

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Class: \_\_\_\_\_

---

# IB Environmental Systems and Societies

## 2.1 Species and populations

### **Significant ideas:**

A species interacts with its abiotic and biotic environment, and its niche is described by these interactions.

Populations change and respond to interactions with the environment.

All systems have a carrying capacity for a given species.



## Key vocabulary

1. Define the following:

### **Species**

a group of organisms sharing common characteristics that interbreed to produce fertile offspring

### **Habitat**

The environment in which a species normally lives.

### **Niche**

The particular environment and "lifestyle" that a species has. It includes habitat, food/feeding method, and interactions with other species.

### **Abiotic factors**

Non-living physical factors that influence organisms.

### **Biotic factors**

Living components of an ecosystem - organisms, their interactions or their waste - that directly or indirectly affect another organism.

### **Carrying capacity**

The maximum number of a species that can be sustainably supported by a given area.



2. Distinguish between *fundamental niche* and *realized niche*.

A *fundamental niche* describes the full range of conditions and resources in which a species could survive and reproduce whereas a *realized niche* describes the actual conditions and resources in which a species exists due to biotic interactions.

3. Explain why population growth slows when a population approaches its carrying capacity.

Limiting factors slow population growth as it approaches the carrying capacity ( $K$ ) of the system. Limiting factors for plants include light, minerals, water, carbon dioxide and temperature. For animals, limiting factors include space, food, mates, nesting sites and water.



# Interactions

1. Define the following species interactions

## **Competition**

An interaction between two organisms in which the fitness of one is lowered by the presence of the other, due to limited resources. (ex food, water, territory, mates)

## **Predation**

An interaction between species in which the predator kills and eats its prey.

## **Herbivory**

An interaction where an animal (herbivore) feeds on a plant.

## **Parasitism**

A relationship in which the parasite feeds off of a host, which may suffer as a result.

## **Mutualism**

A relationship between two organisms that benefits both.

2. Distinguish between intra- and inter-specific competition.

Intraspecific competition occurs within a species whereas interspecific competition occurs between members of different species.



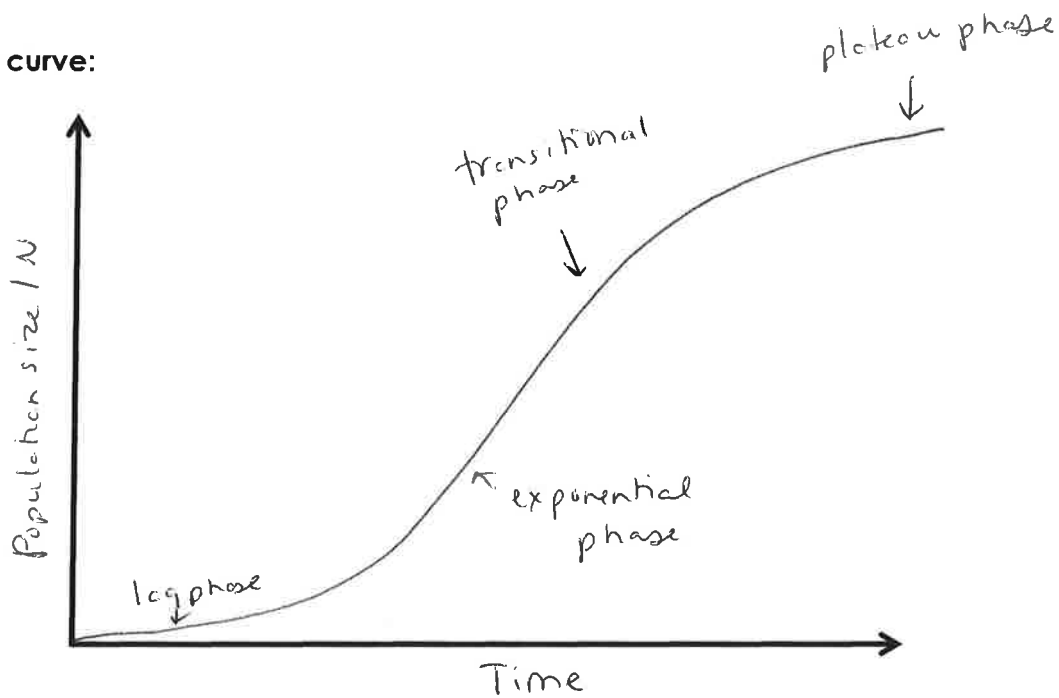
# Population changes

1. Outline what is represented in S and J curves

Both represent population growth curves. S-curves demonstrate rapid exponential growth followed by a leveling off at carrying capacity, J-curves represent only exponential growth.

2. Draw a labeled S and J curve.:

S curve:



J curve:

