S2 Species Survival HW 3 Problem Solving Questions

DO NOT write on these sheets Number \_\_\_\_\_\_

1. An investigation was carried out into the effect of the mineral boron on the growth of young trout.

Immediately after fertilisation, trout eggs were placed in distilled water containing different concentrations of boron.

After hatching, young trout survive on food from their yolk sac for a maximum of four weeks. The graph below shows the average lengths of the young trout three weeks after hatching.

a) For the above experiment what is

i) the input variable?

ii) the output variable? [2]

b) Describe the relationship between boron concentration and the length of the young trout. [1]

c) What is the increase in average length as a result of increasing the boron concentration from 1 micromole per litre to 1000 micromoles per litre? [1]

2. Salmon migrate from the sea into rivers to breed. The numbers of salmon coming into a river can be estimated by capturing them in a sampling trap. The number of salmon captured and the average flow rate of a river were recorded in July each year over a five year period. The results are shown in the following table.



a) Redraw the table to show the average flow rate of the river and number of salmon captured without the year. [2]

b) What evidence is there that a high flow rate is stimulating the salmon to come into the river? [1]

c) In 2007, the total capture for the year was 1125 salmon. What % of the total capture does the July capture represent*? [show your working]* [1]

HINT % = part/total x 100

d) Predict the number of salmon that would be captured in July of a year when the average flow rate of the river was 13 cubic metres / second. [1]

3. An investigation was carried out into the response of flour beetles to humidity. Two T-shaped glass tubes were set up as shown below.

Each T-shaped tube was left for 10 mins before one beetle was placed at the entrance. The direction in which the beetle turned was recorded (see table below). This was repeated using 25 different beetles.



a) The diagram shows that tubes X and Y were set up differently. Why was this done?

b) What conclusion can be drawn from these results?

c) Calculate the total percentage of beetles which turned towards the moist end in the investigation. *[show your working]* [1]

HINT % = part/total x 100

d) What was the purpose of leaving the tubes for 10 minutes before placing a beetle at the entrance? [1]