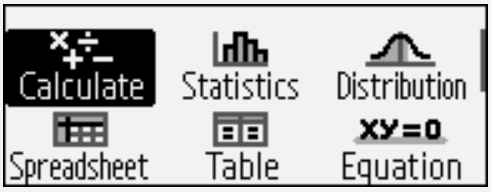
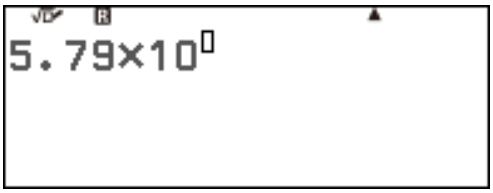
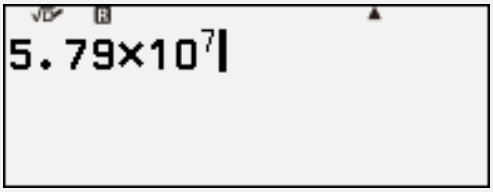
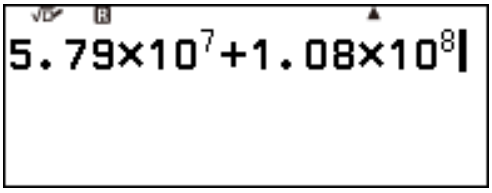
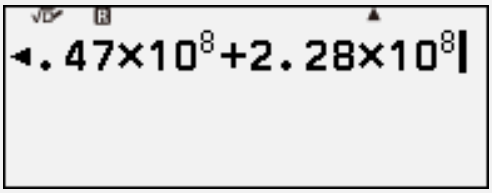
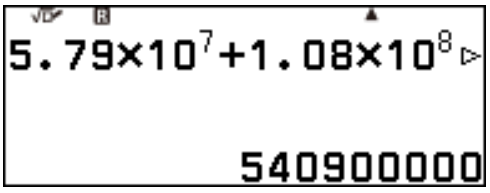
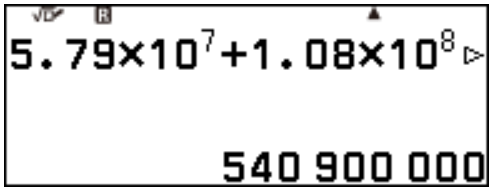
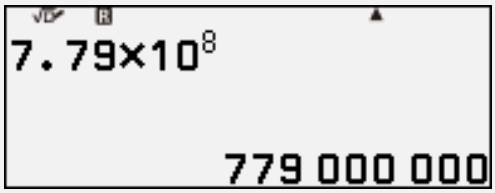
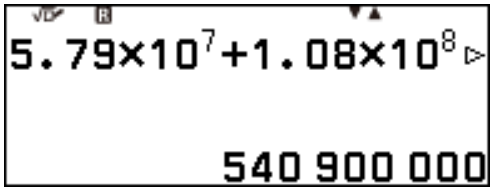
Unit 7: Lesson 15 – Adding & Subtracting with Sci. Notation

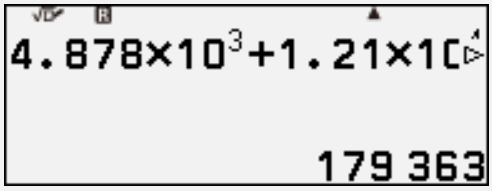
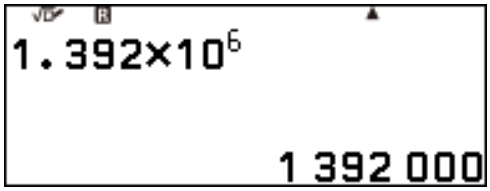
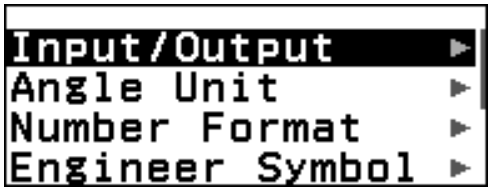
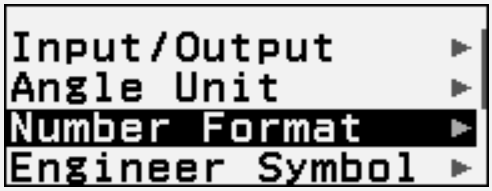
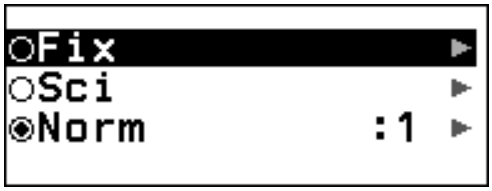
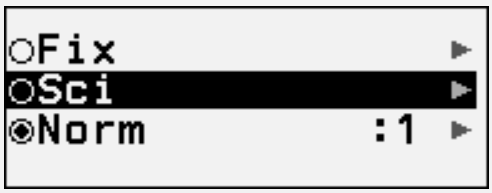
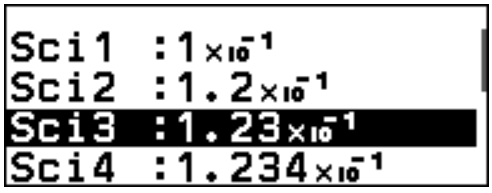
Activity 15.3: A Celestial Dance

Skill: Use the Calculate app to check operations in scientific notation.

Activity Summary:
This lesson shows the different methods for adding and subtracting numbers in scientific notation. Some students will prefer to convert numbers to a decimal before adding or subtracting. Other students may write both numbers with the same powers of ten and add/subtract their coefficients. In either case, the calculator can be used to verify their answers. Depending upon the settings, the calculator can convert standard decimals to scientific notation and vice versa.

1. Turn on the calculator with the ⏻ **- On** button. Press ⌂ **– Home** and then use the arrows to highlight the **Calculate app** in the top left row of apps.	
2. Press either OK or EXE to open the **Calculate app**.	
3. To answer the **Student Tasks** for this activity, we need to add values written in scientific notation. To enter the distance from the Sun to Mercury; **5.79 x 10^7** km; enter the **coefficient**, **5.79** first using the number pad. (5 . 7 9)	
4. Now press the ×10ⁿ button. Notice that the number is "greyed" out until an **exponent** is entered. The cursor is currently in the box to enter the exponent.	
5. Enter the **exponent**; 7 in this case, by pressing 7. When finished typing the exponent, push the **right arrow**, ▶. The cursor drops to the main entry line and the number is now complete.	

6. Next **add** the distance from the Sun to Venus. To add, press the **addition key**, ⊕. Enter **1.08 x 10^8** km as we did in Steps 3-5 above.	
7. Continue to add the distances from the Sun to Earth, **1.47 x 10^8** km, and the Sun to Mars, **2.28 x 10^8** km.	
8. When finished, press either OK or EXE.	
9. To more easily view this large number, go to **Settings** ☰, **Calc Settings** ⊳, push the **up arrow** ⊙ to highlight **Digit Separator** and then press either OK or EXE twice to turn the **Digit Separator** to **"On".**	
10. Press the AC **button** to return to the **Calculate app**. Now you will see a space separating digits similar to a comma separates thousands, millions, billions, etc.	
11. To compare this value to the distance between the Sun and Jupiter, **7.79 x 10^8** km, enter this value written in **scientific notation** into the calculator, and press either OK or EXE.	
12. Comparing these numbers, the distance between the Sun and Jupiter, is greater than the distances between the Sun and Mercury, Venus, Earth, and Mars combined! (If you didn't write down this value of the sum in **standard form**, press the **up arrow** ⊙ to view the **prior calculation**.	

13. For the second task, add the **diameters** of all the **planets** written in the table. Pressing either OK or EXE will find the **sum** written in **standard form**.	
14. Enter the diameter of the Sun in scientific notation into the calculator and press either OK or EXE. The **Sun** is almost **8 times wider** than the **5 planets combined**!	
15. To **convert** from **standard form** to **scientific notation**, press ☰ **- Settings**.	
16. Press either OK, EXE, or ▷ to open **Calc Settings**.	
17. Press the **down arrow** ▽ **twice** to highlight **Number Format**.	
18. Press either OK, EXE, or ▷ to open **Number Format**.	
19. Press the **down arrow** ▽ to highlight **Sci**, which is short for **Scientific Notation**.	
20. Press either OK, EXE, or ▷ to view the **Sci** setting options. **Arrow down** ▽ to the desired number of significant figures. The values in the table had **3 significant figures**.	

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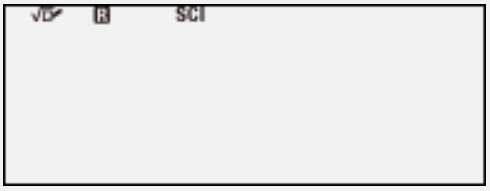
21. Press either OK or EXE to select and press the AC **button** to return to the entry window. You will now see **SCI** at the top of the display.	
22. Now type in a number in **standard form**. Press either OK or EXE to display it in **scientific notation**. When complete, return the **Number Format** to **Norm**, for Normal following **Steps 15 -19** above.