



M2C3 Project

Party Punch Task

Student Work

This file provides one whole group warm-up poster and four Grade – 4 solution paths for the Party Punch Task. Students added and multiplied basic fractions and mixed numbers to determine the amount of punch their recipe created and how many batches of the recipe were needed to serve a larger group.

Factors that Students Considered

- What ingredients would be used to make the punch
- How many people would be at the party
- The size of one serving of punch
- How many servings would each person have

Connections to Students' Experiences

- Students and their family members have used recipes
- Students and their family members have attended or hosted parties



Punch Task

2 cups? 1 cup?

What do we need to know?

Is everyone making a recipe for the whole class?

What is serving size? How many batches or copies?

What juices are we using?

What is it going to cost?

Allergies?

* What measuring cups are we using?

- orange
- grape
- lemonade
- cranberry
- ~~apple juice~~
- strawberry lemonade
- Raspberry
- cherry
- blueberry
- ~~pineapple~~

Assumptions

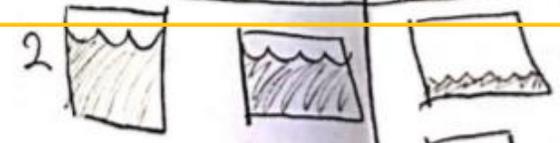
- use ~~differ~~ flavored sparkling water
- we can duplicate our recipe MORE than 1 time —
- we will make 30 servings

How many recipe do we need to make?

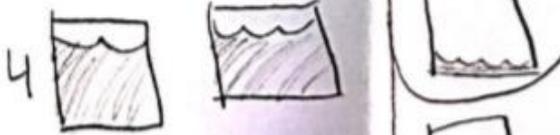
our recipe makes $2\frac{1}{4}$ cups of punch.

for 2 5 People
2 cups $\frac{1}{4}$ cup

1 recipe - 

2 

3 

4 

5 recipes 

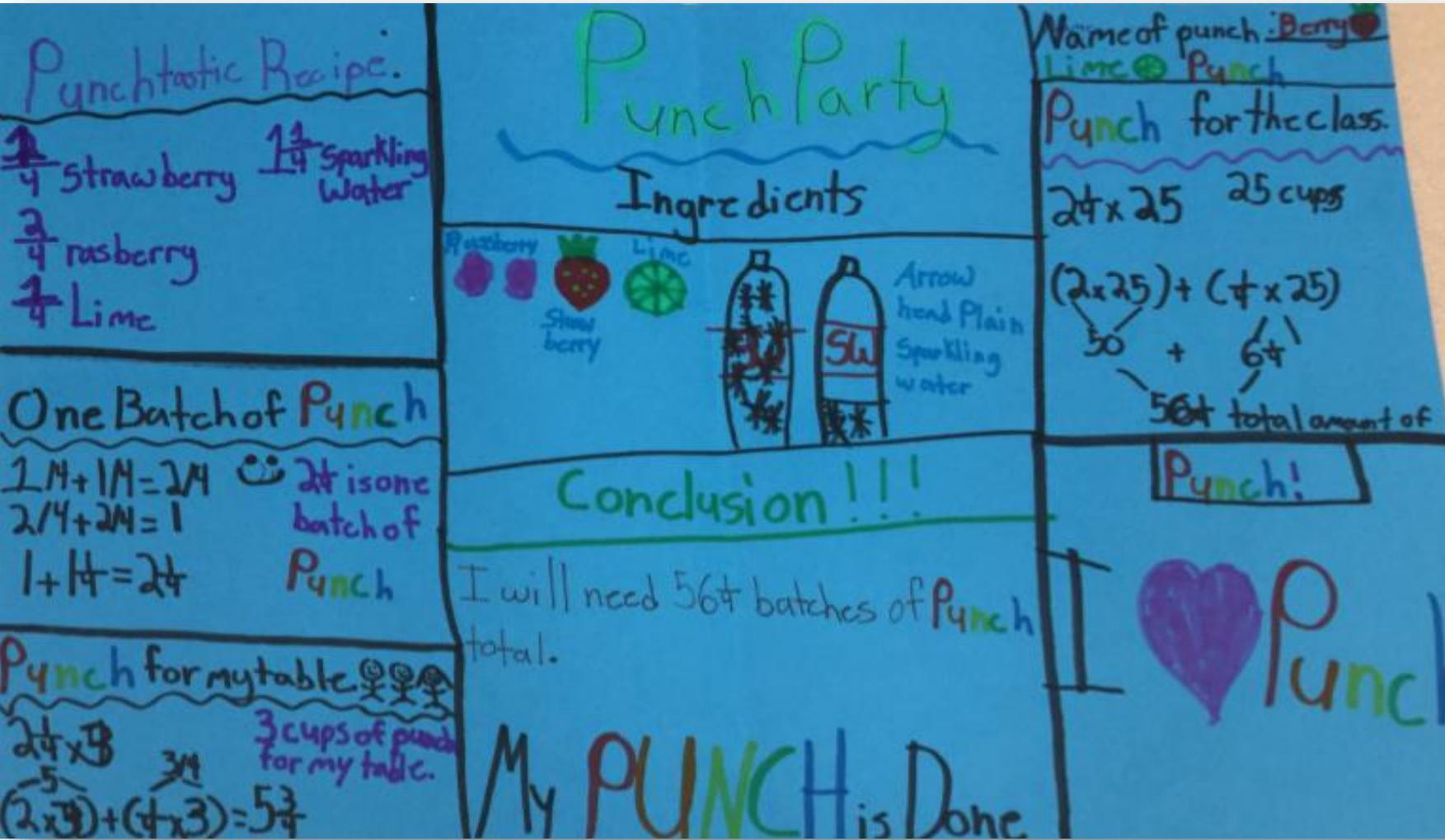
1 whole + 1 = $\frac{5}{4}$ or $1\frac{1}{4}$

our Remanders are for Ms.

We need to make 5 recipes which will equal $5\frac{5}{4}$ or $6\frac{1}{4}$

These students demonstrated their understanding of mixed numbers by representing each batch of punch with a picture of $2\frac{1}{4}$ cups. They planned to serve 5 people by making 5 batches. It appears that each person would be given 2 cups. Recognizing they would have $\frac{1}{4}$ cup left over for each batch, they found $\frac{5}{4}$ or $1\frac{1}{4}$ left over.

In summarizing their work, it is not clear if the students understood they were making 5 batches not $5\frac{5}{4}$ batches. The $\frac{5}{4}$ is the total of the extra amounts in each batch. They would have a total of $10\frac{5}{4}$ cups of punch or $11\frac{1}{4}$ cups of punch if they made 5 batches. At 2 cups per serving they would have 5 servings with less than two cups left over. Labeling the amounts with the appropriate units could help eliminate this confusion.



This group determined a recipe for their punch, the amount of one batch of punch, the amount needed for their table (3 students) and the amount for their class (25 students). For a batch of punch they added the fractional amounts given in their recipe, where the ingredients amounts were specified in fourths. They do not provide the units. They found that a batch of punch would be $2\frac{1}{4}$. To determine the amount needed for the table of 3 students, the mixed number $2\frac{1}{4}$ was multiplied by 3 using the distributive property $(2 \times 3) + (\frac{1}{4} \times 3) = 5\frac{3}{4}$.

The distributive property was used again to determine the amount for the 25 students (labeled as cups) in the class.

$$2\frac{1}{4} \times 25 = (2 \times 25) + (\frac{1}{4} \times 25) = 50 + 6\frac{1}{4} = 56\frac{1}{4}$$

The use of the distributive property to multiply mixed numbers is effective here although (2×3) was added instead of multiplied in one case. Students did not realize that one batch of punch could serve more than one student. Providing units in the recipe might have made this more evident.

Our recipe

Strawberry $\frac{1}{3}$ cup
 Bluberry $\frac{1}{3}$ cups
 Raspberry $\frac{1}{3}$ cups
 Sparkling water $1\frac{2}{3}$ cups

How many batches do we need to make to serve everyone?

$$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{2}{3} + 1 = 2\frac{2}{3} \quad \begin{matrix} \text{Recipe} \\ 1R = 2P \end{matrix}$$

$$2\frac{2}{3} + 2\frac{2}{3} = 5\frac{1}{3} \quad 2R = 5P$$

$$5\frac{1}{3} + 5\frac{1}{3} = 10\frac{2}{3} \quad 4R = 10P$$

$$10\frac{2}{3} + 10\frac{2}{3} = 21\frac{1}{3} \quad 8R = 21P$$

$$21\frac{1}{3} + 21\frac{1}{3} = 42\frac{2}{3} \quad 16R = 42P$$

$$\frac{1}{3} + \frac{2}{3} + \frac{1}{3} + \frac{2}{3} = 2P$$

$$\begin{array}{r} + 2P \\ \hline 44P \end{array}$$

Our recipe makes $2\frac{2}{3}$ of punch.

$$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{2}{3} + 1 = 2\frac{2}{3}$$

Each person gets one cup of punch.

Our recipe will serve 2 people

How much of each juice do I need to buy

8 cups = 1 bottle of Jr
 8 cups = 1 bottle of spu
 water

The students in this group used $\frac{1}{3}$ cup sizes to create their recipe and found that one batch of the recipe made $2\frac{2}{3}$ [cups] of punch. If each person is given 1 cup then one batch would serve 2 people.

To determine how many batches are needed "to serve everyone", they used a doubling process and tracked the number of people who could be served. They found that 16 R (batches of the recipe) = 42 P (people served).

Not recognizing that they had accounted for the fractional parts when they doubled the amount (i.e. $5\frac{1}{3} + 5\frac{1}{3} = 10\frac{2}{3}$), they added the fractional parts resulting from the doubling and determined that they could serve two more people for a total of 44 people.

4th Grade

Using $\frac{3}{4}$ of a cup for each juice and $1\frac{3}{4}$ of a cup for sparkling water, this group of students created a recipe that totaled 4 cups per batch. They identify the 4 cups as 4 servings and note that 6 batches would make 24 cups (servings). By using 1 cup as a serving and labeling cups and servings, they eliminated any confusion found in earlier solution paths related to the two units.

RainBow punch

ingredients

$\frac{3}{4}$ a cup mango

$\frac{3}{4}$ a cup guava Juice

$\frac{3}{4}$ a cup pomegranate

$1\frac{3}{4}$ sparkling water

$\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{4}{4} + \frac{3}{4} = \frac{16}{4} = 4$ cups

1 Batch = 4 cups

6 Batches = 24 cups (servings)

in all

1 batch = 4 ~~servings~~
cup serving

6 batches = 24 cups
serving

24 cups in
all

guava + Dragon Fruit + pomegranate =

RainBow punch

Due to the color of the paper some of the student work is difficult to read. The recipe is $\frac{3}{4}$ cup mango, $\frac{3}{4}$ cup guava juice, $\frac{3}{4}$ cup pomegranate, $1\frac{3}{4}$ cup sparkling water and is followed by summation of the amounts used.

$\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{4}{4} + \frac{3}{4} = \frac{16}{4} = 4$ cups, 1 batch = 4 cups, 6 batches = 24 cups (servings) in all.