

## Why Populations Stop Growing

### Apply

**Skill: Classifying**

### Limiting Factors

In this section, you learned about the various factors that limit population size. Study the following situations and determine whether the limiting factor is density independent or density dependent.

1. Some ocean birds, such as gannets, breed on remote, rocky islands where they are safe from predators. Many gannets flock to these islands each year to build nests. Because the islands are small, only a certain number of birds can nest and reproduce. Is island size a density-independent or density-dependent limiting factor? Explain your answer.  
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2. The trout stream Carlos visits on his annual "catch-and-release" fishing trip always provides him with a plentiful catch. Carlos uses a "fly" lure instead of a worm because young flies are the trout's main food source. Trout especially like flies called midges and stoneflies, and always prefer to eat the ones that are most plentiful. For example, when the midge population is high and the stonefly population is low, the trout eat midges and ignore stoneflies. Is the eating pattern of trout density independent or density dependent? Explain your answer.  
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3. Thrips are small insects that feed on apple blossoms. They can be a serious pest to apple growers. In recent years, a severe drought hit apple orchards in the state of New York. Because of the drought, most apple trees did not blossom. The thrip population declined sharply because their food source disappeared. Was the drought a density-independent or density-dependent limiting factor? Explain your answer.  
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**Why Populations Stop Growing**  
**Limiting Factors** (continued)

4. Tomatoes are Anne's favorite food. Last year, Anne decided to plant her own tomato garden. She wanted a large crop, so she planted many plants in her small garden. At first the plants thrived, but after one month, Anne noticed that they had stopped growing and looked unhealthy. The few tomatoes that her garden produced were small and sour. Anne's neighbor grew only two tomato plants, but harvested many more tomatoes than Anne. From her experience, Anne learned that overcrowding was a limiting factor in the growth of her tomatoes. Was overcrowding a density-independent or density-dependent limiting factor? Explain your answer.

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5. This year, Anne was excited about planting another tomato garden. On a warm day in late March, she carefully set out her tomato seedlings. Two weeks later, the weather turned cold. A frost killed most of the seedlings, and Anne had to plant new ones. Frost was obviously a limiting factor in the growth of Anne's tomatoes. Was it density independent, or density dependent? Explain your answer.

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6. Alberto is visiting his aunt's farm. He notices that the number of ticks are different in two adjacent pastures. One pasture is used for grazing dairy cows while the other pasture is used to grow hay. Alberto finds many ticks in the pasture with the dairy cows and almost none in the hay pasture. Is the tick population density dependent or density independent? Explain your answer.

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