LEARNING IN PLACE

LESSON PLAN

Subject: Grade 7 Math **Lesson:** True Colors

Standard Addressed:

- Analyze proportional relationships and use them to solve real-world and mathematical problems. (NC.7.RP)

Objectives:

- Identify the unit rate (constant of proportionality) within two quantities in a proportional relationship using tables, graphs, equations, and verbal descriptions.
- Use ratios and fractions to solve glaze mixing problems.
- Recognize and represent proportional relationships between quantities of glaze ingredients.
- Create equations and graphs to represent proportional relationships of glaze ingredients.

Materials Needed:

- Device for showing *True Colors* video
- "True Colors" Activity

Outline:

- Prior to this lesson students should understand:
  - Proportional relationships
  - Ratios
  - How to use graphs and tables to represent data
- Before the video, have students look over page 1 of the activity and review some of what you have learned about proportional relationships.
- Show the 10 minute video, *True Colors*, https://youtu.be/LcwJ_AkBhNE
- Students may fill out page 1 of the activity while watching the video.
- After the video, students may complete the activity sheets individually or in a group.

Take It Further: Learn about the Golden Ratio using the links below. Have the students draw a set of boxes on graph paper using the Golden Ratio. https://craftwhack.com/golden-ratio-for-kids/ ; https://drawpaintacademy.com/golden-ratio-in-art/ ; https://nrich.maths.org/7668

Cross-Curriculum Connection: Pick a favorite muffin recipe that serves 12. Use ratios to change the ingredient quantities so that it will serve 9. Make that recipe and share with the group. Does it taste like what you expected?

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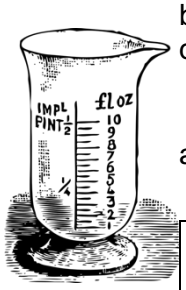
Student Name: _____ Date: _____

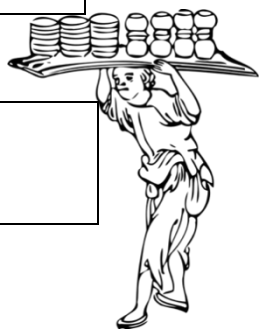
Activity 1:



The potter is mixing a glaze with dry glaze mix. The potter knows that the relationship between the amount of dry mix and water is proportional. The recipe requires 2,000 grams of dry mix for every 128 oz of water.

Which of the following combinations of values for the dry mix and water support the assumption that the relationship between the two values is proportional? Circle one.

a.) 200 g of dry mix for 6.4 oz of water	b.) 300 g of dry mix for 12.8 oz of water	c.) 100 g of dry mix for 6.4 oz of water	d.) 100 g of dry mix for 12.8 oz of water



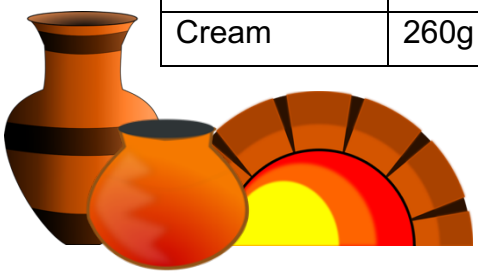
Write this ratio as the three smallest equivalent fractions.

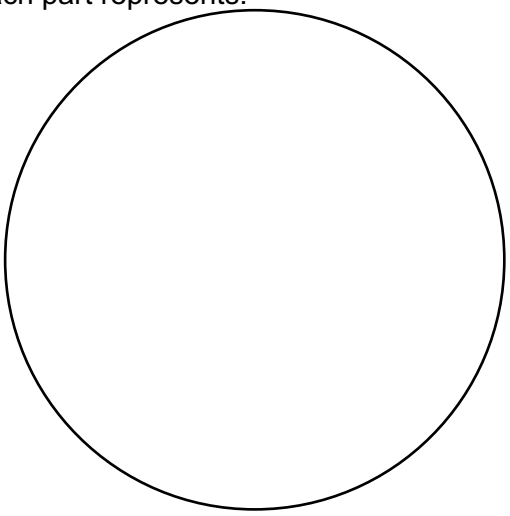
Activity 2:

The potter collected the following data about the dry glazes he uses most often.

Create a circle graph that illustrate the data in the table. Label each part of the circle graph with the correct glaze color and the percent of the whole each part represents.

Glaze colors	Grams
Orange	1000g
Green	520g
Brown	220g
Cream	260g





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Student Name: _____ Date: _____

Activity 3:

The first table has the ingredients for a glaze mixture. Fill in the second table with the correct grams to create a 2000 g bucket of mixture.

Percentage (100 g)	
Silica	**31.03%**
Lead	**26.82%**
Feldspar	**19.16%**
Kaolinite	**13.41%**
Chalk	**9.58%**

Bucket Size (2,000 g)	
Silica	**g**
Lead	**g**
Feldspar	**g**
Kaolinite	**g**
Chalk	**g**

Activity 4:

The following is a real recipe from Salem Pottery's glaze manual in 1793. The manual makes use of an ingredient called "tin ashes" which is actually a mixture of lead and tin at the ratio of 3 parts lead to 1 part tin. We now know that the ingredient lead is highly toxic. Using this ratio, look at the recipe below and see if you can determine how much lead is present in the mixture.

> "12 lbs. of tin ashes, 7 lbs. of flint, 4.5 lbs. of white English clay, 2.5 lbs. of sodium bicarbonate, 1 lb. of ash, 1 lb. of white glass. These materials are pounded very fine, each separately put thru' a sieve and well mixed together."

Show your work here:

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ANSWER KEY

Activity 1:

The potter is mixing a glaze with dry glaze mix. The potter knows that the relationship between the amount of dry mix and water is proportional. The recipe requires 2,000 grams of dry mix for every 128 oz of water.

Which of the following combinations of values for the dry mix and water support the assumption that the relationship between the two values is proportional? Circle one.

a.) 200 g of dry mix for 6.4 oz of water	b.) 300 g of dry mix for 12.8 oz of water	c.) 100 g of dry mix for 6.4 oz of water	d.) 100 g of dry mix for 12.8 oz of water

Write this ratio as the three smallest equivalent fractions.

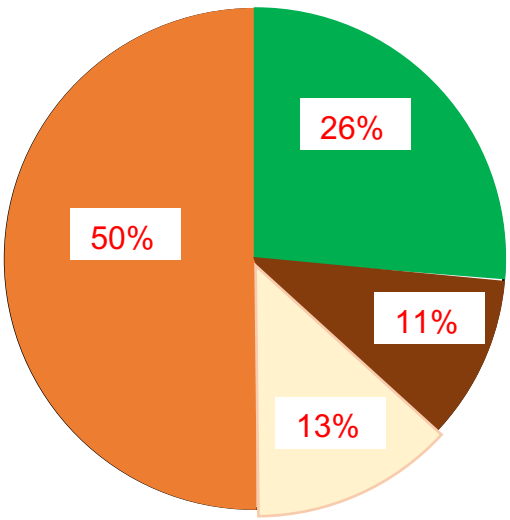
125/8	500/32	250/16

Activity 2:

The potter collected the following data about the dry glazes he uses most often. Create a circle graph that illustrate the data in the table. Label each part of the circle graph with the correct glaze color and the percent of the whole each part represents.

Glaze colors	Grams
Orange	1000g
Green	520g
Brown	220g
Cream	260g

50%
26%
11%
13%



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Kaolinite	**13.41%**
Chalk	**9.58%**

Bucket Size (2,000 g)	
Silica	**620.6 g**
Lead	**536.4 g**
Feldspar	**383.2 g**
Kaolinite	**268.2 g**
Chalk	**191.6 g**

Activity 4:

The following is a real recipe from Salem Pottery's glaze manual in 1793. The manual makes use of an ingredient called "tin ashes" which is actually a mixture of lead and tin at the ratio of 3 parts lead to 1 part tin. We now know that the ingredient lead is highly toxic. Using this ratio, look at the recipe below and see if you can determine how much lead is present in the mixture.

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9 lbs. of Lead