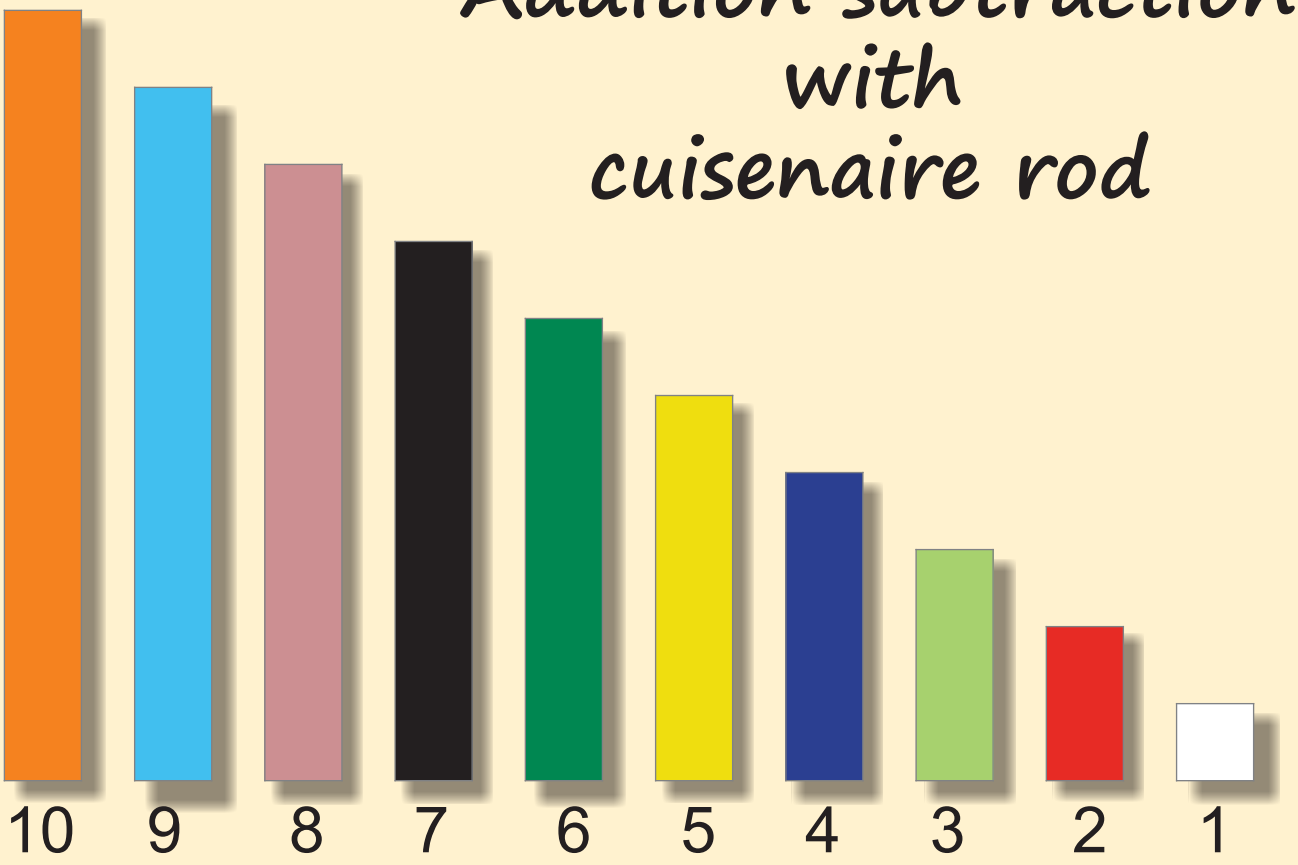
Addition subtraction with cuisenaire rod



Example

4 + 3 = ?

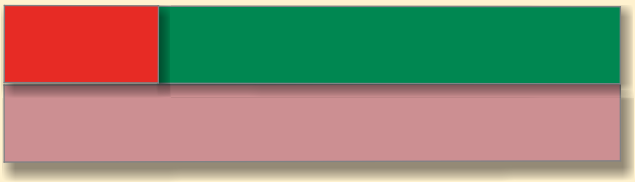
Find 4 + 3 by first making a train with a purple rod (4) and a light green rod (3) and then find the single rod (black) whose length (7) is equal in length to the train made up of purple and light green.

4 + 3 = 7

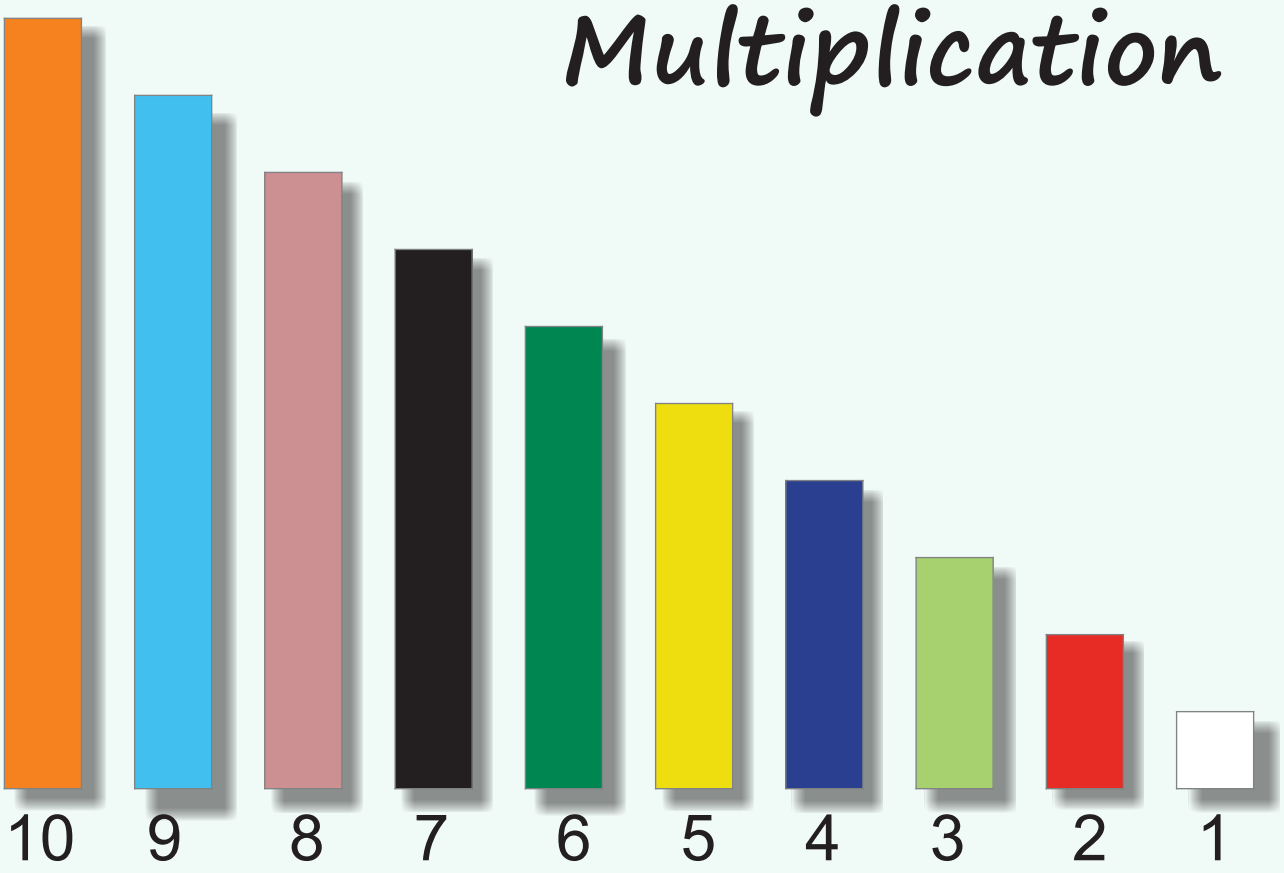
8 - 2 = ?

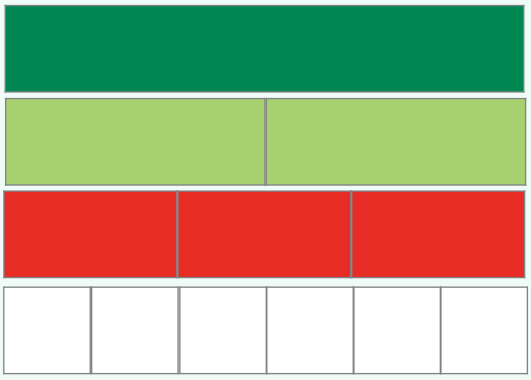
Find 8 – 2 by placing a red rod (2) on top of a brown rod (8). Then look for the rod that, when placed next to the red rod, makes a train equal in length to the brown. The missing addend, a dark green rod (6), is the solution to this subtraction problem.

8 - 2 = 6



Multiplication





$1 \times 6 = 6$

$2 \times 3 = 6$

$3 \times 2 = 6$

$6 \times 1 = 6$

In these equations, the first number is the multiplier, the second number is the multiplicand, and the final number, 6, is the product.
For example, in the equation 2 x 3 = 6, the 3 stands for the light green rod.

Division

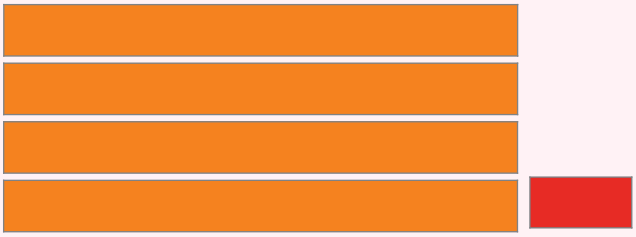
$20 \div 4 = ?$

Since 10 is the orange rod, so 20 is an orange-orange train and 4 is the purple rod. Now we will find how many times the purple rod go into the orange-orange train. We can see in the picture below that we need 5 purple rods to match the size of orange-orange train.

$20 \div 4 = 5$

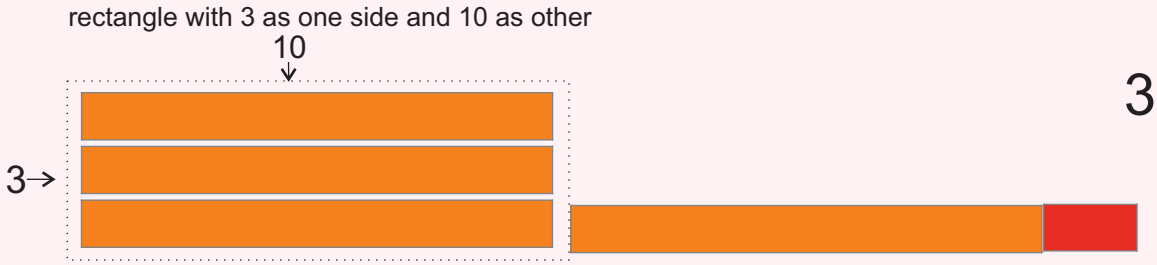
$42 \div 3 = ?$

42 is 4 orange(10) rods and 1 red (2) rod.



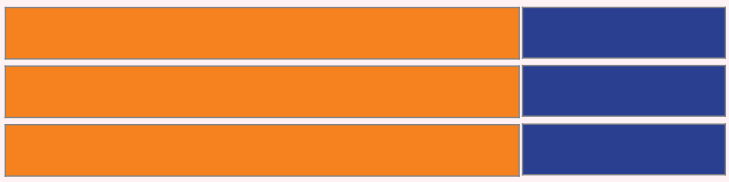
we will make rectangle with 3 as one side and we have 10 as other side, so we have 1 on tens place.

Total we have 3 orange rods in rectangle so we have 30.



$$\begin{array}{r} 1 \\ 3\overline{)\,42} \\ \underline{30} \\ 12 \end{array}$$

We have left over 12 and we need to make rectangle with 3 as one side so we will replace 12 as 3 purple (4) rods. Now we have 14 as one side of rectangle so 4 will be at ones place.



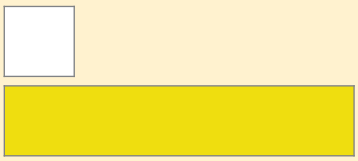
$$\begin{array}{r} 14 \\ 3\overline{)\,42} \\ \underline{30} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

So the answer is 14 $42 \div 3 = 14$

Find the fraction

Example

The red rod is $\frac{2}{4}$ of the purple rod.

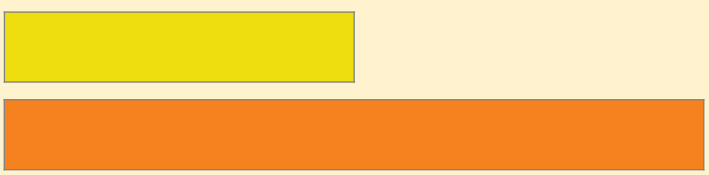


The white rod is ____ of the yellow rod.

The red rod is ____ of the black rod.

The purple rod is ____ of the dark green rod.

The light green rod is ____ of the blue rod.



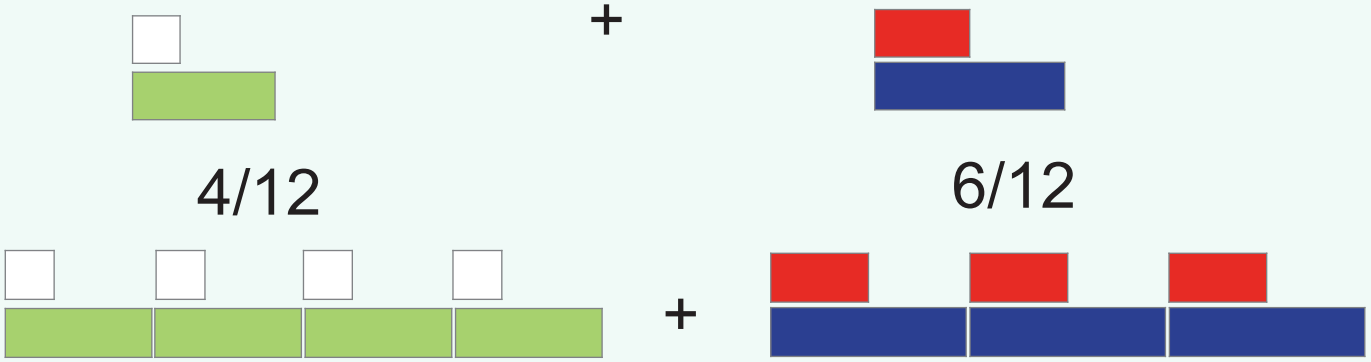
The yellow rod is ____ of the orange rod.

Addition & Subtraction

Fractions with unlike denominators

To add or subtract the fractions, their denominator should be common, so we will match the size of bottom rods to find the least common multiple (LCM) and then we add or subtract the numerator

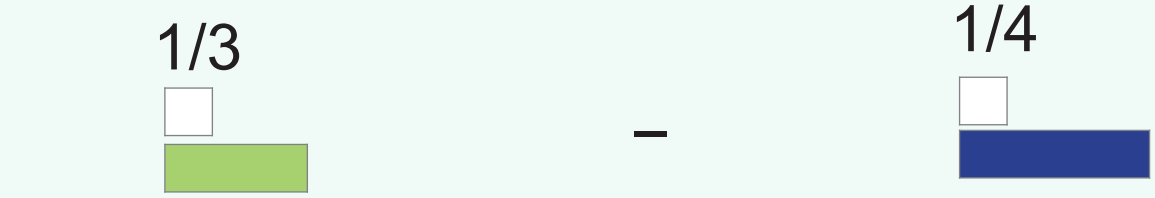
1/3 + 2/4



4/12 + 6/12

$$\frac{4}{12} + \frac{6}{12} = \frac{10}{12}$$

1/3 − 1/4



4/12 − 3/12

$$\frac{4}{12} - \frac{3}{12} = \frac{1}{12}$$

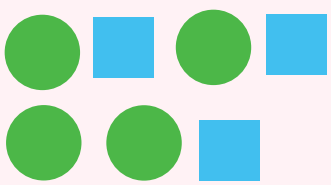
Ratio

We use ratios to show various relationships between quantities, including whole to part, part to whole, and part to part. Ratios are expressed in three ways a to b, a;b, and $\frac{a}{b}$.

Write the ratio in three different ways using cuisenaire rods

Example:

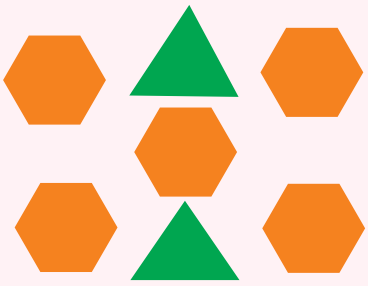
Circle to square



circle = 4
square = 3

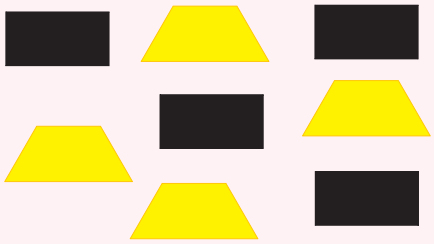
Words - 4 to 3
Ratio - 4:3
Fraction - $\frac{4}{3}$

1) Triangle to Hexagon



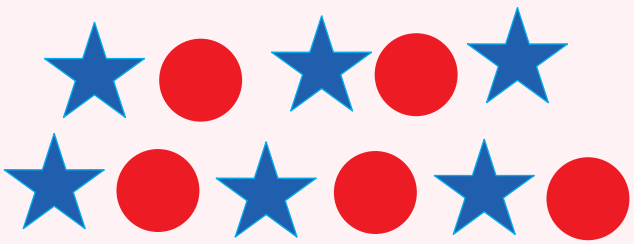
Words - _____
Ratio - _____
Fraction - _____

2) Trapezium to Rectangle



Words - _____
Ratio - _____
Fraction - _____

3) Star to Circle



Words - _____
Ratio - _____
Fraction - _____

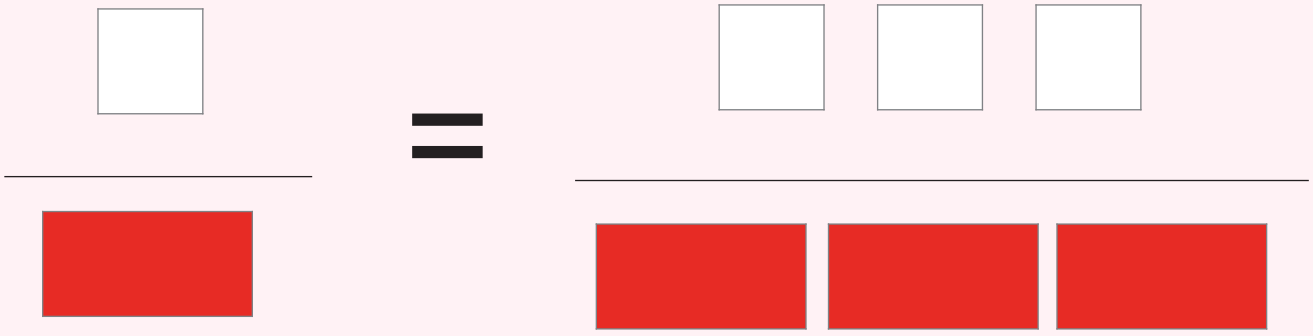
Proportion

A proportion is formed by equivalent ratios

Solve the proportions using cuisenaire rods

Example: $\frac{1 \text{ apple}}{2 \text{ mangoes}} = \frac{3 \text{ apples}}{x}$

- Place a pair of rods to the left of equal sign to represent 1 apple : 2 mangoes.
- Build an equal ratio to the right by adding 1 apple: 2 mangoes until you reach 3 apples.
- Count the mangoes and write the proportion.



$$\frac{1 \text{ apple}}{2 \text{ mangoes}} = \frac{3 \text{ apples}}{6 \text{ mangoes}}$$

So, x = 6