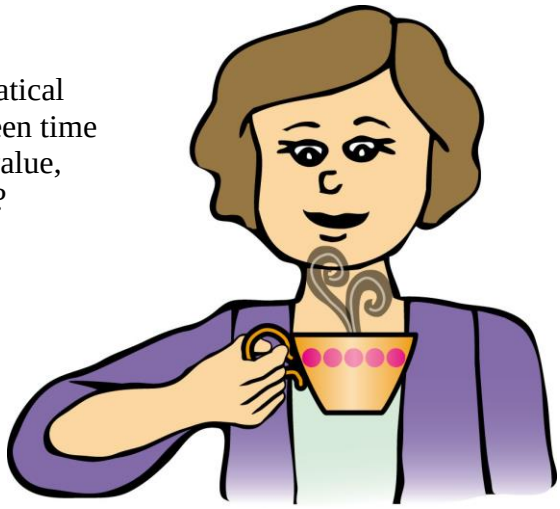
Too Hot To Handle

NAME_____

This lesson could save your lips and tongue.



1. For a cooling cup of coffee, what kind of mathematical model would best represent the relationship between time and temperature? Is the function linear, absolute value, quadratic, square root, exponential or logarithmic?

Exponential function
or exponential decay.

2. Use this table to record data points.

TIME (t)	TEMPERATURE (T)

3. To graph the data above, which variable should be used for the domain? Why?

Time should be used for the domain because temperature is dependent on time.
The domain is always represented by the dependent variable.

4. To graph the data above, what should the scale for the domain be? For the range?

The domain will be approximately from 0 to 30 minutes. By 20 minutes, changes are slow. The range should be approximately 70° to 200° F.

5. What is the scale interval for the *x*-axis? For the *y*-axis?

The interval for the *x*-axis could be in increments of 3 minutes, and the interval for the *y*-axis could be in increments of 10° F.

6. Graph the points as a scatterplot.

7. Now that you can see the graph, what type of function models the relationship between temperature and time?

Exponential (decay)

8. What temperature is considered scalding (hot enough to burn flesh)?

Answers will vary, but a reasonable estimate is 120–130°F.

9. At what temperature is it safe to take the first sip?

Answers will vary, but 120°F is reasonable.

10. So, after your coffee is poured, how much time should you wait before you take the first sip?

Answers will vary, though using the information from the video,
the coffee is approximately 210°F when poured into the cup,
and it reaches a temperature of 120°F after approximately 30 minutes.
Therefore, waiting a half-hour would be appropriate for that cup of coffee.