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Environmental Systems and Societies

Internal Assessment

Biomass Productivity

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Aim-

The aim of this experiment is to determine the productivity of a piece of grass within a five week period.

Hypothesis –

I think the productivity of the grass will show a gradual increase over the weeks that we measure it, because the grass it photosynthesizing all the time thus increasing in mass. Photosynthesis is a process by which green plants use the light energy to convert carbon dioxide and water into the simple sugar glucose.

Variables

Controlled

- Area of sample
- Time between each measurement

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Independent

- Different sections within the bounded area.

Dependent

- Biomass of the grass
- Size of sample

Method-

To determine the productivity of an area of grass in our school we measure the biomass of a controlled size of grass every week. To do this first we measured and bounded a $1m^2$area of grass within the school premises. Our initial aim was to find the biomass of a $50cm^2$area but we realized during the first week that this area is far too large to measure the biomass accurately, it also didn't fit into the oven we wanted to dry the sample in. So we decided for the next four samples to measure the biomass of a $10cm^2$sample and multiply our result by 25. And since we couldn't fit the first sample into an oven and had to dry it in the sun, we did all the other samples in this way to make it a fair test.

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Raw Data

This biomass is a measurement from a $50cm^2$area thus has a higher value than the others

$Week_n$	Biomass (grams)	Biomass per $50cm^2$
Week 1	457	457
Week 2	23.11	577.75
Week 3	34	850
Week 4	48	1200
Week 5	51.2	1280

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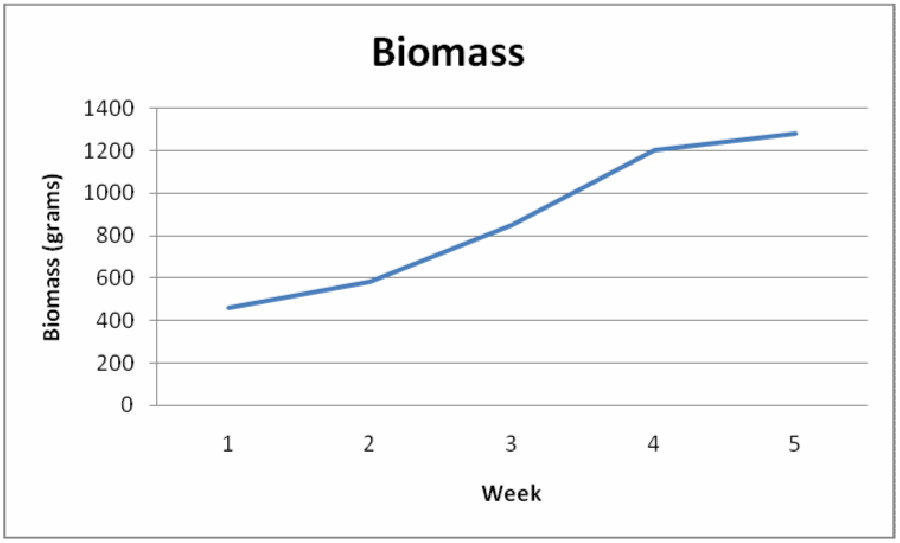

Processed Data

Productivity = $Week_n - Week_{n-1}$

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Conclusion/Analysis

The results I got for my productivity proved my hypothesis; that the biomass would increase over time. I think the biomass for the first week is very low, not only because the initial biomass would be low, but also because of the large loss of biomass while washing the bigger sample. The second sample had a higher biomass than the first one; this is due to photosynthesis occurring thus increasing the biomass of the grass. With these two samples the productivity is clearly increasing, there is a defined difference between the two

The third week has got a very high level of biomass and productivity accordingly reiterating the fact that productivity had an increasing trend. During that week there was a lot of sunlight hence the large increase in the productivity percentage. However the next week there is an unexpected decline in productivity percentage. Although the biomass has increased the percentage by which it sis is very low. This is probably due to a decreased availability of sunlight as the weather had changed over time, the level of biomass would obviously not decrease but the productivity had.

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Evaluation

There were several factors that might have affected the results we got in a negative way. Each of these may have contributed in altering the actual productivity of the piece of grass that we measured

Limitations:

- While washing the grass we lost some of the biomass, a difference in the amount is going to affect the productivity that we got.
- The experiment was over a five week span, this means a difference in the climate of the area. More sunlight at one point would mean more photosynthesis thus resulting in higher productivity. There may also have been wind that blew away some of our biomass, giving a false result of a lowered productivity.
- During the first week we measured a much larger area that in the consequent weeks, this may have affected the results that we got.
- The area which we left the grass to dry is frequented by kids, thus leading in lower biomass as the kids may have played with the grass somehow.