TCAP/CRA 2013

6

Anchor Set

Grade 6 - Temperature Task

SECURE MATERIAL - Reader Name: _____

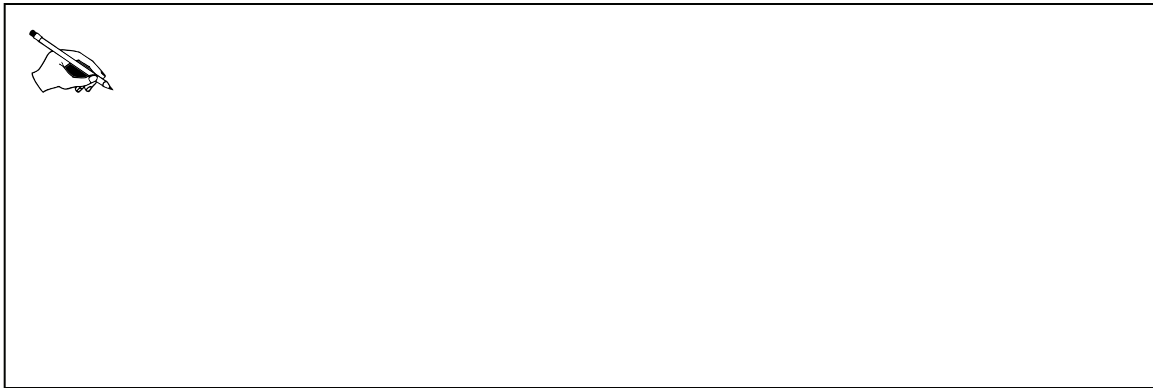**Tennessee Comprehensive Assessment Program**
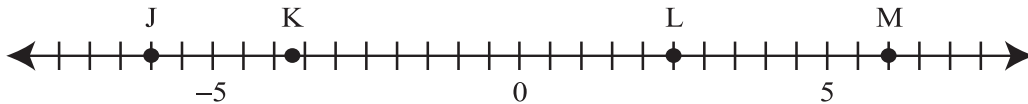
Part 1: Constructed Response Task Section

Temperature Task

The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
Banksville	−3.2
Crockerville	−7.0
Sandtown	−3.7
Bluetown	6.0
Southville	−6.0
Humbletown	2.5

a.   List the average temperatures from lowest to highest.

The number line below shows the average temperature for some of these towns.

b.   On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

c.   Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

d.   Explain how you can use the number line to determine which two temperatures have the same absolute value.

REVIEW YOUR WORK IF YOU HAVE TIME.

Scoring Guide

The CCSS for Mathematical Content (3 points)

6.NS.C.7   Orders the values in the table correctly from lowest to highest. **(1 Point)**   _____

6.NS.C.7c   Indicates that points on the number line that are equidistant from zero   _____
have the same absolute value.   **(1 Point)**

6.NS.C.6   Plots points representing the average temperature of Banksville and   _____
Crockerville correctly. **(1 Point)**

The CCSS for Mathematical Practice (1 point)

MP3   Agrees with Juan in Part C and argues that K has the value of –3.7 in any of the
following ways:
- Noting the point is located between –3.5 and – 4;
- Noting the point is closer to – 4 than it is to –3; **(1 Point)**
(MP3: Construct viable arguments and critique the reasoning of others.)

TOTAL POINTS: 4

The CCSS for Mathematical Content Addressed In This Task

Apply and extend previous understandings of numbers to the system of rational numbers.
6.NS.C.6   Understand a rational number as a point on the number line. Extend number line diagram and coordinate axes familiar from previous grade to represent points on the line and in the plane with negative number coordinates.
6.NS.C.7   Understand ordering and absolute value of rational numbers.
6.NS.C.7c   Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars.*

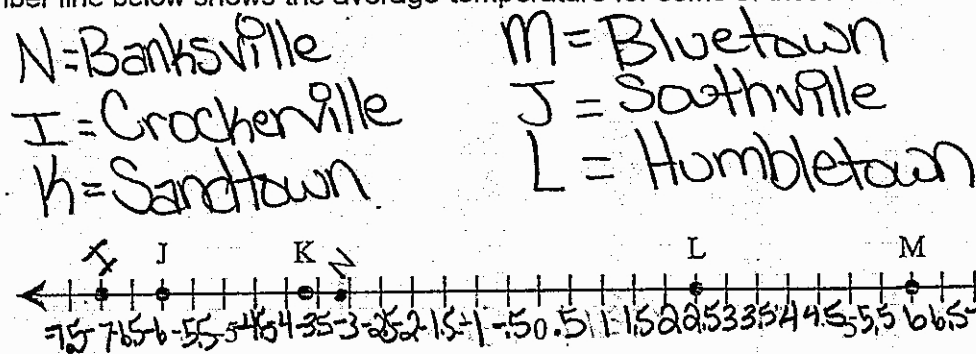| The CCSS for Mathematical Practice* |
|---|
| 1.   Make sense of problems and persevere in solving them. |
| 2.   Reason abstractly and quantitatively. |
| 3.   Construct viable arguments and critique the reasoning of others. |
| 4.   Model with mathematics. |
| 5.   Use appropriate tools strategically. |
| 6.   Attend to precision. |
| 7.   Look for and make use of structure. |
| 8.   Look for and express regularity in repeated reasoning. |
| * Gray type indicates Mathematical Practices not addressed in this assessment. |

4. Temperature Task

The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
Banksville	−3.2
Crockerville	−7.0
Sandtown	−3.7
Bluetown	6.0
Southville	−6.0
Humbletown	2.5

a. List the average temperatures from lowest to highest.

✎ −7.0, −6.0, −3.7, −3.2, 2.5, 6.0

The number line below shows the average temperature for some of these towns.

N = Banksville   M = Bluetown
I = Crockerville   J = Southville
K = Sandtown   L = Humbletown

b. On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

Litho#: 0090

c.   Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

> I agree with Juan because it's located in between -3.5 and -4. That's the only place it could be unless it wasn't negative.

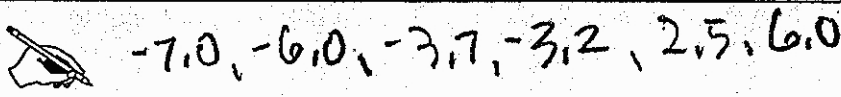d.   Explain how you can use the number line to determine which two temperatures have the same absolute value.

> The absolute value is how far a number is away from 0. You find all of the absolute values until two numbers land on the same spot as one another. |6| and |-6| have the same absolute value.

)

Anchor 1   Litho 0090

Total Content Points: 3   (6.NS.C.7, 6.NS.C.7c, 6.NS.C.6)

Total Practice Points: 1   (MP3)

In Part A, the student orders the values in the table correctly from lowest to highest by writing a left-to-right horizontal sequence (–7.0 … 6.0) (6.NS.C.7). In Part B, the student correctly plots points representing the average temperatures of Banksville and Crockerville on the number line by identifying Banksville as "N" at –3.2 and Crockerville as "I" at –7.0 (6.NS.C.6). In Part C, the student agrees with Juan that point K represents the average temperature of Sandtown (–3.7) because it is located on the number line "between –3.5 and –4" (MP3). In Part D, the student explains points on the number line that are equidistant from zero have the same absolute value, stating, "The absolute value is how far a number is away from 0," and when two numbers are on the "same spot," they have the same absolute value (6.NS.C.7c).

Total Awarded Points: 4 out of 4

4. Temperature Task

The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
Banksville	O. −3.2
Crockerville	R −7.0
Sandtown	N −3.7
Bluetown	M 6.0
Southville	J −6.0
Humbletown	L 2.5

a. List the average temperatures from lowest to highest.

−7.0, −6.0, −3.7, −3.2, 2.5, 6.0

The number line below shows the average temperature for some of these towns.

R = Crockerville
O = banksville

b. On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

Litho#: 0143

c.　Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

> I agree with Juan. He is right because, For every two dashes he son the number line it is one whole number. it is betwen -3.5 and -4. So the only one in the number line described by that is Point K.

d.　Explain how you can use the number line to determine which two temperatures have the same absolute value.

> You could see which ones would be on the game space if you folded the number line at zero. You do this because absolute value is the number without negatives.

Anchor 2   Litho 0143

Total Content Points: 3   (6.NS.C.7, 6.NS.C.7c, 6.NS.C.6)

Total Practice Points: 1   (MP3)

In Part A, the student orders the values in the table correctly from lowest to highest by writing a left-to-right horizontal sequence (–7.0 … 6.0) (6.NS.C.7). In Part B, the student correctly plots points representing the average temperatures of Banksville and Crockerville on the number line, identifying Banksville as "O" at –3.2 and Crockerville as "R" at –7.0 (6.NS.C.6). In Part C, the student agrees with Juan that point K represents the average temperature of Sandtown because it is located on the number line between –3.5 and –4 (MP3). In Part D, the student explains that points on the number line that are equidistant from zero have the same absolute value by noting that "if you folded the number line at zero" then points would have the "same space" or distance from zero (6.NS.C.7c).
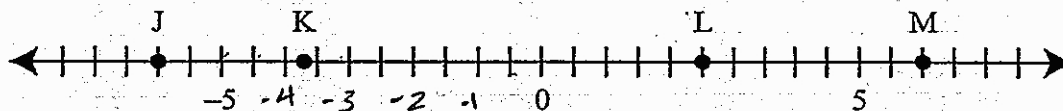
Total Awarded Points: 4 out of 4

4. Temperature Task

The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
Banksville	−3.2 4
Crockerville	−7.0 1
Sandtown	−3.7 3
Bluetown	6.0 6
Southville	−6.0 2
Humbletown	2.5 5

a. List the average temperatures from lowest to highest.

✍ −7.0, −6.0, −3.7, −3.2, 2.5, 6.0

The number line below shows the average temperature for some of these towns.

```
        J       K                       L               M
  ◄─┼─┼─┼─●─┼─┼─┼─●─┼─┼─┼─┼─┼─┼─┼─┼─●─┼─┼─┼─┼─┼─●─┼─┼─►
       −5  −4  −3  −2  −1   0               5
```

b. On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

Litho#: 0124

A-3b

c. Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

> I agree with Juan. On the number line, there are 10 ticks between the numbers -5 and 0. Since each tick is equal, each tick increases by .5, starting from zero. The point K is between ticks 7 & 8, or numbers -3.5 and -4. Sandtown's average temperature is -3.7°F, which is between -3.5°F and -4°F.

d. Explain how you can use the number line to determine which two temperatures have the same absolute value.

> You can use the number line to determine which 2 temperatures have the same absolute value by reflecting all points below zero (on the left side of zero) to the positive side (on the right side of zero). Points J and M overlap each other, so they have the same absolute values. Absolute value merely makes all numbers positive, so numbers above zero stay where they are

Litho#: 0124

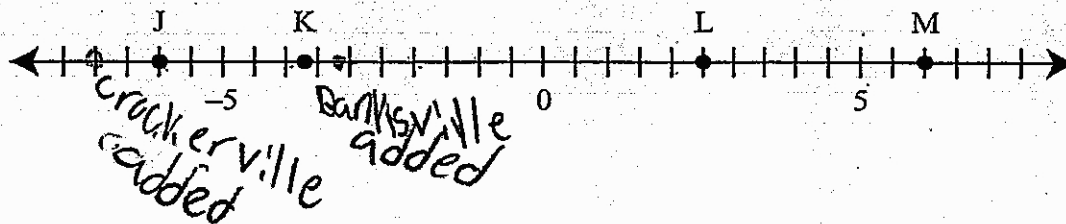Anchor 3   Litho 0124

Total Content Points: 2   (6.NS.C.7, 6.NS.C.7c)

Total Practice Points: 1   (MP3)

In Part A, the student orders the values in the table correctly from lowest to highest by writing a left-to-right horizontal sequence (–7.0 … 6.0) (6.NS.C.7). In Part B, the student does not plot points representing the average temperatures of Banksville and Crockerville on the number line (no credit for 6.NS.C.6). In Part C, the student agrees with Juan that point K represents the average temperature of Sandtown because there are 10 tick marks between –5 and zero, so "each tick increases by .5," and "point K is between ticks 7 & 8, or the numbers –3.5 and –4" (MP3). In Part D, the student explains points on the number line that are equidistant from zero have the same absolute value, noting that "reflecting" the points on the left side of zero to the right side of zero will result in points overlapping, which indicates equal distance from zero, such as points J and M (–6.0 and 6.0 respectively) (6.NS.C.7c).

Total Awarded Points: 3 out of 4

4. Temperature Task

The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
Banksville	−3.2
Crockerville	−7.0
Sandtown	−3.7
Bluetown	6.0
Southville	−6.0
Humbletown	2.5

a.   List the average temperatures from lowest to highest.

-7.0, -6.0, -3.7, -3.2, 2.5, 6.0
(°F)

The number line below shows the average temperature for some of these towns.

b.   On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

Litho#: 0141

c. Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

> I agree with Juan, because every two marks is one. That means every mark in between two marks is point five (0.5).

d. Explain how you can use the number line to determine which two temperatures have the same absolute value.

> You can find the same absolute value by finding if they are the same number of marks away from zero as the other. That is how I find the absolute value. You could even take the negative numbers same and adding its self twice to get the same number as a whole.

Anchor 4   Litho 0141

Total Content Points: 3   (6.NS.C.7, 6.NS.C.7c, 6.NS.C.6)

Total Practice Points: 0

In Part A, the student orders the values in the table correctly from lowest to highest by writing a left-to-right horizontal sequence (–7.0 … 6.0) (6.NS.C.7). In Part B, the student correctly plots points representing the average temperatures of Banksville and Crockerville on the number line by identifying Banksville at –3.2 and Crockerville at –7.0 (6.NS.C.6). In Part C, the student agrees with Juan; however, the analysis only describes the scale of the number line as "every two marks is one" and does not indicate why K is –3.7 (no credit for MP3). In Part D, the student explains points on the number line that are equidistant from zero have the same absolute value by stating, "they are the same number of marks away from zero as the other" (6.NS.C.7c).
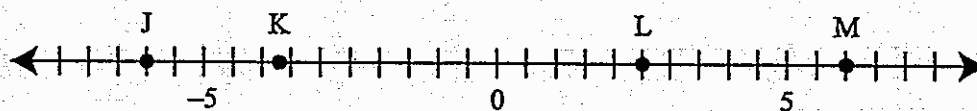
Total Awarded Points: 3 out of 4

4. Temperature Task

The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
Banksville	−3.2
Crockerville	−7.0
Sandtown	−3.7
Bluetown	6.0
Southville	−6.0
Humbletown	2.5

a. List the average temperatures from lowest to highest.

The number line below shows the average temperature for some of these towns.

b. On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

Litho#: 0044

A-5b

c.   Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

> I disagree with Juan because at point K its not −3.7 its about −4.25

d.   Explain how you can use the number line to determine which two temperatures have the same absolute value.

> by Counting from zero on both sides because absolute value is the distence from zero.

Litho#: 0044

Anchor 5   Litho 0044

Total Content Points: 2   (6.NS.C.7, 6.NS.C.7c)

Total Practice Points: 0

In Part A, the student orders the values in the table correctly from lowest to highest by writing a top-to-bottom vertical list (–7.0 … 6.0) (6.NS.C.7). In Part B, the student does not plot points representing the average temperatures of Banksville and Crockerville on the number line (no credit for 6.NS.C.6). In Part C, the student disagrees with Juan that point K is –3.7, stating that "its about –4.25" (no credit for MP3). In Part D, the student explains points on the number line that are equidistant from zero have the same absolute value by noting that absolute value is "the distence from zero" (6.NS.C.7c).

Total Awarded Points: 2 out of 4

4. Temperature Task

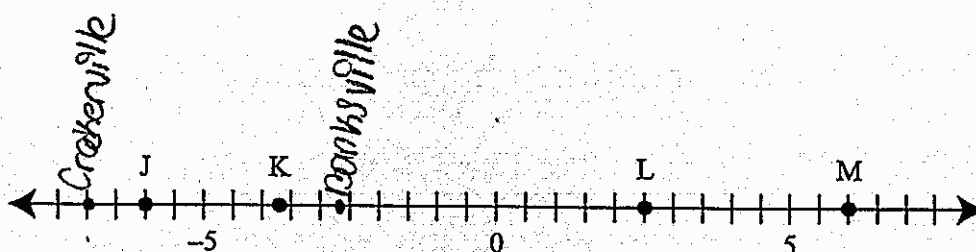The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
✓ Banksville	−3.2
✓ Crockerville	−7.0
✓ Sandtown	−3.7
✓ Bluetown	6.0
✓ Southville	−6.0
✓ Humbletown	2.5

a. List the average temperatures from lowest to highest.

Crockerville, Southville, Sandtown, Banksville, Humbletown and Bluetown.

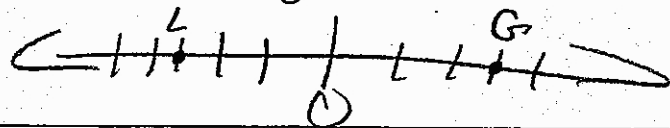The number line below shows the average temperature for some of these towns.

Crockerville   J   K   Banksville   L   M

−5   0   5

b. On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

Litho#: 0021

c.   Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

> I agree with Juan because that point on the number line represents the number −3.7.

d.   Explain how you can use the number line to determine which two temperatures have the same absolute value.

> You can use the number line by seeing if the negative number would be the same if you put it on the not negative side like this

These are the same numbers only one of them is negative.

Anchor 6   Litho 0021

Total Content Points: 2   (6.NS.C.7, 6.NS.C.7c)

Total Practice Points: 0

In Part A, the student orders the values in the table correctly from lowest to highest by writing the names of the towns in a correct left-to-right order, starting with Crockerville and ending with Bluetown (6.NS.C.7). In Part B, the student correctly plots and labels Crockerville at −7.0; however, Banksville is incorrectly plotted at −2.7 (no credit for 6.NS.C.6). In Part C, the student agrees with Juan that point K is −3.7 but does not explain with mathematical reasoning how K is determined to be −3.7 on the number line (no credit for MP3). In Part D, the student explains points on the number line that are equidistant from zero have the same absolute value by creating two points (L and G) on a number line located at the same distance from zero (3 increment marks), with one point (L) being left of zero and one point (G) being right of zero (6.NS.C.7c).
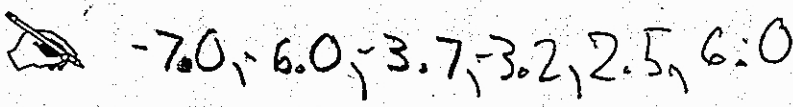
Total Awarded Points: 2 out of 4

4. Temperature Task

The table illustrates the average temperatures of several towns for the month of January.
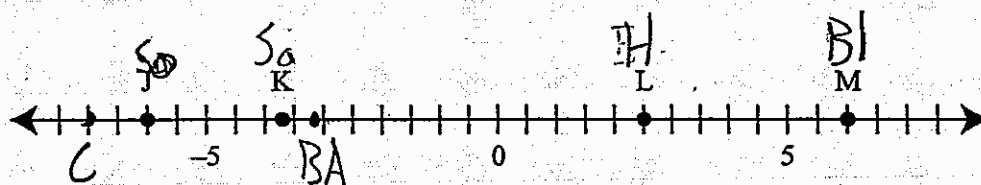
Town	Average Temperature (in °F)
Ba Banksville	X −3.2
C Crockerville	X −7.0
Sa Sandtown	O X −3.7
Bl Bluetown	O X 6.0
So Southville	O X −6.0
H Humbletown	O X 2.5

a.   List the average temperatures from lowest to highest.

$-7.0, -6.0, -3.7, -3.2, 2.5, 6.0$

The number line below shows the average temperature for some of these towns.

So   Sa   H   Bl
  K   L   M

C   −5   BA   0   5

b.   On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

c.   Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

> I agree because the K on the number line is the same as it is on the table

d.   Explain how you can use the number line to determine which two temperatures have the same absolute value.

> count how many numberes are between the numbere and zero

Anchor 7   Litho 0014

Total Content Points: 2   (6.NS.C.7, 6.NS.C.6)

Total Practice Points: 0

In Part A, the student orders the values in the table correctly from lowest to highest by writing a left-to-right horizontal sequence (−7.0 … 6.0) (6.NS.C.7). In Part B, the student correctly plots points representing the average temperatures of Banksville and Crockerville on the number line by identifying Banksville as "BA" at −3.2 and Crockerville as "C" at −7.0 (6.NS.C.6). In Part C, the student agrees with Juan that point K is the same as it is in the table, but does not use mathematical reasoning to explain how K is determined to be −3.7 on the number line (no credit for MP3). In Part D, because the explanation includes no reference to equidistance from zero, the student does not successfully explain that points on the number line that are equidistant from zero have the same absolute value (no credit for 6.NS.C.7c).
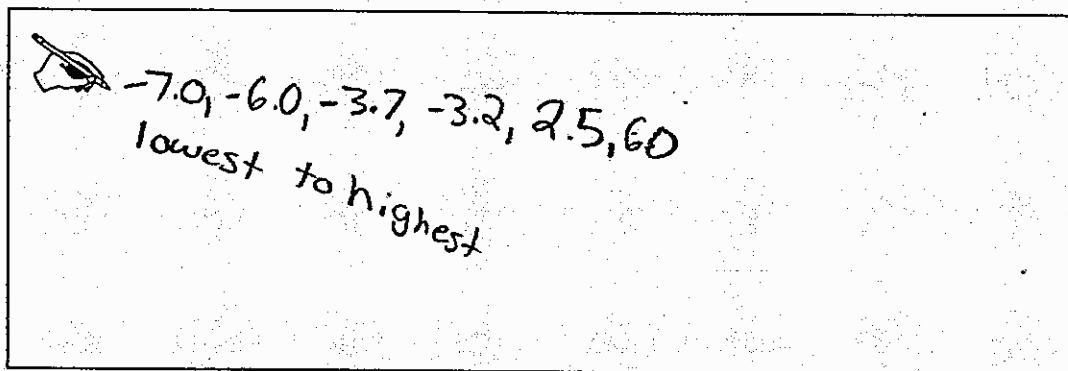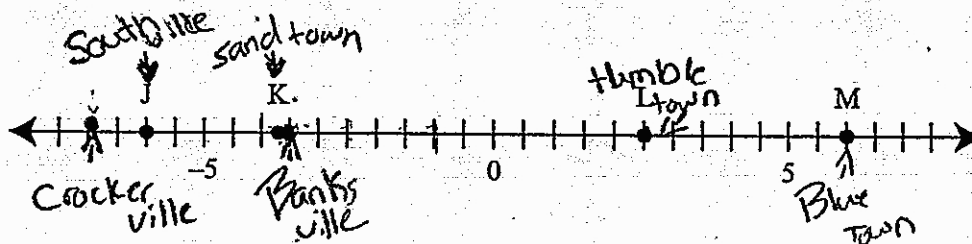
Total Awarded Points: 2 out of 4

4. Temperature Task

The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
Banksville	−3.2
Crockerville	−7.0
Sandtown	−3.7
Bluetown	6.0
Southville	−6.0
Humbletown	2.5

a.   List the average temperatures from lowest to highest.

−7.0, −6.0, −3.7, −3.2, 2.5, 60
lowest to highest

The number line below shows the average temperature for some of these towns.

b.   On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

Litho#: 0003

A-8b

c. Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

I agree because it is on the
Point of Sandtown, "-3.7

d. Explain how you can use the number line to determine which two temperatures have the same absolute value.

the 2 that are the same
Which would be Bluetown + Southuille
with -6.0 +6.0

Litho#: 0003

Anchor 8 Litho 0003

Total Content Points: 1 (6.NS.C.7)

Total Practice Points: 0

In Part A, the student orders the values in the table correctly from lowest to highest by writing a left-to-right horizontal sequence (–7.0 … 6.0) (6.NS.C.7). In Part B, the student correctly plots and labels Crockerville at –7.0; however, Banksville is incorrectly plotted at –3.5 (no credit for 6.NS.C.6). In Part C, the student agrees with Juan that point K is the same point as Sandtown (–3.7), but does not use mathematical reasoning to explain how K is determined to be at –3.7 on the number line (no credit for MP3). In Part D, the student explains that Bluetown and Southville (6.0 and –6.0, respectively) "are the same," but does not indicate that these points on the number line are equidistant from zero (no credit for 6.NS.C.7c).

Total Awarded Points: 1 out of 4

4. Temperature Task

The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
Banksville	−3.2
Crockerville	−7.0
Sandtown	−3.7
Bluetown	6.0
Southville	−6.0
Humbletown	2.5

a. List the average temperatures from lowest to highest.

✍ Crockerville: −7.0, Southville: −6.0, Sand town: −3.7, Banksville: −3.2, Humbletown: 2.5, Bluetown: 6.0

The number line below shows the average temperature for some of these towns.
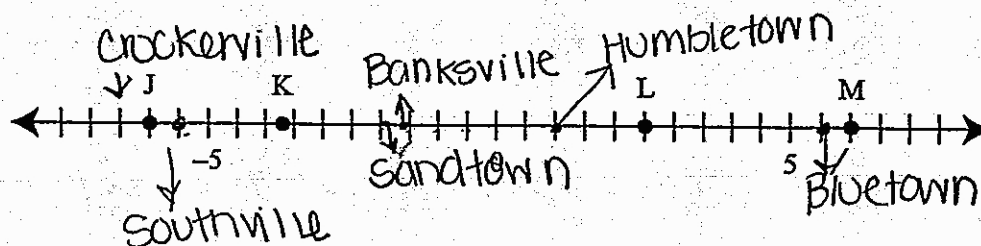
b. On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

Litho#: 0002

c. Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

I disagree with Juan. K is no location on the chart.

d. Explain how you can use the number line to determine which two temperatures have the same absolute value.

Sand town and Banksville. Because their tempreture are almost the same

Litho#: 0002

Anchor 9   Litho 0002

Total Content Points: 1   (6.NS.C.7)

Total Practice Points: 0

In Part A, the student orders the values in the table correctly from lowest to highest by listing the towns and corresponding temperatures in a left-to-right, top-to-bottom order starting with Crockerville (–7.0) and ending with Bluetown (6.0) (6.NS.C.7). In Part B, the student incorrectly plots the locations of Banksville and Crockerville on the number line (no credit for 6.NS.C.6). In Part C, the student disagrees with Juan and notes that point K is not on the chart, thus not using mathematical reasoning to show how K is determined to be –3.7 on the number line (no credit for MP3). In Part D, the student explains that Sandtown's and Banksville's temperatures "are almost the same," but does not indicate that these points on the number line are equidistant from zero (no credit for 6.NS.C.7c).
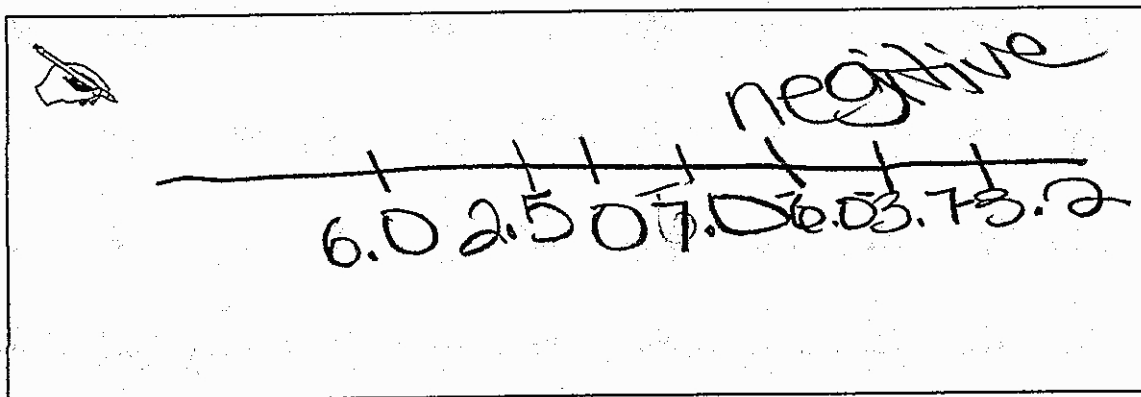
Total Awarded Points: 1 out of 4

A-10a

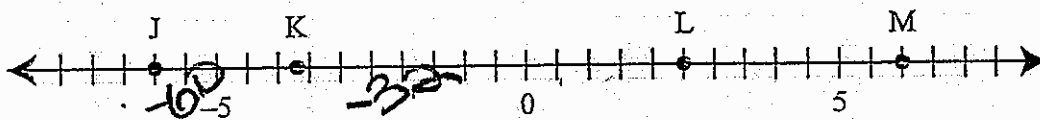## 4. Temperature Task

The table illustrates the average temperatures of several towns for the month of January.

Town	Average Temperature (in °F)
Banksville	~~3.2~~
Crockerville	~~-7.0~~
Sandtown	~~-3.7~~
Bluetown	~~6.0~~
Southville	−6.0
Humbletown	~~2.5~~

a.   List the average temperatures from lowest to highest.

The number line below shows the average temperature for some of these towns.

b.   On the number line, plot points to represent the average temperatures of the towns in the table that are not already on the number line. Clearly indicate which towns you have added.

Litho#: 0069

c. Juan says that point K on the number line represents the average temperature of Sandtown. Do you agree or disagree with Juan? Use mathematical reasoning to explain why you agree or disagree with Juan.

> I agree because right after 5 would be 4 then 3 so K is -3.7

d. Explain how you can use the number line to determine which two temperatures have the same absolute value.

> $|6| = -6$
> $|-6| = 6$
> So Bluetown and Southville have the same absolute value

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Total Content Points: 0

Total Practice Points: 0

In Part A, the student does not correctly order the values in the table from lowest to highest (no credit for 6.NS.C.7). In Part B, the student does not correctly plot and label the points for Banksville and Crockerville (no credit for 6.NS.C.6). In Part C, the student agrees with Juan that point K is −3.7, but does not construct a viable mathematical argument to support the position, instead stating, "after 5 would be 4 then 3 so K is −3.7" (no credit for MP3). In Part D, the student explains that Bluetown and Southville have the same absolute value, but does not indicate that these points on the number line are equidistant from zero (no credit for 6.NS.C.7c).

Total Awarded Points: 0 out of 4