

# Final Lift



Hot & Cold chirping Crickets

1. Find the  $y$  value that should be paired with  $x = 21$ .

| X  | Y |
|----|---|
| 3  | 3 |
| 6  | 5 |
| 9  | 7 |
| 12 | 9 |
| ⋮  | ⋮ |
| ⋮  | ⋮ |
| 21 |   |

2. Write an equation that you could use to find the  $y$ -value paired with any  $x$ .

3. Use your equation to find the value of  $y$  when  $x = 93$ .

- Simplify your equation as far as you can.

Did you know that crickets chirp faster as the temperature goes up? Here is some data that a friend of mine collected one night last summer:

| Chirps<br>(per min) | Temperature<br>(degrees F) |
|---------------------|----------------------------|
| 90                  | 61                         |
| 150                 | 75                         |
| 165                 | 78.5                       |
| 180                 | 82                         |

- Write an equation that will allow you to predict the temperature outside from the number of cricket chirps you hear in 1 minute. Use  $x$  to represent the number of Chirps (per minute) and  $y$  to represent the temperature (in degrees Fahrenheit).
- Simplify your equation as much as possible.
- Are  $x$  and  $y$  proportional? Why or why not? Provide evidence for your thinking.

... but when are we ever going to use this? Let's use your equations to make those crickets tell us the temperature!

You will hear recordings of crickets chirping at different temperatures. *[Note: The length of time on each recording is different, so the number of chirps per minute must be calculated from the number you count. Your teacher will help you with this.]*

8. When listening to the recordings:

- Count the number of chirps in each unit of time
- Estimate the number of chirps you would have heard if the recording would have continued for a whole minute (60 seconds).

|              | # of chirps you heard | # of seconds | Estimated # of chirps per minute |
|--------------|-----------------------|--------------|----------------------------------|
| Recording #1 |                       | 20 seconds   |                                  |
| Recording #2 |                       | 20 seconds   |                                  |
| Recording #3 |                       | 13 seconds   |                                  |
| Recording #4 |                       | 8 seconds    |                                  |

9. Now estimate the temperature when each cricket was recorded. Use your estimate the number of chirps in a minute and your equation above (see #1 or #2) to create your estimates.

|              | Estimated # of chirps per minute | Calculations using your equation | Temperature (°F) |
|--------------|----------------------------------|----------------------------------|------------------|
| Recording #1 |                                  |                                  |                  |
| Recording #2 |                                  |                                  |                  |
| Recording #3 |                                  |                                  |                  |
| Recording #4 |                                  |                                  |                  |

10. Do you think this equation would be accurate for any temperature? Why or Why not? Use some examples to justify your thinking.