

**Background Information:**

Male crickets and katydids chirp by rubbing their front wings together. Each species has its own chirp and chirping is temperature dependent. Crickets chirp faster with increasing temperature and slower with decreasing temperatures. Therefore, at least in theory, the temperature can be estimated by counting the chirps. However, problems with putting this theory into practice abound.

**Sources of Error:**

- (1) Crickets generally do not sing at temperatures below 55 °F or above 100 °F,
- (2) Some crickets do not chirp in discrete bursts, they utter a more continuous trill.
- (3) Chirp rate is affected by other factors such as the cricket's age, mating success, hunger, and with competition from nearby males.

**Conclusions:**

The original formula for determining temperature (°F) from cricket chirps appears to have been published in 1897 by A.E. Dolbear, a physics professor at Tufts College. Since Dolbear's time, formulas have been devised for various species. Here are three formulas. They may or may not actually work!

In all cases, T is the temperature and N is the number of chirps per minute.

- Field Cricket:  $T = 50 + ((N - 40) / 4)$
- Snowy Tree Cricket:  $T = 50 + ((N - 92) / 4.7)$
- Katydid:  $T = 60 + ((N - 19) / 3)$



**Listen!**

**Get a signature when you listen.**

a) Use audios found on *Central Science* → *Life* → *Animal* →.

Count each 5 times and figure an average to use to find the temperature below.

- 1) *Cricket Chirp 1*    \_\_\_ \_\_\_ \_\_\_ \_\_\_ \_\_\_ / 5 = \_\_\_\_\_ (Seconds=\_\_\_)
- 2) *Cricket Chirp 2*    \_\_\_ \_\_\_ \_\_\_ \_\_\_ \_\_\_ / 5 = \_\_\_\_\_ (Seconds=\_\_\_)

Cricket Thermometer	Average Chirp Count	Seconds	Multiply by ___ to = 1 minute	Chirps per minute	Temperature ° Fahrenheit
Chirp 1					
Chirp 2					

b) Write the equation:

Show the substitution, steps and your answer. Fill in the temperature above.

1) Cricket Chirp 1          	2) Cricket Chirp 2          
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