



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
Support Materials
2016**

**Grade 4
Science**

**NECAP 2016 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 1-3	2	MC	C	1
3	SAE	PS 2-6	2	MC	B	1
4	INQ	ESS 1-1	2	MC	C	1
5	INQ	ESS 1-3	2	MC	B	1
6	NOS	ESS 1-3	2	MC	C	1
7	SAE	LS 1-2	1	MC	B	1
8	POC	LS 1-3	2	MC	B	1
9	FAF	LS 4-8	1	MC	D	1
10	POC	LS 4-9	2	CR4		4

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	3-8	2	SA	2
2	INQ	3-8	2	CR3	3
3	INQ	3-10	2	SA	2
4	INQ	4-12	2	SA	2
5	INQ	1-2	2	SA	2
6	INQ	4-11	2	SA	2
7	INQ	2-6	2	SA	2
8	INQ	4-12	3	CR3	3

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

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

**NECAP 2016 RELEASED ITEMS
GRADE 4 SCIENCE**

PS1 (K-4) INQ-1 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 wants to find out how adding salt affects the time it takes water to freeze. The table below gives the results of two trials.

Effects of Salt on Freezing

Container (50 mL water at 25°C)	Amount of Salt Added	Time (Trial 1)	Time (Trial 2)
Container X	0 g	45 min	43 min
Container Y	5 g	70 min	75 min
Container Z	10 g	120 min	118 min

How does adding salt affect how water freezes?

- A. Adding salt makes water form thick ice.
- B. Adding salt speeds up freezing.
- C. Adding salt slows down freezing.
- D. Adding salt makes water form small ice cubes.

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GRADE 4 SCIENCE

PS1 (K-4) SAE-3 Use measures of weight (data) to demonstrate that the whole equals the sum of its parts.

- 2 A student has a ball of clay that weighs 3000 grams. She shapes the clay into three equal-sized cubes and weighs the clay again.

Which statement describes the three cubes of clay?

- A. Together, the cubes weigh 2000 grams.
- B. Together, the cubes weigh 6000 grams.
- C. Each cube of clay weighs 1000 grams.
- D. Each cube of clay weighs 3000 grams.

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GRADE 4 SCIENCE

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

- 3 A person makes pancakes in a frying pan. He slides the pancakes onto a plate and puts some butter on top of the pancakes. The butter soon melts.

In which direction does the heat flow so that the butter melts?

- A. from the butter to the pancakes
- B. from the pancakes to the butter
- C. from the plate to the butter
- D. from the butter to the frying pan

**NECAP 2016 RELEASED ITEMS
GRADE 4 SCIENCE**

ESS1 (K-4) INQ-1 Given certain Earth materials (soils, rocks or minerals), use physical properties to sort, classify, and describe them.

- 4 The table below shows the characteristics of four minerals.

Characteristics of Minerals

Mineral	Hard or Soft	Shiny or Dull	Weight
W	Soft	Shiny	4 g
X	Hard	Shiny	6 g
Y	Hard	Dull	3 g
Z	Hard	Dull	8 g

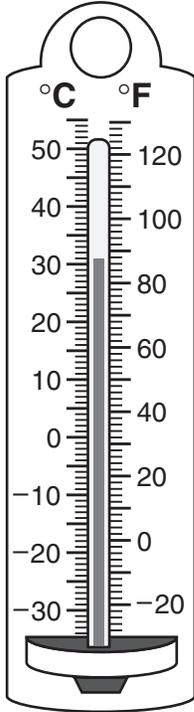
Which minerals are **most likely** the same kind?

- A. Minerals W and X
- B. Minerals X and Y
- C. Minerals Y and Z
- D. Minerals W and Z

NECAP 2016 RELEASED ITEMS
GRADE 4 SCIENCE

ESS1 (K-4) INQ-3 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).

- 5 The thermometer shown below gives the temperature on Day X. The chart next to the thermometer describes the types of days to expect at different temperatures.



**Day X
Temperature**

Temperature	Description
40°C/104°F	Heat wave
30°C/86°F	Good day for a swim
20°C/68°F	Nice day
10°C/50°F	A bit chilly—wear a light jacket
0°C/32°F	Time for a coat (water freezes)

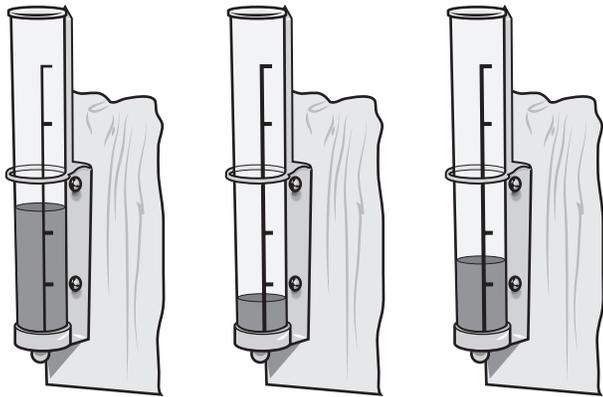
Based on the temperature shown on the thermometer, which phrase from the chart describes Day X?

- A. “Heat wave”
- B. “Good day for a swim”
- C. “Nice day”
- D. “Time for a coat”

NECAP 2016 RELEASED ITEMS
GRADE 4 SCIENCE

ESS1 (K-4) NOS-3 Use results from an experiment to draw conclusions about how water interacts with earth materials (e.g., percolation, erosion, frost heaves).

- 6 Rain gauges are set up outside three schools during the month of April. At the end of the month, the data are collected, as shown in the diagram below.



Front Street School

Bartlett School

Country Day School

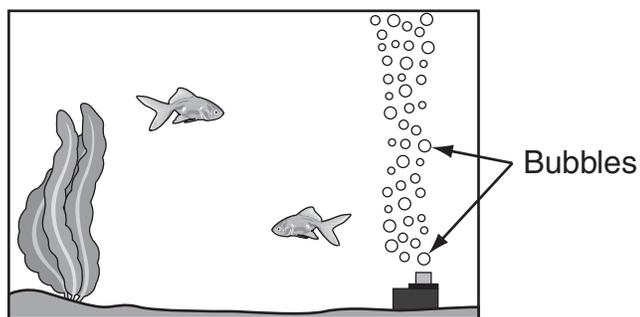
The data collected from the rain gauges **best** supports which conclusion?

- A. More rain fell at Bartlett School than at Front Street School.
- B. Less rain fell at Country Day School than at Bartlett School.
- C. More rain fell at Country Day School than at Bartlett School.
- D. Less rain fell at Front Street School than at Bartlett School and Country Day School together.

NECAP 2016 RELEASED ITEMS
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LS1 (K-4) SAE-2 Identify the basic needs of plants and animals in order to stay alive. (i.e., water, air, food, space).

- 7 Many small fish tanks have a pump that blows bubbles into the water, as shown below.



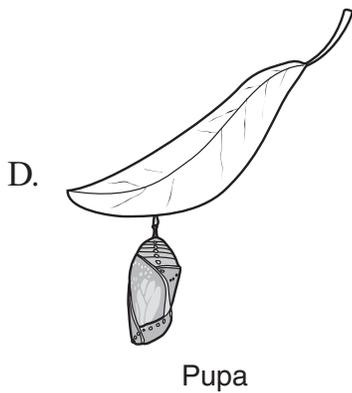
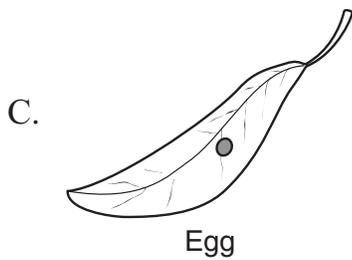
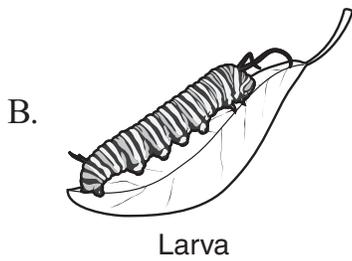
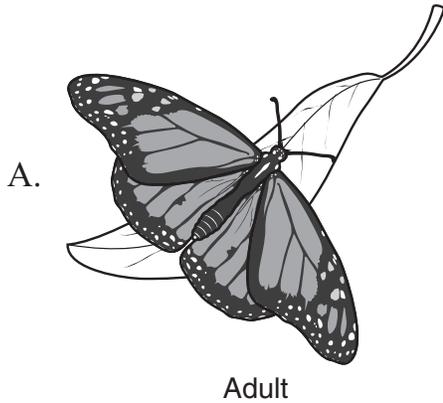
The bubbles help the fish survive. How do the bubbles help the fish survive?

- A. by adding food to the water
- B. by adding air to the water
- C. by keeping the water clean
- D. by keeping the water warm

NECAP 2016 RELEASED ITEMS
GRADE 4 SCIENCE

LS1 (K-4) POC-3 Predict, sequence or compare the life stages of organisms—plants and animals (e.g., put images of life stages of an organism in order, predict the next stage in sequence, compare two organisms).

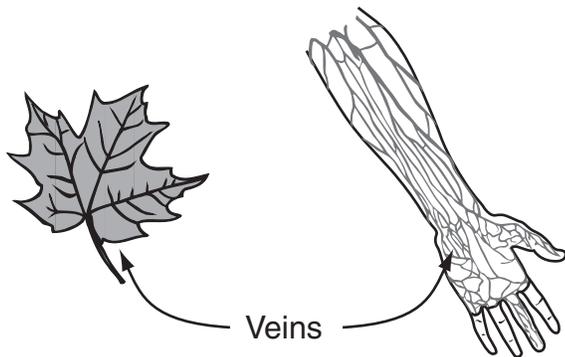
- 8 During which stage in the life cycle of a butterfly does it eat plant leaves and grow the most?



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LS4 (K-4) FAF-8 Identify what the physical structures of humans do (e.g., sense organs—eyes, ears, skin, etc.) or compare physical structures of humans to similar structures of animals.

- 9 Both plants and humans have veins, as shown in the diagram below.



Veins do almost the same job in plants and in humans. What job do veins do?

- A. give support
- B. break down food
- C. sense heat
- D. transport materials

**NECAP 2016 RELEASED ITEMS
GRADE 4 SCIENCE**

LS4 (K-4) POC-9 Distinguish between characteristics of humans that are inherited from parents (i.e., hair color, height, skin color, eye color) and others that are learned (e.g., riding a bike, singing a song, playing a game, reading).

- 10 Marc and John are alike in many ways. They are taller than anyone else in the class. They both enjoy playing soccer and reading. They both have curly black hair and blue eyes. They both play instruments in a band.
- a. Identify **three** characteristics that show that Marc and John might have the same birth parents. Explain your reasoning.

 - b. Identify **three** characteristics that Marc and John learned. Choose **one** and explain what a person has to do to learn this characteristic.

**NECAP 2016 RELEASED ITEMS
GRADE 4 SCIENCE**

Scoring Guide

Score	Description
4	The response demonstrates a thorough understanding of characteristics that are inherited from parents versus characteristics that are learned. The response lists three examples of inherited characteristics and explains the reasoning that supports that the students have the same birth parents. The response also includes three examples of learned characteristics and explains what a person has to do to develop a learned characteristic.
3	The response demonstrates a general understanding of characteristics that are inherited from parents versus characteristics that are learned. The overall response is general.
2	The response demonstrates a limited understanding of characteristics that are inherited from parents versus characteristics that are learned. The overall response is limited.
1	The response demonstrates a minimal understanding of characteristics that are inherited from parents versus characteristics that are learned. The overall response is minimal.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

Part a: Height - tall; hair color - black; hair texture - curly; eye color - blue
Inherited characteristics are passed from birth parents to children.

Part b: Traits that are learned - reading, playing soccer, playing instruments
Learned characteristics develop because children have been taught or have practiced how to do something.

10 (A) The kids are tall and you inherit tallness it doesn't just happen. Curly black hair is also a thing you inherit. Blue eyes is something you inherit too! These are all things you get from your birth parents.

(B) The kids learned how to read in school, they couldn't read when they were newborns. They also learned to play in a band, but they had to practice to get better. If they like soccer they didn't inherit soccer from their parents for all I know their parents hate soccer.

The response demonstrates a thorough understanding of characteristics that are inherited from parents versus characteristics that are learned. In part (a), the response lists correct characteristics and explains that the kids receive these characteristics from their parents. In part (b), the response gives three correct characteristics with the explanation that the kids would need to learn how to read in school or practice soccer to learn how to play.

10

A. Three characteristics that show Marc and John might have the same birth parents are they both are taller than anyone else in the class. They both have curly black hair. They both have blue eyes.

B. Three characteristics that Marc and John learned are they play soccer and they play a instrument then they like reading. You have to learn to play a instrument by taking lessons.

The response demonstrates a general understanding of characteristics that are inherited from parents versus characteristics that are learned. In part (a), the response provides the correct characteristics, but the explanation is insufficient. In part (b), three correct characteristics are given with the explanation that you would have to take lessons to be able to play an instrument. With only an explanation missing in part (a), this response demonstrates general understanding.

SCORE POINT 2

⑩ Three characteristics that show Marc and John have the same birth Parents are they both have blue eyes, black curly hair, and they are both tall.

Three characteristics that they learned are they both play instruments, and they play soccer, also they enjoy reading. they just like to play soccer.

The response demonstrates a limited understanding of characteristics that are inherited from parents versus characteristics that are learned. In each part, the correct characteristics are listed, but there is no explanation for either part of the question.

NECAP 2016 RELEASED ITEMS
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SCORE POINT 1

10

they both have curly
black hair, there both tall,
have blue eyes

The response demonstrates a minimal understanding of characteristics that are inherited from parents versus characteristics that are learned. Three inherited traits are grouped together, but no explanations are provided, and there is no attempt at part (b).

SCORE POINT 0

10 Marc and John enjoy scorr and reading
they dooth have dobacks hair and blue eyes
They have interments in a band the might
have the same birth parents because every
thing they have incoming. They both are tall in
their class, have cruly blacks hair, enjoy playing
sports. They both are tall in their class
they meares how tall they are so thats
how they know they are both tall in their class.

The response is incorrect or irrelevant to the skill or concept being measured. The traits have not been grouped in a way that demonstrates understanding.

**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

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

- ① Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

Data Table 1: Strength of Magnet at Three Distances

	Number of Paper Clips Held at Three Distances			Median

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of using accepted methods for organizing, representing, and manipulating data. The response includes a data table to record the median number of paper clips that one magnet held at three different distances.
1	The response demonstrates a limited understanding of using accepted methods for organizing, representing, and manipulating data. The overall response is limited.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

A general understanding can be exemplified by the following sample response, including the data:

Data Table 1: Strength of Magnet at Three Distances

Number of Stickers	Number of Paper Clips Held at Three Distances			Median
	Trial 1	Trial 2	Trial 3	
0	8	8	7	8
2	4	4	4	4
4	2	2	2	2

SCORE POINT 2

- ① Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

Data Table 1: Strength of Magnet at Three Distances

# of Stickers	Number of Paper Clips Held at Three Distances			Median
	Trial 1	Trial 2	Trial 3	
zero	4	8	8	8
two	8	7	6	7
four	5	4	5	5

The response demonstrates a general understanding of using accepted methods for organizing, representing, and manipulating data. The response includes a completed data table with appropriate labels and organized data.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1

- 1 Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

Data Table 1: Strength of Magnet at Three Distances

trial one 0 stickers	Number of Paper Clips Held at Three Distances			Median
	10	10	9	
trial 2 2 stickers	4	6	8	10
trial 3 4 stickers	5	3	4	6
				4

The response demonstrates a limited understanding of using accepted methods for organizing, representing, and manipulating data. The response includes a completed data table with some appropriate labels and organized data, but the data are shifted up one row, making the median values misaligned with the data.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

- 1 Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

Data Table 1: Strength of Magnet at Three Distances

	Number of Paper Clips Held at Three Distances			Median
	trial 1	4 clips	no stickers	
	trial 2	7 clips	0 stickers	2 3
	trial 3	3 clips	0 stickers	7
	trial 4	3 clips	all stickers	3

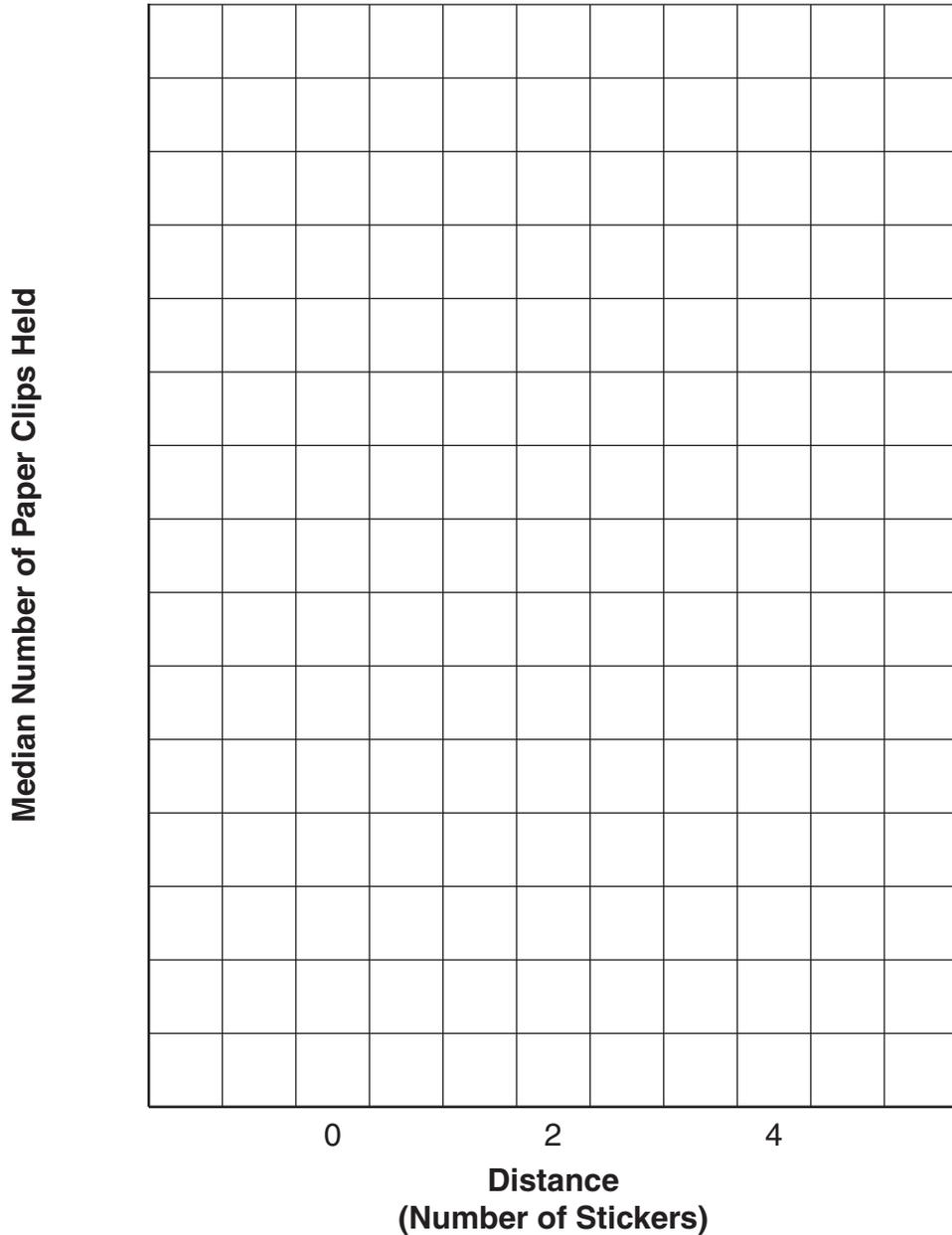
The response does not demonstrate understanding of using accepted methods for organizing, representing, and manipulating data. The data table is not filled out in an organized way and is difficult to decipher.

**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

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

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.

Title: _____



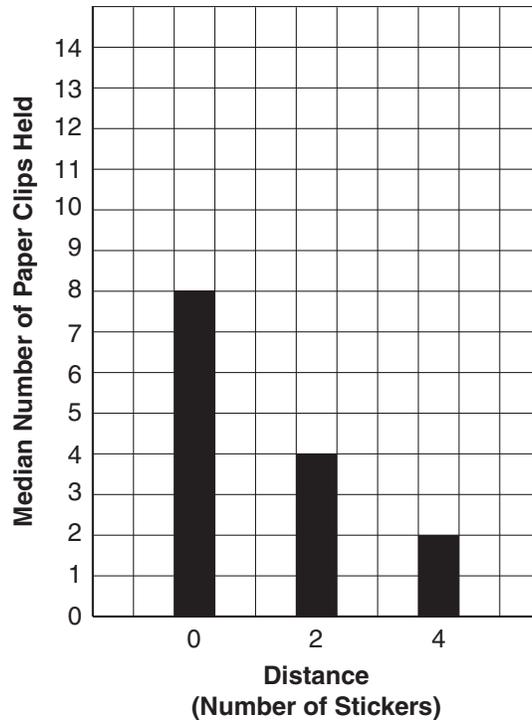
**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of using accepted methods for organizing, representing, and manipulating data. The response uses the data recorded in Data Table 1 to create a bar graph that shows the median number of paper clips the magnet held for each of the three distances. The response includes a title and labels.
2	The response demonstrates a general understanding of using accepted methods for organizing, representing, and manipulating data. The overall response is general.
1	The response demonstrates a limited understanding of using accepted methods for organizing, representing, and manipulating data. The overall response is limited.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A thorough understanding can be exemplified by including the following in the sample response:

**Median Number of Paper Clips
Held at Three Distances**
Title: _____



- Median data used for the three trials of distances of 0, 2, and 4 stickers
- Appropriate title
- Range from zero to maximum number of paper clips held

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GRADE 4 SCIENCE

SCORE POINT 3

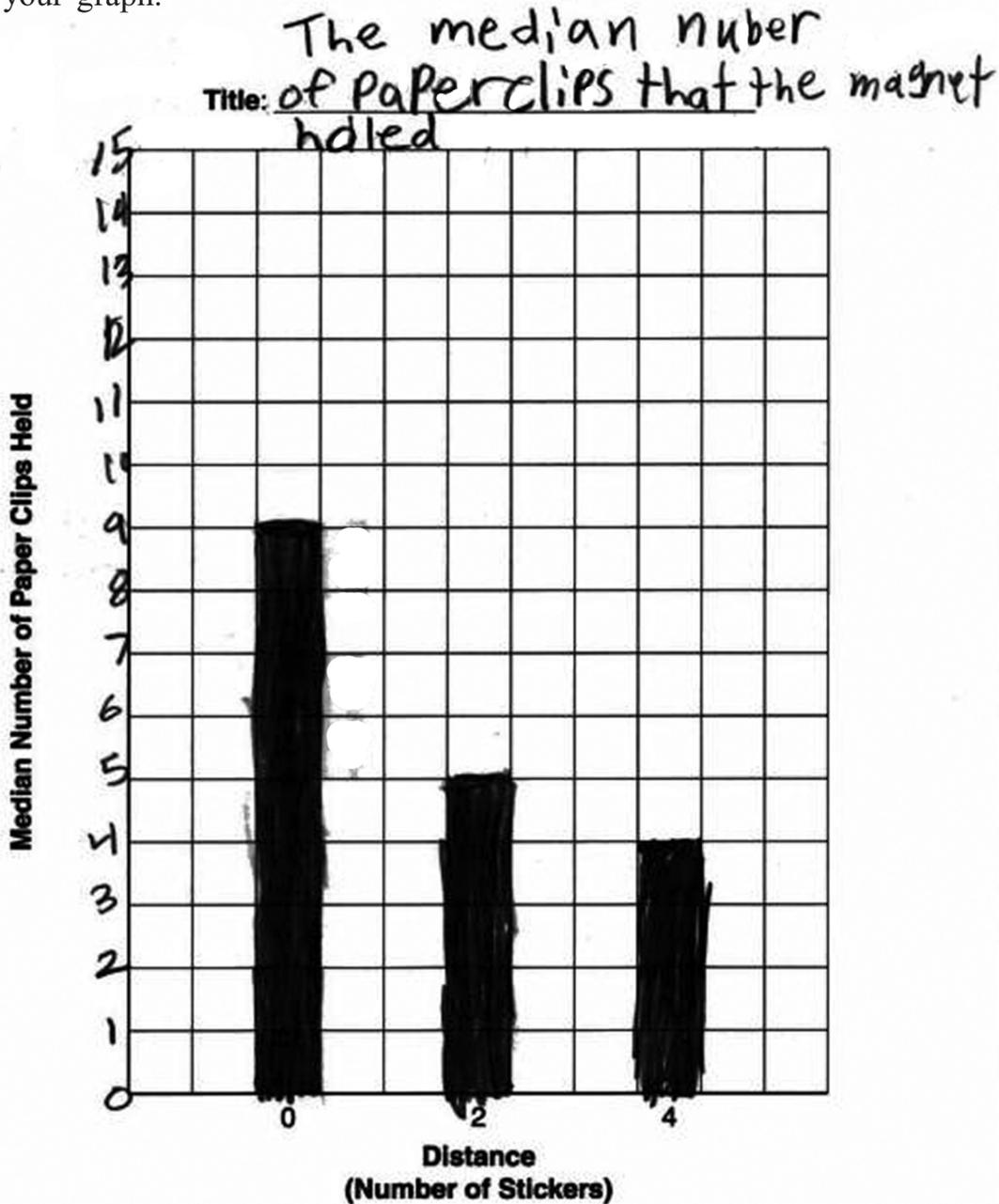
- ① Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

	Number of Paper Clips Held at Three Distances			Median
	1 st	2 nd	3 rd	
without sticker	7	10	9	9
2 sticker	4	5	6	5
1 sticker	4	4	4	4

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 3 (CONTINUED)

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



The response demonstrates a thorough understanding of using accepted methods for organizing, representing, and manipulating data. The response uses the data recorded in Data Table 1 to create a bar graph that shows the median number of paper clips the magnet held for each of the three distances. The response includes an appropriate title, y-axis scale, and correctly graphed values.

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GRADE 4 SCIENCE

SCORE POINT 2

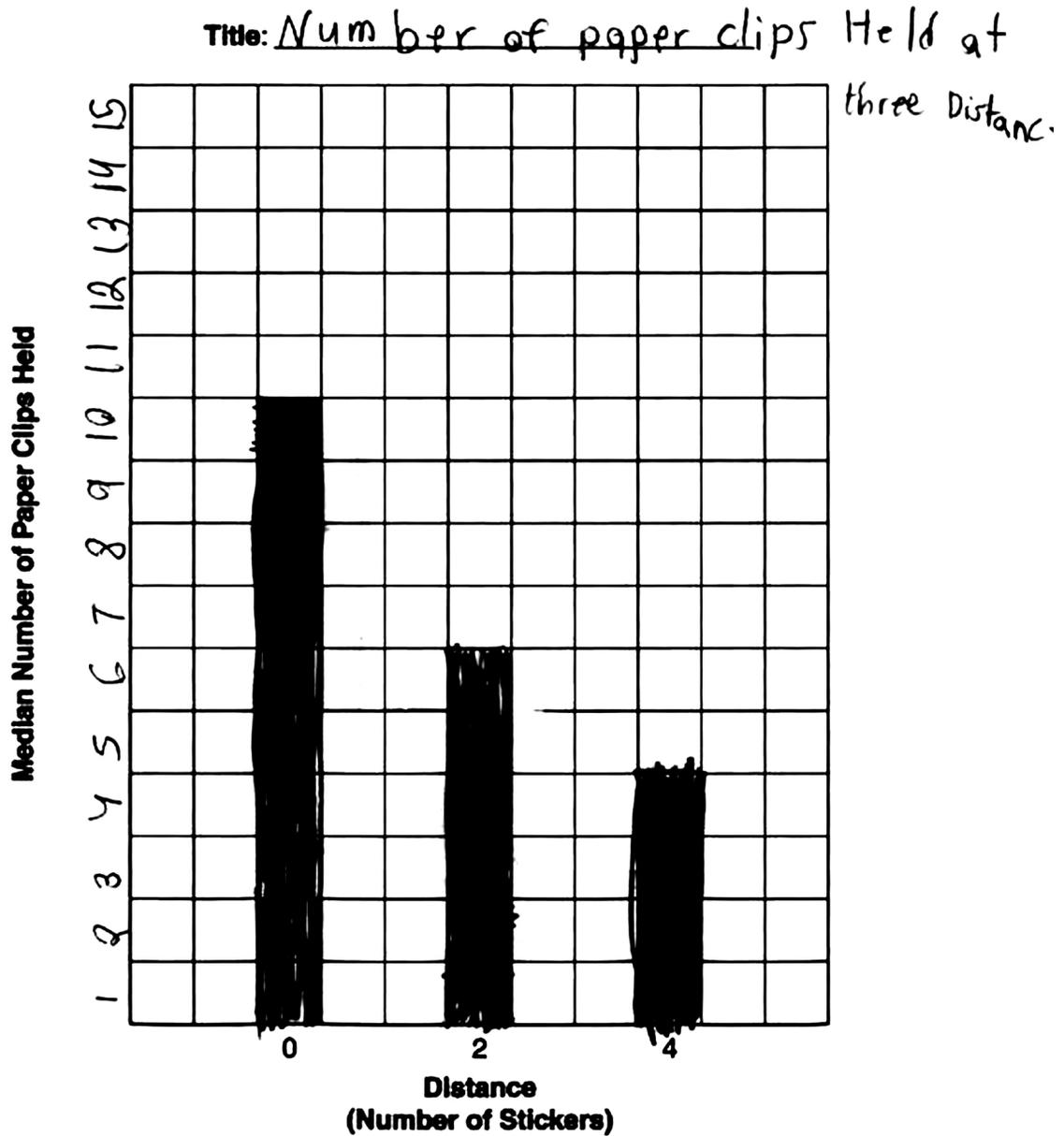
- ① Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

Trials	Number of Paper Clips Held at Three Distances			Median
	0 stickies	2 stickies	4 stickies	
Trial 1	11	6	4	10
Trial 2	10	6	4	6
Trial 3	10	6	4	4

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2 (CONTINUED)

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



The response demonstrates a general understanding of using accepted methods for organizing, representing, and manipulating data. The response includes an appropriate title and correctly graphed values, but the scale on the y-axis is not aligned to the grid lines.

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GRADE 4 SCIENCE

SCORE POINT 1

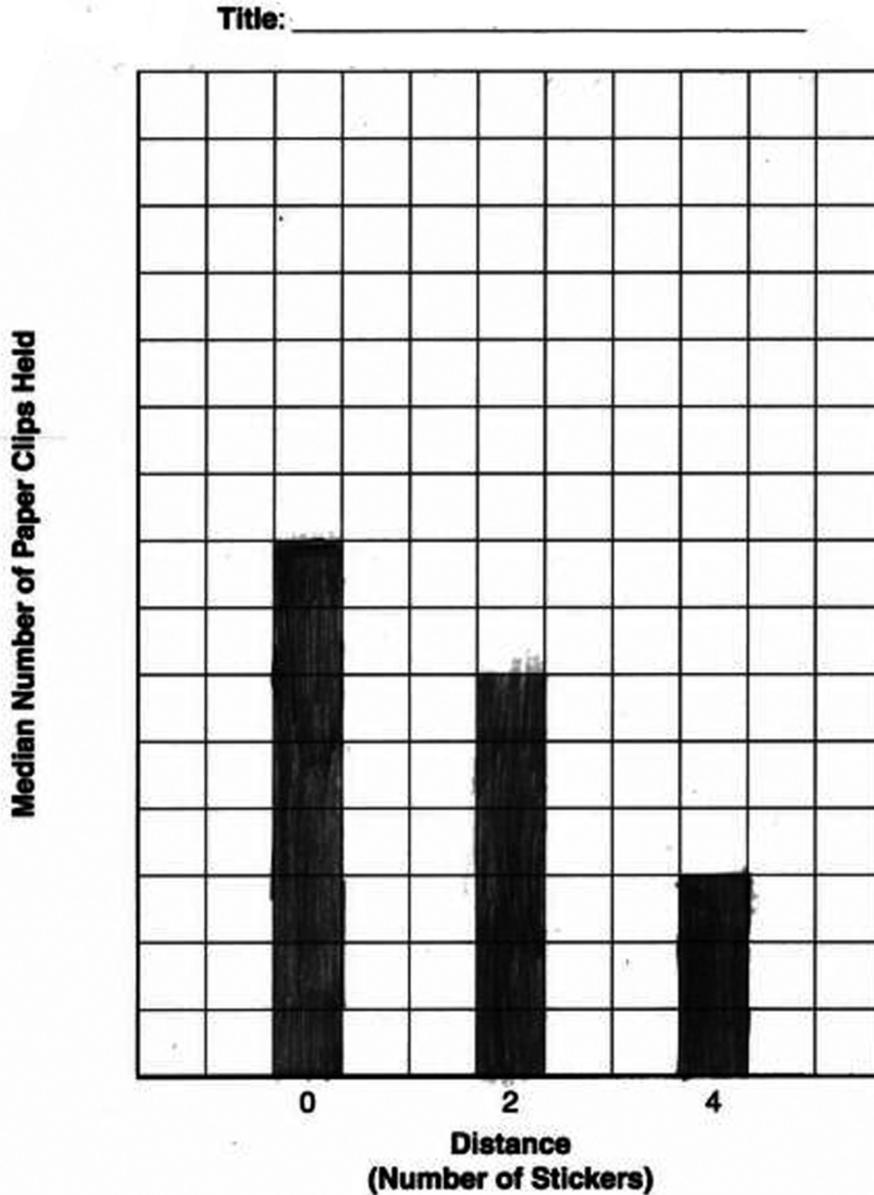
- ① Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

	Number of Paper Clips Held at Three Distances			Median
	trial 1	trial 2	trial 3	
NO stickers	11 clips	8 clips	10 clips	8 clips
2 stickers	4 clips	6 clips	3 clips	6 clips
4 stickers	3 clips	3 clips	4 clips	3 clips

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1 (CONTINUED)

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



The response demonstrates a limited understanding of using accepted methods for organizing, representing, and manipulating data. The response contains correctly graphed values, assuming that each box represents one paper clip. There is no title and no scale for the y-axis.

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GRADE 4 SCIENCE

SCORE POINT 0

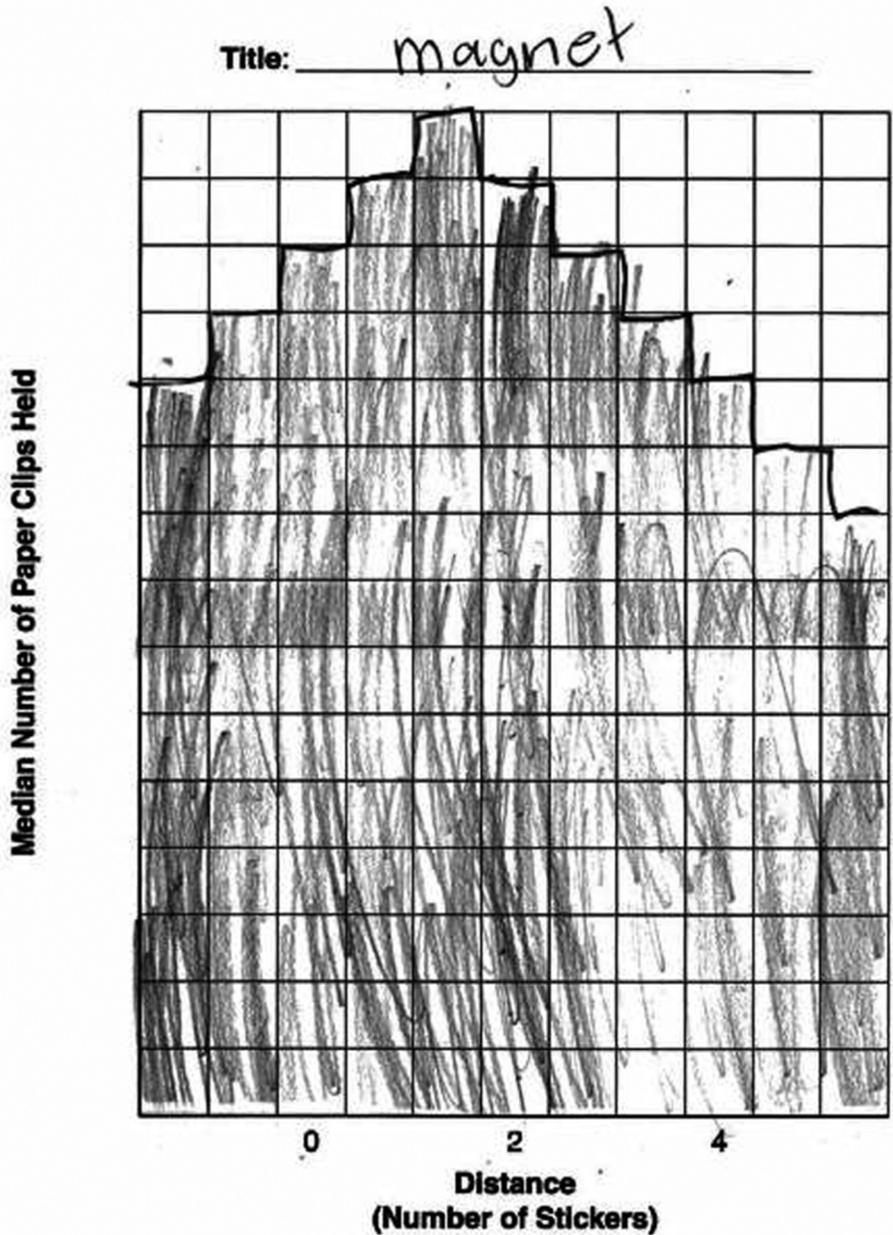
- ① Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

14	Number of Paper Clips Held at Three Distances			Median
	14	3	5	
13	6	4	5	3
12	7	5	6	4
11	5	3	1	5

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0 (CONTINUED)

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



The response is incorrect or irrelevant to the skill or concept being measured. The data are not graphed correctly, and the title "magnet" is not enough to demonstrate understanding.

**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 10:	Conducting Investigations Summarize results based on data.
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3 Describe what your graph on page 2 shows about the strength of a magnet.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of summarizing results based on data. The response describes what the graph on page 2 shows about the strength of a magnet.
1	The response demonstrates a limited understanding of summarizing results based on data. The overall response is limited.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

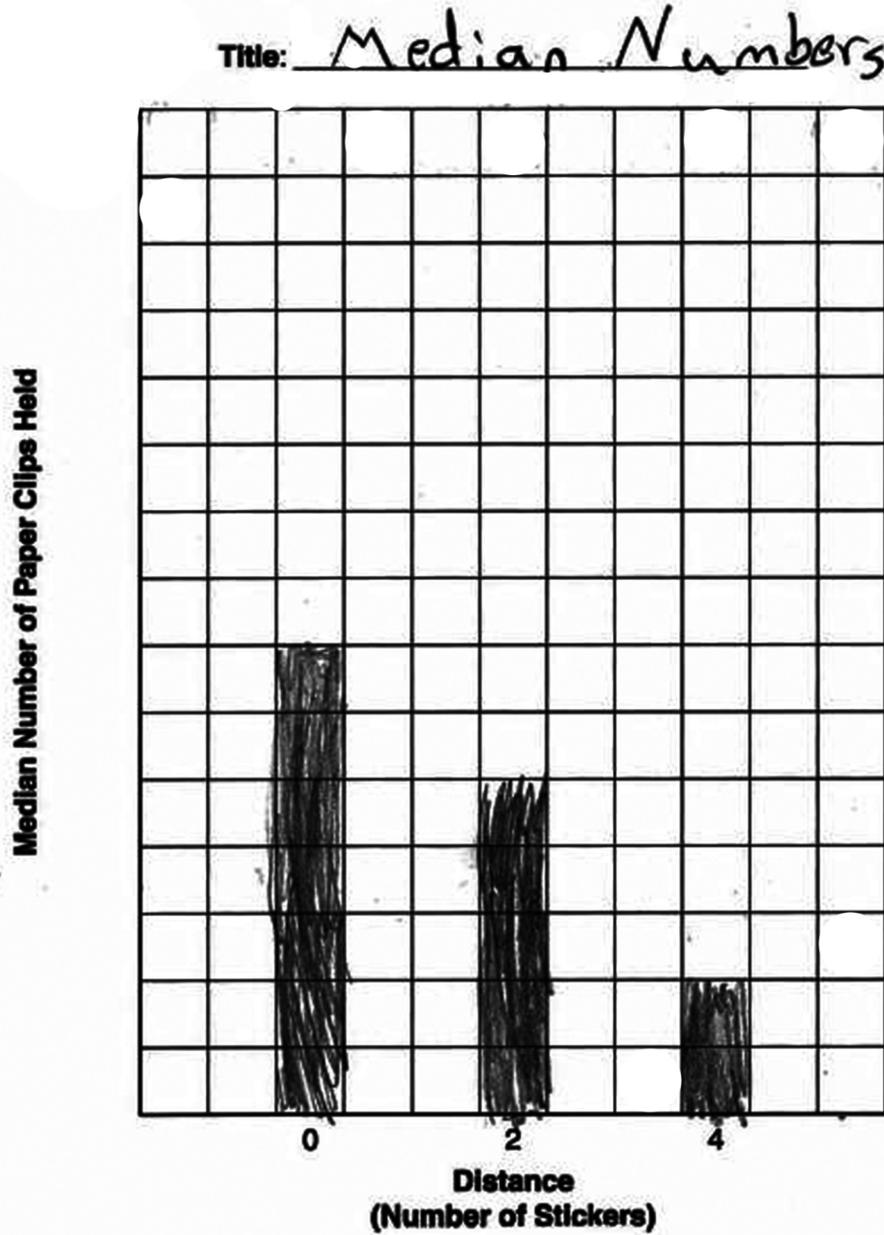
A general understanding can be exemplified by the following sample response:

As the distance from a magnet increases, the strength of the magnet decreases.

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GRADE 4 SCIENCE

SCORE POINT 2

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



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GRADE 4 SCIENCE

SCORE POINT 2 (CONTINUED)

- 3 Describe what your graph on page 2 shows about the strength of a magnet.

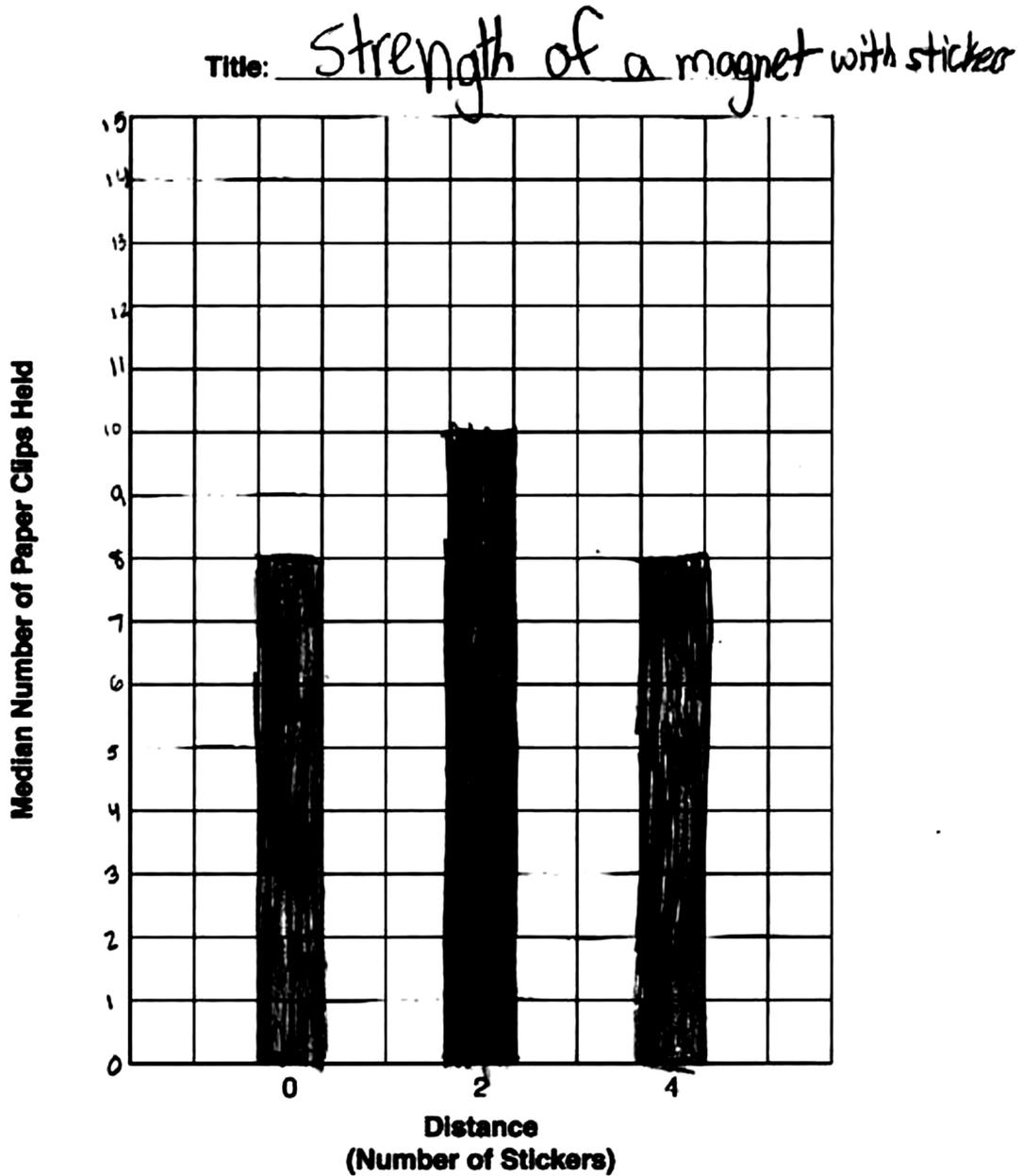
The strength of a magnet decreases as you put things like stickers in the way of the paper clip and the actual magnet.

The response demonstrates a general understanding of summarizing results based on data. The response provides a logical conclusion describing the trend represented by the data.

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GRADE 4 SCIENCE

SCORE POINT 1

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1 (CONTINUED)

- 3 Describe what your graph on page 2 shows about the strength of a magnet.

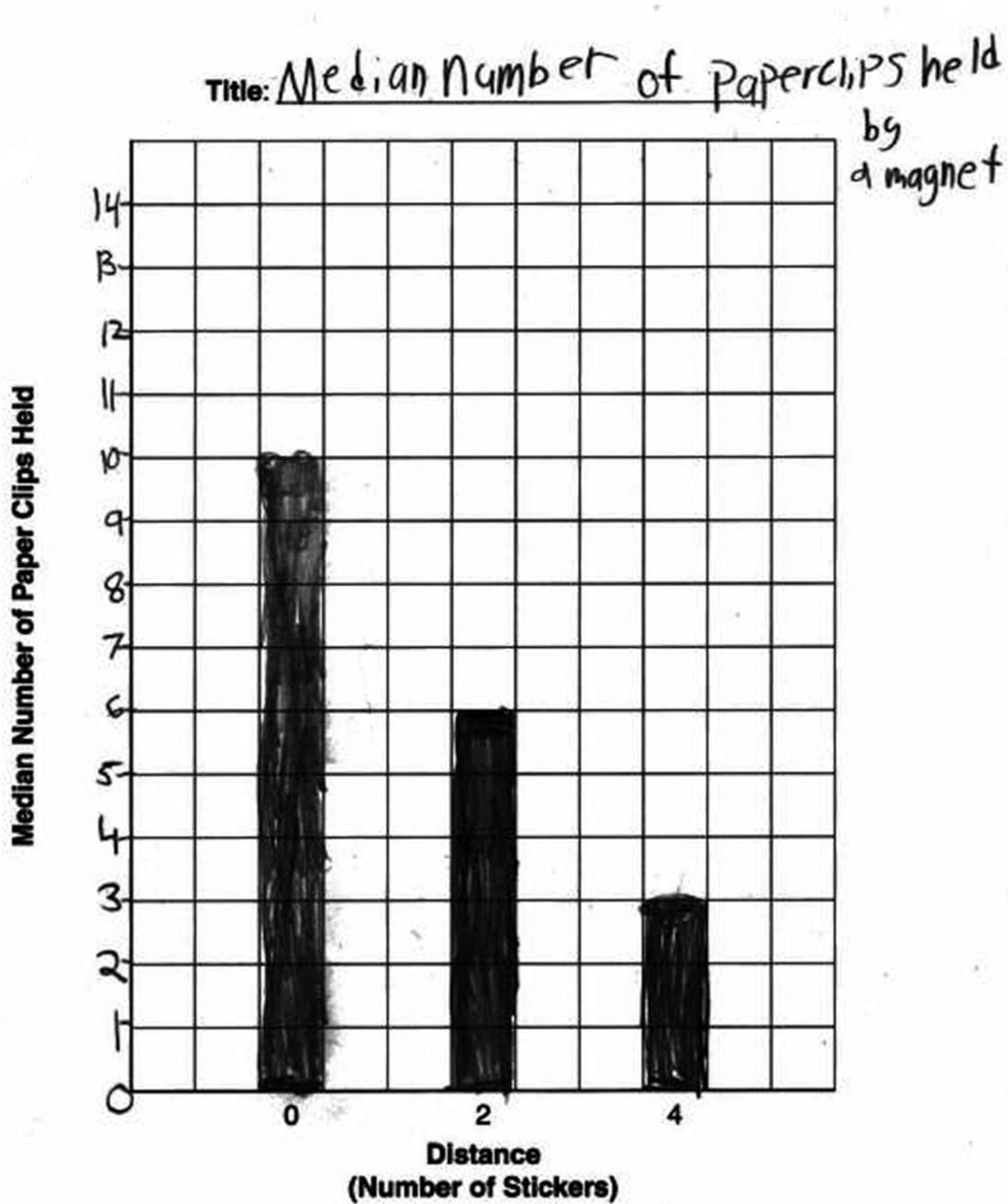
The ^{graph} shows 0 stickers held 8 as a median,
2 stickers held 10 as a median, and
4 stickers held 8 as a median.

The response demonstrates a limited understanding of summarizing results based on data. The response cites the relevant data from the investigation without identifying a trend.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0 (CONTINUED)

- 3 Describe what your graph on page 2 shows about the strength of a magnet.

On page 12 i made the numbers go to
14 on the side and on the title i wrote
Median number of paperclips held by a
magnet. Last in the graph i colored
in the median's of the investigation.

The response is incorrect or irrelevant to the skill or concept being measured. The response describes the procedure rather than identifying a trend in the data.

**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 12:	Developing and Evaluating Explanations Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.
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- 4 Use evidence from Data Table 1 and your graph to describe a pattern in the data as the number of stickers increased.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The response uses evidence from Data Table 1 and the student's graph to describe a pattern in the data as the number of stickers increased.
1	The response demonstrates a limited understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The overall response is limited.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A general understanding can be exemplified by the following sample response:

In the Magnet Strength Investigation, as the numbers of stickers increased, the number of paper clips that one magnet could hold went down. When there were no stickers, the magnet could hold 8 paper clips. When there were two stickers, the magnet could hold 4 paper clips. When there were 4 stickers, the magnet could only hold 2 paper clips.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2

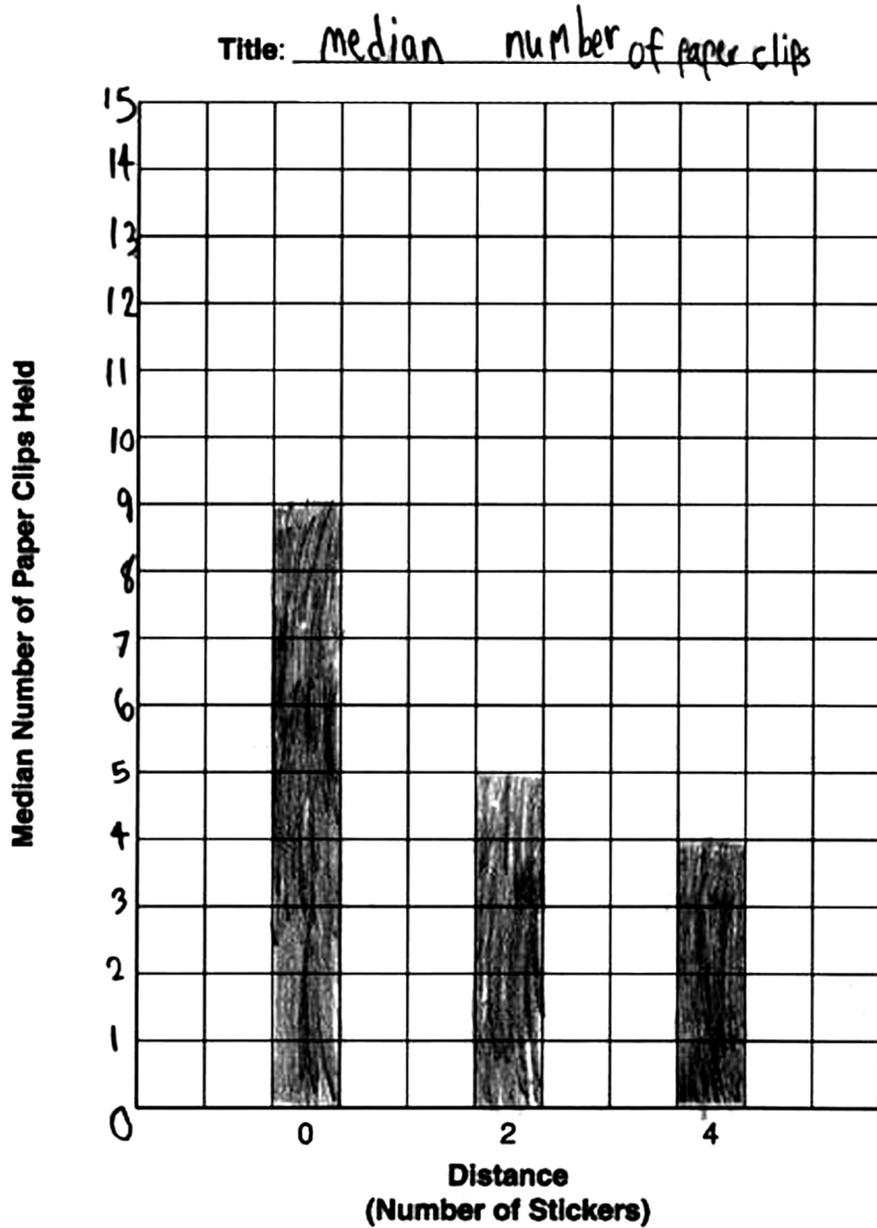
- ① Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

number of stickers	Number of Paper Clips Held at Three Distances			Median
	trial 1	trial 2	trial 3	
0 stickers	9 paper clips	7 paper clips	9 paper clips	9
2 stickers	5 paper clips	5 paper clips	5 paper clips	5
4 stickers	3 paper clips	4 paper clips	4 paper clips	4

NECAP 2016 RELEASED INQUIRY TASK
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SCORE POINT 2 (CONTINUED)

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



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SCORE POINT 2 (CONTINUED)

- 4 Use evidence from Data Table 1 and your graph to describe a pattern in the data as the number of stickers increased.

The pattern is that the median kept getting lower and lower. My evidence is that my data table has 9 as the first median 5 as the second and 4 as the third so they kept on getting lower.

The response demonstrates a general understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The response describes the median as getting lower and lower, and supports the conclusion with specific evidence from the data table and graph.

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SCORE POINT 1

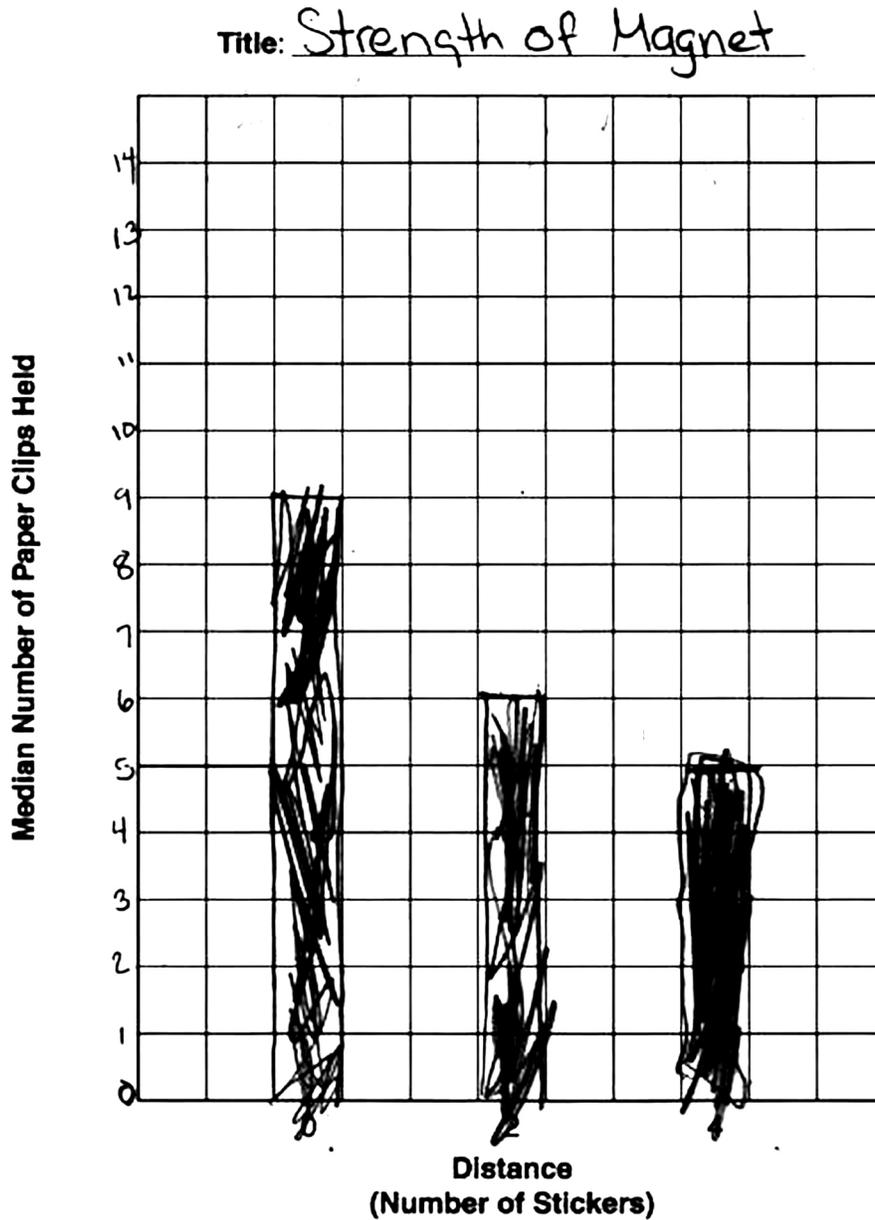
- ① Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

	Number of Paper Clips Held at Three Distances			Median
	Trial 1	Trial 2	Trial 3	
0	8	9	12	9
2	6	6	6	6
4	4	5	5	5

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1 (CONTINUED)

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



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SCORE POINT 1 (CONTINUED)

- 4 Use evidence from Data Table 1 and your graph to describe a pattern in the data as the number of stickers increased.

As the number of stickers increased
the number of paper clips decreased.

The response demonstrates a limited understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The response correctly describes a pattern in the data but does not use specific evidence in support of the pattern.

NECAP 2016 RELEASED INQUIRY TASK
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SCORE POINT 0

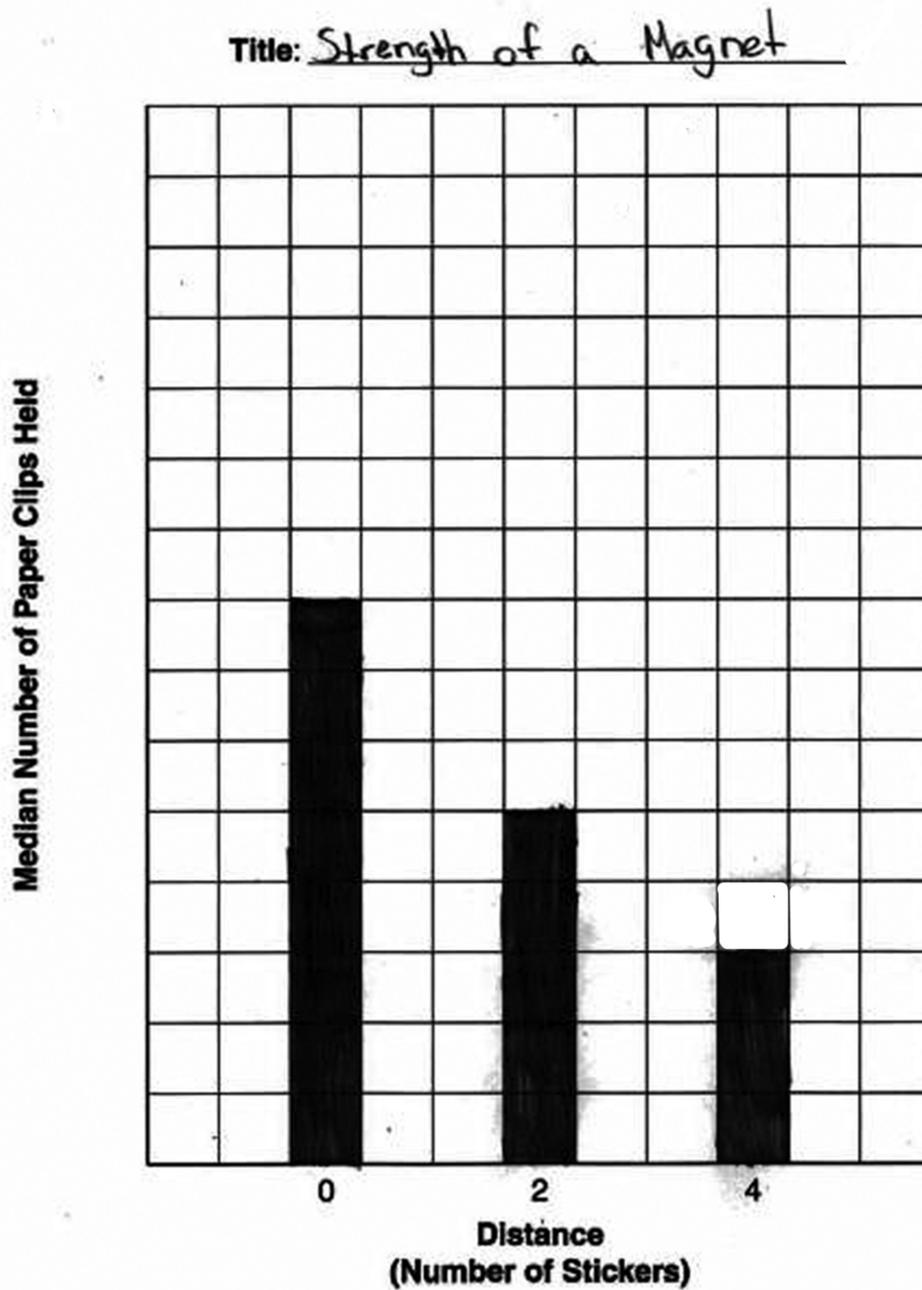
- ① Copy Data Table 1 (including your labels) from page 6 in your Inquiry Booklet into Data Table 1 below.

Number of stickers	Number of Paper Clips Held at Three Distances			Median
	Trail 1	Trail 2	Trail 3	
0 stickers	8 clips	8 clips	9 clips	8 clips
2 stickers	5 clips	5 clips	4 clips	5 clips
4 stickers	2 clips	3 clips	4 clips	3 clips

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0 (CONTINUED)

- 2 Use the data that you recorded in Data Table 1 to create a bar graph that shows the **median** number of paper clips the magnet held for each of the three distances. Label and title your graph.



NECAP 2016 RELEASED INQUIRY TASK
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SCORE POINT 0 (CONTINUED)

- 4 Use evidence from Data Table 1 and your graph to describe a pattern in the data as the number of stickers increased.

The Data Table 1 is 0, 2, and 4.

The response is incorrect or irrelevant to the skill or concept being measured. The response lists the number of stickers for each trial, which is irrelevant to the question.

**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 2:	Formulating Questions & Hypothesizing Construct coherent argument in support of a question, hypothesis, prediction.
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5 Check the box next to the statement that **best** describes whether your data and observations supported or did not support your prediction.

- Yes, the data **supported** my prediction.
- No, the data **did not support** my prediction.

Use evidence from your investigation to explain **why** your data and observations did or did not support your prediction.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of constructing coherent arguments in support of a prediction. The response describes whether the prediction is supported or not supported and explains why the data and observations did or did not support the prediction.
1	The response demonstrates a limited understanding of constructing coherent arguments in support of a prediction. The overall response is limited.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A general understanding can be exemplified by the following sample response:

I predicted that the magnet's attraction will decrease as the distance from the magnet increases. The data did support my prediction because when there were no stickers, the magnet held the most paper clips (8). When there were 2 stickers, the magnet held 4 paper clips, and when there were 4 stickers, the magnet only held 2 paper clips.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2

You investigated the following research question:

How does a magnet's attraction to a metal change as the distance from the metal increases?

Copy your prediction from page 3 in your Inquiry Booklet onto the lines below.

I predict that the magnet's attraction
will decrease

because the farther away the magnet is
to the metal, the smaller the magnetic
field becomes.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2 (CONTINUED)

5 Check the box next to the statement that **best** describes whether your data and observations supported your prediction.

The data **supported** my prediction.

The data **did not support** my prediction.

Use evidence from your investigation to explain why your data and observations did or did not support your prediction.

My data supported my prediction because each time I added more stickers, the less clips could hang. Without stickers, 9 clips hung, with 2 stickers, 5 clips hung, and with 4 stickers, 3 clips hung.

The response demonstrates a general understanding of constructing coherent arguments in support of a prediction. The response describes that the prediction is supported and uses specific evidence from the investigation to explain why the data and observations supported the prediction.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1

You investigated the following research question:

How does a magnet's attraction to a metal change as the distance from the metal increases?

Copy your prediction from page 3 in your Inquiry Booklet onto the lines below.

I predict that the magnets strength
will become weak

because it is a longer distance it
would become weak.

- 5 Check the box next to the statement that **best** describes whether your data and observations supported your prediction.

- The data **supported** my prediction.
 The data **did not support** my prediction.

Use evidence from your investigation to explain why your data and observations did or did not support your prediction.

The magnet became weaker because
we put stickers on it. The stickers
blocked the magnetic field
coming through.

The response demonstrates a limited understanding of constructing coherent arguments in support of a prediction. The response explains that the magnet "became weaker" as stickers were added but does not support the conclusion with specific evidence from the investigation.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

You investigated the following research question:

How does a magnet's attraction to a metal change as the distance from the metal increases?

Copy your prediction from page 3 in your Inquiry Booklet onto the lines below.

I predict that when a magnet, is so strong that when it is magnetice than it will stay,
because I think that when the magnet has force ut goes on something that will stay

5 Check the box next to the statement that **best** describes whether your data and observations supported your prediction.

- The data **supported** my prediction.
- The data **did not support** my prediction.

Use evidence from your investigation to explain why your data and observations did or did not support your prediction.

I think that it supported it because I said in my prediction that when the metal was stronger with it touching the magnet it would stick

The response is incorrect or irrelevant to the skill or concept being measured. The prediction and conclusion are related to the strength of the magnet itself, not the distance from the magnetic strip.

**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 11:	Developing and Evaluating Explanations Analyze data, including determining if data are relevant, artifact, irrelevant, or anomalous.
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- 6 Use Data Table 2 to explain the relationship between the foam squares and the magnets.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of analyzing data, including determining if data are relevant, artifact, irrelevant, or anomalous. The response uses Data Table 2 to explain the relationship between the foam squares and the magnets.
1	The response demonstrates a limited understanding of analyzing data, including determining if data are relevant, artifact, irrelevant, or anomalous. The overall response is limited.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A general understanding can be exemplified by the following sample response:

As the size of the foam squares increased, more magnets were needed to hold up the square without it sliding down. When the students added magnets, it made the force stronger to hold up the large foam square.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2

- 6 Use Data Table 2 to explain the relationship between the foam squares and the magnets.

The medium & the small foam only need one magnet to hold them up but the big foam piece needs two magnets to hold it up. Probably because the big foam piece is heavier than the other two foam pieces.

The response demonstrates a general understanding of analyzing data, including determining if data are relevant, artifact, irrelevant, or anomalous. The response uses Data Table 2 to explain the relationship between the foam squares and the magnets, and explains that the weight of the larger piece of foam is why more magnets were needed to hold it up.

SCORE POINT 1

- 6 Use Data Table 2 to explain the relationship between the foam squares and the magnets.

The small and medium foam pieces are about the same size so they need 1 magnet. The large foam needs 2.

The response demonstrates a limited understanding of analyzing data, including determining if data are relevant, artifact, irrelevant, or anomalous. The response describes the relationship between the foam squares and the magnets but provides only a limited explanation.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

- 6 Use Data Table 2 to explain the relationship between the foam squares and the magnets.

The foam squares are put up against the metal plate and the magnet is touching the foam to keep it connected to the metal.

The response is incorrect or irrelevant to the skill or concept being measured. The response explains the procedure rather than the relationship.

**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 6:	Planning and Critiquing of Investigations Provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation.
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- 7 Use Data Table 3 to explain why it was important for the students to keep the size and thickness of each foam square the same in Investigation 3 to be able to test how strongly a magnet can hold an object.

Scoring Guide

Score	Description
2	The response demonstrates a general understanding of providing reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation. The response explains why it was important for the students to keep the size and thickness of each foam square the same in Investigation 3 to be able to test how strongly a magnet can hold an object.
1	The response demonstrates a limited understanding of providing reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation. The overall response is limited.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A general understanding can be exemplified by the following sample response:

It was important to have the size and the thickness of the foam squares the same to make it a fair test (constant). The only variable was the number of foam squares. If the students used squares of different thicknesses, the magnetic force could not be measured as accurately.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2

Data Table 3:
Number of Magnets Needed to Hold Different Thicknesses

Number of Foam Squares (thickness)	Number of Magnets Needed			Median
	Trial 1	Trial 2	Trial 3	
1	1	1	1	1
2	1	1	1	1
3	3	3	3	3

- 7 Use Data Table 3 to explain why it was important for the students to keep the size and thickness of each foam square the same in Investigation 3 to be able to test how strongly a magnet can hold an object.

Because it won't be a fair test because one will be lighter than all the other ones and the other ones are heavy once you change something you can't change something else because it won't be a fair test.

The response demonstrates a general understanding of providing reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation. The response explains that in order to conduct a fair test, only one variable should be changed at a time.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1

**Data Table 3:
Number of Magnets Needed to Hold Different Thicknesses**

Number of Foam Squares (thickness)	Number of Magnets Needed			Median
	Trial 1	Trial 2	Trial 3	
1	1	1	1	1
2	1	1	1	1
3	3	3	3	3

- 7 Use Data Table 3 to explain why it was important for the students to keep the size and thickness of each foam square the same in Investigation 3 to be able to test how strongly a magnet can hold an object.

so it's a fair test and not
the wrong answer,

The response demonstrates a limited understanding of providing reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation. The response identifies that it's important to keep the size and thickness the same so it will be a fair test, but the explanation is limited.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 0

Data Table 3:
Number of Magnets Needed to Hold Different Thicknesses

Number of Foam Squares (thickness)	Number of Magnets Needed			Median
	Trial 1	Trial 2	Trial 3	
1	1	1	1	1
2	1	1	1	1
3	3	3	3	3

- 7 Use Data Table 3 to explain why it was important for the students to keep the size and thickness of each foam square the same in Investigation 3 to be able to test how strongly a magnet can hold an object.

When there was more foam squares you could put more magnets on. For example 1 foam square = 1 magnet and 3 foam squares = 3 magnets.

The response is totally irrelevant to the skill or concept being measured. The response does not address the importance of controlling variables.

**NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE**

Broad Area of Inquiry: Inquiry Construct 12:	Developing and Evaluating Explanations Use evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis.
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- 8 Explain why the first way Finn tries to hang his art piece does not work, but the second way does. Use evidence from the investigation you performed **and** the investigations you read about to support your answer.

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The response explains why the first way Finn tries to hang his art piece does not work, but the second way does. The response identifies information from the investigations to support the answer.
2	The response demonstrates a general understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The overall response is general.
1	The response demonstrates a limited understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The overall response is limited.
0	The response is incorrect or irrelevant to the skill or concept being measured.
Blank	No response

A thorough understanding can be exemplified by the following sample response:

The first way to hang the art does not work because the frame is too thick, which keeps the magnets too far away from the metal strip. The second way works because it allows the magnet to be directly against the metal strip where it has a stronger magnetic force. In the investigation, the students learned that thicker art pieces represented by foam squares could not be held by the magnets they had. However, they observed magnets holding different sizes of art pieces. These observations suggest that when the magnet is closer to the metal strip, it can hold a piece of art.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 3

- 8 Explain why the first way Finn tries to hang his art piece does not work, but the second way does. Use evidence from the investigation you performed **and** the investigations you read about to support your answer.

The first way Finn tries to hang his art piece does not work, because the cardboard is too thick for the magnet to stick to the metal. The second way works because the magnets are on the metal, with string holding up the art. This is similar to the investigation I performed. With the 4 stickers, the hook couldn't hold many paper clips. With no stickers, it held quite a few.

The response demonstrates a thorough understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The response explains why the thickness of the frame was interfering with the ability of the magnets to hold up the art work and uses evidence from the investigations to support the answer.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 2

- 8 Explain why the first way Finn tries to hang his art piece does not work, but the second way does. Use evidence from the investigation you performed **and** the investigations you read about to support your answer.

I think the magnets he used were not strong enough for the force of the magnets to go through the thick frame so he put the magnets on the metal strip and put string on the hooks then attached it to the thick frame.

The response demonstrates a general understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The response identifies the thickness of the frame as the problem in the first attempt and the string as the method of reducing the distance between the magnets and the bar, but the answer is not supported with evidence from the performed investigation.

NECAP 2016 RELEASED INQUIRY TASK
GRADE 4 SCIENCE

SCORE POINT 1

- 8 Explain why the first way Finn tries to hang his art piece does not work, but the second way does. Use evidence from the investigation you performed **and** the investigations you read about to support your answer.

It didn't work because the thick frame stoped the magnetic force from getting to the metal.

The response demonstrates a limited understanding of using evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis. The response addresses why the first attempt to hang the artwork did not work but does not include evidence from any of the investigations or readings.

SCORE POINT 0

- 8 Explain why the first way Finn tries to hang his art piece does not work, but the second way does. Use evidence from the investigation you performed **and** the investigations you read about to support your answer.

it did not work because he did not use magnets with the same strength.

The response is totally incorrect. The response contains the misconception that the magnets are different strengths.