SECURE MATERIAL – Reader Name: _____

Tennessee Comprehensive Assessment Program

TCAP/CRA

2014

6

Phase III

Are These Ratios the Same? Task

Anchor Set

Are These Ratios the Same? Task

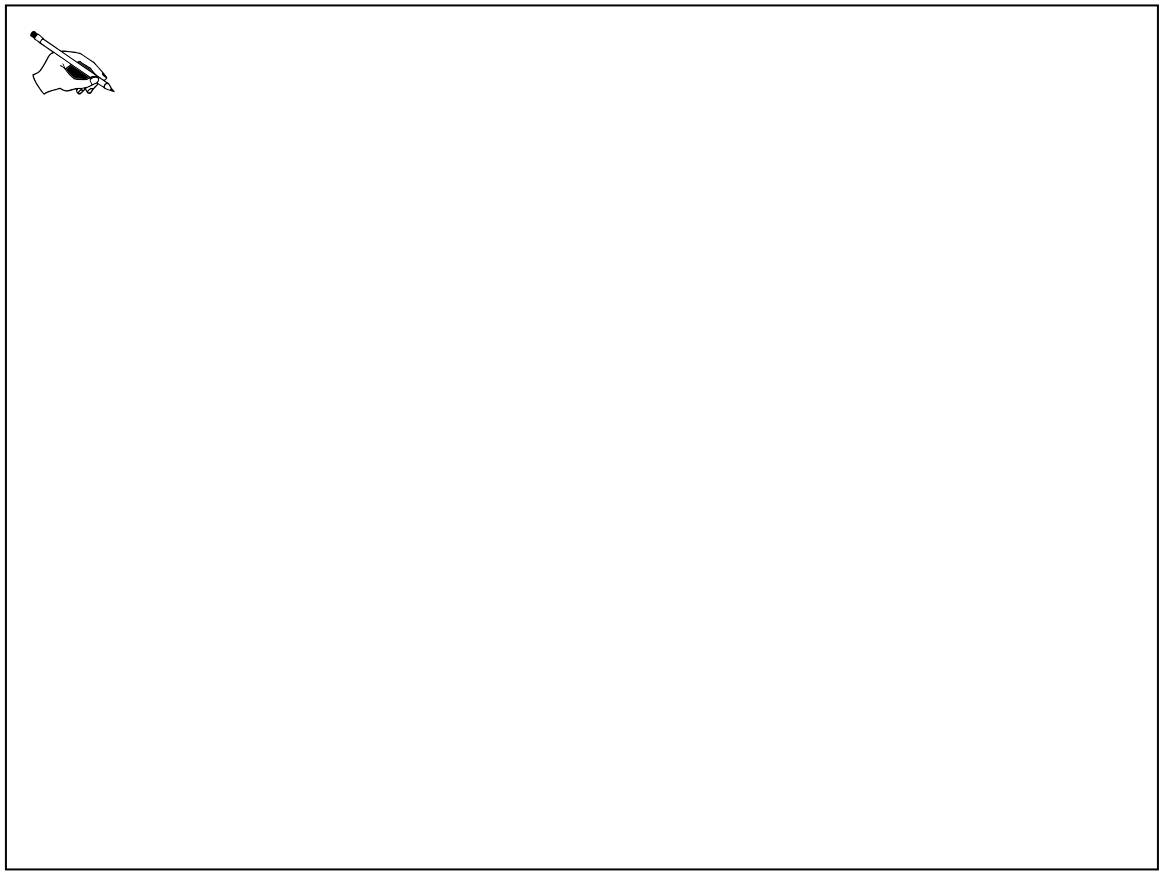
The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.



Scoring Guide

The CCSS for Mathematical Content (4 points)

6.RP.A.1(x) Uses ratios or ratio language to explain the meaning of each of the numbers in part a. **(1 Point)** _____

6.RP.A.1(z) Uses ratios or ratio language to explain the meaning of each of the numbers in part b. **(1 Point)** _____

6.RP.A.2 Uses unit rate to set up a relationship between the number of boys and the number of girls in part c. **(1 Point)** _____

6.RP.A.3 Solves for the missing piece of data in part c. **(1 Point)** _____

The CCSS for Mathematical Practices (1 point)

MP4 Uses an appropriate table or tape diagram to scale the ratio. **(1 Point)** _____
(MP4: Model with mathematics.)

TOTAL POINTS: 5

The CCSS for Mathematical Content Addressed In This Task

Understand ratio concepts and use ratio reasoning to solve problems.	
6.RP.A.1	Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*
6.RP.A.2	Understand the concept of a unit rate a/b associated with a ratio a: b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*
6.RP.A.3	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

The CCSS for Mathematical Practices*

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.

A-1a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

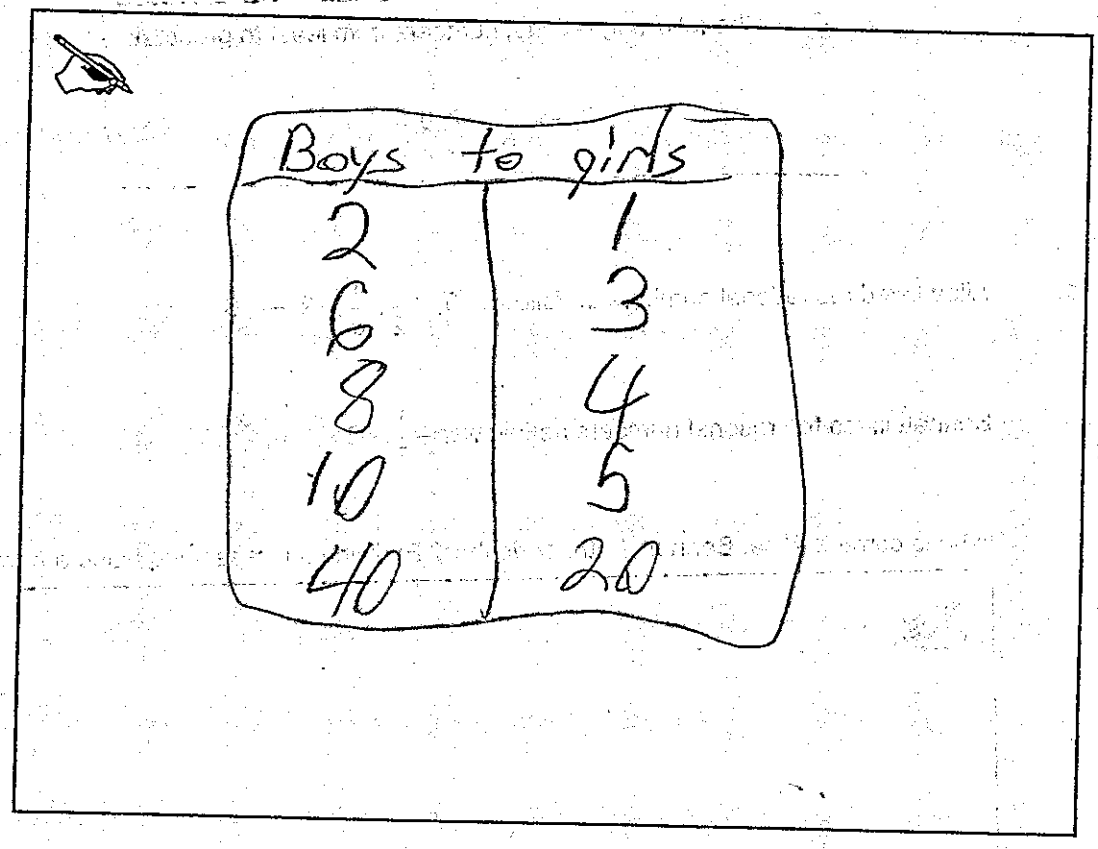
There are 12 boys to 15 girls. Jimmy divided the totals by 3 to get a proportional fraction.

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

12 is the number of boys to 27 students in all.

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.



Anchor 1 Litho 00036200165

Total Content Points: 4 (6.RP.A.1x, 6.RP.A.1z, 6.RP.A.2, 6.RP.A.3)

Total Practice Points: 1 (MP4)

In Part A, the student uses ratio language to explain the meaning of Jimmy's numbers ("There are 12 boys to 15 girls. Jimmy divided the totals by 3 to get a proportional fraction") (6.RP.A.1x). In Part B, the student uses ratio language to explain the meaning of Sammy's numbers ("12 is the number of boys to 27 students in all") (6.RP.A.1z). In Part C, the student uses unit rate to set up the 2:1 relationship between the number of boys and the number of girls (6.RP.A.2). The student then solves for the missing piece of data by determining that 40 boys corresponds with 20 girls (6.RP.A.3). The student provides an appropriate table in Part C that scales the ratio of boys to girls (MP4).

Total Awarded Points: 5 out of 5

A-2a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

Jimmy's numbers represent the ratio of boys to girls.

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

Sammy's numbers represent the ratio of boys to the whole class

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.

$\frac{1}{2} = \frac{x}{40}$ $x = 20$

There are twenty girls

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Total Content Points: 4 (6.RP.A.1x, 6.RP.A.1z, 6.RP.A.2, 6.RP.A.3)

Total Practice Points: 0

The student uses ratio language in Part A to explain the meaning of Jimmy's numbers ("ratio of boys to girls") (6.RP.A.1x). In Part B, the student uses ratio language to explain the meaning of Sammy's numbers ("ratio of boys to the whole class") (6.RP.A.1z). In Part C, the student uses unit rate to set up a proportion $\left(\frac{1}{2} = \frac{x}{40}\right)$ (6.RP.A.2). The student then solves for the missing piece of data ("$x = 20$; There are 20 girls") (6.RP.A.3). The student does not provide an appropriate table or tape diagram in Part C to scale the ratio (no credit for MP4).

Total Awarded Points: 4 out of 5

A-3a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

12:15 both ÷ by 3 = 4 and 5, so 4:5 boys/girls ratio

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

Sammy totally calculated his numbers wrong

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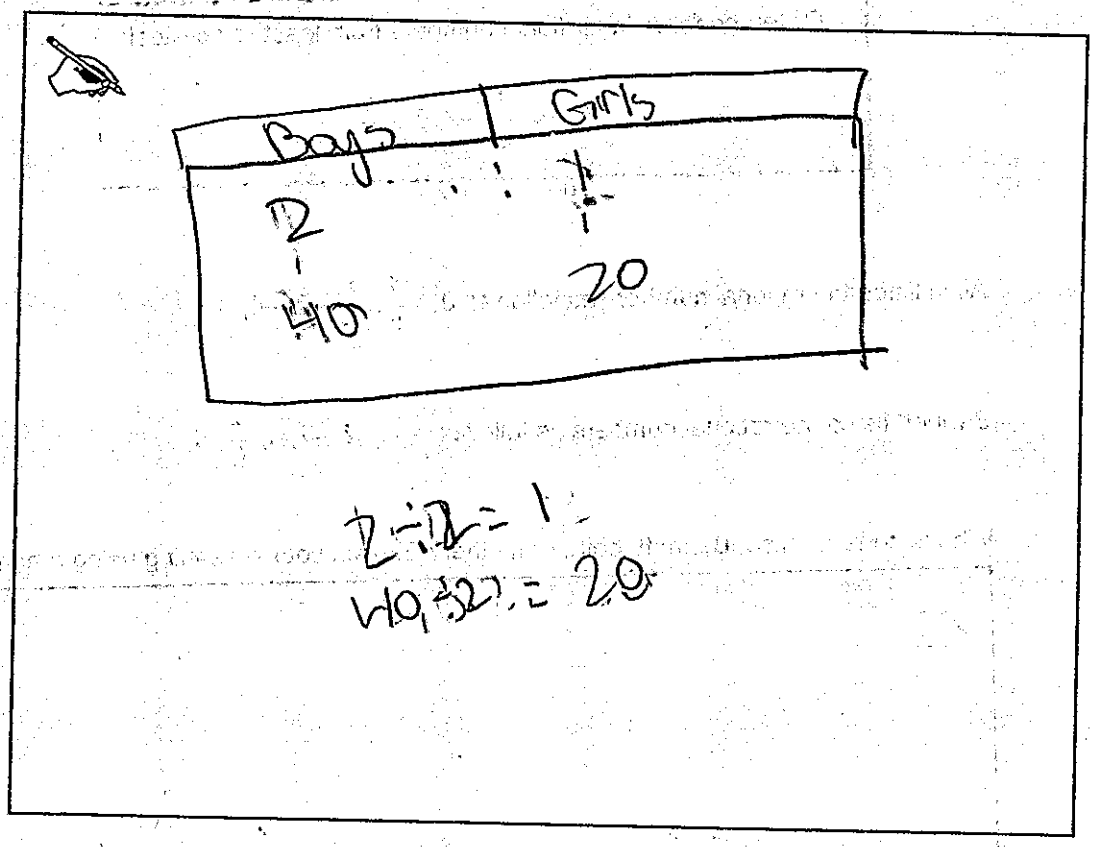
A-3b

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.



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Total Content Points: 3 (6.RP.A.1x, 6.RP.A.2, 6.RP.A.3)

Total Practice Points: 1 (MP4)

The student uses ratios in Part A to explain the meaning of Jimmy's numbers ("4:5 boys/girls") (6.RP.A.1x). In Part B, the student does not use ratios or ratio language to explain the meaning of the given values of 12 and 27 (no credit for 6.RP.A.1z). In Part C, the student uses unit rate to set up the 2:1 relationship between the number of boys and the number of girls (6.RP.A.2). The student then solves for the missing piece of data by determining that 40 boys corresponds with 20 girls (6.RP.A.3). In Part C the student provides an appropriate, though minimal, table that scales the ratio of boys to girls (MP4).

Total Awarded Points: 4 out of 5

A-4a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

There are 12 boys and 15 girls in Jimmy's Class. The ratio of the amount of boys to girls in Jimmy's class is 12 to 15, or 12/15. That ratio will simplify (12/15 ÷3 / ÷3) into the ratio 4 to 5, which are the numbers Jimmy used to represent the ratio of boys to girls.

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

Jimmy's ratio was part to part (boys to girls). Sammy's ratio is part to whole (boys to class). Sammy added the amount of boys to girls to get the entire number of students in the class, in comparison to the amount of boys.

A-4b

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.

Girls	2x	Boys
1	2x1	2
2	2x2	4
4	4x2	8
8	8x2	16
16	16x2	32
24	24x2	48
32	32x2	64
40	40x2	80
48	48x2	96

In the 6th Grade there are 80 boys for every 40 girls, or 2 to 1

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Total Content Points: 3 (6.RP.A.1x, 6.RP.A.1z, 6.RP.A.2)

Total Practice Points: 1 (MP4)

In Part A, the student uses ratio language to explain the meaning of Jimmy's numbers ("4 to 5, which are the numbers Jimmy used to represent the ratio of boys to girls") (6.RP.A.1x). In Part B, the student uses ratio language to explain the meaning of Sammy's numbers ("Sammy's ratio is part to whole (boys to class)") (6.RP.A.1z). In Part C, the student uses unit rate to set up the 2:1 relationship between the number of boys and the number of girls and also shows with a series of expressions in the table the 2:1 relationship (6.RP.A.2). However, the student solves for the number of boys for 40 girls rather than the number of girls for 40 boys (no credit for 6.RP.A.3). The student provides an appropriate table in Part C that scales the ratio of boys to girls (MP4).

Total Awarded Points: 4 out of 5

A-5a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

The ratio 12 to 15 when put into a fraction simplifies to 4/5 (12/15 → 4/5) or 4 to 5 so 4 (or 12) equals the # of boys and 5 (15) equals the number of girls.

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

Sammy did it wrong because it asks to determain the ratio of boys to girls and Sammy only made a fraction because he compared the part, 12 (boys), to the whole, 27 (boys + girls), so he shouldn't have added because thats not what it asked for.

4

A-5b

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.

There would be 20 girls.

X (boys)	Y (girls) X*2=Y
40	20
38	18
36	16
34	14
32	12
30	10
28	8

Continued

x (boys)	y (girls)
26	6
24	4
22	2
20	0
18	0
16	0
14	0
12	0
10	0

and so on...

Anchor 5 Litho 0022620165

Total Content Points: 3 (6.RP.A.1x, 6.RP.A.1z, 6.RP.A.3)

Total Practice Points: 0

In Part A, the student uses ratios to explain the meaning of Jimmy's numbers ("simplifies to $\frac{4}{5}$ . . . or 4 to 5 so 4 (or 12) equals the # of boys and 5 (15) equals the number of girls") (6.RP.A.1x). The student uses ratio language in Part B to explain the meaning of Sammy's numbers ("he [Sammy] compared the part, 12 (boys), to the whole, 27 (boys + girls)") (6.RP.A.1z). In Part C, by showing numbers of boys corresponding to numbers of girls in a ratio other than 2:1, the student does not successfully demonstrate the use of unit rate (no credit for 6.RP.A.2). However, the student does solve for the missing piece of data by determining that 40 boys corresponds with 20 girls (6.RP.A.3). The table that the student provides in Part C is inappropriate for scaling the ratio due to the incorrect correspondence between the numbers of boys to the numbers of girls (no credit for MP4).

Total Awarded Points: 3 out of 5

A-6a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

Jimmy's ratio represent that, for every 4 boys there are; there are 5 girls. 12:15 and 4:5 are equal. 4:5 is just in simplest form.

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

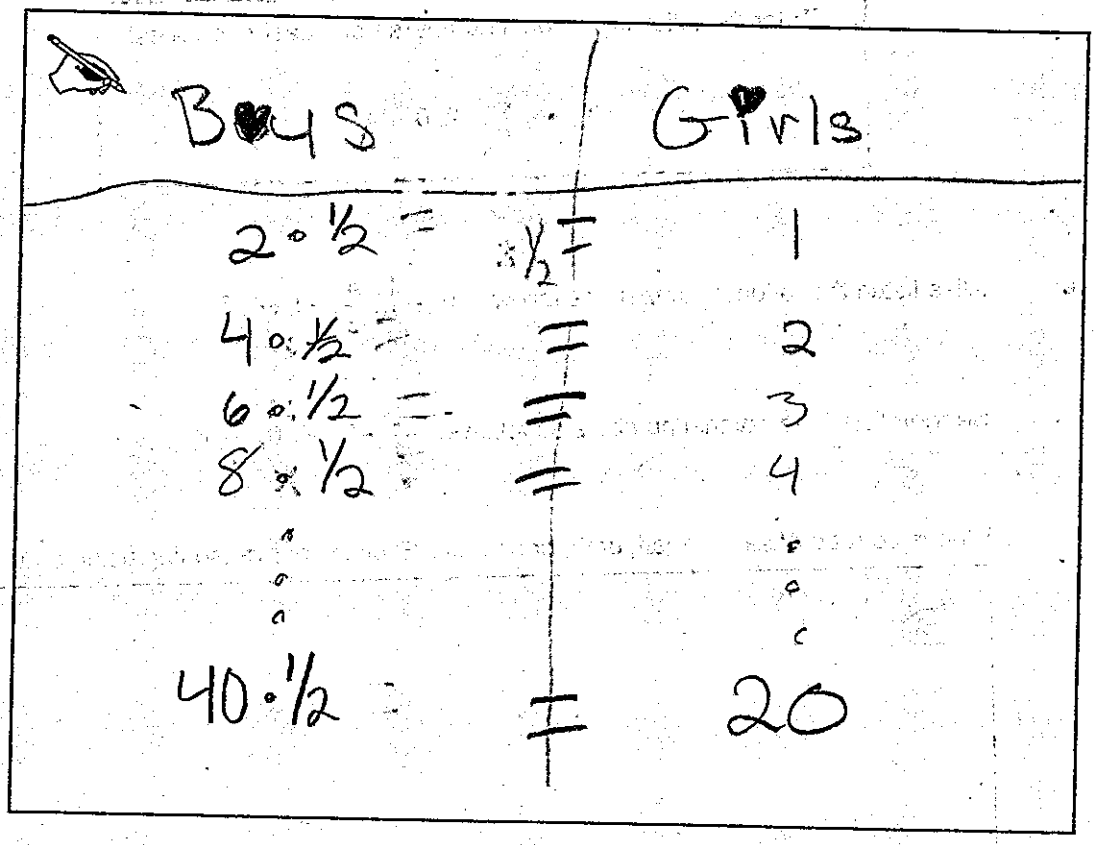
for every 12 boys there are 27 girls.

4

A-6b

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.



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Total Content Points: 3 (6.RP.A.1x, 6.RP.A.2, 6.RP.A.3)

Total Practice Points: 0

In Part A, the student uses ratio language to explain the meaning of Jimmy's numbers ("for every 4 boys there are; there are 5 girls") (6.RP.A.1x). In Part B, although ratio language is used, the student misinterprets the meaning of Sammy's numbers as representing 12 boys to 27 girls instead of to the whole class (no credit for 6.RP.A.1z). In Part C, the student uses unit rate by multiplying the number of boys by $\frac{1}{2}$ to determine the corresponding number of girls (6.RP.A.2). The student concludes through a series of calculations that 40 boys corresponds with 20 girls (6.RP.A.3). The table that the student provides in Part C is inappropriate since the number of boys is shown as a series of expressions rather than as just the number of boys (no credit for MP4).

Total Awarded Points: 3 out of 5

A-7a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

Jimmy simplified 12 and 15 to 4 and 5.

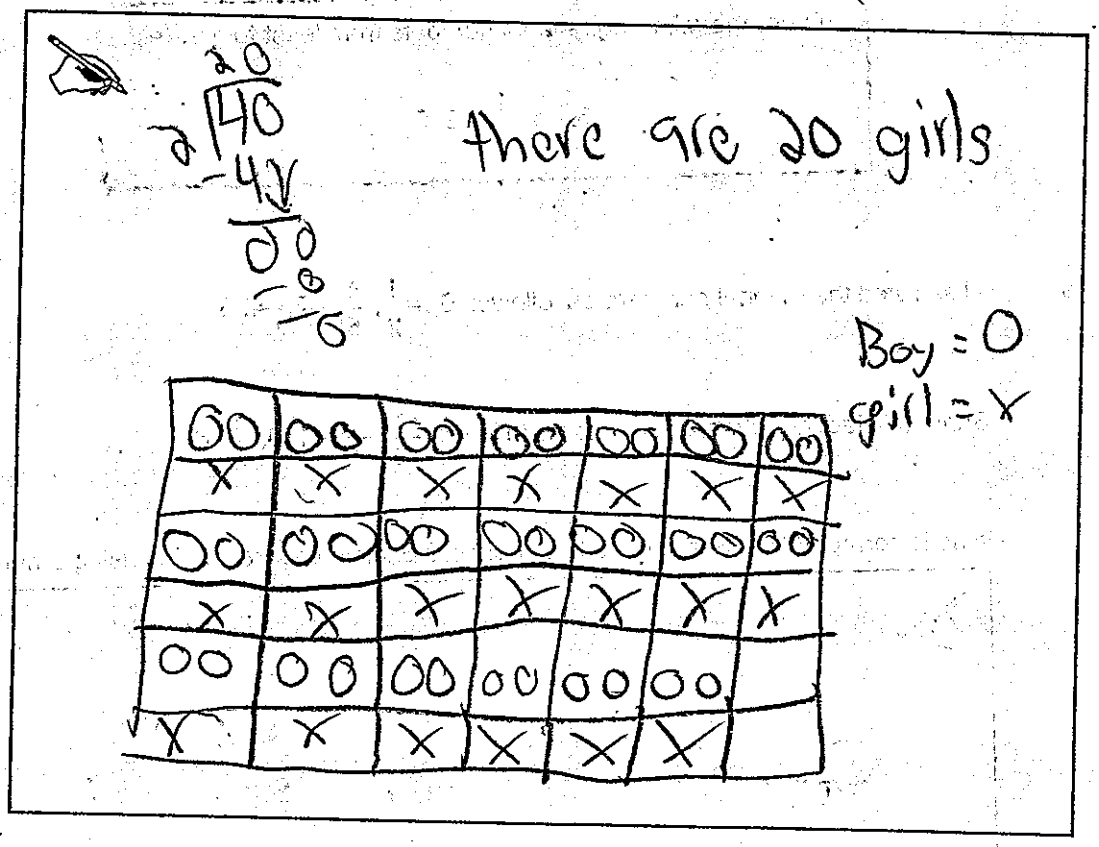
b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

Sammy added 12 and 15.

4

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.



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Total Content Points: 2 (6.RP.A.2, 6.RP.A.3)

Total Practice Points: 0

In Part A, the student does not use ratios or ratio language to explain the meaning of Jimmy's numbers (no credit for 6.RP.A.1x). In Part B, the student does not use ratios or ratio language to explain the meaning of Sammy's numbers (no credit for 6.RP.A.1z). In Part C, the student uses unit rate by defining symbols ("Boy = O; girl = X") and then charting a series of these in a 2:1 ratio (6.RP.A.2). The student solves for the missing piece of data by determining that "there are 20 girls" (6.RP.A.3). The table that the student provides in Part C is inappropriate for scaling the ratio (no credit for MP4).

Total Awarded Points: 2 out of 5

A-8a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

the 4 is the 12 boys and the 5 is the 15 girls because $\frac{12}{15} = \frac{4}{5}$

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

Sammy's number 12 represents the boys and the 27 represents the girls

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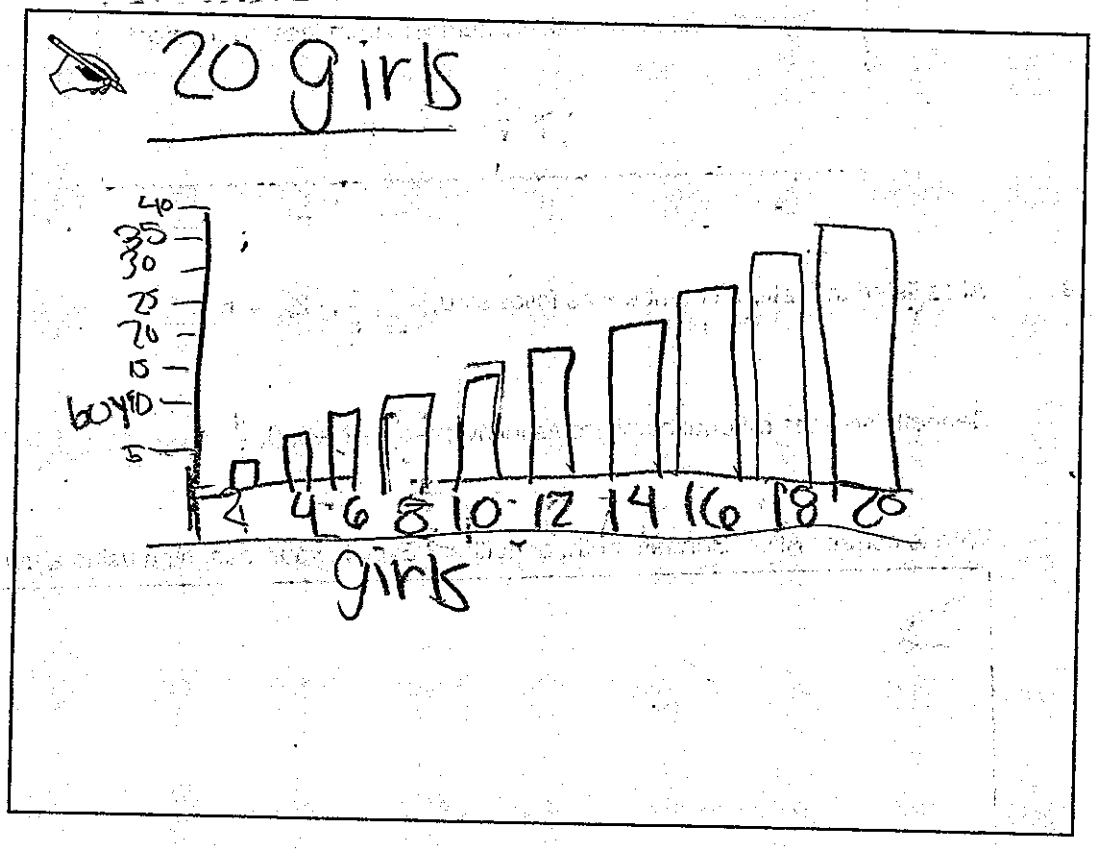
Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.



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Total Content Points: 2 (6.RP.A.1x, 6.RP.A.3)

Total Practice Points: 0

In Part A, the student uses ratios to explain the meaning of Jimmy's numbers ("the 4 is the 12 boys and the 5 is the 15 girls because $\frac{12}{15} = \frac{4}{5}$") (6.RP.A.1x). In Part B, the student misinterprets the meaning of Sammy's numbers as representing 12 boys to 27 girls (no credit for 6.RP.A.1z). In Part C, due to the graphical limitations of the chosen format of the data, which obscures the values that correspond to each other, the student does not provide sufficient evidence of the use of unit rate (no credit for 6.RP.A.2). However, the student does solve for the missing piece of data ("20 girls") (6.RP.A.3). The student's use of a bar graph is not appropriate for scaling the data (no credit for MP4).

Total Awarded Points: 2 out of 5

A-9a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

If you simplify the ratio 12 and 15 you get 4 and 5 which is just a simpler way to represent the data.

$$\frac{12}{15} = \frac{4}{5}$$

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

Sammy most likely tried to make another ratio equal to 12/15 but forgot to also change the first number.

A-9b

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.

If there are two boys for each girl that means that every group of kids there is there is half the amount of boys is the amount of girls.

Girls	Boys
1	2
2	4
3	6
4	8
5	10
6	12
7	14
8	16

5

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Total Content Points: 1 (6.RP.A.2)

Total Practice Points: 1 (MP4)

In Part A, the student does not use ratios or ratio language to explain the meaning of Jimmy's numbers, instead only reducing the numbers and not putting them in the context of boys to girls (no credit for 6.RP.A.1x). In Part B, the student does not use ratios or ratio language to explain the meaning of Sammy's numbers (no credit for 6.RP.A.1z). In Part C, the student uses unit rate to set up the 2:1 relationship between the number of boys and the number of girls and shows this consistent relationship throughout the table (6.RP.A.2). However, the missing piece of data, that 40 boys corresponds to 20 girls, is not given (no credit for 6.RP.A.3). The student provides an appropriate table in Part C that scales the ratio of boys to girls (MP4).

Total Awarded Points: 2 out of 5

A-10a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

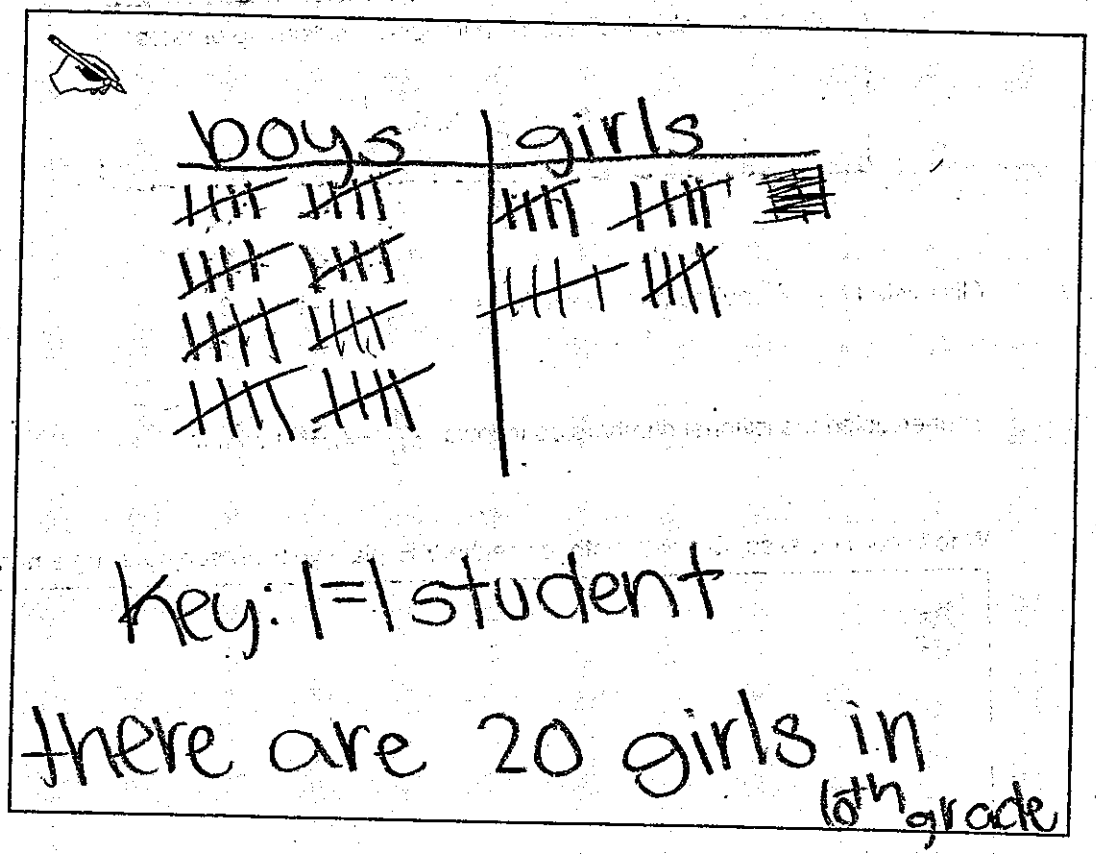
it would be 12:15 but he simplifyed and got the smaller answer is 4:5

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

12:27 is wrong because the part with the boys was changed but the girls wasn't changed

Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.



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Total Content Points: 1 (6.RP.A.3)

Total Practice Points: 0

In Part A, the student does not use ratios or ratio language to explain the meaning of Jimmy's numbers, instead only reducing the numbers and not putting them in the context of boys to girls (no credit for 6.RP.A.1x). In Part B, although the student provides a ratio (12:27), the meaning of Sammy's numbers is not explained (no credit for 6.RP.A.1z). In Part C, the student does not provide evidence of using unit rate to set up a 2:1 relationship between the number of boys and the number of girls ("Key: 1 = 1 student") (no credit for 6.RP.A.2). However, the student does solve for the missing piece of data ("there are 20 girls") (6.RP.A.3). The table that the student provides in Part C only shows 40 boys and 20 girls, and is not appropriate for scaling the ratio (no credit for MP4).

Total Awarded Points: 1 out of 5

A-11a

Are These Ratios the Same? Task

The math class is working with ratios. The teacher asks the students to determine the ratio of boys to girls in the class. Rhonda counts 12 boys and 15 girls in all.

a. Jimmy says "I used the numbers 4 and 5 to write my ratio." Explain using ratio language what the numbers in Jimmy's ratio represent.

The numbers Jimmy uses represents how many boys and girls are in his class multiplied.

b. Sammy says, "My ratio is totally different. I got 12 to 27." Explain using ratio language what the numbers in Sammy's ratio represent.

Sammy's ratio represents that there are 12 boys and 27 girls in his class, he is also comparing.

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Are These Ratios the Same? Task

c. The students then count the boys and girls in the entire 6th grade. They find that there are 2 boys for every 1 girl. Use a table or tape diagram to show how many girls there are if there are 40 boys.

there are 40 girls as well because you would just switch spots.

Girls	Boys
40	40

40

2=1girl 2=1girl 2=1girl
2=1girl 2=1girl
2=1girl 2=1girl
2=1girl 2=1girl
2=1girl 2=1girl
2=1girl 2=1girl
2=1girl 2=1girl
2=1girl 2=1girl
2=1girl 2=1girl

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Anchor 11 Litho 01006200165

Total Content Points: 0

Total Practice Points: 0

In Part A, the student does not use ratios or ratio language to explain the meaning of Jimmy's numbers (no credit for 6.RP.A.1x). In Part B, the student misinterprets the meaning of Sammy's numbers and does not use ratio language ("12 boys and 27 girls") (no credit for 6.RP.A.1z). In Part C, the student does not provide a clearly defined unit rate ("2 = 1 girl") (no credit for 6.RP.A.2). Also, an incorrect solution for the missing piece of data is provided ("there are 40 girls as well") (no credit for 6.RP.A.3). In Part C the student does not provide an appropriate table or tape diagram to scale the ratio (no credit for MP4).

Total Awarded Points: 0 out of 5