisfactory: Students performing at this level have **not yet met** the college and career readiness expectations and will need extensive support to be prepared for the next level of study in this content area.

Achievement Level Descriptors

Achievement Level Descriptors (ALDs) indicate what a typical student at each level should be able to demonstrate based on his or her command of grade-level standards. ALDs are written for the three assessment reporting categories. Access the ALDs on the Assessment Resources Webpage for a breakdown of the knowledge, skills, and practices associated with each achievement level.

Released Items

This section includes released test items. With each item and item set, is a table containing alignment information and the answer key, where possible. Additionally, analyses of the multi-dimensional alignment, achievement level descriptor, rationales for answers, and rubrics for CRs and ERs are included with the items. An asterisk (*) denotes correct answer(s).

The achievement level descriptor provides information about how students who answer the item correctly are performing.

For example, an item is aligned to the SEP and DCI for 4-ESS1-1:

Performance Expectation	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landforms over time. CCC: PAT SEP: 6	Use evidence from patterns in rock formations and fossils in rock layers to construct an explanation for changes in landforms over time.	Use evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landforms over time.	Identify evidence from patterns in rock formations and fossils in rock layers.	Identify evidence from patterns in fossils in rock layers.

Identifies the performance level of students who answer the question correctly.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 3 or higher. The student can identify evidence from patterns in rock formations and fossils in rock layers.

Which evidence best explains when this underwater area changed into solid land?

Identifies how the item aligns to the dimensions.

A. Layer 5, because layer 4 contains fossils of animals that live in water and layer 6 does not.*

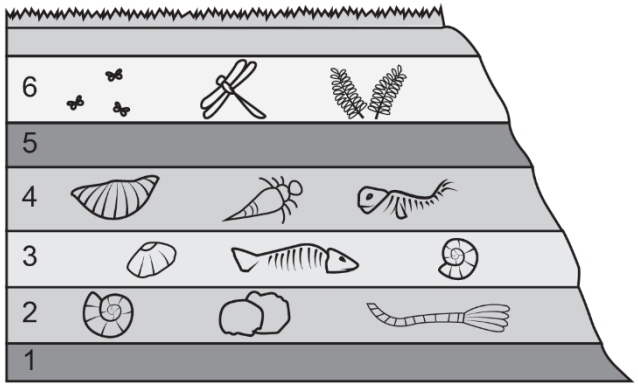
Items Released:
Standalone Items
Item Set: Bryce Canyon
Item Set: Water Hyacinths

Standalone Items

Item Type	PE	DCI	SEP	CCC	Points	Achievement Level
MC	4-ESS1-1	UE.ESS1C.a	6. E/S	PAT	1	3
MS	4-PS3-4	UE.PS3D.a		E/M	1	3
TPI	4-ESS3-2	UE.ESS3B.a	6. E/S	C/E	2	3

SEP = blue; DCI = orange; CCC = green An asterisk (*) denotes correct answer(s).

Multiple Choice
Performance Expectation
4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landforms over time.

Use the information and your knowledge of science to answer the question. Workers were digging a deep trench. They discovered that each rock layer they dug through contained different fossils. **Rock Layers in Trench**  	Which evidence **best** explains when this underwater area changed into solid land? A. Layer 5, because layer 4 contains fossils of animals that live in water and layer 6 does not.* B. Layer 6, because layer 5 has no fossils, while layers 2, 3, and 4 contain fossils of animals that live in water. C. Layer 4, because layer 4 contains fossils of animals that live in water, while layer 5 does not contain fossils. D. Layer 3, because layer 4 contains a fossil of an animal that has legs and layer 3 contains a fossil of an animal that has fins.

Multi-Dimensional Alignment: The item requires the student to apply the science and engineering practices of constructing explanations, and knowledge of: rock formations and fossils in rock layers to demonstrate an understanding of patterns.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 3 or higher. The student can identify evidence from patterns in rock formations and fossils in rock layers.

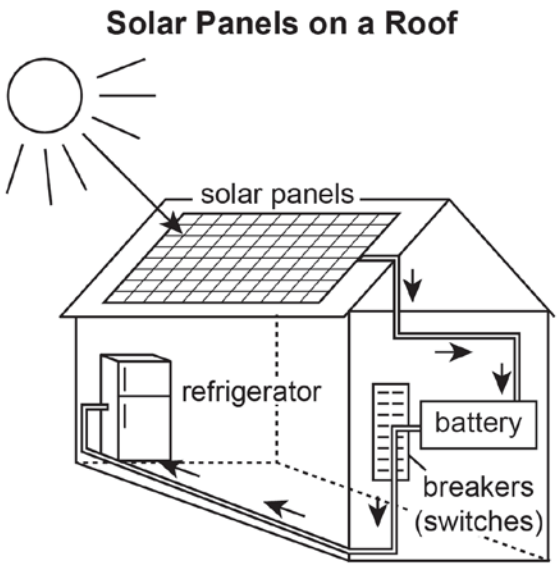
Which evidence best explains when this underwater area changed into solid land?

A. Layer 5, because layer 4 contains fossils of animals that live in water and layer 6 does not.*

Rationales

A. Correct.
B. Layer 6 contains fossils of land organisms, but the layer below it contains no fossils, indicating an environmental disturbance.
C. Layer 4 contains fossils of aquatic organisms.
D. Layer 3 contains fossils of aquatic organisms.

Multiple Select
Performance Expectation
4-PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

Use the information and your knowledge of science to answer the question. A house has solar panels on the roof.  	Which statements **best** describe how energy is transferred to the refrigerator? Select the **two** correct answers. A. The battery stores light energy until it is needed. B. The solar panels transform light energy into electrical energy. * C. The solar panels transfer light energy to other places in the house. D. Electric currents bring energy through the wires to the refrigerator. * E. The battery transforms electrical energy into heat energy that the refrigerator can use.

Multi-Dimensional Alignment: The item requires the student to apply knowledge of a device that converts energy from one form to another to demonstrate an understanding of energy and matter.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 3 or higher. The student can identify in a device the point at which energy is converted from one form to another.

Which statements best describe how energy is transferred to the refrigerator?

B. The solar panels transform light energy into electrical energy. *
D. Electric currents bring energy through the wires to the refrigerator.*

Rationales

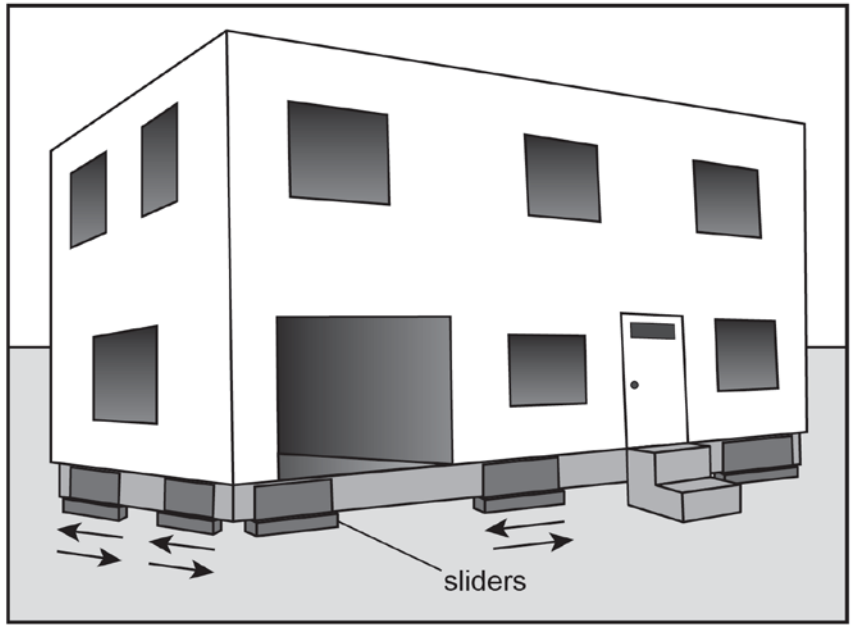
A. The battery converts electrical energy from the solar panel into chemical potential energy.
B. Correct.
C. The solar panels transform light energy into electrical energy.
D. Correct.
E. Refrigerators use electrical energy.

Two-Part Independent
Performance Expectation
4-ESS3-2 Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

Use the information and your knowledge of science to answer the questions.

Most houses are built on concrete to keep them from moving. A new type of house has been made with "sliders" underneath it. The sliders allow the house to sway back and forth. Scientists are testing the house to see how it acts in different conditions.

House on Sliders



Part A

When would the sliders under this house be most helpful?

A. when a river floods
B. during an earthquake*
C. when a hurricane hits
D. during very hot weather

Part B

In which ways would the sliders under this house be most helpful?

Select the two correct answers.

A. protecting the local environment
B. helping prevent natural disasters
C. limiting the amount of damage to homes*
D. allowing people to move their homes to safer places
E. providing increased safety in times of natural disasters*

Multi-Dimensional Alignment: The item requires the student to apply the science and engineering practices of constructing explanations and designing solutions, and knowledge of natural Earth processes on humans to demonstrate an understanding of cause and effect.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 3 or higher. The student can describe the effectiveness of a solution to reduce the impacts of natural Earth processes on humans.

Part A
When would the sliders under this house be most helpful?

B. during an earthquake*

Part B
In which ways would the sliders under this house be most helpful?

C. limiting the amount of damage to homes*

E. providing increased safety in times of natural disasters*

Rationales
Part A
A. Solutions to flooding require technologies that prevent water damage.
B. Correct.
C. Solutions to hurricanes require technologies that prevent wind and water damage.
D. Solutions to extreme heat require technologies that insulate and cool the home.

Part B
A. Sliders only protect the structure to which they are attached.
B. Sliders can only mitigate damage that natural disasters cause.
C. Correct.
D. Sliders only allow the house to sway back and forth.
E. Correct.

Item Set: Bryce Canyon

Item Type	PE	DCI	SEP	CCC	Points	Achievement Level
TPD	4-ESS1-1	UE.ESS1C.a	6. E/S	PAT	2	3
MC	4-ESS2-1	UE.ESS2A.a		C/E	1	2
MC	4-ESS2-1	UE.ESS2A.a	3. INV	C/E	1	4
CR	4-ESS2-1	UE.ESS2A.a		C/E	2	5

SEP = blue; DCI = orange; CCC = green An asterisk (*) denotes correct answer(s).

Use the information about Bryce Canyon and your knowledge of science to answer the questions.

Bryce Canyon

Bryce Canyon in Utah has tall pillars of reddish rock called hoodoos.

Picture 1. Hoodoos in Bryce Canyon

Source: NPS.

Although Bryce Canyon is in the desert, it does get cold. Ice and snow are common in the winter.

Picture 2. Bryce Canyon with Snow

Source: NPS.

It does not rain often, but when it does rain, it rains very hard. Much of the rain contains some acid. Acid does more damage to some kinds of rocks than to others.

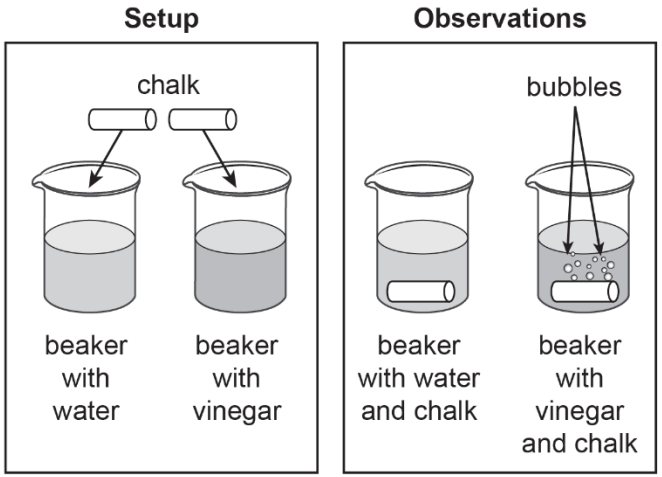
Figure 1 shows how hoodoos form over time.

Figure 1. How Hoodoos Form

Source: NPS.

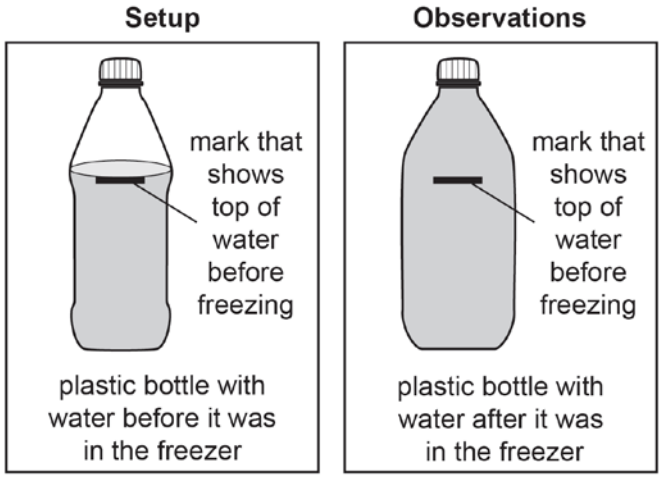
Students set up two experiments to model what happens to the hoodoos. In the first experiment, they used vinegar and chalk to model what happens when an acid touches a rock.

Figure 2. First Experiment



Students next used a plastic bottle to model what happens to water when it freezes between rocks.

Figure 3. Second Experiment



Two-Part Dependent
Performance Expectation
4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landforms over time.

Part A	Part B
Where would the older rocks in Bryce Canyon be found? A. close to the rivers B. at the top of the hoodoos C. in the darker layer of the canyon D. in the lowest layers of the hoodoos*	Which of these give evidence for the age of different layers of rock in the hoodoos? Select the **two** correct answers. A. the color of the rock layer B. the fossils in the rock layer* C. the location of the rock layer* D. the thickness of the rock layer E. the amount of erosion of the rock layer

Multi-Dimensional Alignment: The item requires the student to apply the science and engineering practices of constructing explanations, and knowledge of rock formations and fossils in rock layers to demonstrate an understanding of patterns.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 3 or higher. The student can identify evidence from patterns in rock formations and fossils in rock layers.

Part A
Where would the older rocks in Bryce Canyon be found?

D. in the lowest layers of the hoodoos*

Part B
Which of these give evidence for the age of different layers of rock in the hoodoos?

B. the fossils in the rock layer*
C. the location of the rock layer*

Rationales

Part A

A. Age is determined based on the position among rock layers.
B. The tops of the hoodoos would by the youngest part of the structure.
C. Color is a poor indicator of rock age.
D. Correct.

Part B

A. Color can help with determining the composition of the rock.
B. Correct.
C. Correct.
D. The thickness of the rock layer is determined by the amount of sediments deposited during the time period in which it formed
E. Erosion will remove rock layers, which makes it more difficult to determine the age of the rock.

Multiple Choice
Performance Expectation
4-ESS2-1 Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.

In which way can rainfall cause changes in the hoodoos in Bryce Canyon?

A. It can cause fossils to form.
B. It can wash away bits of loose rock.*
C. It can change the colors of the rocks.
D. It can add more rock to the formations.

Multi-Dimensional Alignment: The item requires the student to apply knowledge of water, ice, wind, and vegetation on the relative rate of weathering and erosion to demonstrate an understanding of cause and effect.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 2 or higher. The student can describe the effects of water, ice, wind, and vegetation on the relative rate of erosion.

In which way can rainfall cause changes in the hoodoos in Bryce Canyon?

B. It can wash away bits of loose rock.*

Rationales
A. Fossilization occurs when sediments build up over remains of an organism.
B. Correct.
C. The color of the rock is dependent on its composition.
D. The hoodoos formed due to the weathering and removal of rock.

Multiple Choice
Performance Expectation
4-ESS2-1 Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.

How does the experiment shown in Figure 2 model part of the weathering process that formed the hoodoos?

A. Acid rain takes place in the area.*
B. The hoodoos are eroded unevenly.
C. Water formed the layers in the canyon.
D. Hoodoos are found in places with strong winds.

Multi-Dimensional Alignment: The item requires the student to apply the science and engineering practices of planning and conducting investigations, and knowledge of water, ice, wind, and vegetation on the relative rate of weathering and erosion to demonstrate an understanding of cause and effect.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 4 or higher. The student can plan an investigation on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.

How does the experiment shown in Figure 2 model part of the weathering process that formed the hoodoos?

A. Acid rain takes place in the area.*

Rationales

A. Correct.
B. The investigation provided no information about differential erosion.
C. The investigation showed no reaction between the chalk and water.
D. The variables in the investigation included acidity and temperature.

Constructed Response
Performance Expectation
4-ESS2-1 Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.

Use Figure 1 to answer the question. Explain the steps of hoodoo formation and what evidence would show that the hoodoos were once all part of the same landform.

Multi-Dimensional Alignment: The item requires the student to apply knowledge of water, ice, wind, and vegetation on the relative rate of weathering and erosion to demonstrate an understanding of cause and effect.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 5 or higher. The student can use evidence to construct an explanation about the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.

Use Figure 1 to answer the question.

Explain the steps of hoodoo formation and what evidence would show that the hoodoos were once all part of the same landform.

Scoring Information	
Score	Description
2	Student's response correctly explains the steps of hoodoo formation AND describes evidence that shows the hoodoos were once part of the same landform.
1	Student's response correctly explains the steps of hoodoo formation, but does not describe evidence that shows the hoodoos were once part of the same landform.
0	Student's response does not correctly explain the steps of hoodoo formation or describe evidence that shows the hoodoos were once part of the same landform.

Scoring notes	Examples
Explanation of steps of hoodoo formation. (1 point)	• Hoodoos were formed because over time, weathering from ice and acid rain led to the loss of pieces of rock from a landform. OR • Over time, ice and acid rain caused cracks in solid rock that eventually caused the rock to break apart. Hoodoos are the rock that is left behind.
Description of evidence that shows the hoodoos were once part of the same landform. (1 point)	• Similar fossils and similar layers of rock in different hoodoos in Bryce Canyon show that the hoodoos used to be part of the same landform. OR • Hoodoos were once part of the same landform because they have similar fossils and similar layers of rock.

Student Responses (CR)

Response 1

the steps of hoodoo formation is first, there has to be a canyon,over time acidtimeacid rain will start to hit the canyon causingcausin tiny rocks to fall off the canyon whenwhe more and more acid rain hit the canyon the canyon would start to lose more and more parts of it ould create a big hole while the tiny rocks that fell could have been eroded because of the wind or rain. Evidence that would show that the hoodoos were once all part of the same landform is if the layers between the hoodoos are the same and if the hoodoos could be connected. This would show that hoodoos were once all part of the same landform.

Score: 2

This response earns a 2. The response accurately explains the steps of hoodoo formation: "first, there has to be a canyon,over time acid rain will start to hit the canyon causing tiny rocks to fall off the canyon when more and more acid rain hit the canyon the canyon would start to lose more and more parts of it ould create a big hole while the tiny rocks that fell could have been eroded because of the wind or rain." The response accurately describes evidence that shows the hoodoos were once part of the same landform: "Evidence that would show that the hoodoos were once all part of the same landform is if the layers between the hoodoos are the same and if the hoodoos could be connected. This would show that hoodoos were once all part of the same landform"

Response 2

Hoodoos are formed by the weathering from wind winter and ice and they were all part of one landform but the weathering made the one landform break apart into many parts.

Score: 1

This response earns a 1. The response accurately explains the steps of hoodoo formation: “Hoodoos are formed by the weathering from wind winter and ice.” The response does not accurately describe evidence that shows the hoodoos were once part of the same landform: “and they were all part of one landform but the weathering made the one landform break apart into many parts.”

Response 3

The Hoodoos went from small to medium, large, to mega over all the years it went threw and sand and rocks helped it grow from small, mediuim, large, mega.

Score: 0

This response earns a 0. It does not accurately explain the steps of hoodoo formation: “The Hoodoos went from small to medium, large, to mega over all the years it went threw and sand and rocks helped it grow from small, mediuim, large, mega.” The response does not include evidence that shows the hoodoos were once part of the same landform.

Item Set: Water Hyacinths

Item Type	PE	DCI	SEP	CCC	Points	Achievement Level
TPD	4-LS1-1	UE.LS1A.a	7. ARG	SYS	2	3
MC	4-ESS2-3	UE.ESS2E.a	1. Q/P		1	4
MC	4-LS1-1	UE.LS1A.a	7. ARG		1	4
CR	4-ESS2-3	UE.ESS2E.a	1. Q/P	C/E	2	5

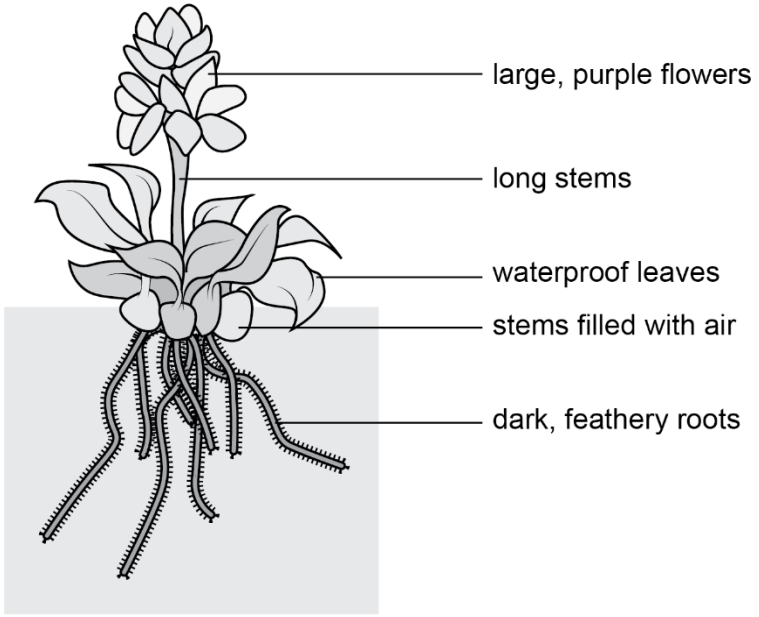
SEP = blue; DCI = orange; CCC = green An asterisk (*) denotes correct answer(s).

Use the information about water hyacinths and your knowledge of science to answer the questions.

Water Hyacinths

Water hyacinths were brought to Louisiana from South America. These plants float on top of the water. Figure 1 shows a water hyacinth.

Figure 1. Water Hyacinth



Water hyacinths reproduce from flowers and seeds. They can also reproduce from small plants that grow off the parent plant. One single plant can reproduce enough to make 500,000 plants in just five months. Water hyacinths make a thick layer as shown in the picture.

Picture 1. Water Hyacinths Growing on a Lake

Source: satori.corvus/Wikimedia Commons.

Two-Part Dependent
Performance Expectation
4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Part A	Part B
Which part of a water hyacinth helps the plant reproduce using seeds? A. flower* B. leaves C. roots D. stem	How does the structure chosen in Part A interact with another structure so that the plant can reproduce? A. Leaves release water so that the roots do not sink. B. Flowers produce sugar so that leaves can produce energy. C. Roots absorb the materials the stems need so that the plant can grow. D. Stems hold the flower above the water so that the flower can attract insects.*

Multi-Dimensional Alignment: The item requires the student to apply the science and engineering practices of engaging in an argument with evidence, and knowledge that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction to demonstrate an understanding of systems and system models.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 3 or higher. The student can identify the functions of the internal and external structures that support survival, growth, behavior, and reproduction in plants and animals.

Part A
Which part of a water hyacinth helps the plant reproduce using seeds?

A. flower*

Part B
How does the structure chosen in Part A interact with another structure so that the plant can reproduce?

D. Stems hold the flower above the water so that the flower can attract insects.*

Rationales

Part A

A. Correct.
B. The leaves absorb sunlight and exchange gases.
C. The roots absorb water and minerals.
D. The stem provides support for the flower and transports substances between parts of the plant.

Part B

A. The leaves may release water vapor, but they do not release liquid water.
B. Sugar is manufactured in the leaves and transported to the flowers.
C. Roots absorb water, but leaves absorb the gas (carbon dioxide) that makes up the bulk of the plant.
D. Correct.

Multiple Choice
Performance Expectation
4-ESS2-3 Ask questions that can be investigated and predict reasonable outcomes about how living things affect the physical characteristics of their environment.

A group of students wants to do an experiment to find out how water hyacinths change their environment. They decide to grow water hyacinths in a small stream.

Which question are they **most likely** trying to answer?

A. Do water hyacinths grow better in deep water or shallow water?
B. Do water hyacinths change how fast water moves through the stream?*
C. Do water hyacinths grow more quickly from seeds or from small plants?
D. Do water hyacinths change how they reproduce when the surface of the stream is covered?

Multi-Dimensional Alignment: While effectively applying the science practice of asking questions, the student demonstrates knowledge of how living things affect the physical characteristics of their environment.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 4 or higher. The student can ask questions that can be investigated and/or predictions to construct explanations about how living things affect the physical characteristics of their environment.

A group of students wants to do an experiment to find out how water hyacinths change their environment. They decide to grow water hyacinths in a small stream.

Which question are they **most likely** trying to answer?

B. Do water hyacinths change how fast water moves through the stream?*

Rationales
A. To determine if water hyacinths grow better in deep water or shallow water, the hyacinths would need to be placed in a body of water that has a different depth than the body of water they are currently growing in.
B. Correct.
C. To determine if water hyacinths grow more quickly from seeds or from small plants, the students would need to measure the growth rates of hyacinths that were grown from seeds and hyacinths that were grown from small plants.
D. To determine if water hyacinths change how they reproduce when the surface of the stream is covered, the hyacinths would need to be covered.

Multiple Choice
Performance Expectation
4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

A student claims that water hyacinths are able to cover a whole pond in a short period of time.

Which evidence supports this claim?

A. Dark roots help water hyacinths hide from animals that might eat them.
B. Having waterproof leaves helps water hyacinths survive many types of weather.
C. Large flowers help water hyacinths attract different types of insects for pollination.
D. Being able to reproduce in more than one way helps water hyacinths spread to new areas.*

Multi-Dimensional Alignment: While effectively applying the science practice of engaging in an argument with evidence, the student demonstrates knowledge that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 4 or higher. The student can support an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

A student claims that water hyacinths are able to cover a whole pond in a short period of time.

Which evidence supports this claim?

D. Being able to reproduce in more than one way helps water hyacinths spread to new areas.*

Rationales
A. The roots help to anchor the plant and to absorb water and nutrients.
B. The leaves use sunlight to convert water and carbon dioxide into chemical energy.
C. Water hyacinths have more than one way to reproduce.
D. Correct.

Constructed Response
Performance Expectation
4-ESS2-3 Ask questions that can be investigated and predict reasonable outcomes about how living things affect the physical characteristics of their environment.

Mary makes a pond in her yard with fish and other living things. After a year, she adds a few water hyacinths.

How will the addition of the water hyacinths change the pond ecosystem? In your answer, be sure to include the following:
- the effect of the water hyacinths on the fish and other living things in the pond
- how any changes are caused by the water hyacinths

Multi-Dimensional Alignment: The item requires the student to apply the science and engineering practices of asking questions, and knowledge of how living things affect the physical characteristics of their environment to demonstrate an understanding of cause and effect.

Achievement Level Descriptor: Students who answer this item correctly are performing at a level of 5 or higher. The student can evaluate questions that can be investigated and/or predictions to construct explanations about how living things affect the physical characteristics of their environment.

Mary makes a pond in her yard with fish and other living things. After a year, she adds a few water hyacinths.

How will the addition of the water hyacinths change the pond ecosystem? In your answer, be sure to include the following:
- the effect of the water hyacinths on the fish and other living things in the pond
- how any changes are caused by the water hyacinths

Scoring Information	
Score	Description
2	Student's response correctly describes how water hyacinths will affect the pond ecosystem AND explains how the water hyacinths cause these changes.
1	Student's response correctly describes how water hyacinths will affect the pond ecosystem, but does not explain how the water hyacinths cause these changes.
0	Student's response does not correctly describe how water hyacinths will affect the pond ecosystem or explain how the water hyacinths cause these changes.

Scoring notes	Examples
Description of at least one effect water hyacinths will have on the pond ecosystem (1 point)	• Water hyacinths will cause a decrease in the number of fish and other living things in the pond. OR • Water hyacinths will cause fish and other living things in the pond to die because there is not enough oxygen in the water.
Explanation of how the water hyacinths cause these effects (1 point)	• This is because water hyacinths will cover the pond surface, blocking the sun and preventing other plants from growing. Tiny animals that eat plants will not be able to get food, and fish and other animals that eat the tiny animals will not be able to survive. OR • This happens when the water hyacinths use up oxygen in the pond so they can grow.

Student Responses (CR)

Response 1

The addition of water hyacinths changed the pond ecosystem. By one single plant can reproduce enough to make 500,00 plants in 5 months. Also if they do make 500,000 plants in 5 months. Then they might effect the fishes in the pond and the other living things in the pond. The changes that are caused by the water hyacinths is that they will block the sun from giving light to the pond. Also they will take the food from other plants and then the plants will die. They will also take the food from the fish to were the fish might die too.

Score: 2

This response earns a 2. It accurately describes at least one effect water hyacinths will have on the pond ecosystem: "the fish might die." It accurately explains how the water hyacinths cause these effects: "The changes that are caused by the water hyacinths is that they will block the sun from giving light to the pond."

Response 2

the hyacinths can make so many that it makes a think layers and can possible trap animals. In the pond and they cant get air or the food the animal needs.

Score: 1

This response earns a 1. The response accurately describes at least one effect water hyacinths will have on the pond ecosystem: "they cant get air…the animal needs." The response does not accurately explain how the water hyacinths cause these effects: "the hyacinths can make so many that it makes a think layers and can possible trap animals."

Response 3

Water Hyacinths float on water it can help the living things in the pond with food problems.

Score: 0

This response earns a 0. It does not accurately describe at least one effect water hyacinths will have on the pond ecosystem: “Water Hyacinths float on water it can help the living things in the pond with food problems.” The response does not accurately explain how the water hyacinths cause these effects.

Resources

Contact the LDOE

- assessment@la.gov for assessment questions
- STEM@la.gov for instructional or curriculum implementation support
- AskLDOE for general questions
- ldoecommunications@la.gov to subscribe to newsletters; include the newsletter(s) you want to subscribe to in your email

Updates Log

The table below lists any updates made to this document after the original posting date.

Available	Description of Updates
July 2025	Document original posting.
November 2025	Corrected font color error on page 25

Email assessment@la.gov with any questions or comments about this released item guide.