





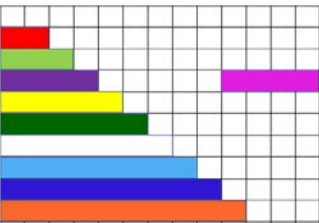
# Visualizing Fractions



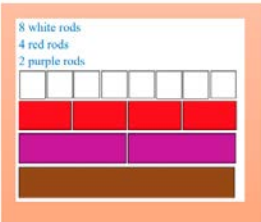
Modeling addition and subtraction using Cuisenaire Rods




## Cuisenaire Rods





8 white rods  
4 red rods  
2 purple rods



$8/8 = 4/4 = 2/2 = 1$   
 $1/2 = 2/4 = 4/8$   
 $1/4 = 2/8$   
 $3/4 = 6/8$



Addition of Fractions with Like Denominators  
Using the Rods

$$\frac{4}{5} + \frac{3}{5}$$


Use the **ORANGE** rod for the whole.



Addition of Fractions with Like Denominators  
Using the Rods

Independent Practice →

$$\frac{3}{4} + \frac{3}{4}$$


Use the **BROWN** rod for the whole.



Subtraction of Fractions with Like Denominators  
Using the Rods

$$\frac{3}{6} - \frac{2}{6}$$


Use the **DARK GREEN** rod for the whole.


Subtraction of Fractions with Like Denominators  
Using the Rods

Independent Practice →  $\frac{5}{2} - \frac{3}{2}$



Use the **BROWN** rod for the whole.

---



---




---



---

Addition of Fractions with Unlike Denominators  
Using the Rods



$\frac{3}{4} + \frac{2}{3}$

Start with the **PURPLE** and **LIGHT GREEN** rods.

---





---



---

Addition of Fractions with Unlike Denominators  
Using the Rods

Independent Practice →  $\frac{3}{5} + \frac{1}{4}$        $\frac{5}{6} + \frac{2}{3}$

Use the **PURPLE** and **YELLOW** rods for the first example:  $\frac{3}{5} + \frac{1}{4}$

Use the **PURPLE** and **RED** rods for the second example:  $\frac{5}{6} + \frac{2}{3}$

---



---

Subtraction of Fractions with Unlike Denominators  
Using the Rods

$$\frac{3}{4} - \frac{1}{2}$$

Start with the **PURPLE** and **RED** rods.


Subtraction of Fractions with Unlike Denominators  
Using the Rods

Independent Practice →

$$\frac{4}{8} - \frac{2}{4}$$

$$\frac{3}{5} - \frac{1}{3}$$

Use the **WHITE** and **RED** rods for the first example:  $\frac{4}{8} - \frac{2}{4}$

Use the **LIGHT GREEN** and **YELLOW** rods for the second example:  $\frac{3}{5} - \frac{1}{3}$


Explain why a fraction  $\frac{a}{b}$  is equivalent to a fraction  $\frac{a \times n}{b \times n}$  by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.


21 Each student in a class plays one of three sports: soccer, volleyball, or basketball.

- $\frac{3}{5}$  of the number of students play soccer
- $\frac{1}{4}$  of the number of students play volleyball

What fraction of the number of students play basketball?

A  $\frac{3}{20}$   
 B  $\frac{4}{9}$   
 C  $\frac{5}{9}$   
 D  $\frac{17}{20}$


Basic set up- always the relation of the part to the whole

The relation of the sum of the parts to the whole- moving to a tape diagram

$\frac{3}{20}$  play basketball


### Virtual modeling using the rods

PBS LearningMedia | New York  
A division of New York's Public Television Stations

Modeling Fractions with Cuisenaire Rods

<https://ny.pbslearningmedia.org/resource/rttt12.math.cuisenaire/modeling-fractions-with-cuisenaire-rods/#.WrUbeOjwaUk>

PBS Learning Media – Modeling Fractions with Cuisenaire Rods

<https://ny.pbslearningmedia.org/resource/rttt12.math.cuisenaire/modeling-fractions-with-cuisenaire-rods/#.WrUbeOjwaUk>

### Visualizing Fractions

- Can you see how modeling fractions develops an understanding of the relationship of the part to the whole?

**Citi**  
Center for Innovation, Technology, and Entrepreneurship