ANSWER KEY.

ZornScience
zornscience.org

Competition and Niche Partitioning

Biology | ANSWER KEY

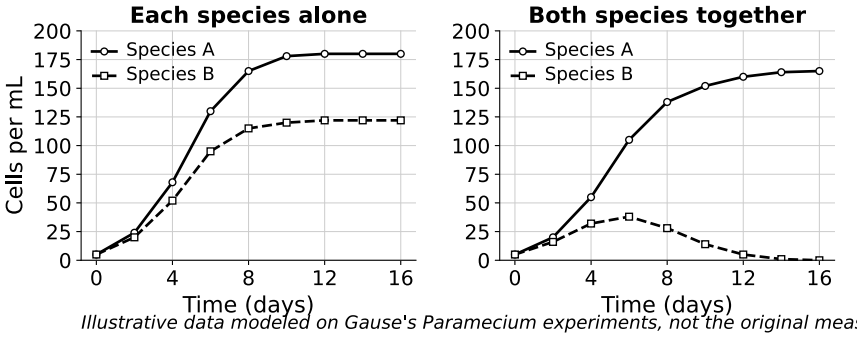
Answer in complete sentences where asked. Show your work for calculations and use the data as evidence.

1. Decide whether each situation is intraspecific or interspecific competition.

Situation	Intraspecific or interspecific?
(a) Two oak seedlings compete for light	
(b) An oak and a maple compete for light	
(c) Two male robins fight over a territory	

(a) **Intraspecific** (the same species) (b) **Interspecific** (different species) (c) **Intraspecific** (the same species)

2. Two species of *Paramecium* (illustrative data) were grown alone and together.



Illustrative data modeled on Gause's Paramecium experiments, not the original measurements.

(a) Which species reaches the higher level when grown alone?

(b) When grown together, what happens to species B between day 6 and day 16?

(c) Write a claim, evidence, and reasoning to answer: which species is the better competitor in this container?

(a) **Species A** (about 180 cells/mL compared with about 122).

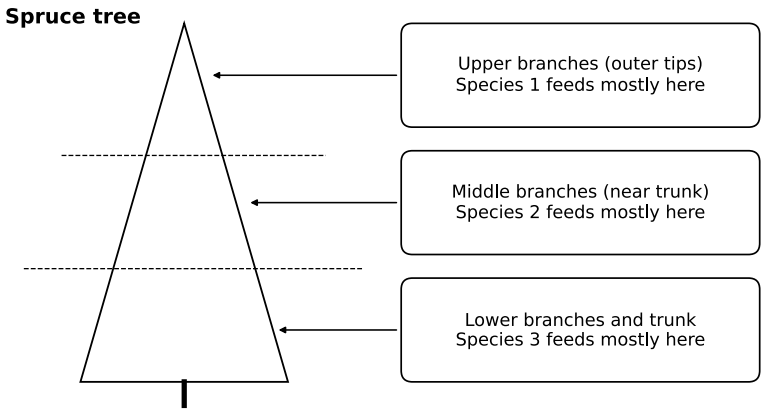
(b) **Species B falls from 38 cells/mL to 0 cells/mL.**

(c) **Model answer: Species A is the better competitor in this container. When grown together, species A kept rising to about 165 cells/mL, while species B peaked at 38 cells/mL on day 6 and fell to 0 by day 16. Both species use the same limited food, so the one that uses it better can keep growing while the other declines.**

A correct answer must include: species A as the better competitor; values from the graph with units; a reason that links shared limited food to the decline of B. Noting that this is a simple lab setting is a plus.

CC BY-NC-SA 4.0 | zornscience.org

3. Warblers that feed in the same spruce tree use different parts of it.



Simplified model. Real warblers overlap somewhat and also vary in how they hunt.

(a) What is this pattern called?

(b) Explain how it can reduce competition between the species.

(a) **Resource partitioning** (niche partitioning).

(b) **Each species feeds mostly in its own zone, so they use less of the same insects. Less niche overlap means less competition, which can let similar species live in the same habitat.**

4. In the graph from problem 2, species B is at 38 cells/mL on day 6 and 5 cells/mL on day 12.

(a) Calculate the percent decrease. Show your setup and round to the nearest tenth.

(b) A new species begins using the same food as species A. Predict one effect on species A. Explain.

(a) $(38 - 5) \div 38 \times 100 = 33 \div 38 \times 100 =$ **86.8%**

(b) **Competition for the food increases, so species A is likely to grow more slowly or decline. Other factors can also matter.**

CC BY-NC-SA 4.0 | zornscience.org