Past-paper walk-through

Effect of Density on Populations ▪ 8.4

eXercise

Questions in this set

- 2019 Q2
- 2016 Q2
- 2015 Q6

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- // separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = "or words to that effect" – the wording need not match.

Question 2

2019 ▪ Q2

A student studying two different aquatic, plant-eating, unicellular protist species (species A and B) designed an experiment to investigate the ecological relationship between the two species (Table 1).

TABLE 1. EXPERIMENTAL TREATMENT GROUPS

Group	**Description**
Group I.	Species A and B are each grown in separate containers.
Group II.	Species A and B are grown together in the same container.

Question 2

In treatment group I, the student placed 10 individuals of species A into a container with liquid growth medium and 10 individuals of species B into a separate container with an equal amount of the same liquid growth medium. In treatment group II, the student placed 5 individuals of each species into a single container with the liquid growth medium. The student then maintained the containers under the same environmental conditions and recorded the number of individuals in each population at various time points. The results are shown in Table 2.

TABLE 2. NUMBER OF INDIVIDUALS IN EACH PROTIST POPULATION IN BOTH TREATMENT GROUPS

Time (h)	Group I. Grown Separately — Species A	Group I. Grown Separately — Species B	Group II. Grown Together — Species A	Group II. Grown Together — Species B
0	10	10	5	5
10	100	50	45	20
20	400	200	100	50
30	1100	500	250	25
40	1400	650	525	20
50	1500	700	900	10
60	1500	700	1250	0

Question 2

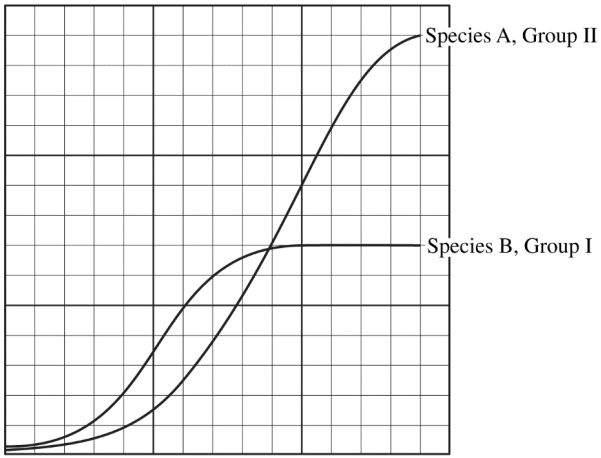
[Graph template: a blank grid (graph paper) with two curves already plotted (shaded columns of Table 2): “Species A, Group II” - an S-shaped curve rising steeply then leveling off at the top right; “Species B, Group I” - an S-shaped curve rising then leveling off at a lower plateau, labeled partway up the right side. Axes are unlabeled on the template, to be completed by the student with the unshaded columns (Species A, Group I and Species B, Group II).]

(a) The growth curves for species B in group I and for species A in group II (shaded columns) have been plotted on the template. Use the template to **complete** an appropriately labeled line graph to illustrate the growth of species A in treatment group I and species B in treatment group II (unshaded columns).

Question 2

	Group I. Grown Separately		Group II. Grown Together	
Time (h)	Species A	Species B	Species A	Species B
0	10	10	5	5
10	100	50	45	20
20	400	200	100	50
30	1100	500	250	25
40	1400	650	525	20
50	1500	700	900	10
60	1500	700	1250	0
70	1500	700	1400	0

Question 2



Question 2

Group I.	Species A and B are each grown in separate containers.
Group II.	Species A and B are grown together in the same container.