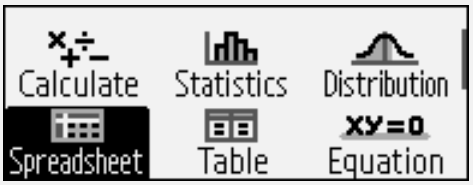
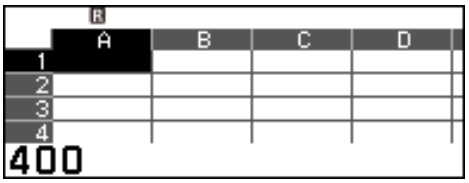
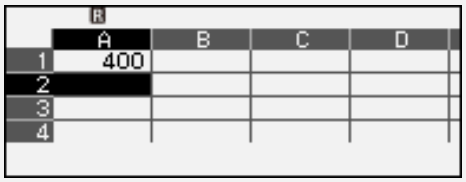
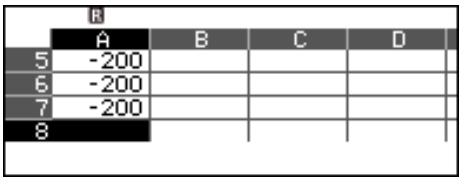
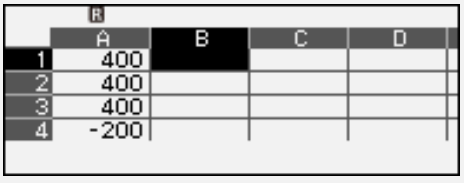
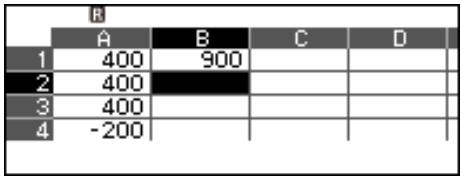
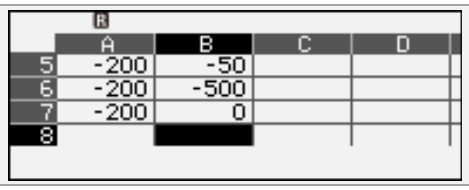
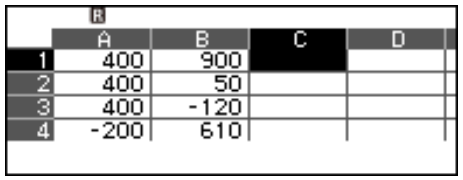
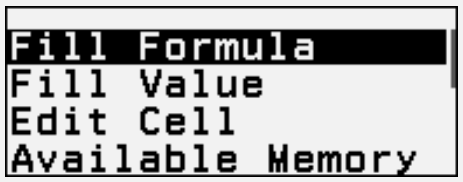
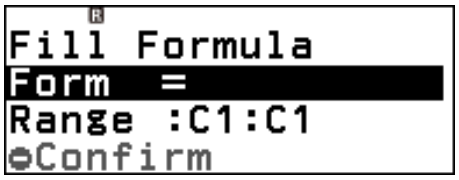
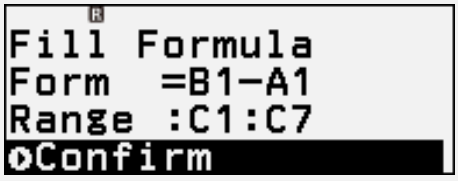
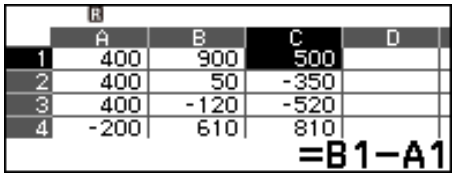
Unit 5: Lesson 6 – Finding Differences

Activity 6.2: Expressions with Altitude

Skill: Use the Fill Formula command in the Spreadsheet app to analyze altitude changes.

Activity Summary:
This activity teaches students about subtracting signed numbers by using a relatable scenario of climbing a cliff. Students will determine the difference between two elevations by setting up and solving subtraction problems. Students should discover that the subtraction expression, $a - b$, can be rewritten as an equivalent addition expression of $a + -b$. The calculator's spreadsheet app can be used to enter the beginning and final elevations. The fill command can be used to quickly determine the changes in altitude. The multiple results can be viewed and analyzed to discover a pattern in subtracting signed numbers.

1. This task will utilize the **Spreadsheet app** to quickly calculate, view, and analyze multiple changes in altitude. Press ⌂ **– Home** and then use the **arrow keys** to highlight the **Spreadsheet app**.	
2. Enter the seven beginning elevations in feet in cells **A1:A7**. In **Cell A1**, enter **400** using the **number pad**.	
3. Press either OK or EXE to enter, and move to the next cell below, **Cell A2**. Enter the next beginning elevation, **400 ft**, in **Cell A2**.	
4. Press either OK or EXE to enter and move to the next cell below. Continue this process to enter the remaining beginning elevations. The last value, representing **-200 ft**, will be in **Cell A7** with **A8** highlighted.	
5. To quickly begin entering the corresponding final elevations in **Column B**, press **Scroll Up**, ⌃, to go directly to **Cell A1** followed by the **right arrow**, ⌄, to move to **Cell B1**. (The arrow keys can also be used to move to Cell B1.)	

6. Enter the seven corresponding **final elevations** in cells **B1:B7**. In **Cell B1**, enter **900** using the **number pad**. Press either [OK] or [EXE] to enter, and move to the next cell below, **Cell B2**.	
7. Continue entering the **remaining final elevation values**, ending with **0** in **Cell B7**.	
8. To quickly move to the top of **Column C**, press **Scroll Up**, [▲], to go directly to **Cell B1** followed by the **right arrow**, [▶], to move to **Cell C1**. In **Column C** the change in elevation will be calculated.	
9. The **Fill Formula** command can be used to complete **Column C** with the change in elevation values as a **Formula**. This option allows for changes in the spreadsheet to be recalculated. Press [∞] **– Tools** to open the menu of options.	
10. The **Fill Formula** option is highlighted at the top. Press either [OK] or [EXE]. The **change in elevation** is the final elevation, **Column B**, **minus** the beginning elevation, **Column A**.	
11. For **Form =**, enter **B1–A1** by typing [▲] [5] [1] [−] [▲] [4] [1] followed by either [OK] or [EXE]. For **Range**, change the **second 1** to a **7**, our last row of data. **Right arrow** to the far right, press the **Backspace key**, [◀], and press [7]. Press either [OK] or [EXE] to enter.	
12. Press either [OK] or [EXE] to **Confirm**. Now **Column C** is filled in with differences of the final elevation minus the beginning elevation for each set of data. Notice **Cell C1** shows the **formula** at the bottom, and not **500**.	
13. Students may now copy these results to their **table on paper** or use the arrow keys to view the results in the **spreadsheet** to **draw conclusions** of the process of subtracting with signed numbers.