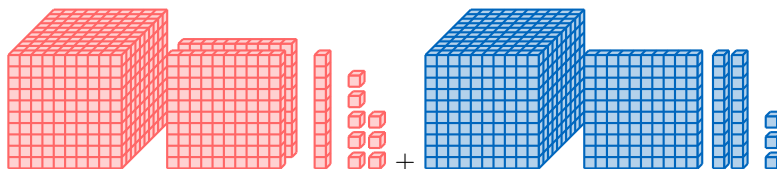# ADDITION

A DEFINITION

Discover: Louis has two boxes of cubes. One box contains $1\,218$ cubes, and the other box contains $1\,123$ cubes.
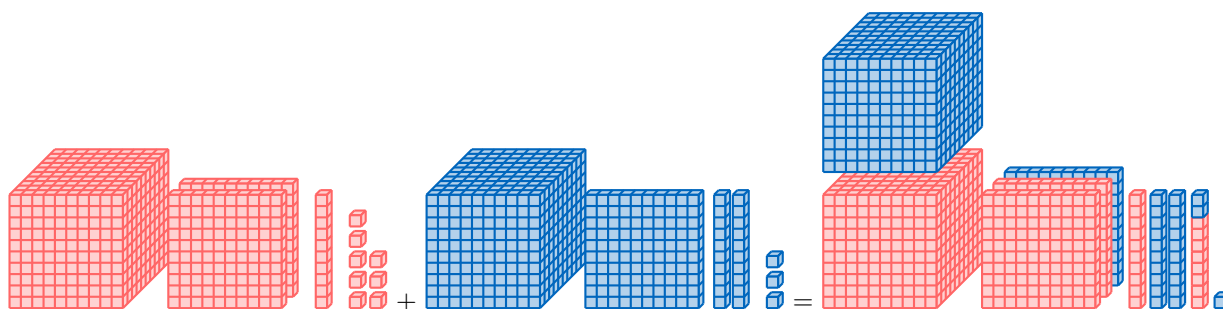

How many cubes does Louis have in total?

Answer: To find the total number of cubes Louis has, we add the cubes in the two boxes:

$$1\,218 + 1\,123$$

Using cubes, we can visualize the addition:

This shows a total of $1\,218 + 1\,123 = 2\,341$ cubes.
Counting each cube one by one would be tedious. Instead, we use column addition to calculate:

$$
\begin{array}{r}
{\scriptstyle 1} \\
1\ 2\ 1\ 8 \\
+\ 1\ 1\ 2\ 3 \\
\hline
2\ 3\ 4\ 1
\end{array}
$$

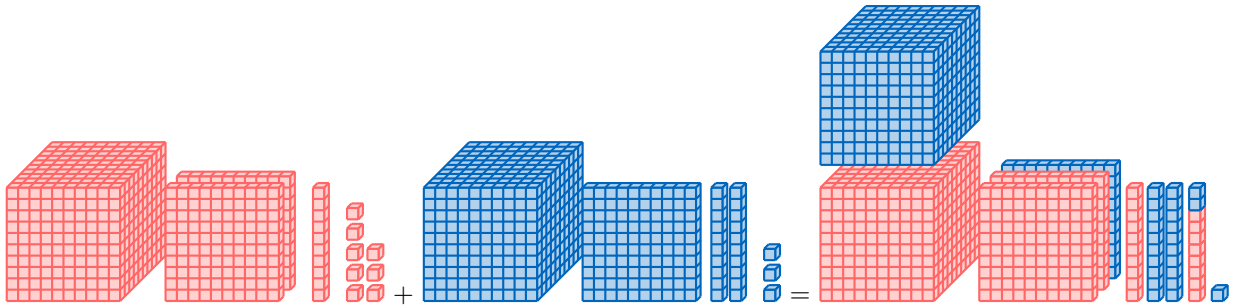**Addition** means combining quantities to find a total.

- The $+$ symbol means "add."

- The $=$ symbol shows equality on both sides.

Addition can be represented as:

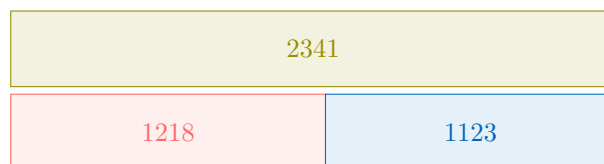- **Numbers**:

$$1\,218 + 1\,123 = 2\,341$$

- **Cubes**:

- **Words**:

  one thousand two hundred eighteen plus **one thousand one hundred twenty-three** equals **two thousand three hundred forty-one**

- **Column Addition**:

$$
\begin{array}{r}
1\\
1\;2\;1\;8\\
+\;1\;1\;2\;3\\
\hline
2\;3\;4\;1
\end{array}
$$

- **Part-whole model**:

2341	
1218	1123

B ADDING USING COLUMNS

To calculate:

$$288 + 545$$

- **Step 1: Set up the addition**
  Write the numbers in a vertical column, making sure the digits line up by place value (ones under ones, tens under tens, hundreds under hundreds).

$$
\begin{array}{r}
2\;8\;8\\
+\;5\;4\;5\\
\hline
\end{array}
$$

- **Step 2: Add the ones**

$$8 \text{ ones} + 5 \text{ ones} = 13 \text{ ones} = 1 \text{ ten} + 3 \text{ ones}$$

Write the 3 in the ones place of the result and carry the 1 ten to the top of the tens column.

$$\begin{array}{r} {\scriptstyle 1} \\ 2\ 8\ 8 \\ +\ 5\ 4\ 5 \\ \hline 3 \end{array}$$

- **Step 3: Add the tens**

$$1 \text{ ten (carried)} + 8 \text{ tens} + 4 \text{ tens} = 13 \text{ tens} = 1 \text{ hundred} + 3 \text{ tens}$$

Write the 3 in the tens place of the result and carry the 1 hundred to the top of the hundreds column.

$$\begin{array}{r} {\scriptstyle 1}\ {\scriptstyle 1} \\ 2\ 8\ 8 \\ +\ 5\ 4\ 5 \\ \hline 3\ 3 \end{array}$$

- **Step 4: Add the hundreds**

$$1 \text{ hundred (carried)} + 2 \text{ hundreds} + 5 \text{ hundreds} = 8 \text{ hundreds}$$

Write the 8 in the hundreds place of the result.

$$\begin{array}{r} {\scriptstyle 1}\ {\scriptstyle 1} \\ 2\ 8\ 8 \\ +\ 5\ 4\ 5 \\ \hline 8\ 3\ 3 \end{array}$$

- **Result**:

$$288 + 545 = 833$$