Name: _____

Score (first try)**:** _____
Score (with corrections)**:** _____

Homework #6: Sampling II

Applied Entomologist Sara Bushmann investigated the causes of the bumblebee disease Nosema bombi*. She chose fields ranging in size from 2.2 to 20.5 hectares, on blueberry farms in Maine. Observing the plants around the blueberry fields closely, she collected sample populations of bumblebees. Math helped Bushmann use the bumblebees she collected to draw conclusions about larger populations of Maine's bumblebees. Answer the questions below to become an entomologist like Bushmann:*

1. You explore Central Park in New York City with a partner, choosing a forested area of the area called the Ramble to make some close observations. Eventually, you spot this bug on an oak leaf:

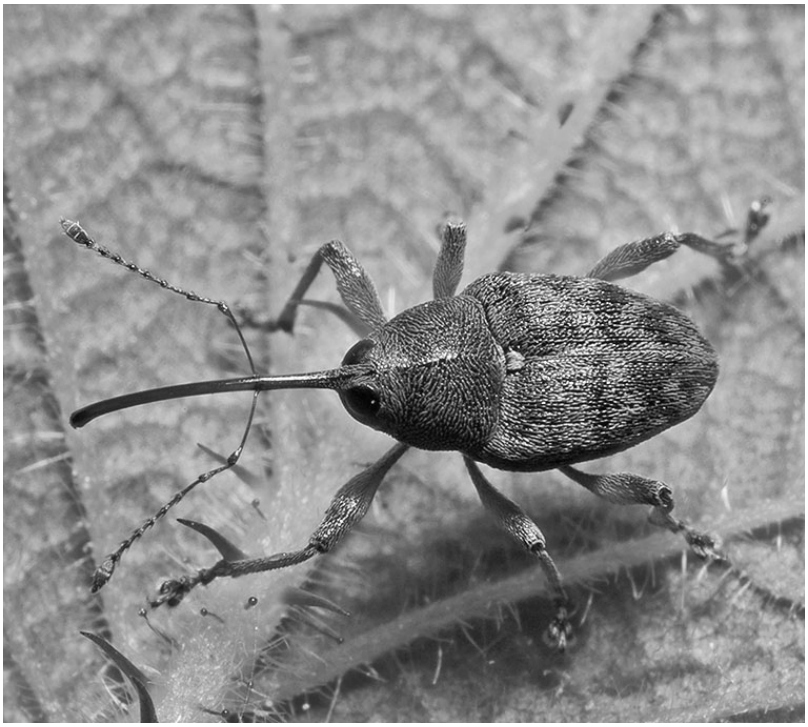

Photo by David Evans

Your partner holds a ruler up to the bug, whose body turns out to be 8 mm long.

Using the picture and the other information above, gather at least 10 facts about this mystery bug. List them here:

-
-
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2. Do some online research and/or search relevant insect guides. Name two or three insects (give their common names AND the genus and species of each one) you suspect may be the mystery insect. Give your best evidence for each one.

Name: _____

Score (first try)**:** _____
Score (with corrections)**:** _____

3. You and your partner use a meter stick to measure out a square sample plot in the Ramble, near where you first spotted the mystery insect. **Each side of the square is 6 meters long**. Searching the ground and all the leaves you can reach on the autumn trees, the two of you find 12 similar bugs (like the one pictured on page one).

a) If there are 3.28 feet in one meter, how many square feet are there in your sample plot? Describe the steps you took to find your answer.

b) If there are 43,560 square feet in one acre, how many acres are equivalent to your sample plot? Describe the steps you took to find your answer.

c) Central Park's Ramble covers an area of 38 acres. Using the calculations you have made, work out your best estimate of the number of these mystery insects in the Ramble. Describe the steps you took to calculate your estimate.

4. Create a list or write a paragraph or two to describe the reasons your estimate might not be accurate. For each reason you come up with, include information about what that might mean for the real number of mystery bugs in the Ramble.

While completing her doctorate in entomology at the University of Maine, Bushmann collected 4,474 wild bees that represent 133 species in blueberry fields.