New England Common Assessment Program

Released Items Support Materials 2012

Grade 4 Science

NECAP 2012 RELEASED ITEMS
GRADE 4 SCIENCE

Grade 4 Science Released Item Information

Item Number	Big Idea[1]	Assessment Target	Depth of Knowledge Code	Item Type [2]	Answer Key	Total Possible Points
1	INQ	PS 1-1	2	MC	C	1
2	SAE	PS 2-6	2	MC	A	1
3	SAE	PS 3-8	2	MC	D	1
4	INQ	ESS 1-1	1	MC	C	1
5	INQ	ESS 1-2	2	MC	C	1
6	POC	ESS 1-5	2	MC	C	1
7	NOS	ESS 1-3	2	CR		4
8	INQ	LS 1-1	2	MC	B	1
9	FAF	LS 1-4	2	MC	C	1
10	SAE	LS 2-6	2	MC	B	1

Grade 4 Science Released Inquiry Task Information

Item Number	Big Idea[1]	Inquiry Construct	Depth of Knowledge Code	Item Type [2]	Total Possible Points
1	INQ	8	2	CR	3
2	INQ	8	2	CR	3
3	INQ	13	2	SA	2
4	INQ	12	3	SA	2
5	INQ	11	2	SA	2
6	INQ	12	3	SA	2
7	INQ	1	3	SA	2
8	INQ	4	2	SA	2

[1]Big Idea: NOS = Nature of Science, SAE = Systems and Energy, MAS = Models and Scale, POC = Patterns of Change, FAF = Form and Function, INQ = Scientific Inquiry

[2]Item Type: MC = Multiple Choice, CR = Constructed Response, SA = Short Answer

PS1 (K–4) INQ-1	Students will collect and organize data about physical properties in order to classify objects or draw conclusions about objects and their characteristic properties (e.g., temperature, color, size, shape, weight, texture, flexibility).

1 A student has a penny and a nickel. She looks at them carefully. She decides that the penny and nickel are made from two different metals.

What does the student see that **best** supports her conclusion?

A. The penny and nickel are different sizes.

B. The penny and nickel have different values.

C. The penny and nickel are different colors.

D. The penny and nickel have different pictures.

PS2 (K–4) SAE-6 Students will experiment, observe, or predict how heat might move from one object to another.

❷ A cook uses a metal spoon to stir soup on a stove. The spoon gets hot. What path does the heat follow?

A. stove → pan → soup → spoon
B. stove → soup → pan → spoon
C. stove → pan → spoon → soup
D. stove → spoon → pan → soup

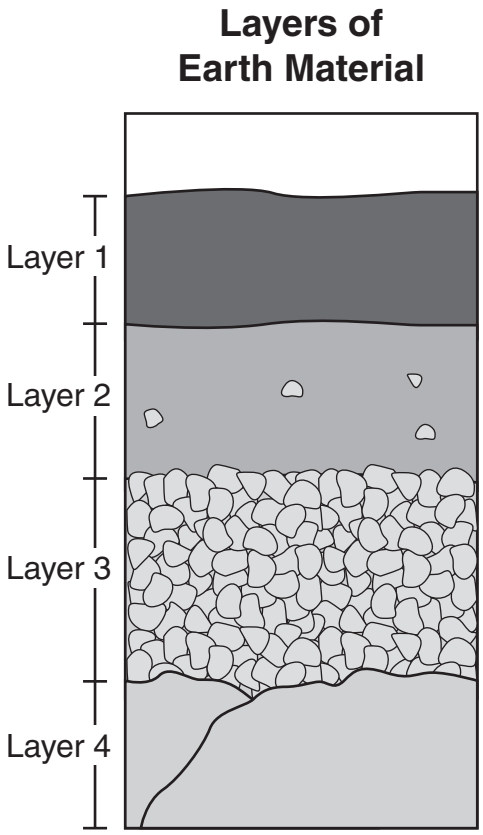
PS3 (K–4) SAE-8 Students will use observations of magnets in relation to other objects to describe the properties of magnetism (i.e., attract or repel certain objects or has no effect).

❸ A student tests several types of magnets. Which observation could **best** help her compare the strengths of different magnets?

A. the shape of the magnets
B. the weight of the magnets
C. the materials attracted by the magnets
D. the distances objects are from the magnets when attracted

ESS1 (K–4) INQ-1 Students will, given certain Earth materials (soil, rocks, or minerals), use physical properties to sort, classify, and describe them.

4 The diagram below shows four layers of earth material.

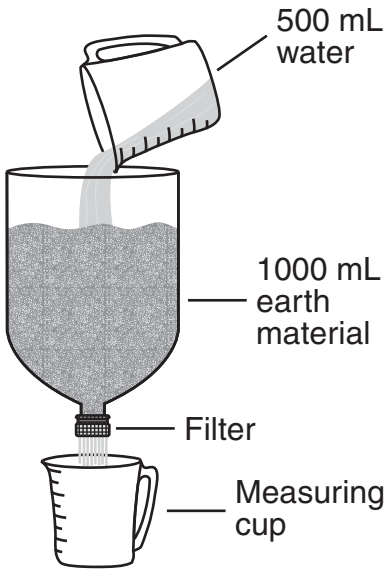


Which layer of earth material is gravel?

A. Layer 1
B. Layer 2
C. Layer 3
D. Layer 4

ESS1 (K–4) INQ-2 Students will use results from an experiment to draw conclusions about how water interacts with Earth materials (e.g., percolation, erosion, frost heaves).

5 Students are testing three types of earth material—sand, gravel, and clay—using the setup shown below.



The students will pour water through each earth material and measure the amount of time it takes to collect 250 mL of water.

After doing the tests, which question will the students **most likely** be able to answer?

A. Which types of earth material are eroded by water?

B. Which type of earth material is the heaviest?

C. How fast does water move through different types of earth material?

D. How fast do different liquids move through the same earth material?

ESS1 (K–4) POC-5 Students will, based on data collected from daily weather observations, describe weather changes or weather patterns.

6 The table below shows normal daily temperatures in New England for a period of five years.

Normal Daily Temperatures in New England

Year	Winter	Spring	Summer	Fall
2002	28°F	53°F	67°F	34°F
2003	20°F	52°F	66°F	36°F
2004	22°F	53°F	64°F	36°F
2005	22°F	54°F	66°F	36°F
2006	27°F	54°F	64°F	40°F

Which statement describes a weather pattern shown in the table?

A. Winter temperatures are steadily increasing each year.

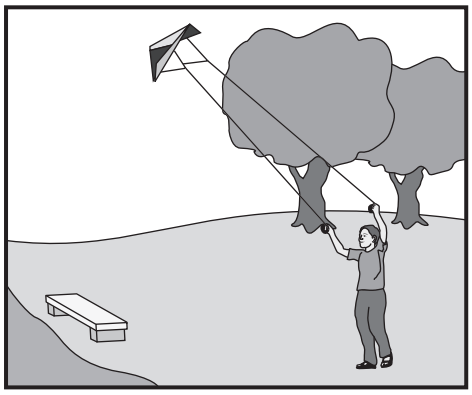
B. Summer changes into fall earlier each year.

C. The temperatures tend to be nearly the same during the same seasons each year.

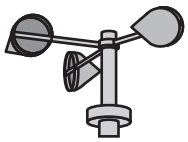
D. The temperatures in New England are cooler than temperatures in southern states.

ESS1 (K–4) NOS-3 Students will explain how the use of scientific tools helps to extend senses and gather data about weather (i.e., weather/wind vane: direction; wind sock: wind intensity; anemometer: speed; thermometer: temperature; meter sticks/rulers: snow depth; rain gauges: rain amount in inches).

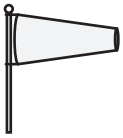
7 A student wants to fly his new kite. The weather needs to be just right to fly a kite.



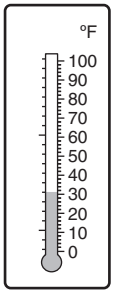
The student can use the tools shown below to learn about the weather.



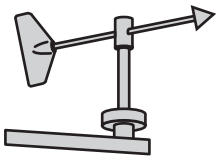
Anemometer



Wind sock



Thermometer



Wind vane

a. Choose the **two** tools that would be **most helpful** for deciding if the weather is just right to fly a kite. Write your choices in your Student Answer Booklet.

b. Explain why the **two** tools you chose in part (a) would be **most helpful**.

Scoring Guide

Score	Description
4	Response demonstrates a thorough understanding of the use of scientific tools to gather data about weather. Response chooses two tools, describes the information each tool gathers, and correctly explains why the tools chosen are helpful for flying a kite. Response contains no errors.
3	Response demonstrates a general understanding of the use of scientific tools to gather data about weather. Response contains an error or omission.
2	Response demonstrates a limited understanding of the use of scientific tools to gather data about weather. Response contains errors or omissions.
1	Response demonstrates a minimal understanding of the use of scientific tools to gather data about weather. Response has several errors or omissions.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

Responses may include a maximum of 4 components: (2) two tools and information gathered and (2) application of information gathered to kite flying.

Tool - no credit for choosing tool	Component 1 Information Gathered	Component 2 Application
Wind vane	shows the wind direction	This information will help decide where to stand when flying a kite.
Anemometer	measures wind speed	This information will help decide whether it is windy enough to fly a kite.
Wind sock	shows wind intensity and wind direction	This information will help decide where to stand and whether it's windy enough to fly a kite.
Thermometer	shows the air temperature	This information will help decide whether it is warm enough to spend time outside.

A score of 4 requires a minimum of three correct components (at least one application). A score of 3 requires a minimum of two correct components (no application required). A score of 2 requires a minimum of one correct component. A score of 1 requires some correct information.

SCORE POINT 4

7

Wind vane and wind sock.

A wind vane is importent to have because it tells you the direction of the wind so that you can put the kite in the direction of the wind. A wind sock is importent so that you can tell if the wind is blowing too hard, too soft, or just right for flying kites.

The response includes two appropriate tools for flying a kite, explains what each tool measures, and how they apply to flying a kite.

Score Point 3

❼ I think it would be the Wind sock and the wind vane. The Wind sock because you can see how strong the wind is blowing and the Wind Vane so you can see which direction it is pointing.

The response includes two appropriate tools and explains what each tool measures; however, there is no connection to how this would be useful to flying a kite.

Score Point 2

❼ The Thermometer and the wind vane would be most helpful because the thermometer would tell what degrese it is and if its to hot or if its to cold, also the wind vane would tell if its windy or not windy at all.

The response chooses one appropriate tool (wind vane) but does not relate its function correctly (wind vane does not measure wind speed). The thermometer's function is described correctly; however, the relationship to kite flying is tenuous at best.

Score Point 1

❼

1. thermometer

2. windsock

I think a windsock and thermometer will be mos— T Helpful beCause a thermom— eTer can tell what. degrees it.

The response includes some correct information (allusion to the thermometer's function).

Score Point 0

❼ Anemometer and wind Van to make it Better

No correct components; no credit for simply selecting tools given in the question. Explanation is not sufficient for credit.

LS1 (K–4) INQ-1 Students will sort/classify different living things using similar and different characteristics; describe why organisms belong to each group or cite evidence about how they are alike or not alike.

8 A student finds a leaf. He wants to find out the kind of tree it comes from. Which characteristic of the leaf is **most** helpful?

A. color
B. shape
C. size
D. texture

LS1 (K–4) FAF-4 Students will identify and explain how the physical structures of an organism (plants or animals) allow it to survive in its habitat/environment (e.g., roots for water; nose to smell fire).

9 Stonefish live on the bottom of the ocean. They have skin that makes them look like a stone.

How does their skin help stonefish survive?

A. Their skin helps stonefish sink to the bottom of the ocean.
B. Their skin helps stonefish warn other fish to stay away.
C. Their skin helps stonefish blend into their environment.
D. Their skin helps stonefish keep warm.

LS2 (K–4) SAE-6 Students will describe ways plants and animals depend on each other (e.g., shelter, nesting, food).

10 A student walks her dog across a field. She notices plant seeds stuck to the dog's fur.

How does this plant **most likely** depend on animals?

A. Animals provide the plant with energy.

B. Animals spread the plant's seeds to new locations.

C. Animals protect the plant's seeds from insects.

D. Animals fertilize the plant with their droppings.

Broad Area of Inquiry:	**Conducting Investigations**
Inquiry Construct 8:	Use accepted methods for organizing, representing, and manipulating data.

1 During your investigation, you observed eight different objects. First you recorded the material you thought each object was made of and then you described the properties of the material in Data Table 1 of your Inquiry Booklet.

Look at **Data Table 1** on page 5 in your Inquiry Booklet. Sort the objects into two groups based on the properties of the materials they are made of. Write the objects in each group in the boxes below.

Group A Objects

Group B Objects

Describe the properties you used to sort the objects into Group A and Group B.

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of how to analyze data including if data are relevant. The response sorts the objects into two groups and describes the properties each group has in common.
2	The response demonstrates a general understanding of how to analyze data including if data are relevant.
1	The response demonstrates a limited understanding of how to analyze data including if data are relevant.
0	The response does not contain any correct elements or is irrelevant.
Blank	No response

Training Notes:

- Objects in Group A: penny, washer, paper clip, foil
- Objects in Group B: yellow chip, straw, toothpick, paper
- All the objects in Group A are described as metals (or metallic), may also include shiny, hard
- All of the items in Group B are described as nonmetals (or nonmetallic), may also include soft, dull
- If objects are missing or miscatagorized, full credit cannot be given.

Note: If objects are sorted appropriately based on properties in Data Table 1, credit may be given.

SCORE POINT 3

1. During your investigation, you observed eight different objects. First you recorded the material you thought each object was made of and then you described the properties of the material in Data Table 1 of your Inquiry Booklet.

   Look at **Data Table 1** on page 5 in your Inquiry Booklet. Sort the objects into two groups based on the properties of the materials they are made of. Write the objects in each group in the boxes below.

Group A Objects	Group B Objects
Penny Foil Paperclip Washer	Paper Yellow Chip Tooth Pick Straw

Describe the properties you used to sort the objects into Group A and Group B.

The properties I used to sort the objects into Group A and Group B were metallic and nonmetallic. Group A = Metallic
Group B = Nonmetallic

The two groups are properly sorted and clearly and correctly labeled based on their properties.

Score Point 2

❶ During your investigation, you observed eight different objects. First you recorded the material you thought each object was made of and then you described the properties of the material in Data Table 1 of your Inquiry Booklet.

Look at **Data Table 1** on page 5 in your Inquiry Booklet. Sort the objects into two groups based on the properties of the materials they are made of. Write the objects in each group in the boxes below.

Group A Objects	Group B Objects
penny paperclip washer	foil paper yellow chip tooth pick straw

Describe the properties you used to sort the objects into Group A and Group B.

the properties I used to sort the objects are these.
All the objects in group A are metallic and stiff.
All the objects in group B are nonmetallic.

The foil is incorrectly categorized as nonmetallic (cannot receive full credit); the response correctly identifies metallic and nonmetallic as two properties, but adds "and stiff" to the metallic category, making this explanation weak.

Score Point 1

❶ During your investigation, you observed eight different objects. First you recorded the material you thought each object was made of and then you described the properties of the material in Data Table 1 of your Inquiry Booklet.

Look at **Data Table 1** on page 5 in your Inquiry Booklet. Sort the objects into two groups based on the properties of the materials they are made of. Write the objects in each group in the boxes below.

Group A Objects	Group B Objects
Brass tin metal metal	tree Plastic wood Plastic

Describe the properties you used to sort the objects into Group A and Group B.

group a is all kinds of metal and
group b is all kinds of nonmetal.

The labeling of the two groups is appropriate, but none of the specific objects given in the inquiry task have been named in the groups as asked for in the question.

SCORE POINT 0

1. During your investigation, you observed eight different objects. First you recorded the material you thought each object was made of and then you described the properties of the material in Data Table 1 of your Inquiry Booklet.

   Look at **Data Table 1** on page 5 in your Inquiry Booklet. Sort the objects into two groups based on the properties of the materials they are made of. Write the objects in each group in the boxes below.

Group A Objects	Group B Objects
Copper Aluminum Wood Metal Plastic Wood Plastic Metal	hard, shiny, stiff flexible, shiny, nonmetallic flexible, nonmetallic dull metal, flexible, shiny nonmetallic, hard, stiff nonmetal, breakable, dull nonmetallic, flexible, dull metallic stiff shiny

Describe the properties you used to sort the objects into Group A and Group B.

I used what me and my partner thought was materials and praterties of the material.

The response does not name or sort the objects based on their properties into two groups. The explanation does not clarify which properties the student felt were the most important to organize the objects given.

Broad Area of Inquiry:	**Conducting Investigations**
Inquiry Construct 8:	Use accepted methods for organizing, representing, and manipulating data.

❷ Use the results from Data Table 2 to organize your data into objects that are conductors and objects that are insulators.

Create a chart to organize your results. Be sure to include labels.

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of how to use accepted methods for organizing data. The response includes labels, eight objects tested, and correct data for each object.
2	The response demonstrates a general understanding of how to use accepted methods for organizing data.
1	The response demonstrates a limited understanding of how to use accepted methods for organizing data.
0	The response does not contain any correct elements or is irrelevant.
Blank	No response

Training Notes:

Possible student responses include:

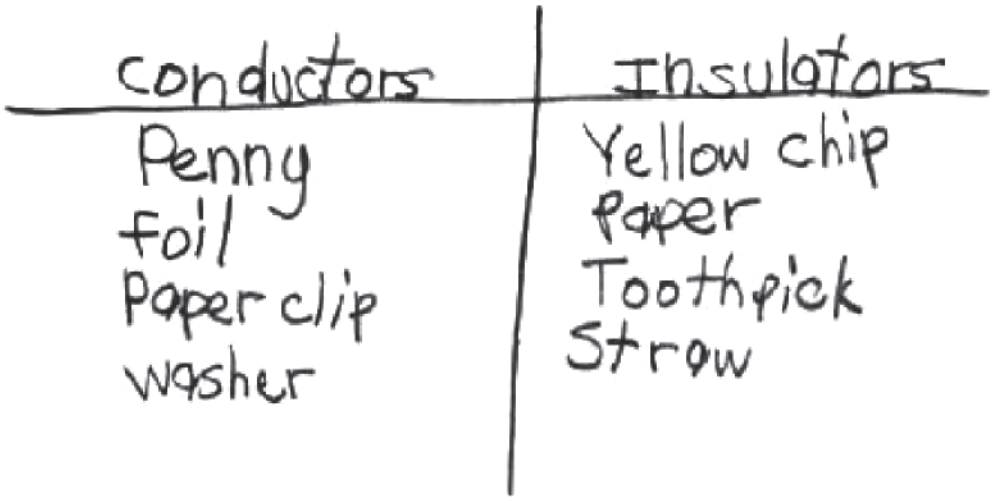
- The chart has labeled columns (e.g., “Conductor,” and “Insulator”).
- The eight objects are listed.
- The response designates whether each object is a conductor or an insulator.

Note: Chart needs to match Data Table 2.

SCORE POINT 3

❷ Use the results from Data Table 2 to organize your data into objects that are conductors and objects that are insulators.

Create a chart to organize your results. Be sure to include labels.



Data Table 2:
Results of Lightbulb Test

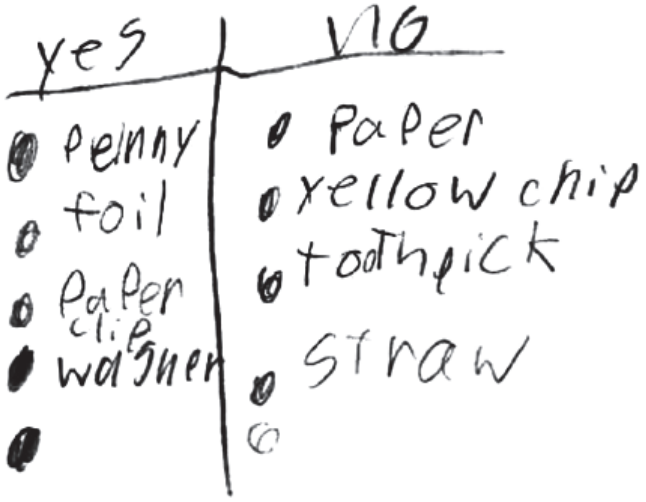
Object	The bulb lights? (Yes/No)
Penny	Yes
Foil	Yes
Paper	NO
Paper clip	Yes
Yellow chip	NO
Toothpick	NO
Straw	NO
Washer	Yes

A T-chart is drawn with correct labels and all of the objects are correctly sorted into the chart.

SCORE POINT 2 (EXAMPLE A)

❷ Use the results from Data Table 2 to organize your data into objects that are conductors and objects that are insulators.

Create a chart to organize your results. Be sure to include labels.



Data Table 2:
Results of Lightbulb Test

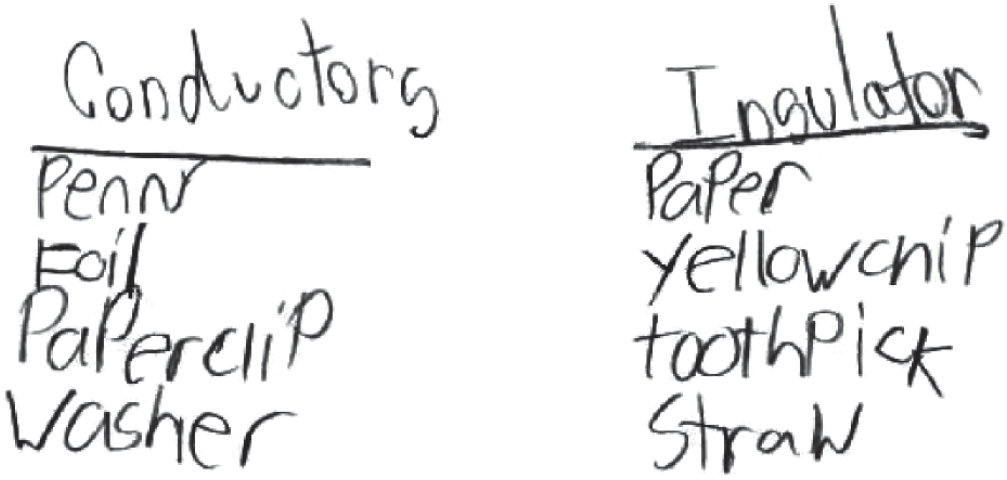
Object	The bulb lights? (Yes/No)
Penny	yes
Foil	yes
Paper	no
Paper clip	yes
Yellow chip	no
Toothpick	no
Straw	no
Washer	yes

In the T-chart drawn in this response, conductors and insulators are not identified or labeled as asked for in the question. Otherwise, objects are sorted correctly.

Score Point 2 (Example B)

❷ Use the results from Data Table 2 to organize your data into objects that are conductors and objects that are insulators.

Create a chart to organize your results. Be sure to include labels.



Data Table 2:
Results of Lightbulb Test

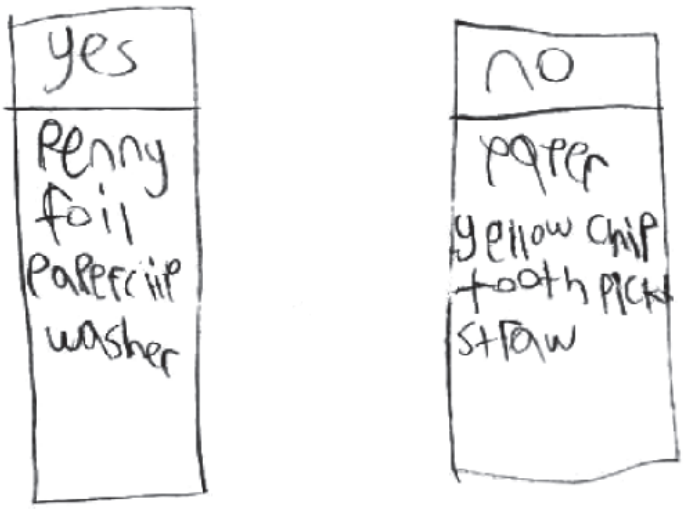
Object	The bulb lights? (Yes/No)
Penny	Yes
Foil	Yes
Paper	No
Paper clip	Yes
Yellow chip	No
Toothpick	No
Straw	No
Washer	Yes

The response is not given in chart format; otherwise, labels and sorting of the objects are correct.

SCORE POINT 1

❷ Use the results from Data Table 2 to organize your data into objects that are conductors and objects that are insulators.

Create a chart to organize your results. Be sure to include labels.



Data Table 2:
Results of Lightbulb Test

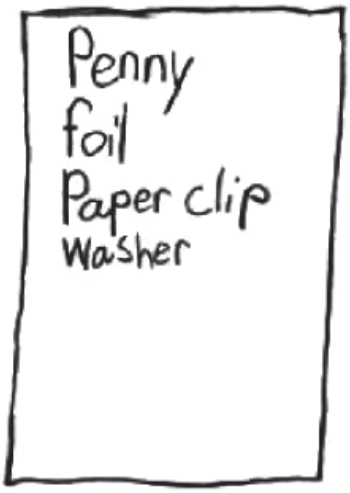
Object	The bulb lights? (Yes/No)
Penny	yes
Foil	yes
Paper	no
Paper clip	yes
Yellow chip	no
Toothpick	no
Straw	no
Washer	yes

The response is not given in chart format, and conductors and insulators are not labeled as asked for in the question. However, the eight objects are sorted correctly and labeled based on Data Table 2, showing a limited understanding of how to organize data.

SCORE POINT 0

❷ Use the results from Data Table 2 to organize your data into objects that are conductors and objects that are insulators.

Create a chart to organize your results. Be sure to include labels.



Data Table 2:
Results of Lightbulb Test

Object	The bulb lights? (Yes/No)
Penny	yes
Foil	yes
Paper	no
Paper clip	yes
Yellow chip	NO
Toothpick	NO
Straw	NO
Washer	yes

The response is not given in chart format and does not include any labels or indication of sorting by objects that are conductors or insulators.

Broad Area of Inquiry:	**Developing and Evaluating Explanations**
Inquiry Construct 13:	Communicate how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations.

❸ In question 2, you grouped together the types of materials that make good conductors of electricity.

Identify **two** different objects you might find in your classroom that could also be tested.

_____

_____

Explain how the properties of the objects you chose would support the way you grouped the materials.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how scientific knowledge applies to propose further investigation. Response lists two materials to test and describes why they would support the grouping.
1	The response demonstrates a limited understanding of how scientific knowledge applies to propose further investigation.
0	The response does not contain any correct elements or is irrelevant.
Blank	No response

Training Notes:

- The response lists additional conducting materials or objects made from different metals or metallic-like materials (e.g., silver, gold, tin, brass, bronze, chrome, nickel, pewter, stainless steel) or objects that are insulators (e.g., wood, paper, plastic).
- The response explains additional materials were chosen to support the conclusion that metals are good conductors of electricity and nonmetals are not good conductors.

Score Point 2

❸ In question 2, you grouped together the types of materials that make good conductors of electricity.

Identify **two** different objects you might find in your classroom that could also be tested.

You coud also test the metal part of your desk. If you wanted to you could test an expo marker eraser.

Explain how the properties of the objects you chose would support the way you grouped the materials.

The metal part of a desk would be in Group A with the conductors, because metal is a conductor. An expo marker eraser would probably be in Group B because it is not made of metal or water, so it would be an insulator.

The response names two specific objects and includes a good explanation of why each object would be sorted as a conductor or an insulator based on the properties of each object chosen.

Score Point 1

❸ In question 2, you grouped together the types of materials that make good conductors of electricity.

Identify **two** different objects you might find in your classroom that could also be tested.

Screw and pencil

Explain how the properties of the objects you chose would support the way you grouped the materials.

The screw would be a conductor, the pencil would not

The response names two specific objects and categorizes them correctly, but does not explain how the properties of the objects support the grouping.

SCORE POINT 0

❸ In question 2, you grouped together the types of materials that make good conductors of electricity.

Identify **two** different objects you might find in your classroom that could also be tested.

white bord
A desk

Explain how the properties of the objects you chose would support the way you grouped the materials.

they both have wood in them & wood isn conductor

The response incorrectly categorizes both objects named, and includes an incorrect explanation of their categorization based on the investigation performed.

Broad Area of Inquiry:	**Developing and Evaluating Explanations**
Inquiry Construct 12:	Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.

4 Check the box next to the statement that **best** describes the data you collected during the investigation. Be sure to include evidence from your investigation to support your answer.

☐ The data **support** my prediction.

☐ The data **do not support** my prediction.

I know this because _____

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how to use evidence to support or refute a prediction. The response correctly identifies whether the data support or do not support the prediction and uses specific data from the investigation to describe why the prediction is or is not supported.
1	The response demonstrates a limited understanding of how to use evidence to support or refute a prediction.
0	The response does not contain any correct elements or is irrelevant.
Blank	No response

Training Notes:

- The response indicates the box that matches the prediction based on the experimental evidence.
- The response cites objects and/or materials from the investigation to explain why the prediction is or is not supported. Student includes examples from the data.

SCORE POINT 2

Copy your prediction from page 3 in your Inquiry Booklet into the box below.

I predict that metal is going to light up the light

because it is something electricity can flow through.

❹ Check the box next to the statement that **best** describes the data you collected during the investigation. Be sure to include evidence from your investigation to support your answer.

☑ **The data support my prediction.**

☐ **The data do not support my prediction.**

I know this because I said that medal would conduct electricity and the penny, piece of foil, papper clip, and washer are all medal and did conduct electricity.

The response correctly identifies that the student's data supports the prediction. The explanation names specific evidence from the investigation in support of the prediction.

Score Point 1

Copy your prediction from page 3 in your Inquiry Booklet into the box below.

I predict Metal will be a good conductor

because if lightning strikes something metal the metal will guide the electricty to the ground

4 Check the box next to the statement that **best** describes the data you collected during the investigation. Be sure to include evidence from your investigation to support your answer.

☑ **The data support my prediction.**

☐ **The data do not support my prediction.**

I know this because all of the metal things made good conductors.

The response correctly identifies that the student's data supports the prediction. However, the response does not use specific data from the investigation in the explanation.

SCORE POINT 0

Copy your prediction from page 3 in your Inquiry Booklet into the box below.

I predict they will use metal, batteries, lights water, glass, ice, paper, and plastic

because most of those are conductors of electricity

4 Check the box next to the statement that **best** describes the data you collected during the investigation. Be sure to include evidence from your investigation to support your answer.

☐ The data **support** my prediction.

☑ The data **do not support** my prediction.

I know this because they used a penny, foil, paper, paper clip, yellow chip, toothpick, straw, and washer.

The response does not discuss data gathered during the investigation; rather, it focuses on the materials used. As a result, this response never addresses the question asked.

Broad Area of Inquiry:	**Developing and Evaluating Explanations**
Inquiry Construct 11:	Analyze data, including determining if data are relevant, artifact, irrelevant, or anomalous.

5 Students from another school performed the same investigation with a circuit test box as you and your partner. Their results were different from yours. Identify one way the students could have gotten different results.

Explain why this way could have affected the results.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how to analyze data, including determining if data are relevant, artifact, irrelevant, or anomolous. The response identifies and explains how a possible source of error could affect the results.
1	The response demonstrates a limited understanding of how to analyze data, including determining if data are relevant, artifact, irrelevant, or anomolous.
0	The response does not contain any correct elements or is irrelevant.
Blank	No response

Training Notes:

- Possible responses may include the battery may have died, wires may have disconnected from the battery or lightbulb, the bulb may have blown out, the wires were attached to the same clip on the lightbulb holder, the students may have incorrectly recorded their data, etc.
- The explanation may include reference to not being able to complete the circuit.

SCORE POINT 2

❺ Students from another school performed the same investigation with a circuit test box as you and your partner. Their results were different from yours. Identify one way the students could have gotten different results.

Maybe when they touched a peice of plastic the two clippers were touching each other and they thoght the plastic was lighting the light bulb.

Explain why this way could have affected the results.

It could have affected the results because the could have put down yes for a peice of plastic when it didn't really light it.

The response includes a clear identification of a possible source of error in the investigation and explains how the results would have been affected by this error.

Score Point 1

❺ Students from another school performed the same investigation with a circuit test box as you and your partner. Their results were different from yours. Identify one way the students could have gotten different results.

The battery could have died on them.

Explain why this way could have affected the results.

They could have been playing with everything they had for the investigation.

The response names a specific source of error, but does not explain how it could affect the results of the investigation.

SCORE POINT 0

❺ Students from another school performed the same investigation with a circuit test box as you and your partner. Their results were different from yours. Identify one way the students could have gotten different results.

Some student could of put it wrong or did it wrong

Explain why this way could have affected the results.

Because some people in my class that did them wrong

The response includes no specifically named source of error ("did it wrong" is too vague for credit) and does not discuss how the results of the investigation could have been affected.

Broad Area of Inquiry:	**Developing and Evaluating Explanations**
Inquiry Construct 12:	Use evidence to support and justify interpretations and conclusions or explain how evidence refutes the hypothesis.

6 Look at the results of your investigation and the chart you created for question 2. Identify the types of materials that make good conductors of electricity. Provide evidence and examples to support your answer.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how to use evidence to justify interpretations and conclusions. The response identifies that metals make good conductors and as support provides examples from the investigation.
1	The response demonstrates a limited understanding of how to use evidence to justify interpretations and conclusions.
0	The response does not contain any correct elements or is irrelevant.
Blank	No response

Training Notes:

- Identification: Metals make good conductors of electricity.
- Justification using examples: Each of the metal objects tested (penny, washer, foil, and paper clip) caused the lightbulb to light up, indicating that electricity flowed through the material to complete the circuit.
- May indicate that the other objects did not light the lightbulb and hence did not make good conductors.

Note: Chart and explanation need to match.

SCORE POINT 2

6 Look at the results of your investigation and the chart you created for question 2. Identify the types of materials that make good conductors of electricity. Provide evidence and examples to support your answer.

Any type of metal would make a good conductor. I know that because everything that I tested and electricity flew through it was made out of a type of metal.

2 Use the results from Data Table 2 to organize your data into objects that are conductors and objects that are insulators.

Create a chart to organize your results. Be sure to include labels.

conductors	Insulators
penny	paper
foil	yellowchip
paperclip	toothpick
washer	straw

The response correctly identifies that metals are good conductors of electricity and justifies the identification with data from the investigation.

Score Point 1

6 Look at the results of your investigation and the chart you created for question 2. Identify the types of materials that make good conductors of electricity. Provide evidence and examples to support your answer.

I say metal is the best conductor.

2 Use the results from Data Table 2 to organize your data into objects that are conductors and objects that are insulators.

Create a chart to organize your results. Be sure to include labels.

Objects that conduct electricity

do	dont
penny	paper
bail	yellow chip
paper clip	toothpick
washer	straw

The response correctly identifies that metals make good conductors; however, it does not support the identification with data from the investigation.

SCORE POINT 0

6 Look at the results of your investigation and the chart you created for question 2. Identify the types of materials that make good conductors of electricity. Provide evidence and examples to support your answer.

metal, plactic, Bord game, Shape color, form, smooth, flat, shiny, those are it.

2 Use the results from Data Table 2 to organize your data into objects that are conductors and objects that are insulators.

Create a chart to organize your results. Be sure to include labels.

data good	data Bad
Pennx	Paper
Foil	Yellow chip
paperclip	tooth pick
Washer	straw

The response does not correctly identify metals as good conductors (or other materials as insulators), nor does it use evidence from the investigation as support.

Broad Area of Inquiry:	**Formulating Questions & Hypothesizing**
Inquiry Construct 1:	Analyze information from observations, research or experimental data for the purpose of formulating a question, hypothesis or prediction.

❼ A student at a different school completely covers a nail with several layers of plastic wrap. Predict whether the nail covered in plastic wrap would be a conductor or an insulator. Use data from your investigation to support your prediction.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of how to analyze information from observations. The response makes a prediction supported by data from the investigation.
1	The response demonstrates a limited understanding of how to analyze information from observations.
0	The response does not contain any correct elements or is irrelevant.
Blank	No response

Training Notes:

- Prediction: The nail covered in plastic wrap would not conduct electricity.
- Evidence: In our investigation, we tested plastic and found out that it did not conduct electricity. Even though the nail is metal, when it is wrapped in plastic, the plastic acts as an insulator and prevents the electricity from flowing through the nail.

Score Point 2

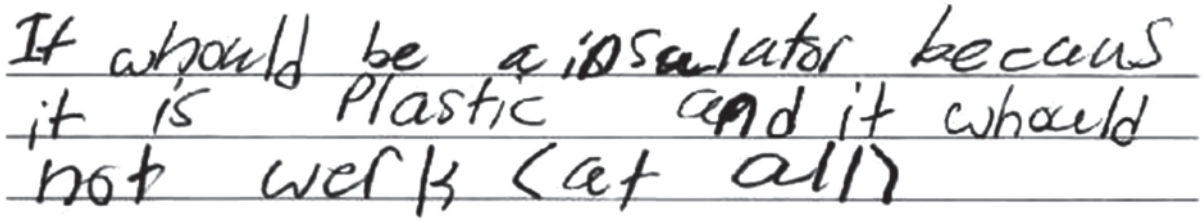
7 A student at a different school completely covers a nail with several layers of plastic wrap. Predict whether the nail covered in plastic wrap would be a conductor or an insulator. Use data from your investigation to support your prediction.

An insulator because The plastic wrap will insulat the electricity From coming thcough. I know this because From the evestigation All of the items made of plastic were Insolators And didn't let the red light bulb light up. SO this Is why A Nail covered in plastic wrap is A Insulator.

The response correctly predicts that the plastic-wrapped nail would be an insulator, and uses specific evidence from the investigation to support the prediction.

Score Point 1

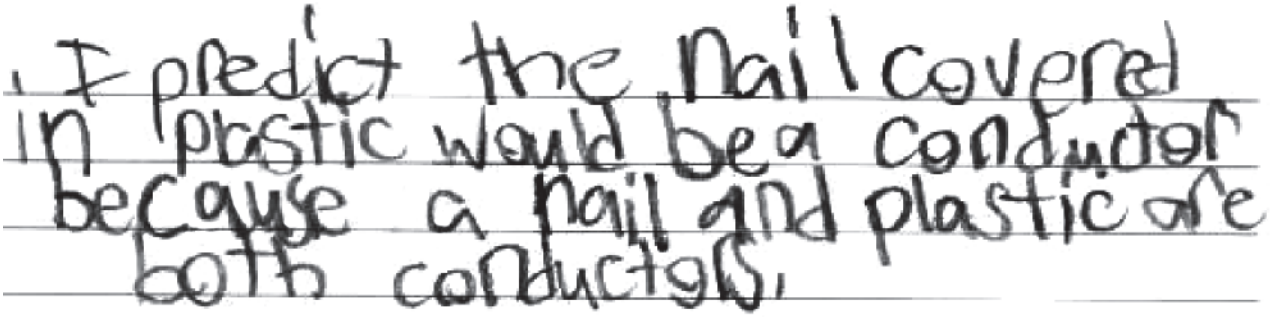
❼ A student at a different school completely covers a nail with several layers of plastic wrap. Predict whether the nail covered in plastic wrap would be a conductor or an insulator. Use data from your investigation to support your prediction.



The response makes a correct prediction about the plastic-wrapped nail; however, it does not provide any specific supporting evidence from the investigation.

Score Point 0

❼ A student at a different school completely covers a nail with several layers of plastic wrap. Predict whether the nail covered in plastic wrap would be a conductor or an insulator. Use data from your investigation to support your prediction.



The response makes an incorrect prediction without any supporting data from the investigation.

Broad Area of Inquiry:	**Planning and Critiquing of Investigations**
Inquiry Construct 4:	Identify information/evidence that needs to be collected in order to answer the questions, hypothesis, prediction.

8 The students wondered whether types of energy other than electricity can be conducted. One student remembered that a spoon becomes hot when placed in hot soup. Describe one way the students could investigate which materials conduct heat energy.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of what data needs to be collected to support a hypothesis. The response makes a reasonable suggestion of necessary data to show heat conduction.
1	The response demonstrates a limited understanding of what data needs to be collected to support a hypothesis.
0	The response does not contain any correct elements or is irrelevant.
Blank	No response

Training Notes:

The response includes one way the students could investigate which materials conduct heat energy, includes a heat source, and a way to observe results.

The response describes that electricity is a form of energy and that the investigation showed that electricity flows better through metals. Student makes the connection that heat is also a form of energy; therefore, like electricity, it moves easily through metals.

Score Point 2

8 The students wondered whether types of energy other than electricity can be conducted. One student remembered that a spoon becomes hot when placed in hot soup. Describe one way the students could investigate which materials conduct heat energy.

The student could boil 2 cups of water in the first cup he/she could place a plactic spoon and in the other a metal one after waiting 5 minutes he/she would take them out and compare the temps.

The response includes an appropriate possible investigation, including a heat source and the way the results would be observed.

Score Point 1

8 The students wondered whether types of energy other than electricity can be conducted. One student remembered that a spoon becomes hot when placed in hot soup. Describe one way the students could investigate which materials conduct heat energy.

Another way a student could investigate wich materials can conduct heat energy is by boiling water and putting an object in it.

The response includes an appropriate possible investigation; however, it does not address how the results would be observed (for example, measuring the heat of the object with a thermometer).

Score Point 0

8 The students wondered whether types of energy other than electricity can be conducted. One student remembered that a spoon becomes hot when placed in hot soup. Describe one way the students could investigate which materials conduct heat energy.

A way students can conduct heat energy is to use a circet box to touch the ends of the wires to a hot spoon and see if its a conducter or a insulater.

This response does not include an appropriate investigation for testing for heat energy conduction; rather, it focuses on electrical conduction.