



Hawai'i Statewide Assessment Program



Online
Smarter Balanced Assessments and
Hawai'i State Science (NGSS)
Assessments
Parent Information Booklet

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What Every Parent Should Know About the Smarter Balanced Assessments and the Hawai'i State Science (NGSS) Assessments

Which assessments will my child take?

If your child is enrolled in grades 3–8 or 11, your child will take the Hawai'i Smarter Balanced English Language Arts/Literacy and Mathematics Assessments. The Smarter Balanced English Language Arts/Literacy Assessment consists of a computer adaptive test (CAT) as well as a performance task (PT). The Smarter Balanced Mathematics Assessment consists of a computer adaptive test (CAT) only. If your child is enrolled in grade 5 or 8, your child will also take the Hawai'i State Science (NGSS) Assessment.

When will the assessments be administered?

Your child will take the Smarter Balanced English Language Arts/Literacy and Mathematics Assessments once for each content area. Test window information for the Smarter Balanced Assessments is available on alohahsap.org. Your child's school will inform you of its testing schedule and when your child will take each content area assessment.

Test window information for the Hawai'i State Science (NGSS) is available on alohahsap.org. Your child's school will inform you of its testing schedule and whether your child will take the Hawai'i State Science Assessment one or two times.

Will my child see the same questions if he or she takes the adaptive online Hawai'i State Science (NGSS) Assessment in the English Language more than once?

The online testing system records which questions your child has answered each time he or she takes the Hawai'i State (NGSS) Assessment. The system also adjusts to your child's knowledge and skills as he or she answers questions in order to provide the most accurate information about his or her performance. Every time your child answers a question, his or her response helps determine the next question he or she receives. Your child will be given a different set of questions each time he or she takes the Hawai'i State Science (NGSS) Assessment. If your child takes the Hawai'i State Science (NGSS) Assessment more than once, only the highest score is kept for his or her official record.

How much time does each assessment take?

The Hawai'i State Science (NGSS) Assessment “The Hawai'i State Science (NGSS) Assessment will take approximately two hours. The Smarter Balanced English Language Arts/Literacy Assessment will take approximately 2 to 3 1/2 hours. The Smarter Balanced Mathematics Assessment will take approximately 1 to 2 hours. Your child may exit an assessment and return on another day to complete it. The online testing system keeps track of the questions that your child has answered and will present the remaining questions when your child resumes the assessment.

What computer skills will my child need for the assessments?

The assessments include questions that will require your child to select one answer from a set of possible answers, draw and move objects, and type responses directly into the testing system. Your child can use the mouse or keyboard or both to take the online assessments, but your child is not required to be an expert computer user or typist.

Students may also choose to use some online tools to help them during the assessments.

Students can:

- zoom in on both text and graphics;
- highlight important information;
- strike out incorrect answer choices; and
- mark questions for review.

We encourage students to practice answering the types of questions included in the assessments. Content area practice and training tests for each grade level or grade level band and assessment are available at alohahsap.org.

When will families get the results of the assessments?

Your family will receive either a paper score report from your child's school; or a link with a unique access code to the Hawai'i Statewide Assessments Family Portal in which you will be able to access your child's final score report in the new school year.

How can I help my child prepare for the assessments?

You can best help your child prepare by providing the consistent support that will help your child do well in school every day. Make sure your child gets adequate sleep, eats a nourishing breakfast, completes homework, and attends school every day. The Smarter Balanced Assessments and the Hawai'i State Science (NGSS) Assessments measure how well your child is meeting the comprehensive content area standards that help guide your child's daily instruction throughout the school year.

You can also help your child become familiar with the types of questions he or she might be asked to answer by reviewing this booklet with him or her and visiting alohahsap.org to answer additional content area practice and training test questions.

What accessibility supports are available for my child?

The assessments offer accessibility options to help **all** students, including English language learners and those with disabilities, demonstrate what they know and are able to do on the state tests. Accessibility supports such as separate setting, text-to-speech, and a Spanish version of the mathematics assessment can help to provide student access to test questions and answer options. For more information on accessibility options, go to alohahsap.org and navigate to the Resources section.

Sample Questions for the Smarter Balanced Assessments and the Hawai'i State Science (NGSS) Assessments

Students will have to answer several different types of questions for the online assessments:

- Multiple-choice questions, in which students will select an answer option from a set of possible choices
- Constructed-response questions:
 - Natural language questions, in which students will type short and longer answers into answer spaces
 - Interactive questions, in which students will use the mouse or keyboard to move items or draw responses within an answer space (also called a grid)
 - Equation editor questions, in which students will input any mathematical expression or equation
 - Simulation prompts, in which students will interact with data and provide answers in varied formats

Students will also have to answer the following types of questions on the Hawai'i State Science (NGSS) online assessments:

- Cluster items, which are designed to engage the student in a grade-appropriate, meaningful scientific activity aligned to a specific NGSS performance expectation. Each item cluster begins with a real-world phenomenon followed by relevant data, and includes two or more interactions that require students to demonstrate the ability to use the science and engineering practices, disciplinary core ideas, and cross-cutting concepts described by the performance expectation.
- Standalone items, which engage students with a phenomenon followed by, most often, a single interaction framed around one task demand.

The questions that follow illustrate the types of questions your child will answer on the Hawai'i Smarter Balanced English Language Arts/Literacy and Mathematics Assessments and the Hawai'i State Science (NGSS) Assessments. A Smarter Balanced English Language Arts or Mathematics question is provided for grades 3, 5, 6, 7, and 11. Hawai'i State Science (NGSS) Assessment questions are provided for grades 5 and 8. Each question includes the correct answer and other scoring information.

If you would like to see additional questions, please visit alohahsap.org.

Grade 3

Subject: Smarter Balanced Mathematics

Hawai'i Common Core Standard: 3.MD.3: [1 | MD | H-3 | a/s | 3.MD.3](#): Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.

AND

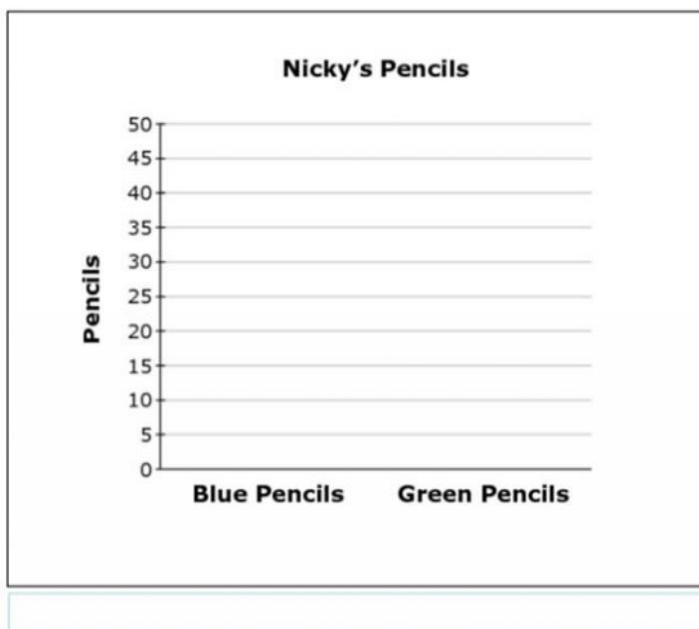
3.OA.8: [1 | OA | D-3 | m | 3.OA.8](#): Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Type of Question: Constructed Response - Interactive (Grid) (1 point)

Nicky has 4 packs of pencils.
Each pack contains 15 pencils. In each pack, 5 pencils are blue and the rest green.

Create a bar graph to show how many of each color pencil Nicky has.

Click the graph to show where the top of the bar should go.

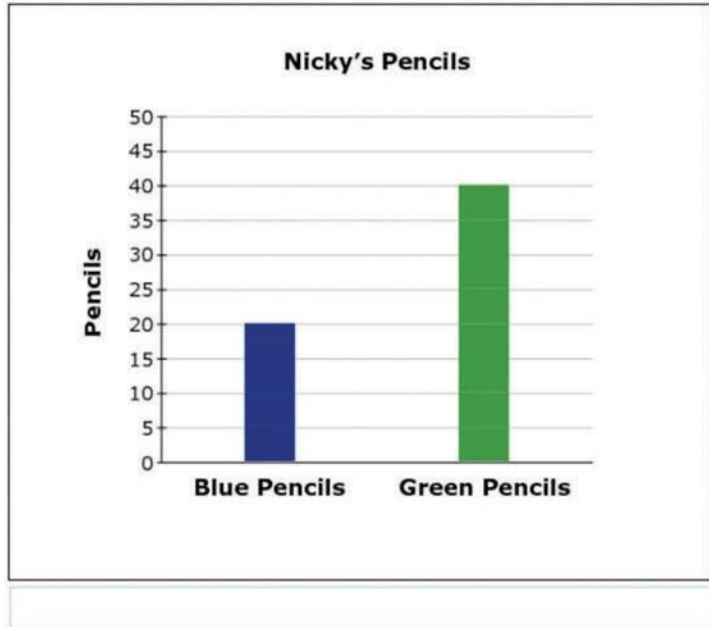


To earn one point, a student must create a bar graph that shows Nicky has 20 blue pencils and 40 green pencils.

Nicky has 4 packs of pencils.
Each pack contains 15 pencils. In
each pack, 5 pencils are blue and
the rest green.

Create a bar graph to show how
many of each color pencil Nicky
has.

Click the graph to show where
the top of the bar should go.



Grade 5

Subject: Smarter Balanced English Language Arts

Hawai'i Common Core Standard: 2-3: 4-CR|2-3: INTERPRET & INTEGRATE INFORMATION: Locate information to support central ideas and subtopics; select and integrate information from data or print and non-print text sources.

Type of Question: Selected Response – Table Match Item (1 point)

A student is writing a research report about tree frogs. The student took notes and thought of three main ideas for her report. Click on the box to show the **best** main idea that each note supports.

	Main Idea A: How Tree Frogs Grow	Main Idea B: Where Tree Frogs Live	Main Idea C: What Tree Frogs Look Like
Note 1: Tree frogs can be found on the ground, in small plants, or in trees.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note 2: Some tree frogs change color to hide in what is around them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note 3: Tree frogs dig a hole in the ground to stay warm when it is cold outside.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note 4: It takes weeks for baby tree frogs to jump because, at first, they have no legs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To earn one point, a student must click the box that identifies Note 1 supporting Main Idea B, Note 2 supporting Main Idea C, Note 3 supporting Main Idea B, and Note 4 supporting Main Idea A.

A student is writing a research report about tree frogs. The student took notes and thought of three main ideas for her report. Click on the box to show the **best** main idea that each note supports.

	Main Idea A: How Tree Frogs Grow	Main Idea B: Where Tree Frogs Live	Main Idea C: What Tree Frogs Look Like
Note 1: Tree frogs can be found on the ground, in small plants, or in trees.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Note 2: Some tree frogs change color to hide in what is around them.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Note 3: Tree frogs dig a hole in the ground to stay warm when it is cold outside.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Note 4: It takes weeks for baby tree frogs to jump because, at first, they have no legs.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

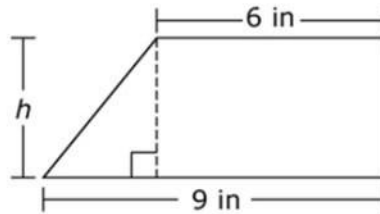
Grade 6

Subject: Smarter Balanced Mathematics

Hawai'i Common Core Standard: H-6: 1|G|H-6: Solve real-world and mathematical problems involving area, surface area, and volume.

Type of Question: Constructed Response – Equation Editor (1 point)

The trapezoid shown is divided into a right triangle and a rectangle.



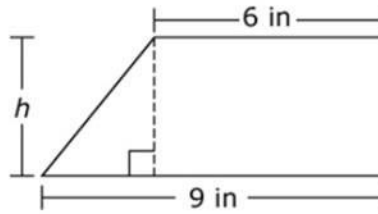
Use the Equation Tool to create an expression that could be used to determine the area of the trapezoid.

← → ↶ ↷ ✖

1	2	3	h
4	5	6	+ - * ÷
7	8	9	< = >
0	.	-	$\frac{\square}{\square}$ \square^\square ()

To earn one point, a student must enter the equation (or an equivalent to) $\frac{1}{2}(3 \times h) + (h \times 6)$.

The trapezoid shown is divided into a right triangle and a rectangle.



Use the Equation Tool to create an expression that could be used to determine the area of the trapezoid.

$$\frac{1}{2}(3*h) + (h*6)$$

← → ↶ ↷ ✖

1	2	3	h
4	5	6	+ - * ÷
7	8	9	< = >
0	.	-	$\frac{\square}{\square}$ \square^\square ()

Grade 7

Subject: Smarter Balanced English Language Arts

Hawai'i Common Core Standard: 3-6: 2-W|3-6: WRITE/REVISE BRIEF TEXTS: Apply a variety of strategies when writing or revising one or more paragraphs of informational text: organizing ideas by stating and maintaining a focus/ tone, developing a topic including relevant supporting evidence/ vocabulary and elaboration, or providing a conclusion appropriate to purpose and audience.

Type of Question: Constructed Response – Extended Response (2 points)

A student is writing a report for English class about folk heroes. Read the draft of his introduction and conclusion and complete the task that follows.

You may never have heard of John Chapman, but you probably have heard of Johnny Appleseed. He was an American folk hero and pioneer who was born in Massachusetts in 1774. When he was eighteen years old, he decided to help the pioneers who were moving west. He had a dream of growing apple trees and giving apple seeds to them. That way, they would never go hungry.

Many people said that Johnny was a cheerful and generous man who loved the wilderness and was gentle with animals. What he is most known for today, though, is walking the countryside and planting apples. He did this for almost fifty years. To this day, many festivals are held every year to honor him. Next time you bite into a crispy, juicy apple, thank Johnny Appleseed.

The student took these notes from credible sources:

- Planted seeds along roadways, forests, and near rivers
- Traveled from Massachusetts to Pennsylvania
- Spent 50 years walking the countryside
- Stayed ahead of settlers
- Planted apple seeds along roadways and in forests as he moved west
- Planted seeds anywhere pioneers would settle
- Got seeds for free from cider mills and kept them in leather bags
- First nickname was the "apple seed man"
- Later called "Johnny Appleseed"
- Made friends with Indian tribes
- Learned some Indian languages
- Lots of festivals named after him
- Children loved him and listened to his stories
- Was generous and kind
- When invited for a meal, would not eat until the whole family had had enough food
- Was kind to animals
- Bought a horse that was going to be put to sleep and gave the horse to someone needy to keep his promise to treat the horse kindly
- Wore apple sacks for clothing and gave nice clothes to settlers

Write one or two body paragraphs using appropriate details from the student's notes to explain the "man behind the legend" without repeating the ideas presented in the first and last paragraphs.

To earn two points, a student must provide logical and relevant points/reasons/details and/or evidence supporting the main idea/thesis/controlling idea about the real person behind the Johnny Appleseed legend to enhance the content clearly and effectively elaborate ideas using precise words/language.

American folk hero and pioneer who was born in Massachusetts in 1774. When he was eighteen years old, he decided to help the pioneers who were moving west. He had a dream of growing apple trees and giving apple seeds to them. That way, they would never go hungry.

Many people said that Johnny was a cheerful and generous man who loved the wilderness and was gentle with animals. What he is most known for today, though, is walking the countryside and planting apples. He did this for almost fifty years. To this day, many festivals are held every year to honor him. Next time you bite into a crispy, juicy apple, thank Johnny Appleseed.

The student took these notes from credible sources:

- Planted seeds along roadways, forests, and near rivers
- Traveled from Massachusetts to Pennsylvania
- Spent 50 years walking the countryside
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- Wore apple sacks for clothing and gave nice clothes to settlers

Write one or two body paragraphs using appropriate details from the student's notes to explain the "man behind the legend" without repeating the ideas presented in the first and last paragraphs.

John Chapman traveled from Massachusetts to Pennsylvania, keeping ahead of the settlements. Every year, he planted apple seeds farther west. He carried a leather bag filled with apple seeds that he collected from cider mills. He would take the seeds from the bag and plant them along roadways, in forests, and in other places where pioneers settled. He was soon known as the "apple seed man" and later as "Johnny Appleseed." Sometimes on his travels, he would be invited to have a meal with a pioneer family. He would not start eating, though, until he knew the whole family would have enough food. The children loved his stories, and their

Grade 11

Subject: Smarter Balanced Mathematics

Hawai'i Common Core Standard: A-REI.C: Solve systems of equations.

Type of Question: Constructed Response – Equation Response (1 point)

The basketball team sold t-shirts and hats as a fund-raiser. They sold a total of 23 items and made a profit of \$246. They made a profit of \$10 for every t-shirt they sold and \$12 for every hat they sold.

Determine the number of t-shirts and the number of hats the basketball team sold.

Enter the number of t-shirts in the first response box.

Enter the number of hats in the second response box.

← → ↶ ↷ ✕		
1	2	3
4	5	6
7	8	9
0	.	-

To earn one point, a student must enter 15 for the number of t-shirts sold in the first response box and 8 for the number of hats in the second response box.

The basketball team sold t-shirts and hats as a fund-raiser. They sold a total of 23 items and made a profit of \$246. They made a profit of \$10 for every t-shirt they sold and \$12 for every hat they sold.

Determine the number of t-shirts and the number of hats the basketball team sold.

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Enter the number of hats in the second response box.

15		
8		
← → ↶ ↷ ✕		
1	2	3
4	5	6
7	8	9
0	.	-

Grade 5

Subject: Hawai'i Science (NGSS)

Hawai'i Next Generation Science Standard: Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. (5 PS3-1)

Type of Question: Standalone Item (3 points)

An alpine marmot eats grass and seeds. In the fall, the marmot weighs more than it did in the spring.

Put the pictures in the correct order to show the flow of energy through the system.

- In Table 1, select a number for each picture to indicate the correct location in Figure 1.
- If a picture is **not** used in Figure 1, select "not used."

Figure 1. Energy Flow Model

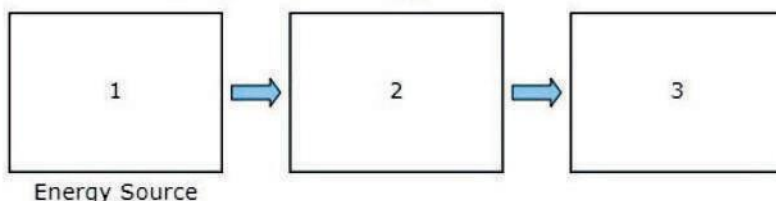




Table 1. Energy Flow Model Order

	Sun	Water	Marmot	Grass and Seeds
Picture				
Location	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Scoring:

The student earns 1 point for each of the following:

- The student indicates that the sun occurs in the model before the grass.
- The student indicates that the grass occurs in the model before the marmot.
- The student did not use water in the model.

A correct answer appears as follows:

An alpine marmot eats grass and seeds. In the fall, the marmot weighs more than it did in the spring.

Put the pictures in the correct order to show the flow of energy through the system.

- In Table 1, select a number for each picture to indicate the correct location in Figure 1.
- If a picture is **not** used in Figure 1, select "not used."

Figure 1. Energy Flow Model

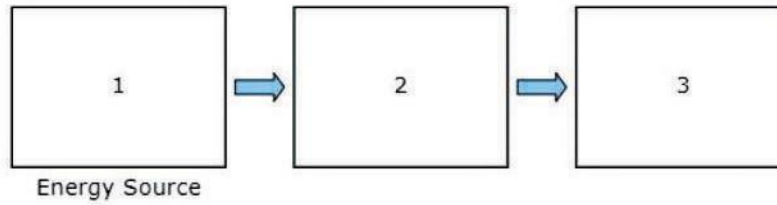


Table 1. Energy Flow Model Order

	Sun	Water	Marmot	Grass and Seeds
Picture				
Location	1 ▾	not used ▾	3 ▾	2 ▾

Grade 5

Subject: Hawai'i Science (NGSS)

Hawai'i Next Generation Science Standard: Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. (3 ESS3-1)

Type of Question: Cluster Item (9 points)

Stimulus:

A house near the ocean in Surfside, New Jersey, is built on stilts.

Sometimes, when buildings are built near areas that are likely to flood, they are built on stilts. This allows the house and its contents to remain safe if the area floods. An example is shown in Figure 1.

Figure 1. Stilt House



Your Task

In the questions that follow, you will make a claim about the effectiveness of stilts as a solution to flooding.

Interactions:

Part A

Select the boxes to identify whether stilts on a house protect against or do **not** protect against each of the actions.

	Protects Against	Does Not Protect Against
Household objects being washed away	<input type="checkbox"/>	<input type="checkbox"/>
Water damage to floors	<input type="checkbox"/>	<input type="checkbox"/>
Water damage to household objects	<input type="checkbox"/>	<input type="checkbox"/>
Yard flooding	<input type="checkbox"/>	<input type="checkbox"/>

Part B

Select **three** conditions that the stilts must meet to allow a building and its contents to remain safe if the area floods.

- cost a lot of money
- resist strong water current
- match the building's appearance
- support the weight of the building
- be tall enough to keep the building out of water

Part C

Choose **three** problems that could be caused by using stilts under buildings.

- Buildings with stilts provide a better view.
- The stilts will get wet during a storm or flooding.
- Buildings would be damaged if stilts were to fail.
- Buildings are harder to enter because of stairs and ramps.
- Stilts can cause buildings to move side to side in high winds.

Part D

Are stilts a good solution to allow a building and its contents to remain safe if an area floods?

Click on each blank box to select the word or phrase that completes the sentences.

Stilts could be a solution to flooding because they . This means that .

Scoring:

The student earns 1 point in Part A for the following:

- The student selects “Protects against” for “Household objects being washed away,” “Water damage to floors,” and “Water damage to household objects.”

AND

- The student selects “Does not protect against” for “Yard flooding”

Part A

Select the boxes to identify whether stilts on a house protect against or do **not** protect against each of the actions.

	Protects Against	Does Not Protect Against
Household objects being washed away	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water damage to floors	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water damage to household objects	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Yard flooding	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The student earns 3 points for selecting the following three answers in Part B:

- “resist strong water current”
- “support the weight of the building”
- “be tall enough to keep the building out of water”

Part B

Select **three** conditions that the stilts must meet to allow a building and its contents to remain safe if the area floods.

- cost a lot of money
- resist strong water current
- match the building’s appearance
- support the weight of the building
- be tall enough to keep the building out of water

The student earns 3 points for selecting the following answers in Part C:

- “Buildings would be damaged if stilts were to fail.”
- “Buildings are harder to enter because of stairs and ramps.”
- “Stilts cause buildings to move side to side in high winds.”

Part C

Choose **three** problems that could be caused by using stilts under buildings.

- Buildings with stilts provide a better view.
- The stilts will get wet during a storm or flooding.
- Buildings would be damaged if stilts were to fail.
- Buildings are harder to enter because of stairs and ramps.
- Stilts can cause buildings to move side to side in high winds.

The student earns 2 points in Part D for selecting the following responses in the dropdowns:

- The student selects “good” in the first dropdown and “allow water to pass underneath the buildings” in the second dropdown, OR the student selected “bad” in the first dropdown and “will damage buildings if they fail” or “cost a lot” in the second dropdown” (1 point)
- The student selects a response in the third dropdown that corresponds to the sentence constructed with the first two dropdowns. (1 point)
 - o For “cost a lot,” the student selects “the money spent on stilts could be better spent elsewhere”
 - o For “will damage buildings if they fail,” the student selects “stilts create new hazards”
 - o For “allow water to pass underneath the buildings,” the student selects “stilts improve safety by reducing the possibility of buildings flooding.”

Examples of full credit responses in Part D:

Part D

Are stilts a good solution to allow a building and its contents to remain safe if an area floods?

Click on each blank box to select the word or phrase that completes the sentences.

Stilts could be a solution to flooding because they . This means that .

Part D

Are stilts a good solution to allow a building and its contents to remain safe if an area floods?

Click on each blank box to select the word or phrase that completes the sentences.

Stilts could be a solution to flooding because they . This means that .

Part D

Are stilts a good solution to allow a building and its contents to remain safe if an area floods?

Click on each blank box to select the word or phrase that completes the sentences.

Stilts could be a solution to flooding because they . This means that .

Grade 8

Subject: Hawai'i Science (NGSS)

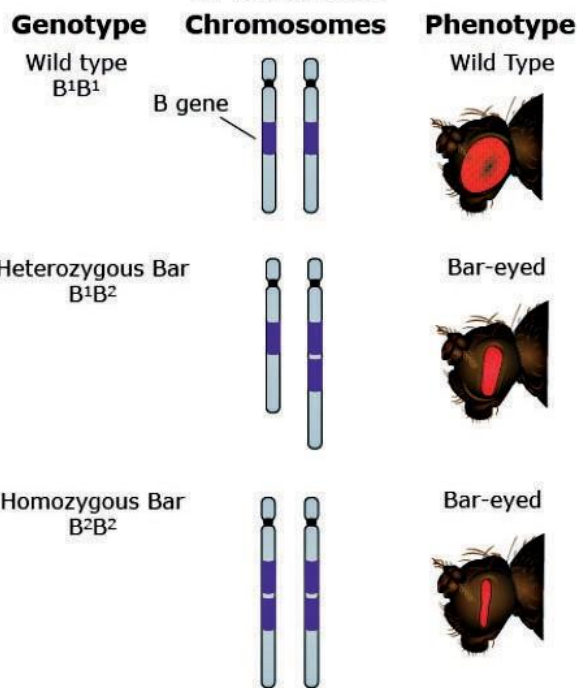
Hawai'i Next Generation Science Standard: Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. (MS-LS3-1)

Type of Question: Standalone Item (2 points)

Flies with bar-eyed phenotypes cannot see as well as those with wild type phenotypes.

The genotypes and phenotypes of three flies are shown in Figure 1.

Figure 1. Genotypes and Phenotypes of Three Flies



Source: Scitable by nature EDUCATION

Click on each blank box to select the statements that complete the chain of events explaining how the bar-eyed mutation reduces a fly's eyesight.

Chain of Events

Step	Event
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	The eyesight of a fly is reduced.

The student earns 1 point for each of the following:

- The student selects “A chromosome has more than one copy of the B gene” in a step directly before “There is a change in the protein production.” (1 point)
- The student selects “There is a change in the protein production” in a step directly before “The fly’s eye structures become narrower.” (1 point)

The student earns 1 point for each of the following:

A correct answer appears as follows:

Chain of Events

Step	Event
1	A chromosome has more than one copy of the B gene. ▼
2	There is a change in the protein production. ▼
3	The fly’s eye structures become narrower. ▼
4	The eyesight of a fly is reduced.

Grade 8

Subject: Hawai'i Science (NGSS)

Hawai'i Next Generation Science Standard: Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. (MS-PS3-5)

Type of Question: Cluster Item (9 points)

Stimulus:

Sparks fly off the wheels of a train when the brakes are applied.

Click the small gray arrow to see a demonstration of this happening in Animation 1.

Animation 1. Braking Train

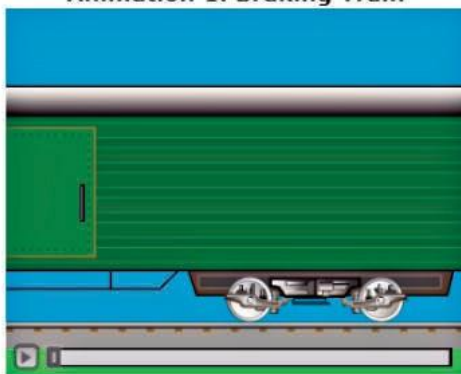


Table 1 explains some properties of the train and its surroundings as energy flows throughout the system.

Table 1. Properties of the Train System

Before Brakes Are Applied	After Brakes Applied
No sparks	Sparks fly off the wheels and brake pads
Brake pads make no sound	Brake pads make sound
Brake pads are cold	Brake pads are hot
Wheels are warm	Wheels are hot
Rails are warm	Rails are warmer
Train is moving fast	Train is moving slow

Your Task

In the questions that follow, you will analyze what happens to the train when the brakes are applied.

Interactions:

Part A

Click on each blank box to select the word or phrase that completes each sentence, constructing an argument about what happens when the train's brakes are applied.

Applying the brakes causes the to transfer kinetic energy to the . This causes the to slow down and have kinetic energy, which slows the train.

Part B

When the train applies its brakes, what happens to the energy of the surroundings?

- Ⓐ The surroundings gain energy.
- Ⓑ The surroundings lose energy.
- Ⓒ The surroundings do not gain or lose energy.
- Ⓓ There is not enough information to determine the energy of the surroundings.

Part C

Which **three** statements support your choice in part B?

- The train maintains its speed.
- Sound is produced.
- Sound is consumed.
- Light is produced.
- Light is consumed.
- Heat is produced.
- Heat is consumed.

Part D

Select **three** pieces of evidence that would support the claim that the kinetic energy of the wheels changes form.

- The brakes give off energy as heat.
- The brakes make a screeching sound.
- The brakes undergo a chemical reaction.
- The sparks that fly off the wheels give off light.
- The potential energy of the train increases as it slows.

Scoring:

The student earns 2 points in Part A for the following:

- The student selects “wheels” in the first blank and “brakes” or “rails” in the second blank. (1 point)
- The student selects “wheels” in the third blank and “less” in the fourth blank. (1 point)

Part A

Click on each blank box to select the word or phrase that completes each sentence, constructing an argument about what happens when the train’s brakes are applied.

Applying the brakes causes the to transfer kinetic energy to the . This causes the to slow down and have kinetic energy, which slows the train.

The student earns 1 point in Part B for selecting “The surroundings gain energy”

Part B

When the train applies its brakes, what happens to the energy of the surroundings?

- The surroundings gain energy.
- The surroundings lose energy.
- The surroundings do not gain or lose energy.
- There is not enough information to determine the energy of the surroundings.

The student earns 3 points in Part C for selecting the following:

- “Sound is produced.”
- “Light is produced.”
- “Heat is produced.”

Part C

Which **three** statements support your choice in part B?

- The train maintains its speed.
- Sound is produced.
- Sound is consumed.
- Light is produced.
- Light is consumed.
- Heat is produced.
- Heat is consumed.

The student earns 3 points in Part D for selecting the following:

- “The brakes give off energy as heat.”
- “The brakes make a screeching sound.”
- “The sparks that fly off the wheels give off light.”

Part D

Select **three** pieces of evidence that would support the claim that the kinetic energy of the wheels changed form.

- The brakes give off energy as heat.
- The brakes make a screeching sound.
- The brakes undergo a chemical reaction.
- The sparks that fly off the wheels give off light.
- The potential energy of the train increases as it slows.