



Water Flea

STEM Sims

Lesson 4: Nicotine Effects

Nicotine is found in cigarettes and is a highly addicting substance. Nicotine is also found in some common pesticides. Complete this investigation to study nicotine's effects. Add hopefully, you'll have enough water fleas left to complete this experiment involving nicotine.

Doing the Science

1. Start the Water Flea Simulation by clicking on the "Sim" tab.
2. You can use the Timer Counter on the left side of the screen to find the water flea's heart rate or you can use a stopwatch. To use the Timer Counter, click the "Start" button, then click the "Click Me" button each time the flea's heart beats. After getting in the rhythm of the beats, click the "Stop" button and the flea's heart rate will be displayed in beats per minute in the space below the buttons. Record this value (normal heart rate) and the gender, feeding status, and mass of the flea in Table 1 below.
3. Click the "Nicotine" button, then select the "Single Dose" button. Count and record in Table 1 the flea's new heart rate. Click the "Clear" button.
4. Click the "Nicotine" button, then select the "Double Dose" button. Count and record in Table 1 the flea's new heart rate. Click the "Clear" button.
5. Click the "Feed Flea" button and repeat steps 2 – 4. Make sure to record your data in Table 1.
6. Select a Male water flea and repeat steps 2 – 5. Make sure to record your data in Table 1.

Table 1.

| Flea | Heart Rate | Gender | Feeding Status | Mass |
|----------------------------|------------|--------|----------------|------|
| Normal | | | | |
| After Single Dose Nicotine | | | | |
| After Double Dose Nicotine | | | | |
| Normal | | | | |
| After Single Dose Nicotine | | | | |
| After Double Dose Nicotine | | | | |
| Normal | | | | |
| After Single Dose Nicotine | | | | |
| After Double Dose Nicotine | | | | |
| Normal | | | | |
| After Single Dose Nicotine | | | | |
| After Double Dose Nicotine | | | | |

Do You Understand?

1. How should nicotine best be classified, as a depressant or as a stimulant? Please explain your response.
2. Did the male and female respond exactly the same to the nicotine? Please explain your response?
3. How did eating a meal impact the effects of nicotine on the flea's heart rates?