



*ISTEP+: Grade 6*

Science

Released Part 1 Applied Skills (open-ended) Items  
and Scoring Notes

## Introduction

The *ISTEP+* Spring 2016 test was administered to Indiana students in Grades 3-8 and 10. The test included two parts: Part 1 was given in March, and Part 2 took place in late April and early May. Part 1 contained Applied Skills test questions (also referred to as open-ended items) that were hand scored by trained evaluators, and Part 2 was machine scored. Scores for Part 1 and Part 2 are combined to generate a student's total score.

Test results, as well as images of the Applied Skills student responses, are available online, and schools are expected to discuss results with parents and students. As a springboard for these conversations and to serve as a resource for teachers, the Indiana Department of Education has created this document, which consists of the following:

- a brief description of the types of questions on the test
- a short summary of scoring rules utilized by the trained evaluators
- a copy of the rubrics—or scoring guides—used by evaluators to score student responses
- a copy of the released Applied Skills questions (*“released” means the items are posted on the web and are no longer secure; therefore, the released test items can be discussed and used with students as future practice items*)
- anchor papers—or sample student responses—used by evaluators to distinguish between score points

### Notes:

- The Part 1 open-ended questions are released when test results are made available.
- It is important to keep in mind that the majority of a student's score is calculated from items in Part 2. Since Part 2 items are secure and are not released, they are not included in this document.

## Question Types

This document addresses questions from *ISTEP+ Part 1*. *Students* demonstrate their knowledge and understanding by responding to items that are open-ended, providing written responses in a short-answer or essay-type format.

Part 1 consists of the following test question types: Constructed-Response (CR), Extended-Response (ER), and a Writing Prompt (WP). Item types vary by subject area. Math, Science, and Social Studies include CR and ER items. English/Language Arts includes CR and WP test questions.

## Scoring

The questions on *ISTEP+ Part 1* are scored by evaluators who must have a four-year college degree and pass a series of qualifying tests. Prior to scoring student responses, evaluators receive extensive training to ensure that student responses are scored accurately and consistently.

For Part 1 of *ISTEP+*, each question is scored according to a rubric, or scoring guide. Rubrics clearly define the requirements for each score point. A set of student responses representing all of the score points on a rubric are selected as anchor papers (exemplars) and are used as clear examples of specific score points. Samples of anchor papers are presented within this document.

<b>ISTEP+ Part 1: Science</b>		
<b>Question Type</b>	<b>Score Reporting Categories</b>	<b>Scoring Method</b>
Constructed-Response (CR)	Physical Science Earth and Space Science Life Science Science, Engineering and Technology The Nature of Science The Design Process	2-pt. CR Rubric (Grades 4 & 6)
Extended Response (ER)	Physical Science Earth Science Life Science Science, Engineering and Technology The Nature of Science The Design Process	4-pt. ER Rubric (Grades 4 & 6)

If a student's response is unable to be scored, it is assigned one of the following condition codes:

- A** Blank/No Response/Refusal
- B** Illegible
- C** Written predominantly in a language other than English
- D** Insufficient response/Copied from text
- E** Response not related to test questions or scoring rule (not applied to Mathematics questions)

More information is available regarding assessment topics on the Office of Student Assessment homepage at <http://www.doe.in.gov/assessment>.

Item #1  
Constructed-Response

**Constructed-Response  
Standard 3: Life Science**

**Question 1**

- 1.** A stable spider population is found on the banks of a small lake where the mosquito population is very large. The spiders build webs between the tulle reeds along the banks. A new species of spider is introduced and starts building webs in the tulle reeds.

Explain how the original spider population might be affected over time.

---

---

Name and explain the resource that might be a factor in how the original spider population is affected over time.

---

---

**Key Element(s):**

- 
- Over time the original spider population might decrease
- 

Any one of the following:

- As the new spider population increases, there might be less food available for the original spider population.
  - As the new spider population increases, there is less habitat available for the population's webs.
- 

**Rubric:**

<b>2 points</b>	Two key elements
<b>1 point</b>	One key element
<b>0 points</b>	Other

**Question 1, Sample A – Score Point 2**

A stable spider population is found on the banks of a small lake where the mosquito population is very large. The spiders build webs between the tulle reeds along the banks. A new species of spider is introduced and starts building webs in the tulle reeds.

Explain how the original spider population might be affected over time.

The original spiders' population might decrease  
because of the new spider species. 3.

Name and explain the resource that might be a factor in how the original spider population is affected over time.

The tulle reeds. The new spiders will take up the  
original spiders shelter, the tulle reeds.

*Scoring Notes: Part one of the response correctly explains how the original spider population might be affected. Part two of the response correctly identifies a resource affecting the original spider population and has a valid explanation as to how the resource affects the original spider population. This response receives two points for two correct key elements.*

**Question 1, Sample B – Score Point 2**

A stable spider population is found on the banks of a small lake where the mosquito population is very large. The spiders build webs between the tulle reeds along the banks. A new species of spider is introduced and starts building webs in the tulle reeds.

Explain how the original spider population might be affected over time.

The population might decrease because there won't be enough food for all the spiders

Name and explain the resource that might be a factor in how the original spider population is affected over time.

The population will be affected because there won't be enough mosquitoes to eat.

*Scoring Notes: Part one of the response correctly explains how the original spider population might be affected. Part two of the response correctly identifies a resource affecting the original spider population and has a valid explanation as to how the resource affects the original spider population. This response receives two points for two correct key elements.*

**Question 1, Sample C – Score Point 1**

A stable spider population is found on the banks of a small lake where the mosquito population is very large. The spiders build webs between the tulle reeds along the banks. A new species of spider is introduced and starts building webs in the tulle reeds.

Explain how the original spider population might be affected over time.

The Original spider population will decrease.

Name and explain the resource that might be a factor in how the original spider population is affected over time.

The new species of spider will increase.

*Scoring Notes: Part one of the response correctly explains how the original spider population might be affected. Part two of the response fails to identify a resource that might be a factor affecting the original spider population and fails to describe how the limited resource could affect the original spider population. This response receives one point for one correct key element.*

**Question 1, Sample D – Score Point 1**

A stable spider population is found on the banks of a small lake where the mosquito population is very large. The spiders build webs between the tulle reeds along the banks. A new species of spider is introduced and starts building webs in the tulle reeds.

Explain how the original spider population might be affected over time.

The original spider population might be affected because the spiders wouldn't have enough room to build their webs.

Name and explain the resource that might be a factor in how the original spider population is affected over time.

The resource would be tulle reeds because the new species of spiders are building their webs on the tulle reeds.

*Scoring Notes: Part one of the response does not explain how the original spider population might be affected. Part two of the response correctly identifies a resource affecting the original spider population and has a valid explanation as to how the resource affects the original spider population. This response receives one point for one correct key element.*

**Question 1, Sample E – Score Point 0**

A stable spider population is found on the banks of a small lake where the mosquito population is very large. The spiders build webs between the tulle reeds along the banks. A new species of spider is introduced and starts building webs in the tulle reeds.

Explain how the original spider population might be affected over time.

The original spider population may get larger, because more webs = more food.

Name and explain the resource that might be a factor in how the original spider population is affected over time.

Mosquitos will be a food resource so spiders population will get bigger.

*Scoring Notes: Part one of the response incorrectly explains how the original spider population might be affected. Part two of the response identifies a resource that might be a factor affecting the original spider population but incorrectly explains how the original spider population would be affected based on that limited resource. This response receives zero points for zero correct key elements.*

**Question 1, Sample F – Score Point 0**

A stable spider population is found on the banks of a small lake where the mosquito population is very large. The spiders build webs between the tulle reeds along the banks. A new species of spider is introduced and starts building webs in the tulle reeds.

Explain how the original spider population might be affected over time.

It might be effected because the other spiders might take over it.

Name and explain the resource that might be a factor in how the original spider population is affected over time.

Because the the spiders who lived there might be stronger.

*Scoring Notes: Part one of the response does not explain how the original spider population might be affected. Part two of the response fails to identify a resource that might be a factor affecting the original spider population and fails to describe how the limited resource could affect the original spider population. This response receives zero points for zero correct key elements.*

Item #2  
Constructed-Response

**Constructed-Response  
Standard 2: Earth Science**

**Question 2**

2. The United States is in the Northern Hemisphere. Argentina is in the Southern Hemisphere.

Identify the season it would be in each country during the month of December. Explain why the seasons are the same or why they are different.

---

---

---

Compare the daylight hours and intensity of sun rays each country has in December.

---

---

---

**Key Element(s):**

- 
- In December, the United States is experiencing winter, while Argentina is experiencing summer. This is caused by the tilt of Earth on its axis as it revolves around the sun. In December, the United States is tilted away from the sun causing winter, while Argentina is tilted toward the sun causing summer.

- 
- In December in Argentina the sun's rays are more intense and there are more daylight hours. In December in the United States the sun's rays are less intense and daylight hours are fewer than in Argentina.
- 

**Rubric:**

<b>2 points</b>	Two key elements
<b>1 point</b>	One key element
<b>0 points</b>	Other

**Question 2, Sample A – Score Point 2**

The United States is in the Northern Hemisphere.  
Argentina is in the Southern Hemisphere.

Identify the season it would be in each country during the month of December. Explain why the seasons are the same or why they are different.

In December the U.S. will have winter in Argentina it's summer because of earth's tilt.

Compare the daylight hours and intensity of sun rays each country has in December.

The intensity of sunlight is greater for Argentina than it is for the U.S. the daylight hours are longer for Argentina.

*Scoring Notes: Part one of the response correctly identifies the season for each country and gives a valid explanation. Part two of the response correctly identifies Argentina as receiving more daylight hours and more intense sunlight. This response receives two points for two correct key elements.*

**Question 2, Sample B – Score Point 2**

The United States is in the Northern Hemisphere.  
Argentina is in the Southern Hemisphere.

Identify the season it would be in each country during the month of December. Explain why the seasons are the same or why they are different.

During December it would be winter in the United States and Summer in Argentina. It would be this way because of the way Earth is tilted

Compare the daylight hours and intensity of sun rays each country has in December.

In the United States the daylight hours and intensity of sun rays would be much less than in Argentina.

*Scoring Notes: Part one of the response correctly identifies the season for each country and gives a valid explanation. Part two of the response correctly identifies Argentina as receiving more daylight hours and more intense sunlight. This response receives two points for two correct key elements.*

**Question 2, Sample C – Score Point 1**

The United States is in the Northern Hemisphere.  
Argentina is in the Southern Hemisphere.

Identify the season it would be in each country during the month of December. Explain why the seasons are the same or why they are different.

The United States would be in winter in December. At the same time Argentina would be in the season of summer in December because it's on the other side of the Earth.

Compare the daylight hours and intensity of sun rays each country has in December.

In December the United States has less daylight hours and less sun intensity because it is winter. In December Argentina has more daylight hours and more sun intensity because it's summer.

*Scoring Notes: Part one of the response correctly identifies the season for each country but gives an invalid explanation. Part two of the response correctly identifies Argentina as receiving more daylight hours and more intense sunlight. This response receives one point for one correct key element.*

**Question 2, Sample D – Score Point 1**

The United States is in the Northern Hemisphere.  
Argentina is in the Southern Hemisphere.

Identify the season it would be in each country during the month of December. Explain why the seasons are the same or why they are different.

In the United States it would be winter but in Argentina it would be summer. The seasons are different because of the world's tilt.

Compare the daylight hours and intensity of sun rays each country has in December.

The United States has little sun in December but Argentina has lots of sun because it's summer in Argentina and winter in the United States.

*Scoring Notes: Part one of the response correctly identifies the season for each country and gives a valid explanation. Part two of the response correctly identifies Argentina as receiving more daylight hours but fails to include information on how the intensity of sunlight would be different. This response receives one point for one correct key element.*

**Question 2, Sample E – Score Point 0**

The United States is in the Northern Hemisphere.  
Argentina is in the Southern Hemisphere.

Identify the season it would be in each country during the month of December. Explain why the seasons are the same or why they are different.

It would be the same season in both because the Sun hits the north and south equators at the same time.

Compare the daylight hours and intensity of sun rays each country has in December.

It depends on where you are at and at what time but each country would have more night than day.

*Scoring Notes: Part one of the response incorrectly identifies the season for each country and provides an incorrect explanation for the seasons. Part two of the response fails to correctly identify Argentina as receiving more daylight hours and more intense sunlight. This response receives zero points for zero correct key elements.*

**Question 2, Sample F, Score Point 0**

The United States is in the Northern Hemisphere.  
Argentina is in the Southern Hemisphere.

Identify the season it would be in each country during the month of December. Explain why the seasons are the same or why they are different.

It would be Winter in the US. It would be Summer in Argentina.

Compare the daylight hours and intensity of sun rays each country has in December.

The daylight hours in Argentina would be longer than in the US.

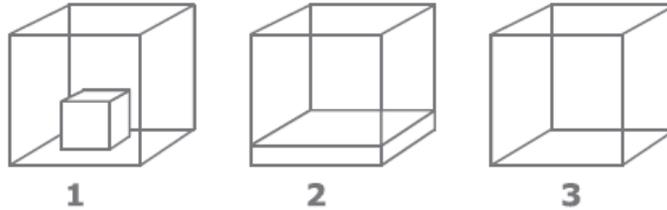
*Scoring Notes: Part one of the response correctly identifies the season for each country but does not include an explanation. Part two of the response correctly identifies Argentina as receiving more daylight hours but fails to include how the intensity of sunlight would be different. This response receives zero points for zero correct key elements.*

Item #3  
Constructed-Response

**Constructed-Response**  
**Standard 1: Physical Science**

**Question 3**

**3.** Each of the boxes below shows the same substance in a different state of matter.



Explain the difference in volume and motion of the molecules in closed boxes 1 and 3.

---

---

What would happen if the tops were removed from each of the three boxes?

---

---

**Key Element(s):**

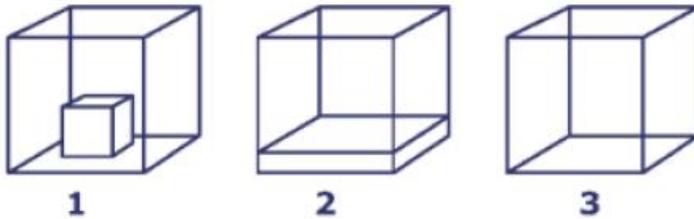
- 
- Box 1 is a solid and the volume is fixed so the molecules vibrate in place. Box 3 is a gas so the volume is the shape of the container, and the molecules move freely within the box.
- 
- There would be no change within the solid and liquid boxes. The gases would escape the container
- 

**Rubric:**

<b>2 points</b>	Two key elements
<b>1 point</b>	One key element
<b>0 points</b>	Other

### Question 3, Sample A – Score Point 2

Each of the boxes below shows the same substance in a different state of matter.



Explain the difference in volume and motion of the molecules in closed boxes 1 and 3.

In box 1 it is a solid and it has a definite volume and molecules are close together and vibrate in place. In box 3 it is a gas it has no definite volume and molecules move freely.

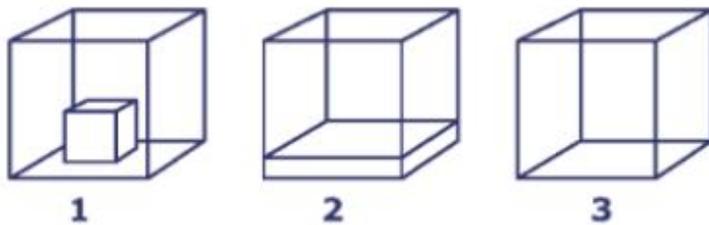
What would happen if the tops were removed from each of the three boxes?

Molecules will escape from box 3 because it is a gas. Nothing would happen to boxes 1 and 2 because they have definite volume.

*Scoring Notes: Part one of the response correctly describes the difference in volume and motion of molecules in boxes 1 and 3. Part two of the response correctly describes what would happen to the molecules if the tops were removed from the boxes. This response receives two points for two correct key elements.*

### Question 3, Sample B – Score Point 2

Each of the boxes below shows the same substance in a different state of matter.



Explain the difference in volume and motion of the molecules in closed boxes 1 and 3.

The difference in volume is that 1 is more compact resulting in a smaller volume than 3. The particles also move around freely in 3 where in 1 they vibrate slightly and are in an area.

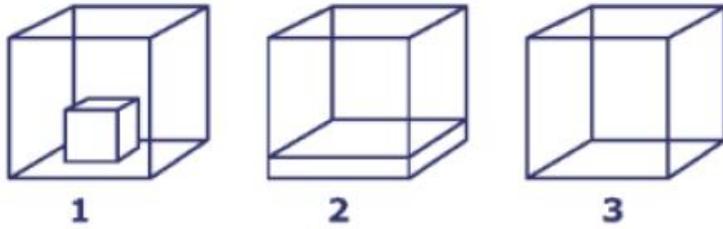
What would happen if the tops were removed from each of the three boxes?

IF the top of box 3 were removed the gas would escape, 2 the liquid would evaporate, and 1 it would possibly melt and evaporate.

*Scoring Notes: Part one of the response correctly describes the difference in volume and motion of molecules in boxes 1 and 3. Part two of the response correctly describes what would happen to the molecules if the tops were removed from the boxes. This response receives two points for two correct key elements.*

### Question 3, Sample C – Score Point 1

Each of the boxes below shows the same substance in a different state of matter.



Explain the difference in volume and motion of the molecules in closed boxes 1 and 3.

Box 1 is a solid so the molecules are packed tightly together, box 3 is a gas so the molecules are moving rapidly.

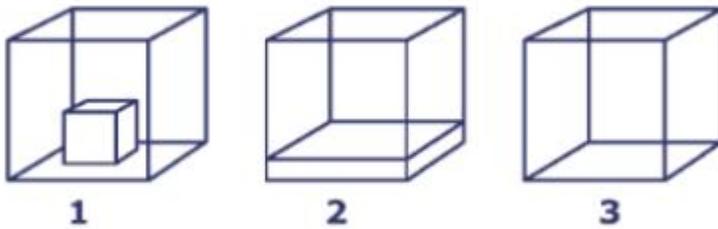
What would happen if the tops were removed from each of the three boxes?

Boxes 1 and 2 would stay the same, but the gas in box 3 would go into the air.

*Scoring Notes: Part one of the response correctly describes the difference in the motion of molecules in boxes 1 and 3, but it does not include the difference in volume. Part two of the response correctly describes what would happen to the molecules if the tops were removed from the boxes. This response receives one point for one correct key element.*

### Question 3, Sample D – Score Point 1

Each of the boxes below shows the same substance in a different state of matter.



Explain the difference in volume and motion of the molecules in closed boxes 1 and 3.

In box 1, the particles are vibrating, and the volume is small.  
In box 3, the particles are moving freely, and the volume is large.

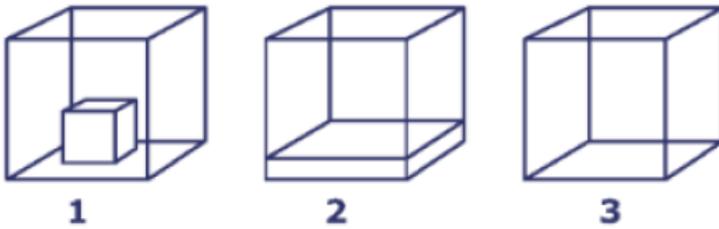
What would happen if the tops were removed from each of the three boxes?

In all 3 boxes, it will fill up with the surrounding gas.

*Scoring Notes: Part one of the response correctly describes the difference in the motion of molecules in boxes 1 and 3, but it does not include the difference in volume. Part two of the response correctly describes what would happen to the molecules if the tops were removed from the boxes. This response receives one point for one correct key element.*

**Question 3, Sample E – Score Point 0**

Each of the boxes below shows the same substance in a different state of matter.



Explain the difference in volume and motion of the molecules in closed boxes 1 and 3.

In 1 and 3 the volume will be different because of size

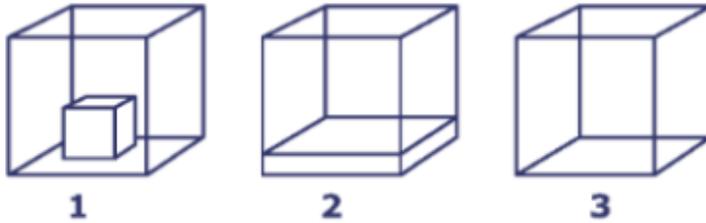
What would happen if the tops were removed from each of the three boxes?

The volume would be smaller.

*Scoring Notes: Part one of the response incorrectly describes the difference in the volume and motion of molecules in boxes 1 and 3. Part two of the response incorrectly describes what would happen to the molecules if the tops were removed from the boxes. This response receives zero points for zero correct key elements.*

### Question 3, Sample F – Score Point 0

Each of the boxes below shows the same substance in a different state of matter.



Explain the difference in volume and motion of the molecules in closed boxes 1 and 3.

The difference is that Box 1 is in  
cube form and Box 3 is in vapor form.

What would happen if the tops were removed from each of the three boxes?

Boxes 1+2 would stay the same,  
while Box 3, the substance would evaporate.

*Scoring Notes: Part one of the response incorrectly describes the difference in the volume and motion of molecules in boxes 1 and 3. Part two of the response incorrectly describes what would happen to the molecules if the tops were removed from the boxes. This response receives zero points for zero correct key elements.*

Item #4  
Extended-Response

**Extended-Response**  
**Standard 5: The Nature of Science**

**Question 4**

4. Two students performed experiments to find out which brand of batteries lasted the longest. Each student placed two D-size Brand A batteries into a flashlight and repeated this process with Brand B and Brand C batteries in two more flashlights. All six flashlights were turned on at the same time and left on until the lights went out. The results of the experiments are shown in the tables below.

**Student 1**

<b>Flashlight</b>	<b>Brand A</b>	<b>Brand B</b>	<b>Brand C</b>
<b>Turned on</b>	9:00 P.M. Fri	9:00 P.M. Fri	9:00 P.M. Fri
<b>Went out</b>	2:00 P.M. Sat	11:00 P.M. Sat	4:00 A.M. Sat
<b>Total time light was on</b>	15 hours	26 hours	7 hours

**Student 2**

<b>Flashlight</b>	<b>Brand A</b>	<b>Brand B</b>	<b>Brand C</b>
<b>Turned on</b>	9:00 P.M. Fri	9:00 P.M. Fri	9:00 P.M. Fri
<b>Went out</b>	9:00 A.M. Sat	9:00 P.M. Sat	3:00 A.M. Sat
<b>Total time light was on</b>	12 hours	24 hours	6 hours

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

---

---

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

1) \_\_\_\_\_

2) \_\_\_\_\_

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

1) \_\_\_\_\_

2) \_\_\_\_\_

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

1) \_\_\_\_\_

2) \_\_\_\_\_

**Key Element(s):**

- 
- All the batteries in Student 1's investigation lasted longer than the batteries in Student 2's investigation.
- 

Any two of the following:

- Brand of flashlight
  - Age of flashlight
  - Size of flashlight
  - Size of bulbs in flashlight
  - How much the flashlight was previously used
  - Any other reasonable response
- 

Any two of the following:

- Age of the batteries/expiration date
  - Whether the batteries were new or used
  - What the batteries were previously used for
  - Any other reasonable response
- 

- Each student could use the same brand new flashlight and use the same brand new batteries.
- 

**Rubric:**

<b>4 points</b>	Four key elements
<b>3 points</b>	Three key elements
<b>2 points</b>	Two key elements
<b>1 point</b>	One key element
<b>0 points</b>	Other

Question 1, Sample A – Score Point 4

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

Student 1's flashlights lasted longer than student 2's flashlights.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) They could have been different flashlights.
- 2) The flashlights might be older

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) They could be used batteries
- 2) The batteries might be too old

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

- 1) Buy new flashlights of the same kind
- 2) Buy new batteries

*Scoring Notes: Part one of the response identifies a correct comparison. Part two of the response correctly identifies two possible differences between the flashlights. Part three of the response correctly identifies two possible differences between the batteries. Part four of the response describes two valid changes to the students' experiments. This response receives four points for four correct key elements.*

**Question 4, Sample B – Score Point 4**

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

Student 1's flashlight was staying lit longer, while student 2's went out a little bit shorter.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) oldness and newness
- 2) type of flashlight.

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) if the batteries were used
- 2) if the batterie was broke and didn't work well.

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

- 1) same flashlight
- 2) brand new batteries.

*Scoring Notes: Part one of the response identifies a correct comparison. Part two of the response correctly identifies two possible differences between the flashlights. Part three of the response correctly identifies two possible differences between the batteries. Part four of the response describes two valid changes to the students' experiments. This response receives four points for four correct key elements.*

**Question 4, Sample C – Score Point 3**

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

Student 1 had more hours of the flashlight being lit.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) Type of the flashlight
- 2) If the batteries had been used or not

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) They could've been older.
- 2) They could've been faulty batteries.

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

- 1) Buy rechargeable batteries and charge them the same.
- 2) use the batteries out of the same pack

*Scoring Notes: Part one of the response identifies a correct comparison. Part two of the response correctly identifies one possible difference between the flashlights but identifies a difference between the batteries instead of the flashlights for the second difference. Part three of the response correctly identifies two possible differences between the batteries. Part four of the response describes two valid changes to the students' experiments. This response receives three points for three correct key elements.*

**Question 4, Sample D – Score Point 3**

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

Student 1 had longer hours than Student 2.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) Different kind of flashlight
- 2) One was new and one was old

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) Old batteries and new batteries
- 2) They could have put in the wrong batteries

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

- 1) Same kind of flashlights
- 2) New flashlights and not old ones

*Scoring Notes: Part one of the response identifies a correct comparison. Part two of the response correctly identifies two possible differences between the flashlights. Part three of the response correctly identifies one possible difference between the batteries but also provides an invalid difference. Part four of the response describes two valid changes to the students' experiments. This response receives three points for three correct key elements.*

#### Question 4, Sample E – Score Point 2

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

Student 1's flashlights stayed lit longer than Student 2's flashlights.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

1) Could have used a bigger flashlight.

2) Could have used a smaller flashlight.

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

1) Could have used a different kind of batteries.

2) Could have use size D batteries.

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

1) Make flashlights the same size.

2) Use the same batteries.

*Scoring Notes: Part one of the response identifies a correct comparison. Part two of the response does not identify two distinct differences between the flashlights and instead identifies a possible difference in the size of the flashlights twice. Part three of the response correctly identifies one possible difference between the batteries but also provides an invalid difference (D batteries). Part four of the response describes two valid changes to the students' experiments. This response receives two points for two correct key elements.*

**Question 4, Sample F – Score Point 2**

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

Student 1's flashlights lasted longer than student 2's.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) Brand of flashlight
- 2) Size of flashlight

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) Type of light
- 2) Brand of flashlight

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

- 1) Have the same brand.
- 2) Have the same type of light.

*Scoring Notes: Part one of the response identifies a correct comparison. Part two of the response correctly identifies two possible differences between the flashlights. Part three of the response fails to identify differences between the batteries. Part four of the response describes only one valid change to the students' experiments. This response receives two points for two correct key elements.*

**Question 4, Sample G – Score Point 1**

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

The hours for each individual battery tested were close together.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) different brands of flashlight
- 2) could have been damaged

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) different size batteries got mixed up
- 2) batteries could have been duds.

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

- 1) record the flashlights
- 2) move testings on the experiment

*Scoring Notes: Part one of the response fails to identify a correct comparison. Part two of the response identifies two possible differences between the flashlights. Part three of the response correctly identifies one possible difference between the batteries (batteries could have been duds) but does not identify a valid second difference. Part four of the response fails to describe two valid changes to the students' experiments. This response receives one point for one correct key element.*

#### Question 4, Sample H – Score Point 1

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

Student 1's flashlights stayed on a total of 50 hours while student 2's flashlights stayed on 42 hours.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) The Bulb in the flashlight broke.
- 2) The flashlight was previously used.

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) Batteries could have been previously used.
- 2) The batteries could have been dead.

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

- 1) one of the students could have charged their batteries.
- 2) they could have changed the brand of flashlight.

*Scoring Notes: Part one of the response identifies a correct comparison that Student 1's flashlight stayed on longer. Part two of the response correctly identifies one possible difference between the two flashlights (previously used) but does not identify a valid second difference. Part three of the response identifies the same difference between the batteries twice. Part four of the response fails to describe two valid changes to the students' experiments. This response receives one point for one correct key element.*

**Question 4, Sample I – Score Point 0**

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

They All lasted long time.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

1) Brand B was better of student 1

2) Brand B was better of student 2

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

1) some is better.

2) some is better.

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

1) get the same brand

2) get the same brand.

*Scoring Notes: Part one of the response fails to identify a correct comparison. Part two of the response fails to identify two possible differences between the flashlights. Part three of the response fails to identify two possible differences between the batteries. Part four of the response fails to describe two valid changes to the students' experiments. This response receives zero points for zero correct key elements.*

**Question 4, Sample J – Score Point 0**

Compare the number of hours Student 1's flashlights stayed lit with the number of hours Student 2's flashlights stayed lit.

they both stayed lit the same amount of time for the most part.

Name TWO possible differences between the flashlights used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) student 1 possible could have used a better flashlight
- 2) student 2 possible could have used better batteries.

Name TWO possible differences between the batteries used by Student 1 and those used by Student 2 that could have caused the differences in their results.

- 1) student 1 might have used a better brand than student 2
- 2) student 2 might have used a different brand.

Describe TWO different changes Student 1 and Student 2 could make to their experiments so that their results would be more similar.

- 1) student 1 could have let student 2 use the same brand as him.
- 2) student 2 could have the same brand.

*Scoring Notes: Part one of the response fails to identify a correct comparison. Part two of the response fails to identify two possible differences between the flashlights. Part three of the response identifies the same difference between the batteries twice. Part four of the response fails to describe two valid changes to each students' experiments. (Responses given are too vague.) This response receives zero points for zero correct key elements.*