

Addition and Subtraction in Other Bases

Activity 1: Modeling addition in other bases

1. Model the numbers 222_{three} and 122_{three} . Use your models to add the numbers. Begin by adding the units cubes. There will be four, which can be regrouped as one "three" (a flat) and one "unit" (a cube). Carry the flat over and combine it with the others. Regroup and carry, etc. Make a sketch showing explicitly how you added, regrouped, carried, etc., and the final answer.

2. Use models to add 234_{five} and 302_{five} . Draw a sketch to show each step of the procedure.

3. Use models to subtract 121_{four} from 1132_{four} . Draw a sketch to show each step of the procedure.

4. Use models to subtract 212_{three} from 2101_{three} . Draw a sketch to show each step of the procedure.

Several groups will be selected to show and explain their modeled calculations to the class.

Activity 2: Addition and subtraction in other bases

1. Perform the following addition problems. Work *in base*; i.e. do not convert to base ten.

a.
$$\begin{array}{r} 625_7 \\ + 342_7 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 1111_2 \\ + 1001_2 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 21.12_4 \\ + 3.02_4 \\ \hline \end{array}$$

2. Complete the following addition table for base four:

	+	0	1	2	3
0					
1					
2					
3					

3. Perform the following subtraction problems *in base*. Check by addition.

a.
$$\begin{array}{r} 12121_3 \\ - 2012_3 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 70413_8 \\ - 677_8 \\ \hline \end{array}$$

4. Fill in the missing digits:

$$\begin{array}{r} 2 \quad _ \quad _ \quad \text{five} \\ - \quad _ \quad 2 \quad _ \quad \text{five} \\ \hline _ \quad 0 \quad 3 \quad \text{five} \end{array}$$