**AP BIOLOGY REVIEW – DAY 7**

**ECOLOGY**

1. Describe three density dependent factors. .................................................................................................................................
2. Describe three density independent factors. .................................................................................................................................
3. What are the differences between exponential growth and logistic growth?
   1. .................................................................................................................................
   2. .................................................................................................................................
4. List and define the three types of symbiosis.
   1. .................................................................................................................................
   2. .................................................................................................................................
   3. .................................................................................................................................
5. What is competition? .................................................................................................................................
6. What is predation? .................................................................................................................................................
7. What is a keystone predator? .................................................................................................................................
8. What is a trophic level? ............................................................................................................................................
   1. How does energy flow through an ecosystem?.........................................................................................
   2. What is meant by biomagnification?..........................................................................................................
9. What are the major concerns (and causes) regarding human impact on the environment on the following issues:
   * 1. Enhanced greenhouse effect................................................................................................................
     2. Reduction of the ozone layer.................................................................................................................
     3. Acid precipitation....................................................................................................................................
     4. Introduced species..................................................................................................................................
10. **Draw and Label:** the pyramid of energy and what is lost/kept at each level
11. **Draw and Label:** nitrogen cycle and important organisms
12. **Draw and Label:** secondary succession

**Primary Productivity –**

**The rate at which organic materials are stored 6CO2 + 6H2O** → **C6H12O6 + 6O2**

|  |
| --- |
| ***Respiration Rate***  Respiration Rate = Initial – Dark (mgO2/L)  Respiration Rate = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

One can determine Primary Productivity by measuring dissolved oxygen in the water (as it is hard to measure it in the air) **Conversion Factors:**

1 mL O2 = .536 mg carbon assimilated

To convert: ppm O2 = mg O2/L

mg O2/L x 0.698 = ml O2/L

ml O2/L x 0.536 = mg carbon fixed/L

## Fill in the table and Graph Net and Gross Productivity vs % of light

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | % light | DO (mg O2/L) | Net PP =  Bottle – Initial  (mg O2/L) | Gross PP = DO – dark  (mg O2/L) | Gross Carbon fixed in mgC/L  Gross PP x 0.698 x 0.536 | | **Initial** | **8.4** | **--** | **--** | **--** | | **Dark** | **6.2** | **--** | **--** | **--** | | **100%** | **10.2** |  |  |  | | **65%** | **9.7** |  |  |  | | **25%** | **9.0** |  |  |  | | **10%** | **8.5** |  |  |  | | **2%** | **7.1** |  |  |  | |  |

1. Using your data table, what seems to be the trend as the % of light decreases? WHY?

1. Using your data table, what seems to be the trend as the % of light increases? WHY?

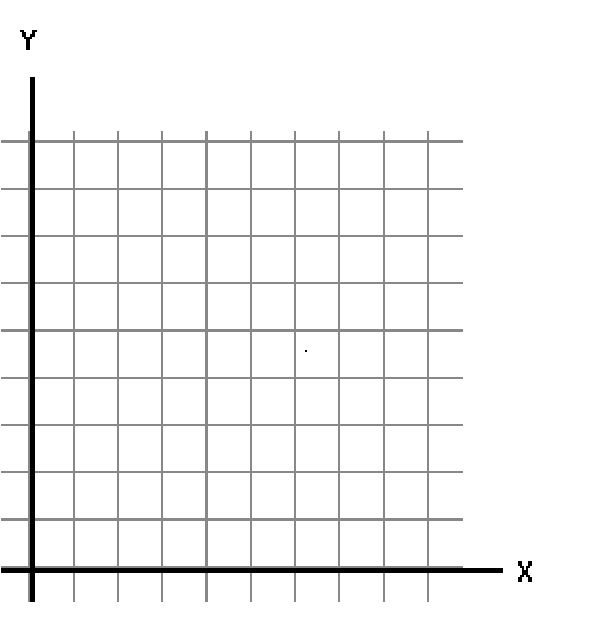
1. Where would you say this organism is using as much energy as they are making? WHY?

1. Using your table and graph, explain why most of the time there are bigger plants on land than in the sea? Explain this in terms of evolution.
2. There are 300 falcons living in a certain forest at the beginning of 2013. Suppose that every year there are 50 falcons born and 30 falcons that die.

1. What is the **population growth rate** (include units)? Interpret the value.

1. What is the **per capita growth rate** of the falcons over a year? Interpret the value.

|  |  |
| --- | --- |
| Year | Population |
| 2013 |  |
| 2014 |  |
| 2015 |  |
| 2016 |  |
| 2017 |  |
| 2018 |  |

1. Fill in the table and the construct a graph.

1. Find the **average rate of change** for the falcon population from 2013 to 2018 (include units). Interpret the value.

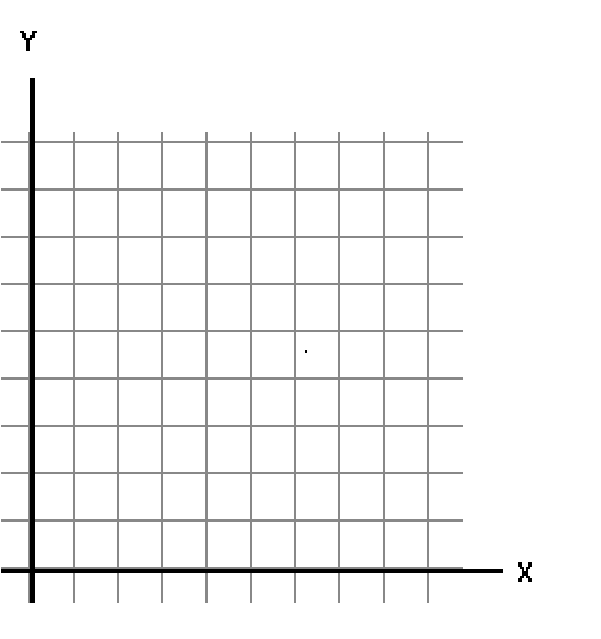
1. Kentwood, Michigan had a population of 49,000 in the year 2013. The infrastructure of the city allows for a carrying capacity of 60,000 people. rmax = .9 for Kentwood.

1. Is the current population above or below the carrying capacity? Will the population increase or decrease in the next year?

1. What will be the **population growth rate** for 2013 (include units)?

1. What will be the **population size** at the start of 2014.

|  |  |  |
| --- | --- | --- |
| Year | Population size | Population growth rate |
| 2013 |  |  |
| 2014 |  |  |
| 2015 |  |  |
| 2016 |  |  |
| 2017 |  |  |

1. Fill in the following table. Then graph year vs. population size.

1. What happened to the population size over the years? What happened to the population growth rate over the years?

1. Explain your answer from part (e) using what you know about carrying capacity.

1. Explain your answer from part (e) using the formula: *dN* = *r*max*N* *K* − *N* 

*dt*  *K* 