



Egg Sampling

STEM Sims

Lesson 2: It's as Easy as 1, 2, 3

Assuming that there is only one source of contamination, one way to find the egg contamination is to test each and every coop to find the source. This is called a linear search. This is a method that will work, but it has some disadvantages. How do you choose the order to test? Based on this order, where will the contaminated coop be placed? It's all a matter of chance for where the contaminated coop will be, so it could be the very first one, the very last one, or a random location somewhere in the middle. You will take your chances with this egg-speriment.

Doing the Science

1. Start the Egg Sampling Simulation by clicking on the "Sim" tab.
2. Record in Table 1 the starting code provided as the simulation started.
3. Click on the "Start Sim" button.
4. Click on a letter of a chicken coop to get an egg. Collect more eggs from the *same* coop by clicking on the letter multiple times. Record the coop letter into Table 1 below.
5. Click on the "Lot Code" button and record the lot code provided into the table.
6. Click on the "Egg Prep Center" button.
7. Click on the "DeSheller" box to deshell the eggs, then click on the "Mixer" box to mix them.
8. Add "KI/I" by clicking on the bottle.
9. Drag and drop the eggs into the "Incubator 9000".
10. Click on the "Start" button to begin the timer.
11. Drag the pH meter to the eggs to test the pH level.
12. Click on "HCl" or "NaOH" to change the pH of the eggs to a pH of between 6.6 and 7.0.
13. Drag the pH meter back onto the shelf.
14. Drag and drop the eggs back into the "Incubator 9000".
15. Click on the "Start" button to begin the timer.
16. Click on "Egg Test Center".
17. Click on each test reagent (1-6) to add the reagent to the egg sample.
18. Click on "Results" to see if the test reagents changed.
19. Analyze the results by clicking on "Egg Test Database" and comparing the colors of the test tubes to the database. Record if the test tube stayed the same, has +Bacteria, or has -Bacteria.
20. Repeat steps 4-19 with the remaining *four other chicken coops* that you need to test.
21. When you find the source of the contamination, enter the coop letter into the table.

Table 1. Starting Code =

	Urease Test	Lysine Decarboxylase	Malonate Broth Test	Phenol Red Sucrose Broth Test	Voges-Proskauer Test	Methyl Red Test
Eggs from: Lot Center:						
Eggs from: Lot Center:						

Eggs from: Lot Center:						
Eggs from: Lot Center:						
Eggs from: Lot Center:						
Egg Contamination Source: Coop ____						

Do You Understand?

1. Although this simulation only has five chicken coops, what would happen if there were thousands of chicken coops?
2. Can you think of another way to search for the contaminated chicken coops *without* having to search through all of the chicken coops?
3. Is a linear search similar to looking to see if a word is in a dictionary? Explain.
4. Provide an example of what you could use a linear search for.
5. Why are there multiple tests to perform on the egg sampling?