



Water Flea

STEM Sims

Lesson 3: Alcohol Effects

People have used alcohol for centuries. But what exactly does alcohol do to a person? You'll use a water flea to investigate some of the effects of alcohol. Hopefully, the water fleas are of legal flea drinking age and they are not planning on driving anywhere today.

Here are some definitions to help you in your investigation.

Water Flea -	a very small aquatic organism that makes up plankton
Drug -	a substance that changes the body or mind of a person
Alcohol -	a natural drug
Stimulant -	a drug that raises the level of activity in an organism
Depressant -	a drug that lowers the level of activity in an organism
Cause -	something that gives rise to an action
Effect -	something that happens because of something else

Doing the Science

1. Start the Water Flea Simulation by clicking on the "Simulation" 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.
3. To use the Timer Counter, click the "Start" button, then click the "Click Me" button each time the flea's heart beats.
4. 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.

5. Record this value (normal heart rate) and the gender, feeding status, and mass of the flea in Table 1 below.
6. Click the "Alcohol" button, then select the "Single Dose" button. Count and record in Table 1 the flea's new heart rate. Click the "Clear" button.
7. Click the "Alcohol" button, then select the "Double Dose" button. Count and record in Table 1 the flea's new heart rate. Click the "Clear" button.
8. Click the "Feed Flea" button and repeat steps 3 - 7. Make sure to record your data in Table 1.
9. Select a Male water flea and repeat steps 3 - 7. Make sure to record your data in Table 1.

Table 1.

Flea	Heart Rate	Gender	Feeding Status	Mass
Normal				
After Single Dose Alcohol				
After Double Dose Alcohol				
Normal				
After Single Dose Alcohol				
After Double Dose Alcohol				
Normal				
After Single Dose Alcohol				
After Double Dose Alcohol				
Normal				
After Single Dose Alcohol				
After Double Dose Alcohol				

Do You Understand?

1. How should alcohol 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 alcohol? Please explain your response.
3. How did eating a meal impact the effects of alcohol on the flea's heart rates?
4. This investigation is a "cause-effect" study. What was the "cause" in this investigation?
5. What was the "effect" in this investigation?

- Often, people do not want to use animals to test the safety of some substances. Give two reasons why water fleas are a good choice to study the effects of alcohol.
- Give two reasons why water fleas may not be a good choice for studying the effects of alcohol.