Module 2 Ratio, Proportion and Mathematical Representations

Student Work Samples
The ratio of boys to girls in a class is 5 to 3. After six girls join the class, the number of boys and girls in the class is the same. How many students are in the class now?

Student #1

I took $\frac{5}{8}$ and multiplied it by $\frac{2}{3}$ which gives me $\frac{10}{16}$ then I added $\frac{6}{16}$ (the number of new girls) to it and it gives me $\frac{16}{16}$, the number of students in the class is 32, 16 girls & 16 boys.

Student #2

<table>
<thead>
<tr>
<th># in class</th>
<th>B</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>24</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>32</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>40</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>48</td>
<td>30</td>
<td>18</td>
</tr>
</tbody>
</table>

# of girls + 6, which will equal the # of boys

$5 \neq 3 + 6$

$10 \neq 6 + 6$

$15 = 9 + 6$
Student #3

\[
\frac{5}{8} = \text{boys} + \text{6 girls}
\]

\[
\frac{5}{8} + \frac{3}{8} = \frac{8}{8}
\]

So

\[
\frac{5}{8} = \frac{3}{8} + \text{6}
\]

\[
\frac{5}{8} + 6 = A
\]

I don’t know

Student #4

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ 6 = 9</td>
<td>+ 6 = 12</td>
<td>+ 6 = 18</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>16</td>
<td>24</td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>
Student #5

The line here shows the same for the girls and boys. That was when we had 15 of each. So at the beginning there must have been 24 students.

Student #6

The third one works because when we give two girls to each pair of girls, then rows of boys and girls are equal.
Proportional Situations and Graphs

Problems

1. A Metric Conversion: If 6 inches is 15.24 cm, 9 inches is how many centimeters?

2. A Candy company is developing packaging for their Chocolates. If they place 60 candies in a long box, there can be 6 rows of 10 candies. If the company decides to use a different box with 4 rows, how many candies would there be in each of 4 rows?

3. Sal is hosting a party for 50 people. He will have people sit at a long line of tables. Each table can seat 4 people, plus one person can sit at each end of the line of tables, as shown. Find the number of tables he will need to seat 50 people.

Solve the above problems. Record your solution strategy and discuss the following:

- Of the above problems, which are proportion problems and which are not? Briefly justify your answers.

- How do you graph each situation?
Student Work Samples
Consider Student Work Samples

- What mathematics does each student know?
- What are the themes emerged from the samples below?
- What do we learn about each child based on their responses?

Student Work Sample #1

[Image of a student's work sample, showing a calculation and a drawing of tables. The text on the page is:]

You would need 10 tables to have 50 p. because if you do 5 p. at each table until you get to 50, then this is what it looks like.

10 tables
Student Work Sample #2

6 P = 4 tables
12 P = 2 tables
18 P = 3 tables
24 P = 4 tables
30 P = 5 tables
36 P = 6 tables
42 P = 7 tables
48 P = 8 tables
50 P = 9 tables

Sed will need 9 tables to seat 50 people. There would be 4 seats left over.

Student Work Sample #3

50 ÷ 4 = 12 S so he will need 13 tables to seat everyone because you can't get half a table
Student Work Sample #4

4 + x = 50
- 2

\[
\begin{array}{c}
48 \\
-2 \\
-48
\end{array}
\]

\[
\begin{array}{c}
58 \\
-58
\end{array}
\]

He will need 12 tables.

Student Work Sample #5

\[
5 + 4 = 9 + 4 = 13 + 4 = 17 + 4 = 21 + 4 = 25 + 4 = 29 + 4 = 33 + 4 = 37 + 4 = 41 + 4 = 45 + 4 = 50
\]

1 2 3 4 5 6 7 8 9 10 11 12

He will need 12 tables.
Student Work Sample #6

20 people at 4 table
9 tables to fit 50 people at her party

Student Work Sample #7

$14 \times 3 = 42$
$46 \div 2 = 23$

\[ 28 + 12 = 50 \]
\[ 38 + 12 = 50 \]

Sal needs 11 tables and he will have 3 chairs left over.