SECURE MATERIAL – Reader Name: _____

Tennessee Comprehensive Assessment Program

TCAP/CRA

2014

3

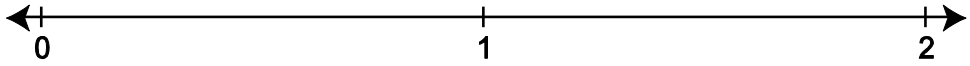
Phase III

Number Line Task

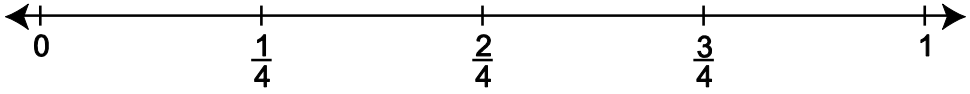
Anchor Set

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

Scoring Guide

The CCSS for Mathematical Content (3 points)

3.NF.A.2a Indicates the approximate location of $\frac{1}{2}$ on the number line. _____

(1 Point)

3.NF.A.2b Indicates the approximate location of $\frac{3}{4}$ on the number line. _____

(1 Point)

3.NF.A.3c Indicates the location of $\frac{2}{2}$ on the number line. _____

(1 Point)

The CCSS for Mathematical Practice (2 points)

MP3 Constructs a valid argument explaining why $\frac{2}{8}$ is equivalent to $\frac{1}{4}$. Student may do this by: _____

- making additional hash marks or points on the number line to show there are 2 pieces inside each $\frac{1}{4}$ segment, and that each of the new segments is $\frac{1}{8}$ in length (that the new segments indicate eighths), and that there are 2 eighths inside the $\frac{1}{4}$;
- stating that the denominator and the numerator are doubled from $\frac{1}{4}$ to $\frac{2}{8}$; or
- writing $\frac{1}{4} \times \frac{2}{2} = \frac{2}{8}$. (*Some students may show an equation as an explanation, but it is not expected.)*

(1 Point)
(MP3: Construct viable arguments and critique the reasoning of others.)

MP6 Uses precise mathematical language in the explanation including referencing the numerator and denominator or the size of the parts as being fourths and eighths. _____
(1 Point)
(MP6: Attend to precision.)

TOTAL POINTS: 5

The CCSS for Mathematical Content Addressed In This Task

Develop understanding of fractions as numbers.	
3.NF.A.2a	Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
3.NF.A.2b	Represent a fraction *a/b* on a number line diagram by marking off *a* lengths 1/b from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.
3.NF.A.3c	Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*

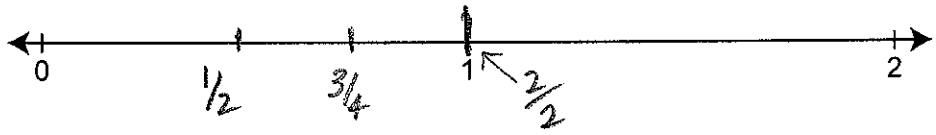
The CCSS for Mathematical Practice*

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.

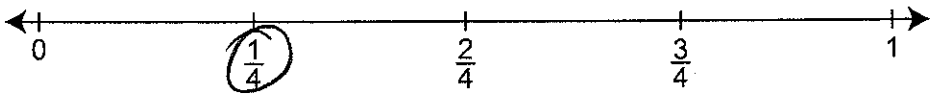
* Gray type indicates Mathematical Practices not addressed in this assessment.

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

I know 1/4 and 2/8 are equivalent because if you double the numerator of 1/4 you get 2 and if you double the denominator of 1/4 you get 8. So $\frac{1}{4} = \frac{2}{8}$

Anchor 1 Litho 00415200179

Total Content Points: 3 (3.NF.A.2a, 3.NF.A.2b, 3.NF.A.3c)

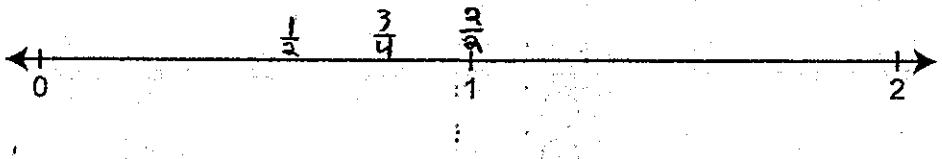
Total Practice Points: 2 (MP3, MP6)

In Part A the student indicates the approximate location of the fraction $\frac{1}{2}$ (3.NF.A.2a); the student also correctly indicates the approximate location of $\frac{3}{4}$ on the number line (3.NF.A.2b). The exact location of $\frac{2}{2}$ is also correctly located on the number line (3.NF.A.3c). In Part B, the student circles $\frac{1}{4}$ on the number line and constructs a valid explanation why $\frac{2}{8}$ is equivalent to $\frac{1}{4}$ by stating that the numerator and denominator are both doubled from $\frac{1}{4}$ to $\frac{2}{8}$ ("if you double the numerator of $\frac{1}{4}$ you get 2 and if you double the denominator of $\frac{1}{4}$ you get 8") (MP3). The student uses precise mathematical language in the explanation, including accurately referencing both the numerator and denominator (MP6).

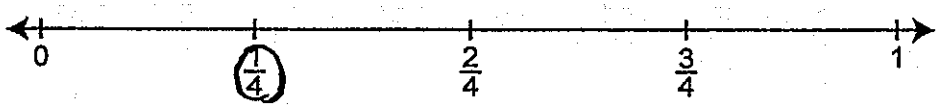
Total Awarded Points: 5 out of 5

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

well all you have to do is simplify $\frac{2}{8}$ down to $\frac{1}{4}$.

Litho#: 00143200170

Anchor 2 Litho 00143200170

Total Content Points: 3 (3.NF.A.2a, 3.NF.A.2b, 3.NF.A.3c)

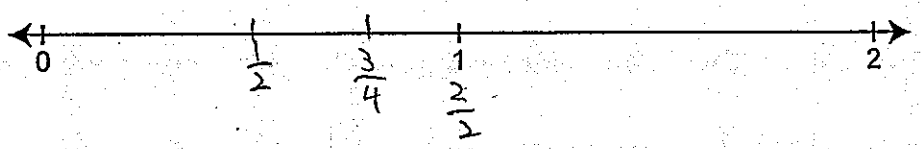
Total Practice Points: 1 (MP3)

In Part A the student indicates the approximate locations of the fractions $\frac{1}{2}$ and $\frac{3}{4}$ on the number line (3.NF.A.2a, 3.NF.A.2b). The student also indicates the location of $\frac{2}{2}$ on the number line (3.NF.A.3c). In Part B, the student circles $\frac{1}{4}$ on the number line and constructs a valid argument to support why $\frac{2}{8}$ is equivalent to $\frac{1}{4}$ ("simplify $\frac{2}{8}$ down to $\frac{1}{4}$") (MP3). However, the explanation does not reference the numerator and denominator or the size of the parts (no credit for MP6).

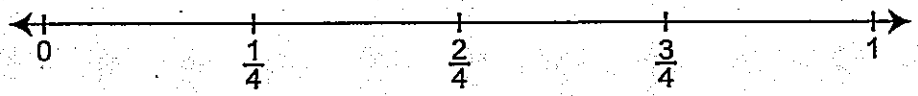
Total Awarded Points: 4 out of 5

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.

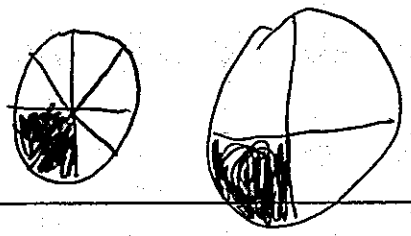


James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

$\frac{2}{8}$ is equivalent to $\frac{1}{4}$ because if you make a circle and make $\frac{2}{8}$ and $\frac{1}{4}$ you see they are equivalent.



Litho#: 00373200173

Anchor 3 Litho 00373200173

Total Content Points: 3 (3.NF.A.2a, 3.NF.A.2b, 3.NF.A.3c)

Total Practice Points: 1 (MP3)

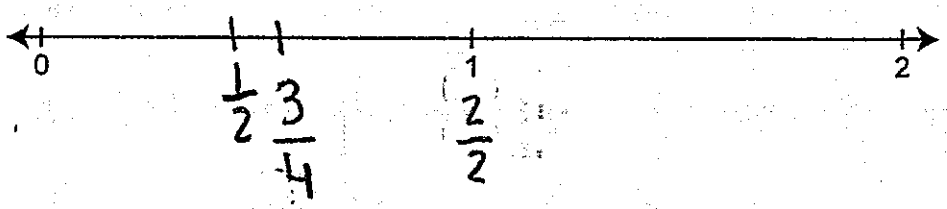
In Part A the student indicates the approximate locations of the fractions $\frac{1}{2}$ and $\frac{3}{4}$ on the number line (3.NF.A.2a, 3.NF.A.2b). The student also indicates the location of $\frac{2}{2}$ on the number line (3.NF.A.3c). In Part B, although the student does not circle $\frac{1}{4}$ on the number line, the response makes it clear that $\frac{1}{4}$ is the choice of fraction equivalent to $\frac{2}{8}$ ("$\frac{2}{8}$ is equivalent to $\frac{1}{4}$"). The student then constructs a diagram showing that one of four pieces $\left(\frac{1}{4}\right)$ is equivalent to two of eight pieces $\left(\frac{2}{8}\right)$ (MP3). By using a diagram to explain equivalence, the student does not with words reference numerator and denominator or the size of the parts, so there is no evidence for precise mathematical language (no credit for MP6).

Total Awarded Points: 4 out of 5

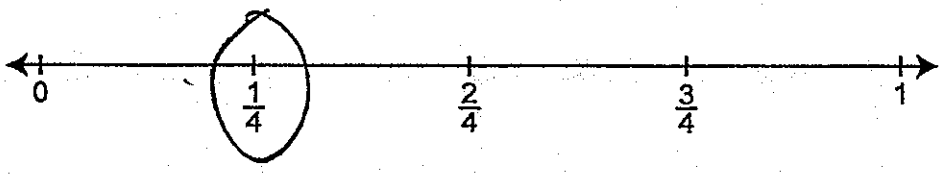
A-4

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

I know that $\frac{1}{4}$ is = to $\frac{2}{8}$ because half of two is 1 and half of 8 is 4.

Litho#: 00073200170

Anchor 4 Litho 00073200170

Total Content Points: 2 (3.NF.A.2a, 3.NF.A.3c)

Total Practice Points: 1 (MP3)

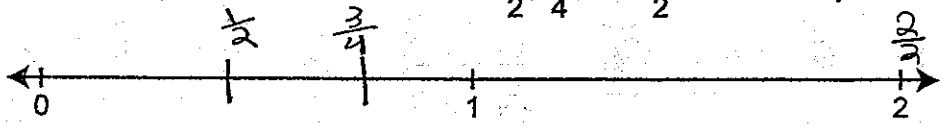
In Part A the student indicates the approximate location of the fraction $\frac{1}{2}$ on the number line (3.NF.A.2a). The student also correctly indicates the location of $\frac{2}{2}$ on the number line (3.NF.A.3c). However, the placement of $\frac{3}{4}$ is not considered a correct approximate location (no credit for 3.NF.A.2b). In Part B, the student circles $\frac{1}{4}$ on the number line and constructs a valid explanation why $\frac{2}{8}$ is equivalent to $\frac{1}{4}$ ("half of two is 1 and half of 8 is 4") (MP3). By not referencing the numerator and denominator or the size of the parts, the student has not demonstrated the use of precise mathematical language (no credit for MP6).

Total Awarded Points: 3 out of 5

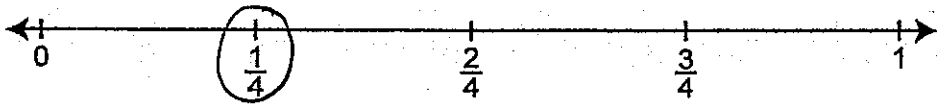
A-5

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

$\frac{2}{8}$ is equivalent to $\frac{1}{4}$ because when you half the numerator its 1. When You half the denominator it 4. When You put 1 and 4 together, You get $\frac{1}{4}$.

Litho#: 00133200170

Anchor 5 Litho 00133200170

Total Content Points: 2 (3.NF.A.2a, 3.NF.A.2b)

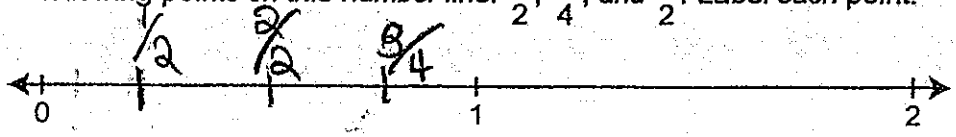
Total Practice Points: 1 (MP3)

In Part A the student indicates the approximate locations of the fractions $\frac{1}{2}$ and $\frac{3}{4}$ on the number line (3.NF.A.2a, 3.NF.A.2b). However, the student incorrectly indicates the location of $\frac{2}{2}$ on the number line (no credit for 3.NF.A.3c). In Part B, the student circles $\frac{1}{4}$ on the number line and constructs a valid explanation why $\frac{2}{8}$ is equivalent to $\frac{1}{4}$ (“when you half the numerator its 1. When You half the denominator it 4”) (MP3). Although the explanation includes accurate referencing of the numerator and denominator, the student does not use precise mathematical language (“When you put 1 and 4 together, you get $\frac{1}{4}$”) (no credit for MP6).

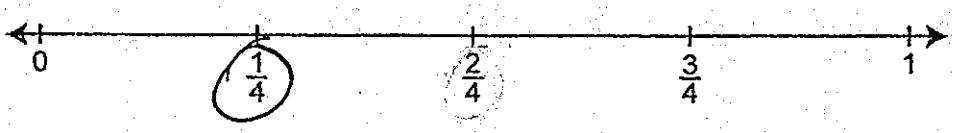
Total Awarded Points: 3 out of 5

Number Line Task

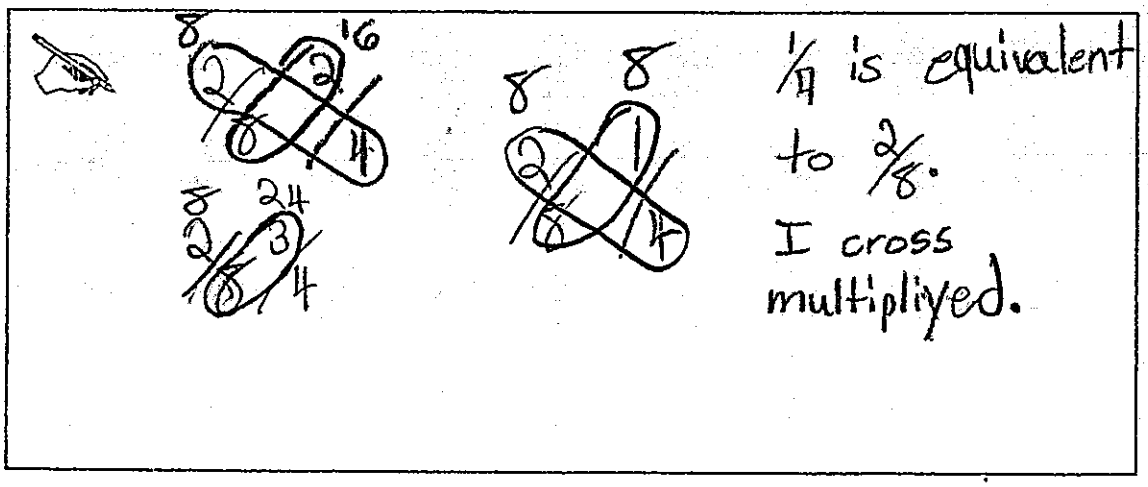
a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.



Litho#: 00783200170

Anchor 6 Litho 00783200170

Total Content Points: 1 (3.NF.A.2b)

Total Practice Points: 1 (MP3)

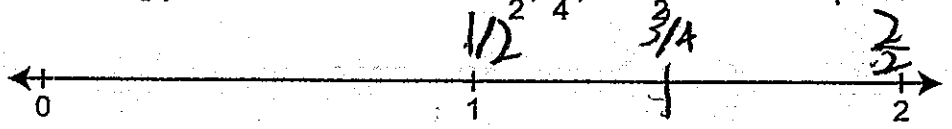
In Part A the student correctly indicates the approximate location of the fraction $\frac{3}{4}$ on the number line (3.NF.A.2b). However, the student incorrectly indicates the approximate location of $\frac{1}{2}$ and incorrectly indicates the location of $\frac{2}{2}$ on the number line (no credit for 3.NF.A.2a, no credit for 3.NF.A.3c). In Part B, the student circles $\frac{1}{4}$ on the number line and constructs a valid explanation why the fractions are equivalent by cross-multiplying $\frac{2}{8}$ with each of the fractions on the number line, proving that $\frac{1}{4}$ is equivalent to $\frac{2}{8}$ by showing equal products (8, 8) (MP3). However, by using cross-multiplying to explain equivalence, the student does not use words to reference the numerator and denominator or the size of the parts, so there is no evidence for precise mathematical language (no credit for MP6).

Total Awarded Points: 2 out of 5

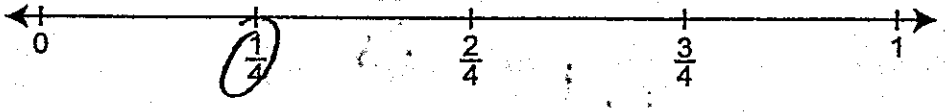
A-7

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

I know it's equle because both the denominater and numerater can be mutiplide by two and make 2/8

Anchor 7 Litho 00443200170

Total Content Points: 0

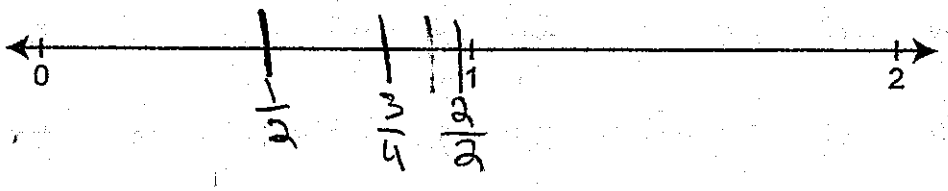
Total Practice Points: 2 (MP3, MP6)

In Part A the student incorrectly indicates the approximate locations of the fractions $\frac{1}{2}$ and $\frac{3}{4}$ on the number line (no credit for 3.NF.A.2a, no credit for 3.NF.A.2b). The student also incorrectly indicates the location of $\frac{2}{2}$ (no credit for 3.NF.A.3c). In Part B, the student circles $\frac{1}{4}$ on the number line and constructs a valid explanation why the fractions are equivalent ("it is equle because both the denomonater and numerater can be mutiplide by two and make $\frac{2}{8}$") (MP3). The student uses precise mathematical language in the explanation, including accurately referencing both the numerator and denominator (MP6).

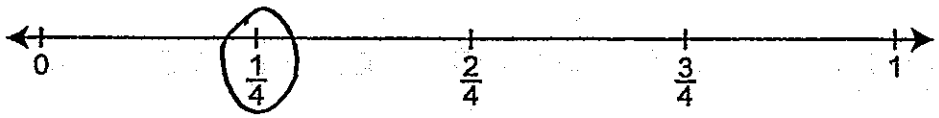
Total Awarded Points: 2 out of 5

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

I know 1/4 is equivalent because I cut 2/8 in half to get 1/4.

Anchor 8 Litho 00303200170

Total Content Points: 2 (3.NF.A.2a, 3.NF.A.2b)

Total Practice Points: 0

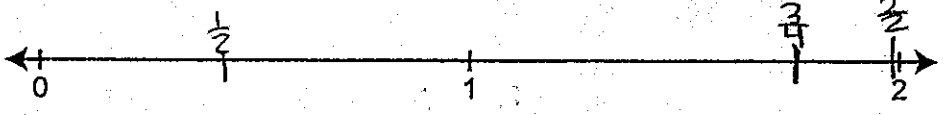
In Part A the student indicates the approximate locations of the fractions $\frac{1}{2}$ and $\frac{3}{4}$ on the number line (3.NF.A.2a, 3.NF.A.2b). However, the student incorrectly indicates the location of $\frac{2}{2}$, which needs to be placed exactly on the 1 on the number line to demonstrate recognition that whole numbers can be expressed as fractions (no credit for 3.NF.A.3c). In Part B, the student circles $\frac{1}{4}$ on the number line. However, by incorrectly stating "cut $\frac{2}{8}$ in half to get $\frac{1}{4}$," instead of indicating that the numerator and denominator, or 2 and 8, need to each be divided by two, the student does not construct a valid explanation why the fractions are equivalent (no credit for MP3). The explanation in Part B neither uses precise mathematical language nor references the numerator and denominator or the size of the parts (no credit for MP6).

Total Awarded Points: 2 out of 5

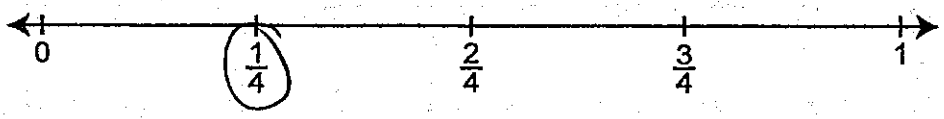
A-9

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

$\frac{1}{4}$ fourth is equivalent to $\frac{2}{8}$ because 2 going into 8 4 times so $\frac{1}{4}$ fourth is equivilant to $\frac{2}{8}$

Litho#: 00253200170

Anchor 9 Litho 00253200170

Total Content Points: 1 (3.NF.A.2a)

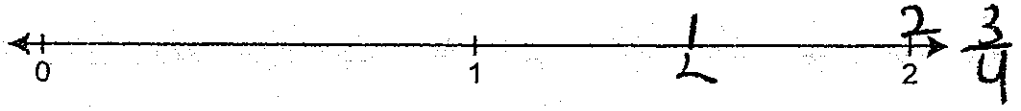
Total Practice Points: 0

In Part A the student indicates the approximate location of the fraction $\frac{1}{2}$ on the number line (3.NF.A.2a). However, the student incorrectly indicates the approximate location of $\frac{3}{4}$ and incorrectly indicates the exact location of $\frac{2}{2}$ on the number line (no credit for 3.NF.A.2b, no credit for 3.NF.A.3c). In Part B, the student circles $\frac{1}{4}$ on the number line, but by giving an incomplete statement that only addresses the reducing of the 8 and not the 2 in the fraction $\frac{2}{8}$ ("because 2 going into 8 4 times so $\frac{1}{4}$ fourth is equvilant to $\frac{2}{8}$"), does not construct a valid explanation why the fractions are equivalent (no credit for MP3). The explanation in Part B neither uses precise mathematical language ("$\frac{1}{4}$ fourth") nor references the numerator and denominator or the size of the parts (no credit for MP6).

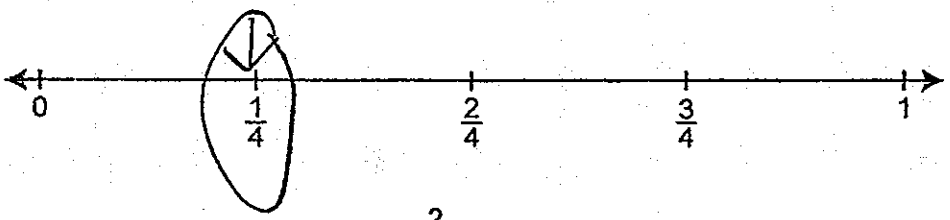
Total Awarded Points: 1 out of 5

Number Line Task

a. Place the following points on this number line: $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{2}{2}$. Label each point.



James says that $\frac{2}{8}$ is equivalent to a fraction marked on the number line below. James is correct.



b. Circle the fraction that is equivalent to $\frac{2}{8}$ on this number line. Explain in words how you know that the fraction you circled is equivalent to $\frac{2}{8}$.

two is half of one and eg wight is half of four.

Litho#: 00853200170

Anchor 10 Litho 00853200170

Total Content Points: 0

Total Practice Points: 0

In Part A the student incorrectly indicates the approximate locations of the fractions $\frac{1}{2}$ and $\frac{3}{4}$ on the number line (no credit for 3.NF.A.2a, no credit for 3.NF.A.2b). The student also incorrectly indicates the location of $\frac{2}{2}$ (no credit for 3.NF.A.3c). In Part B, the student circles $\frac{1}{4}$ on the number line, but by giving an incorrect statement ("two is half of one and eghight is half of four"), does not construct a valid explanation why the fractions are equivalent (no credit for MP3). The explanation in Part B neither uses precise mathematical language nor references the numerator and denominator or the size of the parts (no credit for MP6).

Total Awarded Points: 0 out of 5