Numeration and Operations 9: Alternate Algorithms

Objectives

$\Rightarrow$ To learn alternate ways of doing addition, subtraction and multiplication

Activity 1:   Addition and Subtraction

1. Someone will be chosen to explain to the class how and why scratch addition works. Practice it on the following addition problems:

$$\begin{array}{r} 136 \\ 299 \\ 57 \\ + \ 148 \end{array} \qquad \begin{array}{r} 113_{\text{ four}} \\ 203_{\text{ four}} \\ 32_{\text{ four}} \\ + \ 330_{\text{ four}} \end{array} \qquad \begin{array}{r} 88D_{\text{ sixteen}} \\ 648_{\text{ sixteen}} \\ + \ 79B_{\text{ sixteen}} \end{array}$$

2. The Austrian method of subtraction is illustrated below:

$$\begin{array}{r} 5 \quad 2 \quad 7 \\ - \ 4 \quad 9 \quad 8 \end{array} \quad \longrightarrow \quad \begin{array}{r} 5 \quad 2 \quad 17 \\ - \ 4 \quad 10 \quad 8 \end{array}$$

$$\longrightarrow \quad \begin{array}{r} 5 \quad 12 \quad 17 \\ - \ 5 \quad 10 \quad 8 \\ \hline 2 \quad 9 \end{array}$$

Thus $527 - 498 = 29$.

    a.   Explain what was done in going from one step to the next. Why can the digits in the original problem be changed in that way ? What is the advantage of rewriting the problem in the way it was ?