

Fahrenheit vs. Celsius

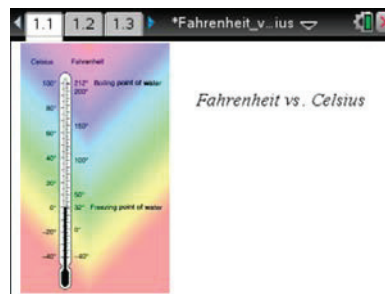
Student Activity

Name _____

Class _____



Open the TI-Nspire™ document *Fahrenheit_vs_Celsius_PD.tns*.

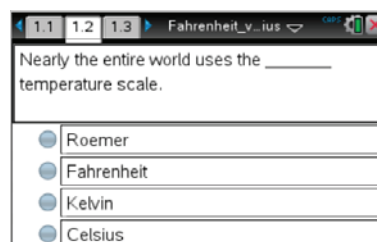
While nearly the entire world uses the Celsius (Centigrade) temperature scale, the United States continues to use the Fahrenheit scale. This activity will explore the relationship between the two temperature scales by gathering, graphing, and analyzing data.



Move to page 1.2.

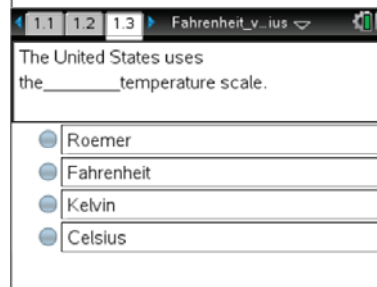
Answer the question on your TI-Nspire™ CX CAS handheld.

Press **ctrl**  and **ctrl**  to navigate through the lesson.



Move to page 1.3.

Answer the question on your TI-Nspire handheld.



Move to page 2.1.

1. Pour about 100 mL of tap water into a 250-mL beaker.
2. Connect the TI-Nspire™ Lab Cradle to the handheld.
3. Connect Vernier EasyTemp® USB temperature sensors to the TI-Nspire Lab Cradle (see the photo to the right).
4. In the Vernier DataQuest™ app for TI-Nspire, set up the data-collection mode by selecting **Menu > Experiment > Collection Mode > Events with Entry**.



5. Enter *Sample* as the Name, leave the *Units* field blank, and click OK.



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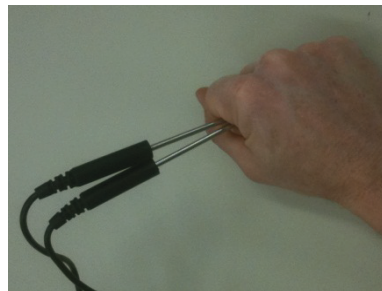
Name _____

Class _____

6. Select **Menu > Experiment > Setup Sensors > Change Units** and select Fahrenheit for temperature sensor 2. Click OK.
7. Start data collection by pressing **Start**.

You will measure the temperature of one group member's hands in both Celsius and Fahrenheit.

8. The volunteer should pick up the two temperature sensors and simultaneously hold their tips in the palm of the same hand as shown to the right.



9. Watch the live temperature read out. When the temperature stops rising, click the **Keep** button.
10. You will be prompted to enter a number. Type 1 to number the first temperature measurement trial, and click OK. The two temperature measurements have been saved.
11. Place the two temperature sensors simultaneously in the tap water.
12. When the temperature stabilizes, click the **Keep** button, and type 2 for the second trial when prompted.
13. Add several ice cubes to the beaker of tap water. Stir using both probes. When the temperature stops decreasing, click the **Keep** button, and enter 3 when prompted.
14. Stop data collection.
15. Select **Menu > Graph > Y-axis Columns > Temperature 2 (°F)**.
16. Select **Menu > Graph > X-axis column > Temperature (°C)**.
17. Select **Menu > Analyze > Curve Fit > Linear**.
18. a. What is the slope of the line? _____
 b. What is the y-intercept? _____



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19. Explain the meanings of these values.

Move to page 3.1.

Answer the question on your TI-Nspire handheld.

What type of relationship exists between Celsius and Fahrenheit temperatures?

- Indirect
- Inverse
- Exponential
- Linear

Move to page 3.2.

Answer the question on your TI-Nspire handheld.

The slope of the Fahrenheit vs. Celsius graph represents the fact that _____ Fahrenheit degrees equals 1 Celsius degree.

- 32
- 5/9
- 1.8
- 32

Move to page 3.3.

Answer the question on your TI-Nspire handheld.

The y-intercept of the Fahrenheit vs. Celsius graph represents the _____ the freezing points between the Fahrenheit and Celsius temperature scales.

- difference in
- magnitude of
- ratio of
- product of



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Extension

1. Select **Menu > Graph > Y-axis Columns > Temperature (°C)**.
2. Select **Menu > Graph > X-axis Column > Temperature 2 (°F)**.
3. Select **Menu > Analyze > Curve Fit > Linear**.
4. a. What is the slope of the line? _____
 b. What is the y-intercept? _____
5. Explain the meaning of these values.
6. Disconnect the temperature sensors.
7. Properly dispose of the water in the beaker.

Move to page 3.4.

Answer the question on your TI-Nspire handheld.

