

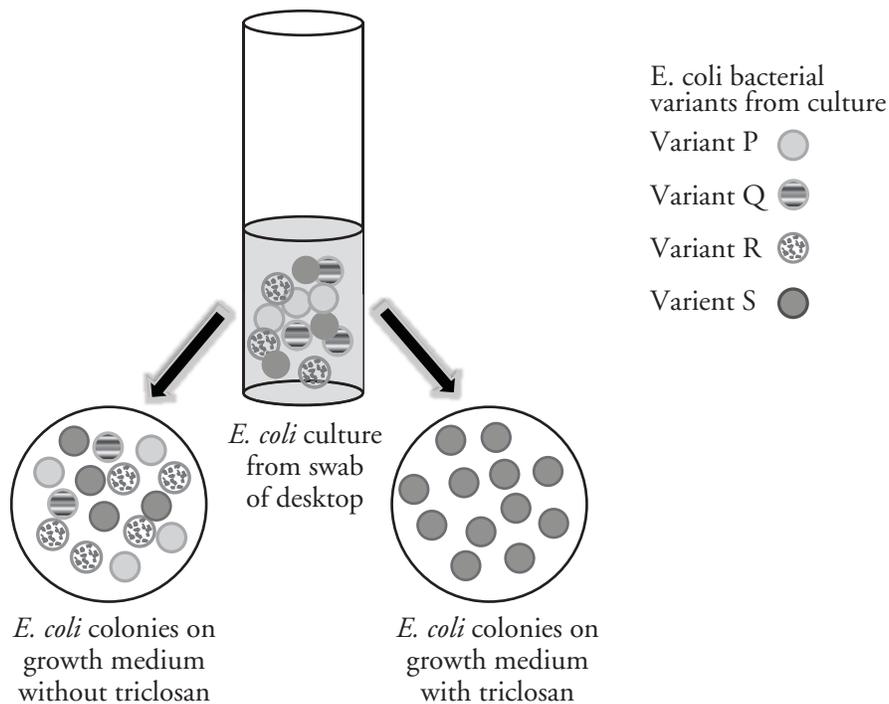
# Evolution and Selection

What mechanisms lead to changes in the diversity of species on Earth?

## Why?

People make choices by selecting options they like best. The natural world also “selects” (although not as a conscious decision) when environmental conditions allow organisms with a particular genetic trait to live healthier lives than other organisms. In this activity, we will explore how selection affects populations over time.

## Model 1 – Desktop Swab Results



1. What is the source of the bacteria in the culture tube in Model 1?
2. How many genetic variants of *E. coli* were present in the culture from the initial swab?
3. What variants of *E. coli* are found on the dish grown without triclosan?
4. Refer to the dish in Model 1 with the medium that included triclosan.
  - a. What variants of *E. coli* are found on the dish grown with triclosan?
  - b. What likely happened to the other variants of *E. coli* on the dish with the medium containing triclosan?

5. Based on its effect on *E.coli*, why is triclosan used as a cleaning agent?
  
6. Suppose the desktop swabbed earlier was cleaned with a solution containing triclosan. Would living *E.coli* remain? Support your answer.
  
7. Suppose the desktop was swabbed again after cleaning it with triclosan over a 9-month school year. When the sample was cultured only variant S was seen.
  - a. What characteristic does the variant S bacteria have that allows it to remain on the desktop even after several months of treatment with triclosan?
  
  - b. Is it likely that the bacteria in the new swab were on the desk 9-months ago, or are they offspring of the original bacteria?
  
  - c. Propose an explanation for the presence of only variant S on the desktop after so much time.

## Read This!

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Populations of most living organisms exhibit genetic diversity among individuals. Certain traits in a population give some organisms a greater chance of survival than individuals that lack these traits. Because these traits tend to increase the chance of survival, these individuals may produce more offspring that will also have the trait that favors survival. Over time, the number of individuals within the population possessing the favorable trait increases while the number of offspring with the favorable trait decreases.

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