Colored Sand Jars

Use ratios, symbols and a visual model to solve these problems.

The 6th grade students were making colored sand jars as a mathematical art project. They used mason jars that could hold 1 pint (500 ml) of sand.

These are the measuring cups available: 1 cup, ½ cup, 1/3 cup, ¼ cup, 100 ml and 50 ml.

1) Eli measured his sand so that 40% of his jar had blue sand, 30% was yellow, 15% was green and 15% was white. How many more ml of sand were blue than white?

2) Cameron measured ¾ cup red sand, ½ cup blue sand and the rest was yellow sand. How many ounces were yellow in Cameron's jar?

3) Tiffany measured 5 ounces of pink sand, ¼ cup white sand, and the rest of her sand was divided evenly between blue, yellow and purple. How many more ounces of pink did she have than purple?

4) Lizzy measured her sand using ml. She says she has twice as much blue sand as red sand. She says her green and yellow combined are half as much as her red sand. When she measured her green and yellow sand, she had 100 ml total. Do you agree with Lizzy's ratio? Why or why not?

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These are the measuring cups available: 1 cup, ½ cup, 1/3 cup, ¼ cup, 100 ml and 50 ml.

1) Eli measured his sand so that 40% of his jar had blue sand, 30% was yellow, 15% was green and 15% was white. How many more ml of sand were blue than white?

40% Blue 200 ml	30% Yellow 150 ml	15% Green 75 ml	15% White 75 ml	500 ml

10% of 500 ml = 50 ml

200 ml – 75 ml = 125 ml
blue   white

2) Cameron measured ¾ cup red sand, ½ cup blue sand and the rest was yellow sand. How many ounces were yellow in Cameron's jar?

¾ cup red	½ blue	¾ yellow	2 cups

1 cup = 8 ounces   ¾ cup = 6 ounces

½ cup = 4 ounces   Yellow = 6 ounces

¼ cup = 2 ounces

3) Tiffany measured 5 ounces of pink sand, ¼ cup white sand, and the rest of her sand was divided evenly between blue, yellow and purple. How many more ounces of pink did she have than purple?

5 oz pink	2 oz ¼ cup white	3 oz blue	3 oz Yellow	3 oz Purple	2 cups No Ounces

4) Lizzy measured her sand using ml. She says she has twice as much blue sand as red sand. She says her green and yellow combined are half as much as her red sand. When she measured her green and yellow sand, she had 100 ml total. Do you agree with Lizzy's ratio? Why or why not?

Blue   400
Red   200
Green and   100
  Yellow

No, because if green and yellow measure 100 ml, then red would measure at 200 ml and blue would measure at 400 ml. If you added 400 + 200 + 100 = 700 ml which is more than would fit into a 500 ml jar.

Colored Sand Rubric 6RP1

Score	Description	Examples
4	**In addition to exhibiting level 3 performance, in-depth inferences and applications in situations that GO BEYOND what was taught in class.**	
3.5	*In addition to exhibiting level 3 performance, partial success at in-depth inferences and applications that go beyond what was taught in class.*	
3	**No major errors or omissions regarding any of the information and/or processes (SIMPLER OR COMPLEX) that were explicitly taught.**	Students can critique Lizzy's reasoning in question 4 and articulate the flaws in her reasoning. Students can determine Delia's reasoning in question 5 and articulate her error.
2.5	*No major errors or omissions regarding any of the simpler information and/or processes and partial knowledge of the more complex information and processes.*	Students can adequately compute and explain their steps for solving question 3.
2	**No major errors or omissions regarding the SIMPLER details and processes BUT major errors or omissions regarding the more COMPLEX ideas and processes.**	Students can find percent of a number in question 1 and explain their process (visual). Students can compute ounces of yellow for question 2 and explain their process (visual).
1.5	*Partial knowledge of the simpler details and processes, but major errors or omissions regarding the more complex ideas and processes.*	
1	**With help, a partial knowledge of some of the simpler and complex details and processes.**	
.5	*With help, a partial knowledge of some of the simpler details and processes but not of the more complex ideas and processes.*	
0	**Even with help, no understanding or skill demonstrated.**	