

# OAKS SCIENCE TEST

5th Grade New Item Type Training Test Scoring Guide



### About the New Item Type Training Test Scoring Guide

The OAKS Science New Item Type Training Test Scoring Guide provides details about the tasks, student response types, correct responses, and related scoring considerations for the OAKS Science Test 2017-18 embedded field test items. The tasks selected for the New Item Type Training Test are designed to reflect:

- a broad coverage of standards
- a broad range of student response types

It is important to note that the online New Item Type Training Test provides a representative sample of tasks, not all possible scenarios.

Within this guide, each task is presented with the following information:

- **Standard:** The 2014 Oregon Science Standard (NGSS Performance Expectation) to which the task/item is aligned.
- **Task Demands:** A statement that explains what a student will be able to do in response to an item in order to provide evidence that they have met the standard. These statements guide item writers to ensure alignment to the 2014 Oregon Science Standards (NGSS Performance Expectations).
- **Scoring Criteria:** A statement that explains what a student will be able to do in response to a task simulation, question, or elicitation.
- **Rubric:** Score point representations for student responses.
- **Static Presentation of the Stimulus:** A static presentation of the stimulus field from the test administration system.
- **Static Presentation of task/item:** A static presentation of simulations, questions, elicitations, and student response areas within a task or item.

The following tasks are a representative sample of tasks that students can expect to experience when taking the Science OAKS test for Grade 5. Each 'criterion' is scored separately toward the cumulative score rather than each 'part' or 'task'.

## Task 1- Earth and Space Science

### Standard

3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

### Task Demands

- Identify or assemble from a collection, including distractors, the relevant aspects of the hazard that a given design solution resolves/improves.
- Using given information, select or identify constraints that the design solution must meet.
- Identify missing components, relationships, or other limitations of the design solution.
- Make a claim about the merit of the design solution that can be defended.

### 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.

**Part A**

Choose **three** ways that stilts protect houses from flooding.

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

Scoring Criteria

## Part A

- The student selected “Protects Against” for “Objects being washed away,” indicating an understanding of how to assemble the relevant aspects of a hazard that the design solution resolves or improves.
- The student selected “Protects Against” for “Water damage to floors,” indicating an understanding of how to assemble the relevant aspects of a hazard that the design solution resolves or improves.
- The student selected “Protects Against” for “Water damage to objects,” indicating an understanding of how to assemble the relevant aspects of a hazard that the design solution resolves or improves.
- The student selected “Does Not Protect Against” for “Yard flooding,” indicating an understanding of how to assemble the relevant aspects of a hazard that the design solution resolves or improves.

Rubric

## Part A (4 points possible)

- Protects Against selected for “Household objects being washed away” (1 Point)
- Protects Against selected for “Water damage to floors” (1 Point)
- Protects Against selected for “Water damage done to household objects” (1 Point)
- Does Not Protect Against selected for “Yard flooding” (1 Point)

**Part B**

Select **three** conditions that the stilts must meet to be effective.

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

Scoring Criteria

## Part B

- The student selected “support the weight of the building,” indicating an understanding of how to identify constraints that the design solution must meet.
- The student selected “resists strong water current,” indicating an understanding of how to identify constraints that the design solution must meet.
- The student selected “tall enough to keep the building out of water,” indicating an understanding of how to identify constraints that the design solution must meet.

Rubric

## Part B (3 points possible)

- “support the weight of the building” selected (1 Point)
- “resists strong water current” (1 Point)
- “tall enough to keep the building out of water (1 Point)

**Part C**

Choose **three** problems caused by using stilts under buildings.

- Building would be damaged if it falls.
- The stilts will get wet during the flood.
- Buildings are harder to enter because of stairs and ramps.
- The space stilts occupy could be another floor of the building.
- The building would not be able to protect the surrounding area from the flood.

Scoring Criteria

## Part C

- The student selected “Building would be damaged if it falls,” indicating an understanding of the limitation of the design solution.
- The student selected “Buildings are harder to enter because of stairs and ramps,” indicating an understanding of the limitations of the design solution.
- The student selected “The space stilts occupy could be another floor of the building,” indicating an understanding of the limitations of the design solution.

Rubric

## Part C (3 points possible)

- “building would be damaged if it falls” selected (1 Point)
- “Buildings are harder to enter because of stairs and ramps” selected (1 Point)
- “The space stilts occupy could be another floor of the building” selected (1 Point)

**Part D**

Are stilts a good solution to deal with possible 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 Criteria

## Part D

- The student selected a claim in the first dropdown and defends it with an appropriate choice in the second dropdown, indicating an understanding of how to make a claim about the merit of a design solution to a natural hazard.
- The student selected an explanation for the claim they made in the first sentence, indicating an understanding of the cause-and-effect relationships that determine if the design solution has merit.

Rubric

## Part D (2 points possible)

- “good” selected in the first dropdown

And

- “allow water to pass underneath the buildings” for the second dropdown (1 Point)

And

- “stilts improve safety by reducing the possibility of buildings flooding” for the third dropdown (1 Point)

OR

- “bad” selected in the first dropdown

And

- “cost a lot” selected in the second dropdown (1 Point)

And

- “the money spent on stilts could be better spent elsewhere” for the third dropdown (1 Point)

OR

- “bad” selected in the first dropdown

And

- “will damage buildings if they fail” selected in the second dropdown. (1 Point)

And

- “stilts create new hazards” for the third dropdown. (1 Point)

## Task 2- Life Science

### Standard

3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment.

### Task Demands

- Express or complete a causal chain explaining that traits can be influenced by the environment. This may include indicating directions of causality in an incomplete model such as a flow chart or diagram, or completing cause-and-effect chains.
- Identify evidence supporting the inference of causation that is expressed in a causal chain.
- Use an explanation to predict changes in the trait of an organism given a change in environmental factors.
- Describe, identify, and/or select information needed to support an explanation of environmental influence on traits.

### Stimulus

A group of flamingos stands by a pond. The adults are pink but the babies are all gray and white.

Flamingos are known for their pink color but all baby flamingos are born gray and white. The pink color appears and gets darker during the first year of a flamingo's life. Figure 1 shows the difference in coloring between an adult and a baby flamingo.

**Figure 1. Flamingo with Baby**



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A flamingo's feathers can be many different shades of pink. Wild, adult flamingos in the Caribbean are dark pink. Adult flamingos at the London Zoo are light pink. This difference in color can be seen in Figure 2.

### **Figure 2. Flamingos in Different Habitats**



**Wild, Adult Flamingos  
in the Caribbean**

© Martin Pettitt



**Adult Flamingos  
at the London Zoo**

© Pam Frey

Table 1 describes four groups of flamingos.

**Table 1. Four Flamingo Groups**

<b>Group</b>	<b>Description</b>
Group 1	Wild, adult flamingos in the Caribbean (see top panel in Fig 2).
Group 2	Adult flamingos born at the London Zoo (see bottom panel in Fig 2).
Group 3	The parents of group 1 (wild flamingos).
Group 4	The parents of group 2 (when they were caught in the wild).

Table 2 shows characteristics of flamingos in each of the groups.

**Table 2. Characteristics and Habitats of Flamingo Groups**

<b>Group</b>	<b>Feather Color</b>	<b>Rain</b>	<b>Drinking Water</b>	<b>Diet</b>
Group 1	Dark pink	Rain falls all year	Drinking water is freely available	Saltwater plants and shrimp
Group 2	Light pink	Rain falls all year	Drinking water is freely available	Fish and plants that are not part of the flamingos' diet in the wild
Group 3	Dark pink	Rain fell all year	Drinking water was freely available	Saltwater plants and shrimp
Group 4	Dark pink	Rain fell all year	Drinking water was freely available	Saltwater plants and shrimp

## Your Task

In the questions that follow, you will create an explanation for the difference in color between the flamingos in the Caribbean and the flamingos at the London Zoo.

**Part A**

Using Table 2 compare the groups of flamingos and their habitats. Select the boxes in the table to show whether the factors are the same or different.

	<b>Feather color</b>	<b>Drinking water</b>	<b>Rain</b>	<b>Diet</b>
<b>Same for all 4 groups of flamingos</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Different for group 1 only</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Different for group 2 only</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Different for group 3 only</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Different for group 4 only</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Scoring Criteria

## Part A

- The student identified diet as different for Group 2 only and feather color different for Group 2 only demonstrating the ability to make observations to support an explanation of how traits of an organism can be influenced by their environment.
- The student identified drinking water and rain as the same demonstrating the ability to make observations to support an explanation of how traits of an organism can be influenced by their environment.

Rubric

## Part A (2 points possible)

- 'diet' identified as 'Different for Group 2 only' and 'feather color' identified as 'Different for Group 2 only' (1 point)
- 'drinking water' and 'rain' identified as same for all 4 groups (1 point)

**Part B**

Using the table from Part A, what is the **most likely** cause for the darkness of the flamingos' pink feather color?

- Ⓐ color is related to drinking water
- Ⓑ color is inherited from parents
- Ⓒ color is related to rainfall
- Ⓓ color is related to diet

Scoring Criteria

## Part B

- The student identified a factor corresponding to one selected as 'different' in Part A demonstrating an understanding of how traits of an organism can be influenced by their environment.

Rubric

## Part B (1 point possible)

- 'color is related to diet' selected (or a factor corresponding to whatever was selected as 'different' in Part A (1 Point)

**Part C**

Click on the boxes and choose the words and phrases to make a statement that **best** explains why there is a difference in flamingo feather color between Group 1 and Group 2.

Flamingos in the Caribbean are  pink because . This means that traits can .

Scoring Criteria

## Part C

- The selected 'dark' and a reason consistent with their response in Part B indicating an ability to use evidence to support the feather color of the flamingos.
- The student selected a cause for the feather color of the flamingos consistent with their reasoning in the first sentence indicating an ability to use evidence to support an explanation about the feather color of flamingos.

Rubric

Part C (2 points possible)

- 'dark' and 'they eat more saltwater and shrimp' selected (or a reason consistent with response in Part B) (1 Point)

And

- 'be affected by the habitat' selected (or a reason consistent with reasoning in first part of sentence) (1 Point)

**Part D**

What could be done to change the coloring of the flamingos in the London Zoo to a darker pink?

- Ⓐ give the flamingos lots of drinking water
- Ⓑ move the flamingos inside so that they are away from rainfall
- Ⓒ feed the flamingos more of the shrimp they would eat in the wild
- Ⓓ nothing, since coloring is inherited from parents

Scoring Criteria

Part D

- The student selected an action consistent with their response in Part C indicating an ability to use an explanation of flamingo feather color to predict the effect of changes made to their environment.

Rubric

Part D (1 point possible)

- 'feed the flamingos more of the shrimp they would eat in the wild' selected [or an answer consistent with response in Part C] (1 point)

## Task 3- Physical Science

### Standard

5-PS1-3 Make observations and measurements to identify materials based on their properties.

### Task Demands

- Identify from a list, including distractors, the materials or tools needed to observe or measure properties of matter to identify materials.
- Make and/or record observations or measurements from the investigation of the properties of materials.

### Stimulus

Three mineral crystals are placed on a table. The three crystals have a similar color. They look like clear glass. However, they are all different minerals.

Figure 1 shows all three unknown minerals.

**Figure 1. Unknown Minerals**



Minerals can be identified by their properties. One common property is hardness. A hardness test can be used to determine the identity of a mineral. Hardness testing is done by scratching a mineral with another mineral or tool. For example, diamond is the hardest known mineral and will scratch all other minerals.

Table 1 shows the mineral hardness scale. The identities of Minerals A, B, and C are shown in **bold**.

**Table 1. Hardness Scale**

<b>Hardness</b>	<b>Material</b>
1	Talc
1.5	<i>Chalk</i>
2	<b>Halite</b>
2.5	<i>Fingernail</i>
3	<b>Calcite</b>
3.5	<i>Penny</i>
4	Fluorite
5	Apatite
5.5	<i>Steel Nail</i>
6	Orthoclase
6.5	Pyrite
7	<b>Quartz</b>
7.5	Garnet
8	Topaz
10	Diamond

\*Materials in *italics* are tools, not minerals.

### Your Task

In the questions that follow, you will investigate the hardness of the unknown minerals to identify which mineral is halite, which is calcite, and which is quartz.

**Part A**

Use the simulation to determine the hardness of the unknown minerals.

First, select a Tool to scratch the unknown mineral sample. Next, select a Mineral to test. Then click Run Trial to see your results.

- You are only allowed to submit four trials. All four trials will be scored.

Tool

Mineral to Test

Trial Number	Tool	Mineral	Does the Tool Scratch the Crystal?

Scoring Criteria

Part A

- The student correctly used the simulation to determine the hardness of each material, providing some evidence that the student understood when they had the necessary and sufficient observations to identify the mineral.
- The student did not use the chalk or the diamond for any trials, providing some evidence that they understood that these tools could not provide useful information.

Rubric

Part A (2 points possible)

- The student correctly used the simulation to determine the hardness of the material (1 Point)
- The student did not use chalk or diamond for any trials (1 point)

**Part B**

Using the data that you collected from the simulation, click the boxes to complete the table to identify the unknown mineral crystals.

<b>Mineral</b>	<b>Identification</b>
Mineral A	<input type="text"/>
Mineral B	<input type="text"/>
Mineral C	<input type="text"/>

Scoring Criteria

## Part B

- The student correctly identified Mineral A as Calcite by using the correct tools, indicating an ability to communicate conclusions from an investigation of the properties of materials.
- The student correctly identified Mineral B as Quartz by using the correct tools, indicating an ability to communicate conclusions from an investigation of the properties of materials.
- The student correctly identified Mineral C as Halite by using the correct tools, indicating an ability to communicate conclusions from an investigation of the properties of materials.

Rubric

## Part B (3 points possible)

- Mineral A is Calcite (1 Point)
- Mineral B is Quartz (1 Point)
- Mineral C is Halite (1 Point)

## Task 4- Physical Science

### Standard

3-PS2-3 Ask questions to determine cause and effect relationships of electrical or magnetic interactions between two objects not in contact with each other.

### Task Demands

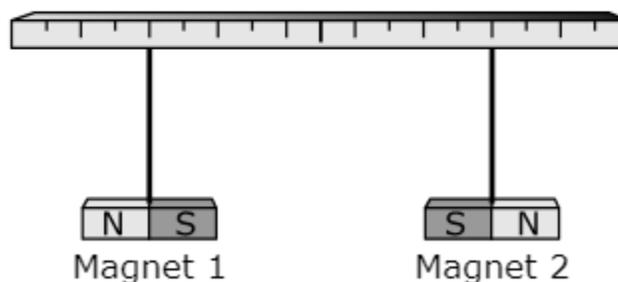
- Select or identify from a collection questions that will help clarify the properties that are correlated with the strength or direction of the forces in the phenomenon. In addition to other plausible distractors, distractors may include non-testable (“nonscientific”) questions.
- Make and/or record observations about how the size of the forces, both magnetic and electric, depend on different characteristics such as strength/orientation of the magnet, the amount of electric charge, materials, etc.
- Identify, describe, or select from a collection of characteristics/properties/features/processes to be manipulated or held constant, while gathering information to answer a well-articulated question.

### Stimulus

Two magnets are placed right next to each other. They seem to pull together. A third magnet is then placed right next to the first two magnets. This magnet seems to push away from the first two.

To help better understand these forces, you can conduct an experiment by tying two magnets to strings and hanging them from a meter stick. You can then observe how the magnets interact with each other. The setup of the experiment is shown in Picture 1.

**Picture 1. Hanging Magnets Experiment**



In the experiment, you will be able to change the orientation of each magnet as well as the distance between the magnets. The orientation of the magnet depends on the direction that the N (north) side is pointing.

For example, a magnet's orientation can start with the N side pointing to the right. If the orientation is changed, then the N side is pointing to the left.

## Your Task

In the following questions, you will set up and perform an experiment that will help you understand what affects the force between the two magnets.

### Part A

Select a testable, scientific question that can be answered by performing an experiment with the setup shown in Picture 1.

- Ⓐ How does the distance between the magnets affect the force?
- Ⓑ How does the orientation of the magnets affect the force?
- Ⓒ Will the force between the magnets always exist?

### Scoring Criteria

#### Part A

- The student selected "A- How does the distance affect the force" or "B- How does the orientation affect the force," indicating that they understand what questions are scientific and can be tested.

### Rubric

#### Part A (1 point possible)

- Either 'How does the distance between the magnets affect the force? Or 'How does the orientation of the magnets affect the force?' selected (1 Point)

**Part B**

Use the table to select the properties you want to hold constant and the properties you want to change when you run your experiment to answer the question you chose in part A.

Select a box to identify whether each property should be held constant or changed in your experiment.

	Constant	Change
Magnet orientation	<input type="checkbox"/>	<input type="checkbox"/>
Magnet type	<input type="checkbox"/>	<input type="checkbox"/>
Magnet size	<input type="checkbox"/>	<input type="checkbox"/>
Distance between the magnets	<input type="checkbox"/>	<input type="checkbox"/>

Scoring Criteria

## Part B

- The student selected “Distance Between Magnets” as the only variable to be changed in part B, if they selected “A” in part A, or selected “Magnet Orientation” as the only variable to be changed in part B, if they chose “B” in part A, indicating understanding of how to carry out a valid scientific experiment to determine the cause and effect relationships of magnetic interactions.
- The student selected “Distance Between Magnets” to remain constant in part B, if they selected “B” in part A, or selected “Magnet Orientation” to remain constant in part B if they selected “A” in part A, indicating understanding of how to carry out a valid scientific experiment to determine the cause and effect relationships of magnetic interactions
- The student selected “Magnet size” to remain constant, indicating an understanding that changing the magnet size would not help address any of the questions in Part A.
- The student selected “Magnet type” to remain constant, indicating and understanding that changing the magnet type would not help address any of the question in Part A.

Rubric

## Part B (4 points possible)

- If ‘How does the distance between the magnets affect the force?’ was selected in Part A, ‘distance between magnets’ is changed while all other values are held constant (1 Point)

OR

- If ‘How does the orientation of the magnets affect the force?’ was selected in Part A, ‘Magnet orientation’ is changed while all other values are held constant (1 Point).

And

- If how does the distance between the magnets affect the force? Was selected in Part A, 'magnet orientation is indicated as needing to remain constant (1 Point)

OR

- If 'How does the orientation of the magnets affect the force?' was selected in Part A, 'magnet orientation' indicated as needing to remain constant (1 Point)

And

- 'Magnet size' indicated as needing to remain constant (1 Point)
- 'Magnet type' indicated as needing to remain constant (1 Point)

### Part C

Use the Hanging Magnets Experiment simulation to run the experiment and gather observations to answer your question from part A.

First, select the Distance and Orientations. You must select an orientation for each magnet in each trial. Then, click Start to run the simulation.

- You will be limited to **three** rows of data.
- Be sure the final data table includes data that answers your question.
- Click on the trash can icon if you want to delete a row and generate new data.

### Hanging Magnets Experiment

Distance Far

Orientation of Magnet 1

Orientation of Magnet 2

Start

Trial Number	Distance	Orientation of Magnet 1	Orientation of Magnet 2	Observations

Scoring Criteria

Part C

- The student ran their experiment correctly by holding orientation constant while varying distance (If A was selected in Part A), or by holding distance constant while varying orientation (if B was selected in Part A), indicating that they can manipulate variables to gather information about the cause and effect relationships of magnetic interactions.
- The student correctly ran a controlled experiment, indicating that they can manipulate variables to gather information about the cause and effect relationships of magnetic interactions.

Rubric

## Part C (2 points possible)

- If 'How does the distance between the magnets affect the force? Was selected in Part A, the distance between the magnets was varied while the orientation was held constant (1 Point)

OR

- If 'How does the orientation of the magnets affect the force? Was selected in part A, the orientation was varied while the distance between the magnets was held constant (1 Point)

And

- The student ran a controlled experiment by holding one property constant while varying the other (1 Point)

**Part D**

Click the box to select the answer to the question you decided to test in part A, based on the results of the experiment you ran in the simulation.

<b>Result of Experiment</b>	
<b>Answer to Question</b>	
	▼

Scoring Criteria

## Part D

- The student correctly selected "Changes in the distance between the magnets change the strength of the force" if they varied the distance in the simulation, or correctly selected "Changes in the orientation of the magnets change the direction of the force" if they varied magnet position in the simulation, or they correctly selected 'Changes in the orientation of the magnets does not affect the force" if they varied magnet orientation but kept the distance at "Far", indicating that they can make and record observations about the size of magnetic forces based on orientation and distance between the objects.

Rubric

## Part D (1 point possible)

- If 'How does the distance between the magnets affect the force?' was selected in Part A, 'Changing magnet distance changes strength of force selected (1 point)

OR

- If 'How does the orientation of the magnets affect the force?' was selected in Part A, 'Changing magnet orientation changes direction of force' (1 Point)