

Blank Number Lines



Fraction Addition and Subtraction

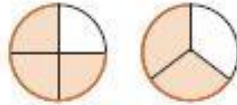
Make a diagram to represent each problem below. How are your diagrams similar? How are they different? What type of problem (join, separate, part-part-whole, or comparison) does each problem represent?

1. James has $2\frac{1}{2}$ pages full of stickers. He gives $\frac{3}{4}$ of a page to his sister Josie. How many pages of stickers does James have now?
2. James has $2\frac{1}{2}$ pages full of stickers. His sister Josie has $\frac{3}{4}$ of a page of stickers. How many more pages of stickers does James have than Josie?
3. James wants to fill $2\frac{1}{2}$ pages in his book with stickers. Right now he has enough stickers to fill $\frac{3}{4}$ of a page. How many more pages full of stickers does James need?
4. James has $2\frac{1}{2}$ pages full of superhero stickers. He has $\frac{3}{4}$ of a page of sports stickers. How many pages of stickers does James have altogether?

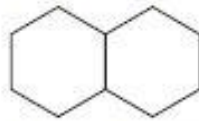
Examining Student Work

Erin has $\frac{3}{4}$ of a pound of chocolate candies and $\frac{2}{3}$ of a pound of mint candies. How many pounds of candy does she have altogether?

Student A: I used fraction circles for the $\frac{3}{4}$ and $\frac{2}{3}$. Because the pieces are different sizes, they can't be added together. Also, if you could put them together, the result would be more than one circle.



Student B: I used pattern blocks with 2 hexagons as the whole, so this

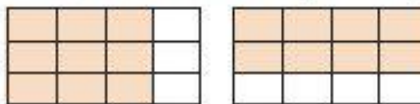


represents 1. That means $\frac{3}{4}$ is 3 red trapezoids and $\frac{2}{3}$ is 4 blue rhombuses. So $\frac{3}{4} + \frac{2}{3} = \frac{7}{10}$.



Erin has $\frac{7}{10}$ of a pound of candy.

Student C: I used rectangles as a whole, and I divided each rectangle into 12 equal pieces.



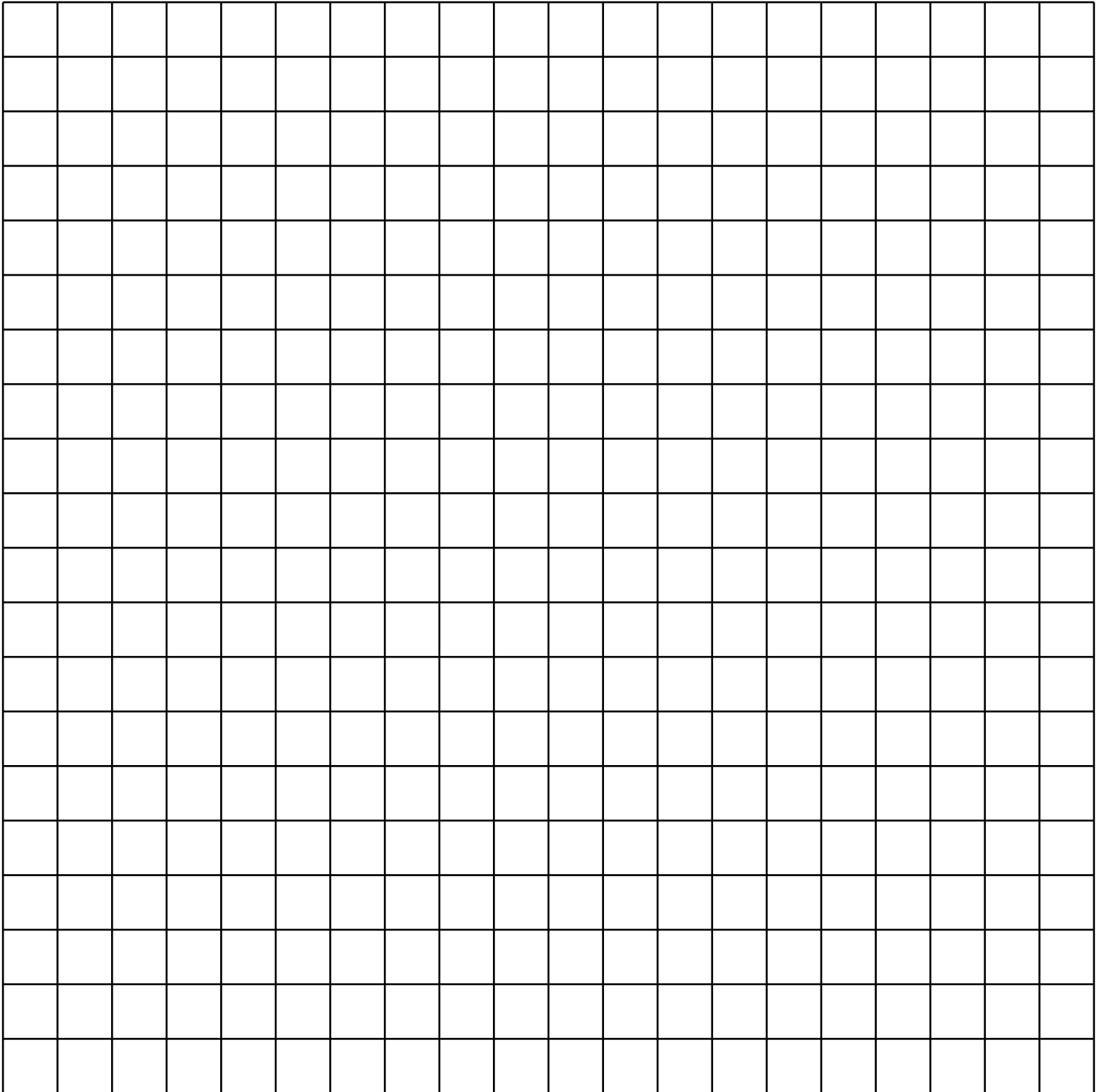
So $\frac{3}{4} + \frac{2}{3} = \frac{17}{12}$. Erin has $\frac{17}{12}$ of a pound of candy.

Student D: I know that 3 and 4 both multiply to 12, so I replaced $\frac{3}{4}$ with $\frac{9}{12}$ and $\frac{2}{3}$ with $\frac{8}{12}$.

Then $\frac{3}{4} + \frac{2}{3}$ becomes $\frac{9}{12} + \frac{8}{12}$. Take $\frac{3}{12}$ from the $\frac{8}{12}$ and put it with the $\frac{9}{12}$ to make $\frac{12}{12}$.

You still have $\frac{5}{12}$ left from the $\frac{8}{12}$. So $\frac{3}{4} + \frac{2}{3} = \frac{12}{12} + \frac{5}{12} = 1\frac{5}{12}$. Erin has $1\frac{5}{12}$ pounds of candy.

Student E: Both of these fractions are a little less than 1, so the sum will be less than 2. Take 2 minus $\frac{1}{4}$, which leaves $1\frac{3}{4}$. Now take away $\frac{1}{3}$. $1\frac{3}{4} - \frac{1}{3}$ is the same as $1.75 - .333... = 1.4666...$
So Erin has 1.4666... pounds of candy.



Subtracting Fractions

$2 - 1 =$

$1 - 7/10 =$

$1 - 5/6 =$

$2/2 - 1/2 =$

$4 - 2 =$

$1 \frac{5}{6} - 1/6 =$

$1 - 1/2 =$

$4/3 - 2/3 =$

$1 \frac{1}{6} - 5/6 =$

$5 - 1 =$

$1 \frac{1}{3} - 2/3 =$

$1 - 5/12 =$

$5/5 - 1/5 =$

$1 \frac{1}{3} - 1/3 =$

$1 \frac{1}{12} - 7/12 =$

$1 - 1/5 =$

$1 - 3/8 =$

$1 \frac{4}{15} - 13/15 =$

$1 - 2/5 =$

$1 - 7/8 =$

$3 - 1 =$

$1 - 4/5 =$

$1 \frac{7}{8} - 3/8 =$

$3/3 - 1/3 =$

$1 - 3/5 =$

$1 \frac{3}{8} - 7/8 =$

$1 - 1/3 =$

$1 - 1/4 =$

$7 - 4 =$

$8 - 1 =$

$1 - 3/4 =$

$7/5 - 4/5 =$

$8/8 - 1/8 =$

$1 - 1/10 =$

$1 \frac{2}{5} - 4/5 =$

$1 - 1/8 =$

$1 - 9/10 =$

$1 \frac{4}{5} - 2/5 =$

$5/4 - 3/4 =$

$1 - 3/10 =$

$1 - 1/6 =$

$1 \frac{1}{4} - 3/4 =$

Fluency Interview (Fractions)

1. Show how to use a number bond to decompose the difference between $16/9 - 5/9$. Record your answer as a mixed number.
2. Jhordan explains that $3/12 + 1/12 = 1/3$. Is he correct? Explain how you know.
3. Solve $1/2 + 1/3$. What strategy did you use?
4. Dhruva has $3/8$ of a medium pepperoni pizza. His dad gives him $2/8$ more of a medium pepperoni pizza. How much of a medium pepperoni pizza does he have now? Explain how you got your answer.
5. Jasmine solved $1 - 1/3$ by changing it in her mind to $3/3 - 1/3$. Why do you think she did this?

A purple octopus wearing glasses is holding a large glowing bubble containing the fraction $11/24$. The octopus is surrounded by several smaller bubbles of varying colors (blue, green, white). The background is green with a decorative border. At the bottom, the logo for ILLUMINATIONS (Resources for Teaching Math) is displayed, featuring the NCTM logo.

A purple octopus wearing glasses is holding a large glowing bubble containing the fraction $1/6$. The octopus is surrounded by several smaller bubbles of varying colors (blue, green, white). The background is orange with a decorative border. At the bottom, the logo for ILLUMINATIONS (Resources for Teaching Math) is displayed, featuring the NCTM logo.

A purple octopus wearing glasses is holding a large glowing bubble containing the fraction $3/8$. The octopus is surrounded by several smaller bubbles of varying colors (blue, green, white). The background is green with a decorative border. At the bottom, the logo for ILLUMINATIONS (Resources for Teaching Math) is displayed, featuring the NCTM logo.

A purple octopus wearing glasses is holding a large glowing bubble containing the fraction $1/4$. The octopus is surrounded by several smaller bubbles of varying colors (blue, green, white). The background is orange with a decorative border. At the bottom, the logo for ILLUMINATIONS (Resources for Teaching Math) is displayed, featuring the NCTM logo.

A purple octopus wearing glasses is holding a large glowing bubble containing the fraction $1/3$. The octopus is surrounded by several smaller bubbles of varying colors (blue, green, white). The background is green with a decorative border. At the bottom, the logo for ILLUMINATIONS (Resources for Teaching Math) is displayed, featuring the NCTM logo.

A purple octopus wearing glasses is holding a large glowing bubble containing the fraction $5/12$. The octopus is surrounded by several smaller bubbles of varying colors (blue, green, white). The background is orange with a decorative border. At the bottom, the logo for ILLUMINATIONS (Resources for Teaching Math) is displayed, featuring the NCTM logo.

A purple octopus wearing glasses is holding a large glowing bubble containing the fraction $7/24$. The octopus is surrounded by several smaller bubbles of varying colors (blue, green, white). The background is green with a decorative border. At the bottom, the logo for ILLUMINATIONS (Resources for Teaching Math) is displayed, featuring the NCTM logo.

A purple octopus wearing glasses is holding a large glowing bubble containing the fraction $1/2$. The octopus is surrounded by several smaller bubbles of varying colors (blue, green, white). The background is orange with a decorative border. At the bottom, the logo for ILLUMINATIONS (Resources for Teaching Math) is displayed, featuring the NCTM logo.

A purple octopus wearing glasses is holding a large glowing bubble containing the fraction $5/24$. The octopus is surrounded by several smaller bubbles of varying colors (blue, green, white). The background is green with a decorative border. At the bottom, the logo for ILLUMINATIONS (Resources for Teaching Math) is displayed, featuring the NCTM logo.

Adding Fractions

Examine the problems below. Which of these problems can be solved by adding $\frac{1}{2} + \frac{1}{3}$? Show work to support your answer to each problem.

1. Gabriel pours $\frac{1}{2}$ of a cup of sand into an empty box. Then he pours $\frac{1}{3}$ of a cup of sand into the box. How many cups of sand are in the box now?
2. Jayla has a full glass of water. She pours $\frac{1}{2}$ cup of water from the glass into an empty bowl. Then Jayla pours in another $\frac{1}{3}$ of the water from the glass into the bowl. How many cups of water are in the bowl now?
3. $\frac{1}{2}$ of the boys in the class are wearing tennis shoes. $\frac{1}{3}$ of the girls in the class are wearing tennis shoes. What fraction of the class is wearing tennis shoes?
4. $\frac{1}{2}$ of the children at Highland Elementary School say they would like to visit the aquarium. $\frac{1}{3}$ of the children at Highland Elementary School say they would like to visit the children's museum. What fraction of the children at Highland Elementary School would like to visit the aquarium or the children's museum?

Subtracting Fractions

Examine the problems below. Which of these problems can be solved by subtracting $\frac{2}{3} - \frac{1}{2}$? Show work to support your answer to each problem.

1. Starting at his house, Dhruva bikes $\frac{2}{3}$ of a mile down the street. Then he turns around and bikes $\frac{1}{2}$ mile back toward his house. How far down the street is Dhruva from his house?
2. $\frac{2}{3}$ of the children at Mayfair Elementary rode the ferris wheel at the state fair. $\frac{1}{2}$ of the children at Mayfair Elementary rode the carousel. What fraction of the children rode the ferris wheel, but not the carousel?
3. Maggie pours $\frac{2}{3}$ cup of milk into her mug. Then she pours out $\frac{1}{2}$ of the milk that is in her mug into the sink. How many cups of milk are in Maggie's mug now?
4. $\frac{2}{3}$ of the kingdom of Reyna is forestland. $\frac{1}{2}$ of the neighboring kingdom of Lexia is forestland. How much more forestland is there in Reyna than in Lexia?