# Choosing an efficient strategy to solve a calculation

With any calculation, there are usually several ways that you could work it out. We often choose a written method, but this is not always the most efficient way. "Efficient" means you are quick and accurate. Making good choices that are best for you is important. The following will help you to reflect on different strategies and make good choices – based on the numbers involved and the type of calculation required.

On the first page, there is an example of a problem, followed by several different approaches chosen by different people. Look at each one carefully and work out each person's strategy and why it worked. Think also about how you would have solved it. Then think about which is the most efficient strategy – and why.

Then, there is a framework for you to use to help you explore different strategies to arithmetic questions, followed by a worked example.

After this, there are some arithmetic questions to work through using the framework and thinking about different ways you could solve the calculation.

You will need some copies of the framework master.

# Examples of children's calculations

There are 12 pencils in a box.

A school buys 24 boxes.

How many pencils does the school buy?

Show your working. You may get a mark.

**Thaddeus**

$$24 \times 12$$

$$\begin{array}{r} 72 \\ 72 \\ 72 \\ 72 \\ \hline 288 \end{array}$$

$$\begin{array}{r} 12 \\ 12 \\ 12 \\ 12 \\ 12 \\ 12 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 4 \\ \times 72 \\ \hline 288 \end{array}$$

| 288 |

**Daniel**

$$\begin{array}{r} 120 \\ + \ 120 \\ 48 \\ \hline 288 \end{array}$$

| 288 pencils |

**Rebecca**

$$\begin{array}{r} 12 \\ \times 24 \\ \hline 48 \\ 240 \\ + 240 \\ \hline 288 \end{array}$$

$$\begin{array}{r} 12 \\ \times 4 \\ \hline 48 \end{array} \qquad \begin{array}{r} 12 \\ \times 20 \\ \hline 240 \end{array}$$

| 288 |

**Katherine**

$$\begin{array}{r} 24 \\ \times \ 12 \\ \hline 240 \\ + \ 48 \\ \hline 288 \end{array}$$

| 288 |

**Corinne**

tally marks

$$240$$
$$48$$

| 288 |

**Robert**

$$\begin{array}{cccc} 12 & 12 & 12 & 12 \\ 12 & 12 & 12 & 12 \\ 12 & 12 & 12 & 12 \\ 12 & 12 & 12 & 12 \\ \hline 36 & 24 & 24 & 24 \end{array}$$

$$\begin{array}{r} 144 \\ + 144 \\ \hline 288 \end{array}$$

| 288 |

**Amrin**

$$\begin{array}{r} 48 \\ 48 \\ 48 \\ 48 \\ 48 \\ + \ 48 \\ \hline 288 \end{array}$$

| 288 |

# Framework for choosing the most efficient strategy

**The calculation:**

**My estimate of the answer:**

**Three mental strategies I could use:**

**Answer to the calculation:**

**The most efficient strategy was:**

# Framework for choosing the most efficient strategy

**The calculation:**

**12 x 24**

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**My estimate of the answer:**

**Greater than 240 (because 10 x 24 would be 240)**

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**Three strategies I could use:**

**Double 12 x 12**

12 x 12 = 144. Double 144 is 288.

**(10 x 24) + (2 x 24)**

10 x 24 = 240, 2 x 24 is 48, 240 + 48 is 288.

```
      24
    x 12
      48
     240
     288
```

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**Answer to the calculation:**

**288**

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**The most efficient strategy was:**

**"Double 12 x 12 because I knew this times table fact and I could double 144 easily in my head."**

# Questions for making efficient strategy choices.

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|---|---|
| 345 − 60 = | 2.7 + 3.014 = |
| 167 × 4 = | 9 − 3.45 = |
| 45% of 460 = | 1 ½ x 57 = |
| 46 + 304 = | 879 x 3 |
| 4 − 1.15 = | 60 ÷ 15 = |
| 10 − 5.4 = | 0.5 × 28 = |
| 3.9 × 30 = | 99% of 200 = |
| 1.5 x 40 | 24 × 3 = |
| 472 − 9 = | 1.52 × 6 = |
| 95% of 240 = | 18 x 5 |