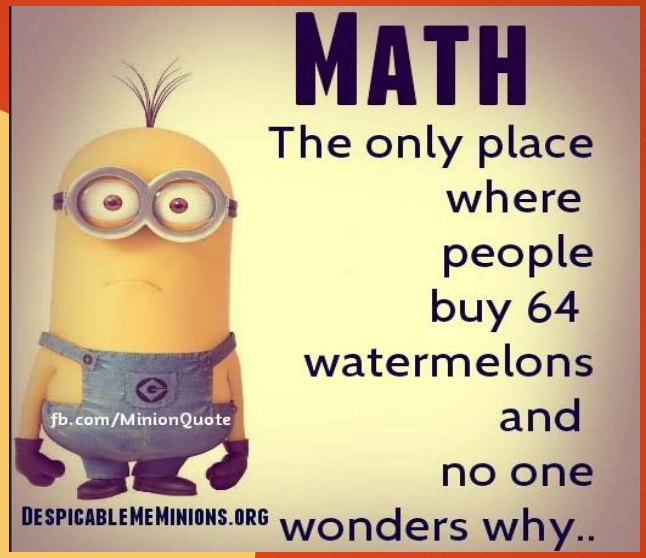
Building Number Sense with Singapore Math



Learning Goal

Teachers will obtain strategies to build number sense.

What is Number Sense?

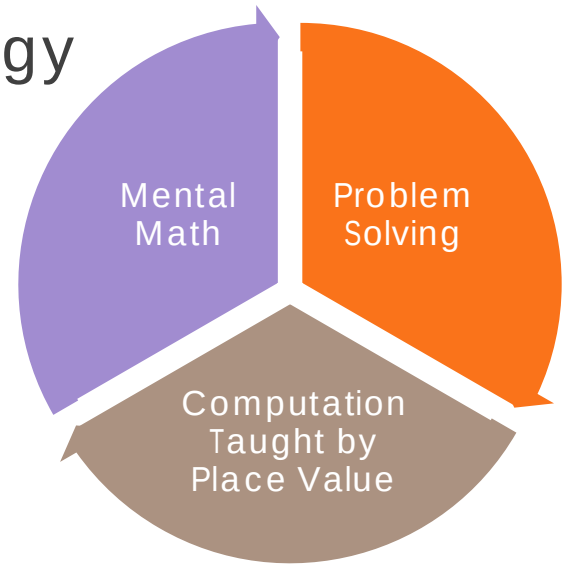
TURN AND TALK

Number Sense Is...

A general **understanding** of the magnitude of numbers in relation to other numbers and the ability to use this understanding in **flexible** ways.

The Fundamental Ideas of Math in Singapore

- Math is about thinking not about rote procedures.
- Visualization/look for patterns
- Concrete-Pictorial-Abstract Pedagogy
- Teach fewer topics for mastery



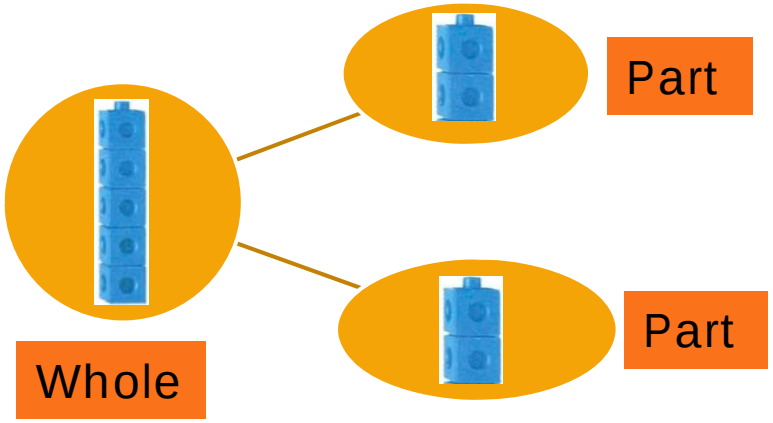
The Research – Richard Skemp

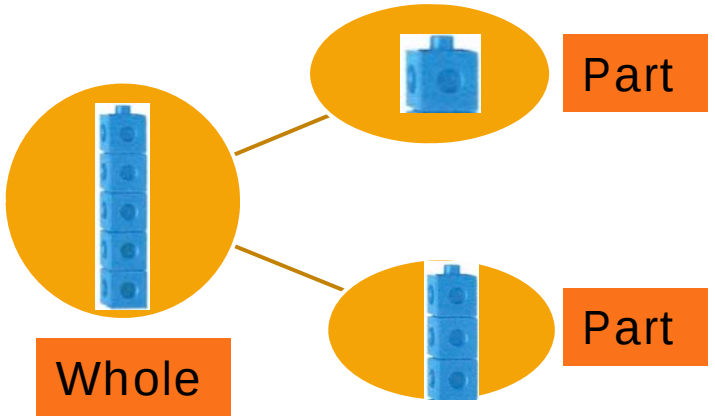
- Educational Theorist
- Author of **Mathematics in the Primary School**
- "If one learns with *instrumental understanding* one learns to use *rules without reasons* whereas with *relational understanding* one knows *both what to do and why*..."

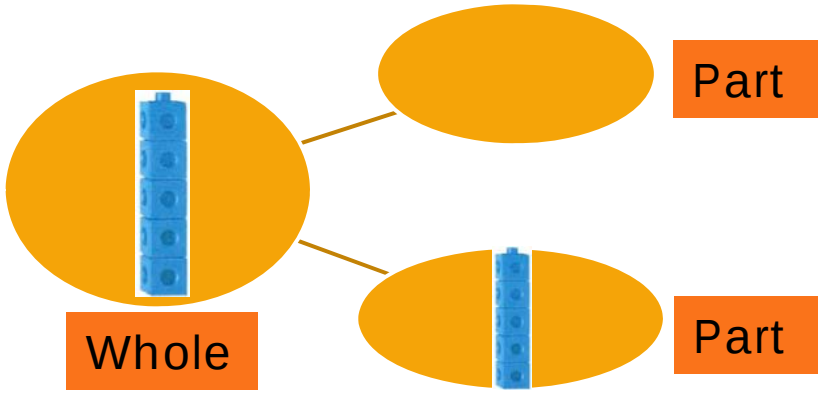
The Research – Jerome Bruner

- Harvard-educated psychologist
- The three modes of representation:

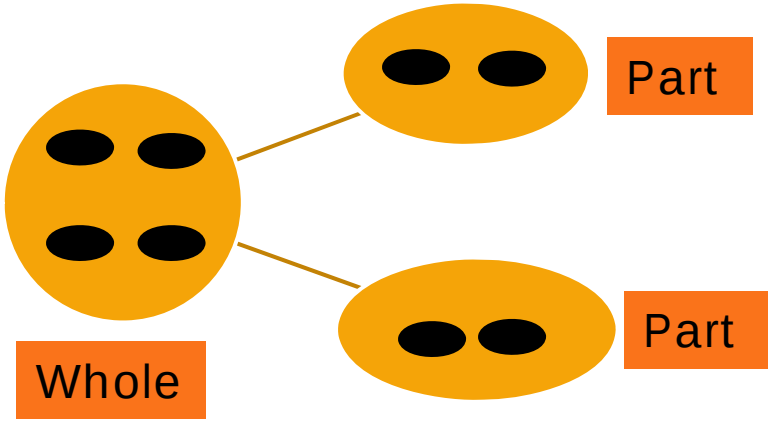
Number Bonds – Concrete Representation

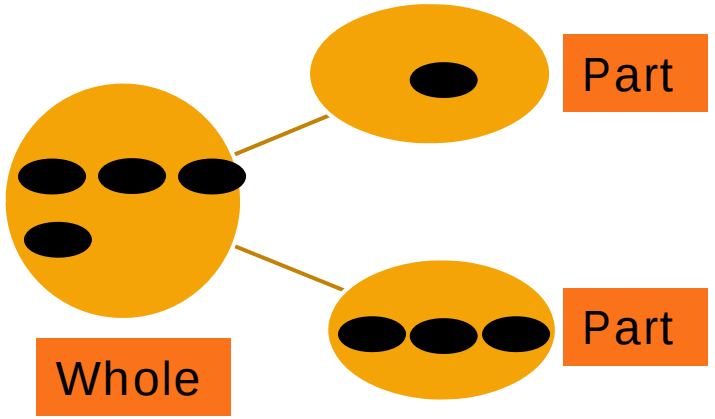


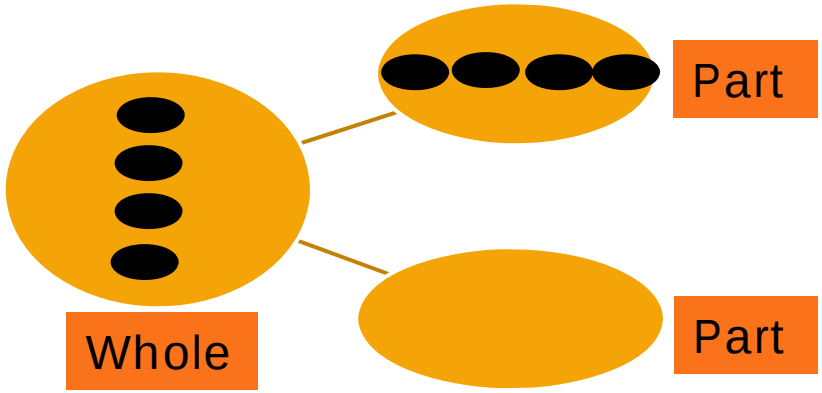




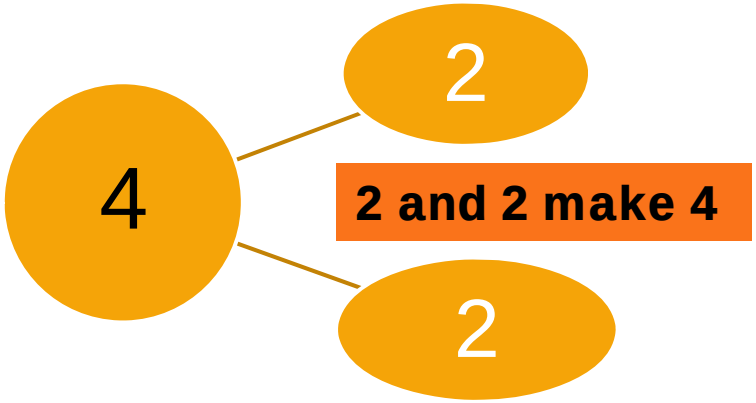
Number Bonds – Pictorial Representation

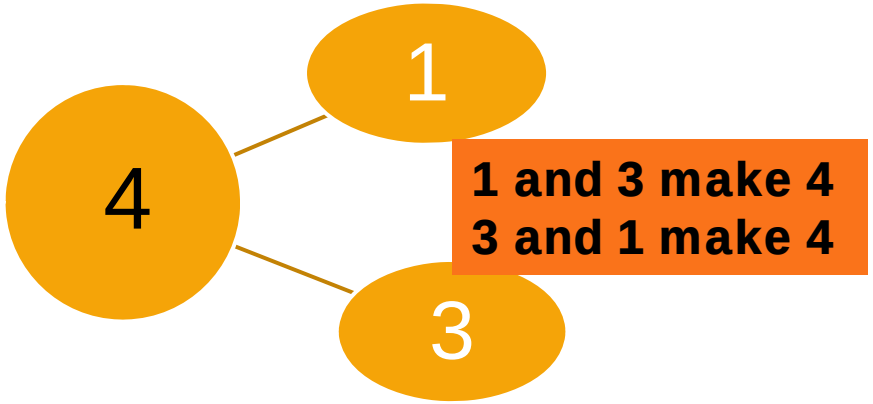


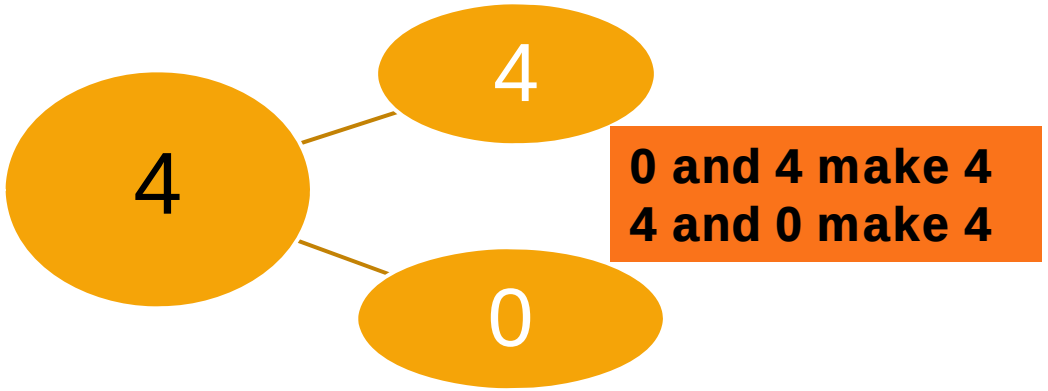




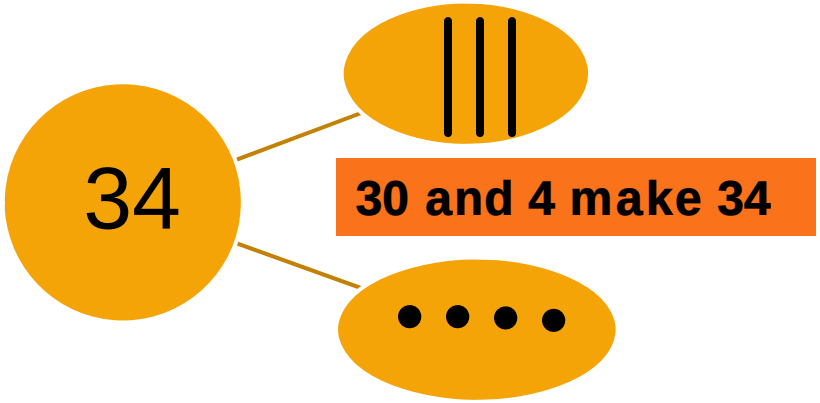
Number Bonds – Abstract Representation

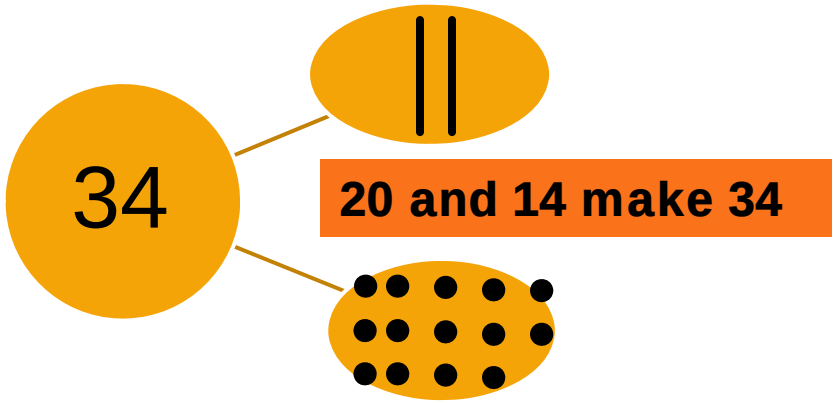


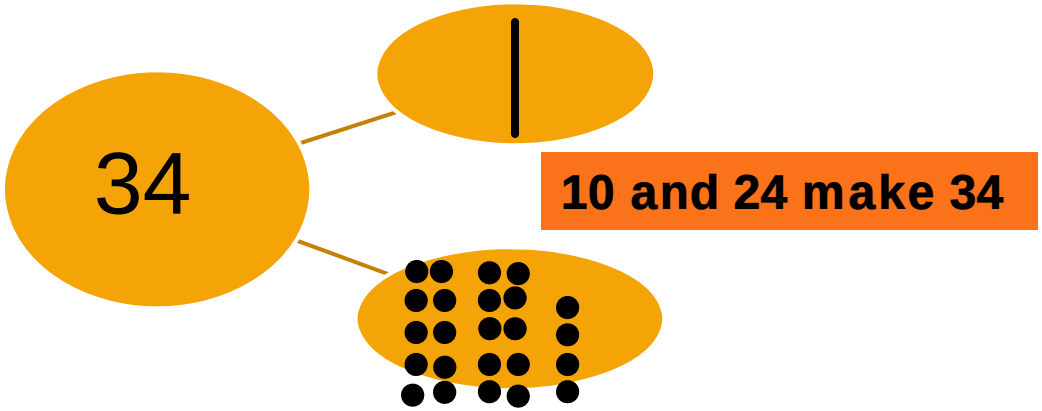




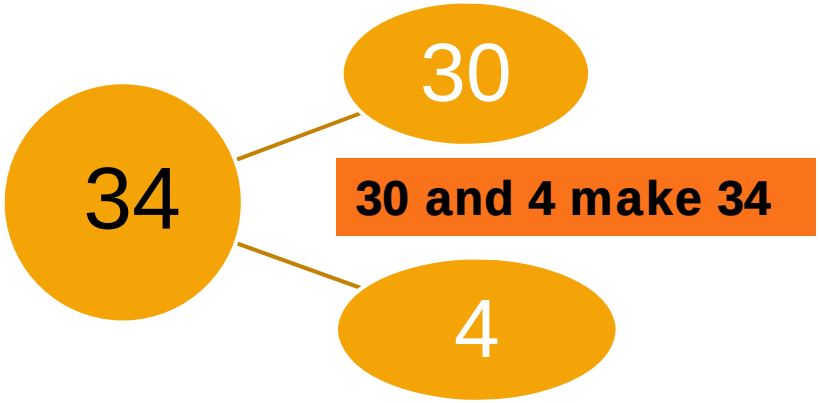
Number Bonds

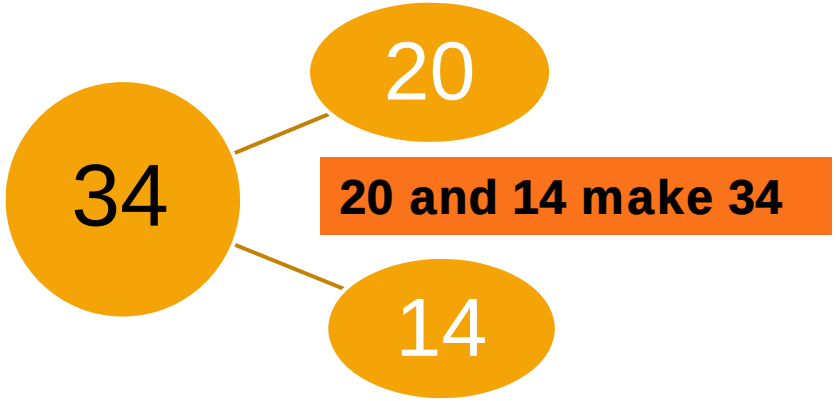


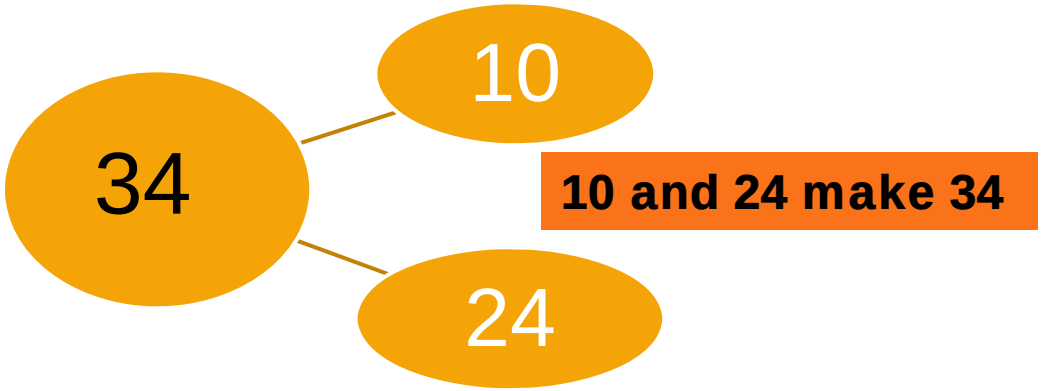




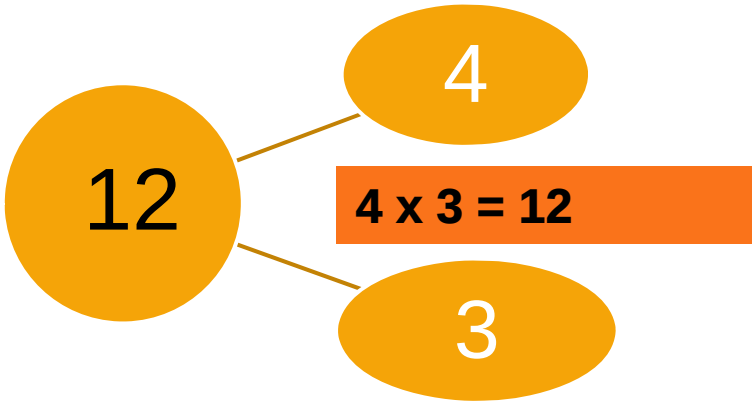
Number Bonds

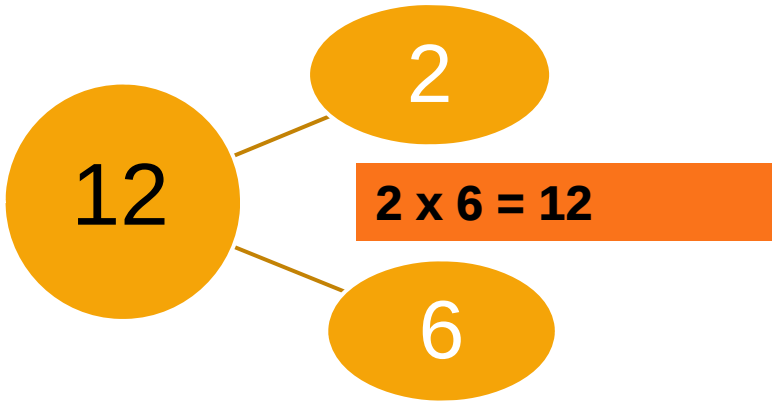


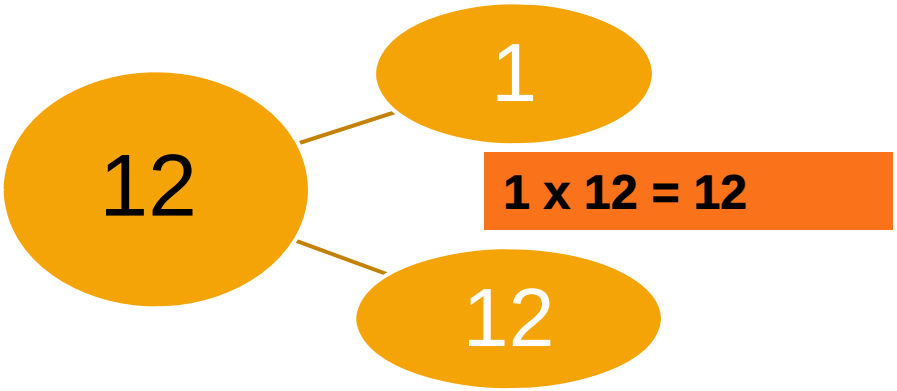




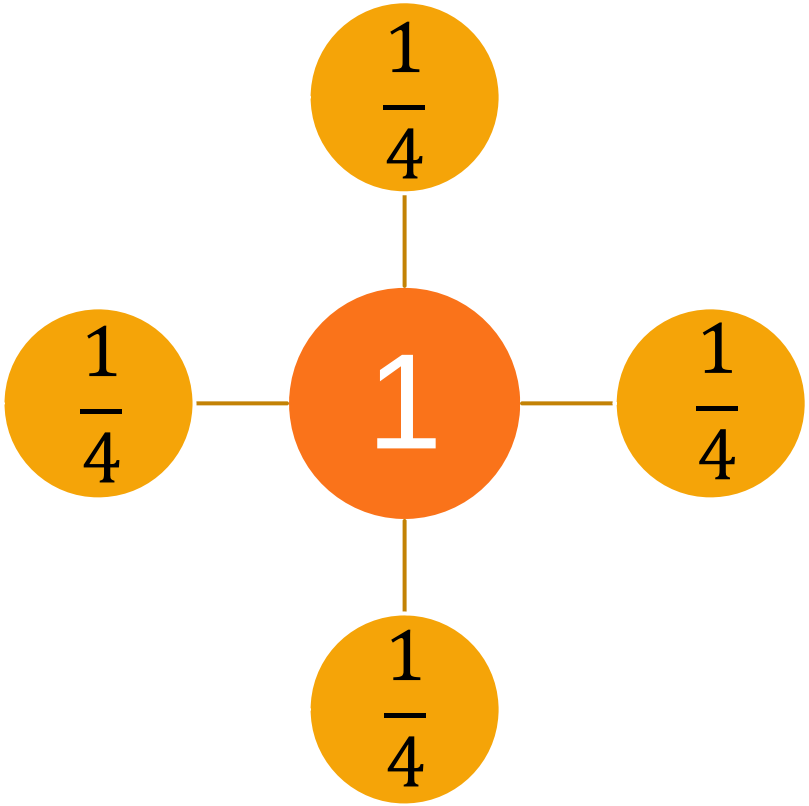
Multiplication/Division Number Bonds



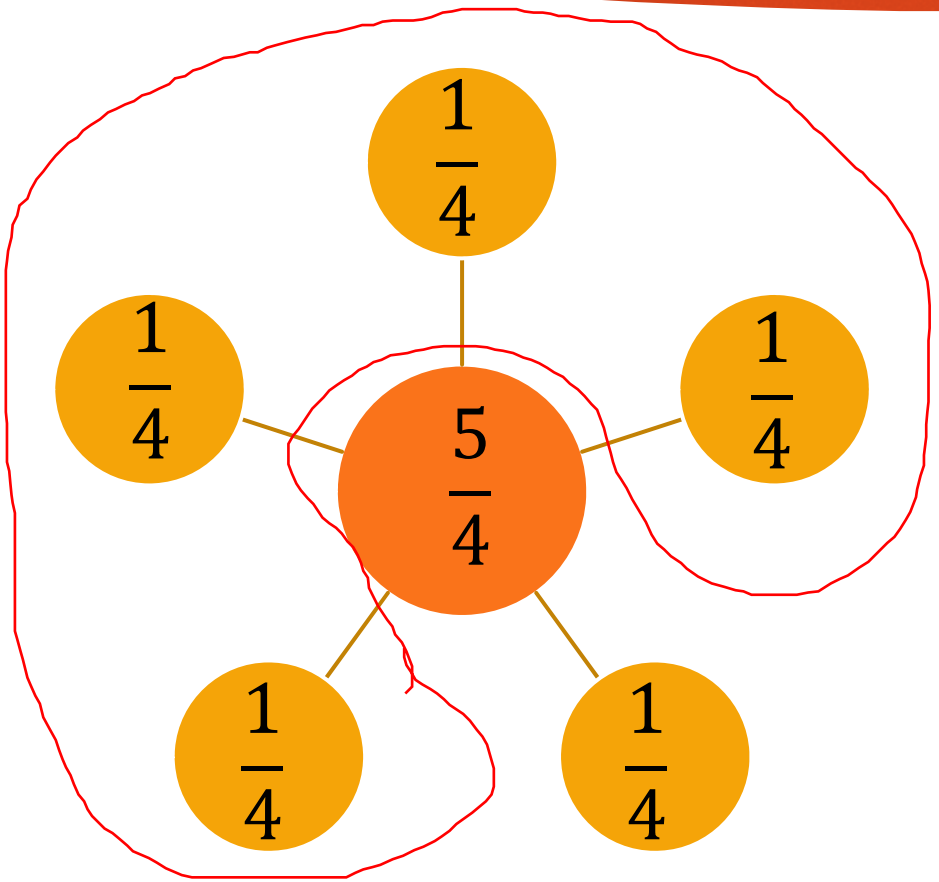




Fraction Number Bonds



Create number bonds fractions.



$1\frac{1}{4}$

Addition Strategies – Left to Right Addition

125 + 247

(100 + 20 + 5) + (200 + 40 + 7)

100 + 200 = 300

20 + 40 = 60

5 + 7 = 12

372

Addition Strategies – Vertical Addition

$$
\begin{array}{r}
125 \\
+\ 247 \\
\hline
300 \\
60 \\
12 \\
\hline
372
\end{array}
$$

https://www.youtube.com/watch?v=l6y7IMsmKno

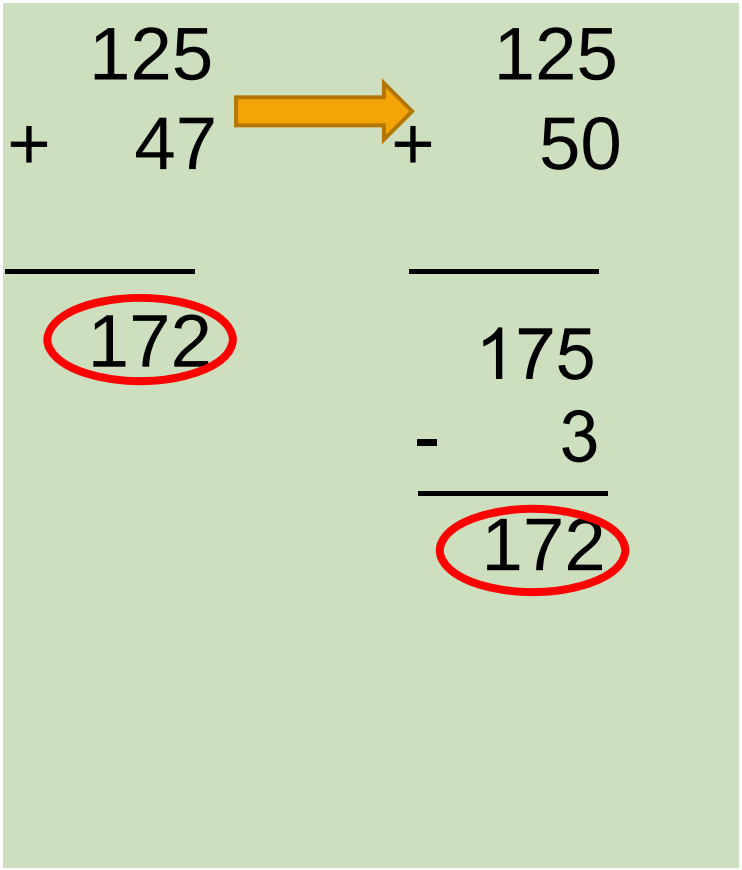
Addition Strategies – More Complex Strategies

125
+ 47

16 tens + 12 ones

160 + 12 = 172

Addition Strategies



You Try Together – Pick any two numbers to add. First solve mentally. Then, solve using paper and pencil.

116

289

12

290

48

246

56

125

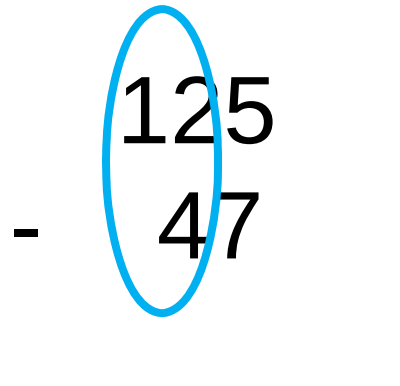
Subtraction Strategies

125 – 47

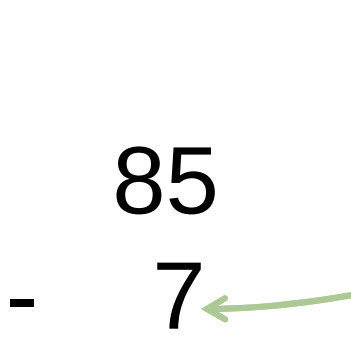
https://www.youtube.com/watch?v=mAh3BYRYIp4

125	105	100	80
- 20	- 5	- 20	- 2
105	100	80	78

Subtraction Strategies – More Complex Strategies



12 tens take away 4 tens = 8 tens



85 take away 5 = 80
80 take away 2 = 78

You Try Together – Pick any two numbers to subtract. First solve mentally. Then, solve using paper and pencil.

116

289

12

290

48

246

56

125

Compensation – Subtracting Across Zeros

$$\begin{array}{rcl} 6{,}000 & \xrightarrow{-1} & 5{,}999 \\ -\ 4{,}396 & \xrightarrow{-1} & -\ 4{,}395 \\ \hline & & 1{,}604 \end{array}$$

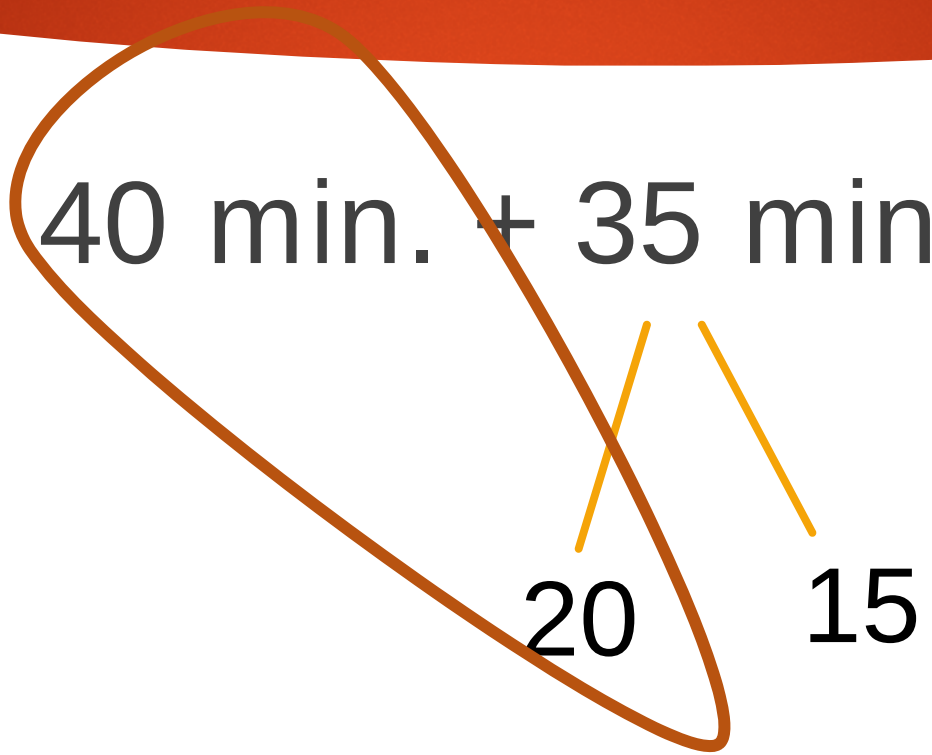
Compensation - Money

$5.01 - .02 → $4.99

- $3.47 - .02 → - $3.45

$1.54

Compensation – Elapsed Time



60 min. = 1 hour

1 hour 15 minutes