

Wind Chill

In this investigation you'll use the relationship between temperature and wind chill to explore the concept of rate of change and its connections to tables, scatter plots, recursive routines, equations, and graphs. The data in the table represent the approximate wind chill 15 mi/h. Use this data set to complete each task.

Temperature (°F)	Wind Chill (°F)	Change in Temperature	Change in Wind Chill	Rate of change
-5	-26			
0	-19			
5	-13			
10	-7			
15	0			
20	6			
35	25			
40	32			

Step 1 Define the input and output variables for this relationship.

Step 2: Plot the points and describe the viewing window you used.

Step 3: Write a recursive routine that gives the pairs of values listed in the table.

Step 4: Complete the third and fourth columns of the table by recording the changes between consecutive temperatures and wind chill values. Then find the rate of change.

Step 5: Use your routine to write a linear equation in intercept form that relates wind chill to temperature. Note that the starting value, -26, is not the y-intercept. What does your equation tell you?

Step 6: Graph the equation on the same set of axes as your scatter plot. Use the calculator table to check that your equation is correct. Does it make sense to draw a line through the points? Where does the y-intercept show up in your equation?

Step 7: What do you notice about the values for rate of change listed in your table? How does the rate of change show up in your equation? In your graph?

Step 8: Explain how to use the rate of change to find the actual temperature if the weather report indicates a wind chill of 9.5° with 15 mi/h winds.

Step 9. Explain how to use the rate of change to find the wind chill if the weather report indicates a temperature of 25° F with 15 mi/hr winds.