Pleurococcus

Pleurococcus (a.k.a. Protococcus) is single celled green algae, it is found on the bark of trees but it never grows on softwood trees. It is the most common green algae in the world. It is found is all seasons and grows in moist places. It reproduces by cell division and is transported by the wind. As it is a green plant it photosynthesizes. The formula for photosynthesis is:

$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

Carbon dioxide + Water → Glucose + Oxygen

The variables that affect *Pleurococcus* are:

Abiotic:

- Light (needed for photosynthesis)
- Moisture/humidity: if it is too dry the *Pleurococcus* will die
- Wind
- Temperature
- Amount of rainfall (and that trickles down the tree)

Biotic

- Position of tree (shading etc.)
- Tree species (some trees have bark that is more suited to *Pleurococcus* than others)

I'm going to investigate the affect of light on the amount of *Pleurococcus.*

I predict that the side with the least light will have the most *Pleurococcus.* This is because if there is too much light the *Pleurococcus* will dry out and die, as it has no roots and the only way for it to get water is to absorb the water that runs down the tree that it grows on. So the most *Pleurococcus* will grow on the north side because the sun rises in the west goes round the south and sets in the east, so the north side will get the least sunlight.

Apparatus:

- Metre ruler
- Quadrat
- Light sensor (lockets)
- Compass

Method:

Firstly we measure 1 metre up the tree so that all the results are from 1 metre up, then we find which way north is (with a compass) and measure the amount of light with a light sensor on the north, south, east and west sides. Then we place a quadrat at the height and count all the squares that have *Pleurococcus* in them one each of the 4 sides. As there are 100 squares in the quadrat it will be out of a hundred and will easily be converted into a percentage (e.g. 54 out of 100 squares have *Pleurococcus* so it's 54%). We will do this on 10 trees.

Fair test:
To makes this a fair test we will make sure that we only measure the same tree species, we will tell if the trees are the same species by getting a leaf off one tree and comparing it to others. All the measurements will be taken 1 metre up each tree. We will use the same type of quadrat (100 squares) and we will use the same type of light sensor each time. We will get the same people to do the same tasks ever time to make this a fair test.

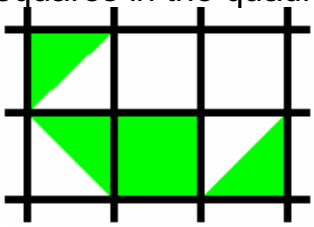
Results:

	Amount of *Pleurococcus* (%)				Amount of light (%)			
Tree	**North**	**South**	**East**	**West**	**North**	**South**	**East**	**West**
1	7	24	35	36	83.8	89.1	85.7	87.6
2	16	0	63	0	84.5	98.4	84.8	88
3	65	3	85	8	84.8	90.8	88	87.1
4	100	20	64	100	79.8	87.1	85.2	85.2
5	38	96	25	100	92	94	91.7	94
6	100	22	30	10	88.7	87	99.5	94
7	32	9	17	12	89	91	86	90
8	33	49	27	90	84	88	82	91
9	15	9	4	0	84	92	85.7	98
10	50	23	61	44	87	93	93	88
Average	45.6	25.5	41.1	40	85.76	91.04	88.16	90.29

I found that where there is the most light (on the south side) there is the least amount of *Pleurococcus* and where there is least light (on the north side) there is the most *Pleurococcus*. For example tree 4 (shaded in grey) has the most *Pleurococcus* on the north side and least on the south. This is the only tree that has the most *Pleurococcus* on the north and least on the south. This gives a fraction of 1/10.

Conclusion:
My prediction was correct; most *Pleurococcus* grows on the north side because there is least light on the north side (as the sun rises in the east, sets in the west, leaving the south to exposure). *Pleurococcus* grows where the is less light because it is only a single celled organism and it has no roots, therefore the only way it can collect water is absorb when it is running down the tree when it rains, this is show by the rose diagram. The rose diagram shows that the side with the most light on average which is the south side has the least *Pleurococcus*. As *Pleurococcus* is a green plant it photosynthesizes ($6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$) and for photosynthesis water (H_2O) is needed so if the *Pleurococcus* is in direct sunlight the water in the *Pleurococcus* will dry out quicker, therefore there is more *Pleurococcus* where there is less light. My prediction was correct, this is shown in the averages; on the north side there is least light (85.76%) and most *Pleurococcus* (45.6%) and on the south there is most light (91.04%) and least *Pleurococcus* (25.5%).

Evaluation:
I think that the experiment worked out pretty well because from the averages I can see a pattern. The averages were accurate enough but the separate results were not, this is because some of the trees that we tested for *Pleurococcus* we in a shaded area for example on trees 2,3 and 4 there is a lot of *Pleurococcus* on the east side because these trees were next to a fence that shaded them on the east side. To make this experiment more accurate I could have counted the amount of *Pleurococcus* in the individual squares in the quadrat, for example:



I would have counted this as 4 out of 6 but if I had more time I would have counted it as 2.5 out of 6.