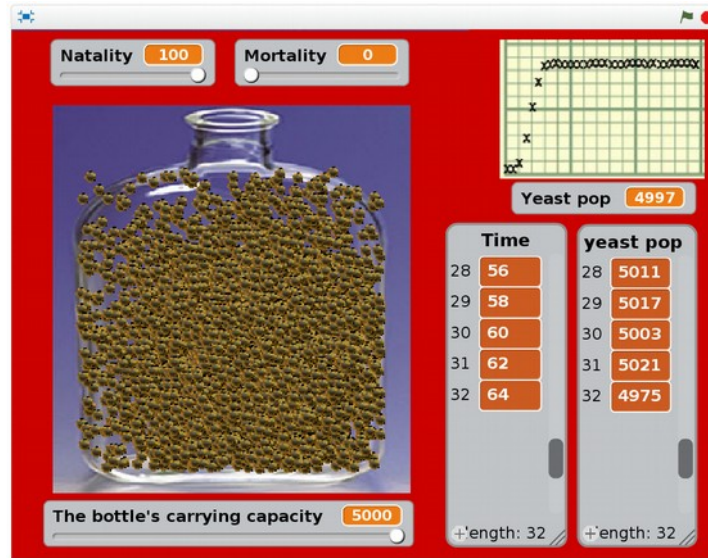


Population growth curves - Activities

These activities illustrate the importance of natality, mortality and carrying capacity to the growth of a population.

Use the Scratch animation Exponential growth of Yeast on the Inthinking website <https://www.thinkib.net/biology/page/27387/population-growth-yeast-or-barnacles>



Set the Natality to 100 (the highest birth rate) and the Mortality to 0 (lowest death rate)
Set the Bottle's carrying capacity to its maximum, 5000 individuals.

Click on the green flag to start the animation.



Questions

1. How many seconds does it take for the population to reach the carrying capacity 5000 ?

.....

2. Suggest why the population doesn't increase very rapidly in the first few seconds when the population is small?

.....

.....

Set the Natality to 50 and run the animation again. Then repeat at Natality 25.

3. How many seconds does it take for the population to reach the carrying capacity 5000 in each case Natality 100, 50 and 25?

.....

Population growth curves - Activities

4. Suggest what effect the birth rate has on the population growth rate.

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.....

5. Suggest the effect very low populations have on the growth rate.

.....
.....

Keep the natality at 100 and the mortality at 0. Now change the carrying capacity and run the animation three times.

6. Describe the effect of the carrying capacity on
a. the maximum rate of population growth. (The maximum steepness of the graph)

-
b. the maximum population size.

.....

Keep the natality at 100 and the Carrying capacity at 500 for these next tests.
Set the mortality rate to 50, then 80.

7. Describe the effect of the mortality on

- a. the maximum rate of population growth. (The maximum steepness of the graph)

-
b. the maximum population size.

.....

8. Suggest how the mortality rate would affect the population growth rate if it increased as the population gets close to the carrying capacity.

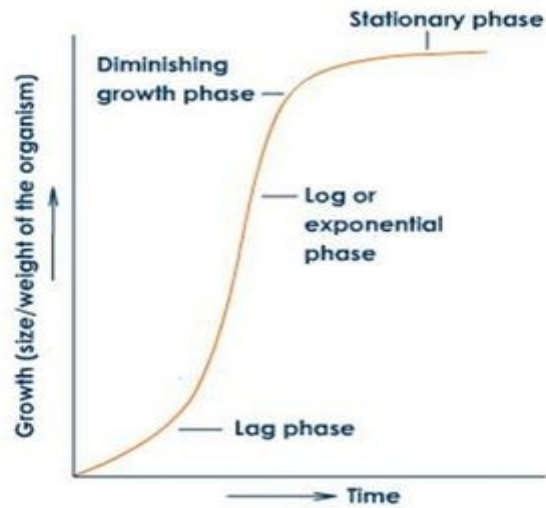
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9. Explain why the population size curves before reaching the carrying capacity.

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.....

Population growth curves - Activities

When describing population growth curves biologists sometimes refer to four phases,



Complete the table below describing how the birth rate (natality), the death rate (mortality) and the carrying capacity influence each of the four phases of population growth.

	Lag phase	Exponential growth	Diminishing growth	Stationary phase
Birth rate	Low birth rate because few organisms			
Death rate		The death rate is very low because space is plentiful and there is little competition for food.		
Carrying capacity				The population has reached the carrying capacity, there is a lot of competition for space and resources

