Photosynthesis test questions essay

Photosynthesis is basically the production of food from water and carbon dioxide by green plants using the energy from the sun via sunlight which is absorbed by the chlorophyll located in the surface of the leafs. Simply put, photosynthesis is how plants feed. The equation: 6CO2 + 6H2O C6H12O6 + 6O2 (In the presence of chlorophyll)(Light)Plants need to photosynthesis in order to survive, they photosynthesis by taking the light energy that falls on the leaf and trapping it in the chlorophyll which are found in the chloroplast at the surface of the leaf. The chlorophyll basically turns the sunlight in to energy needed for chemical reactions to take place in the plant in order for it to survive. So as the amount of or intensity of light increases the more light in absorbed by the chlorophyll and more energy in produced for the chemical reactions to take place.

Meaning that as the amount/intensity of light increases so does the rate of photosynthesis in the plant, in our case Elodea. When green plants photosynthesis they take in carbon dioxide and give out oxygen, this can only happen in daylight when light is available as an energy supply. Plants photosynthesis and respire at the same time. So all the carbon dioxide produced by the plant is transformed into oxygen and food for the plant.

When the rate of photosynthesis is greater then the rate of respiration then carbon dioxide is taken in and excess oxygen given out. However at night time oxygen is taken in and carbon dioxide given out since photosynthesis cannot occur in darkness. In dim light the rate of photosynthesis is equal to the rate of respiration so there is no gas exchange taking place. In bright light oxygen is given out and carbon dioxide made from the plant respiring is taken in to use with photosynthesis.

So the more light (higher the light intensity) the faster the rate of photosynthesis, however there are a few limiting factors which affect the rate of photosynthesis not just light intensity. Blackman's sates that " The least available factor will be the limiting factor" so light intensity, amount and concentration of carbon dioxide and temperature can all be limiting factors in the process of photosynthesis. Limiting FactorsSo as the light intensity increases, the rate of photosynthesis also increase until the plant is photosynthesising as fast as it can, we can call this point the LSP point (Light Saturation Point) where the rate of photosynthesis stops accelerating and stays constant. So at this point light intensity cannot make the rate of photosynthesis any faster even if we were to double the amount of light intensity the rate of photosynthesis would stay the same. So according to Blackman's Law the factor that is least available would be the limiting factor. Meaning carbon dioxide, water or temperature would be the limiting factor.

So as the amount of carbon dioxide increases, the rate of photosynthesis also increase until the plant is photosynthesising as fast as it can, we can call this point the CSP point (Carbon dioxide Saturation Point) where the rate of photosynthesis stops accelerating and stays constant. So at this point carbon dioxide cannot make the rate of photosynthesis any faster even if we were to double the amount of carbon dioxide the rate of photosynthesis would stay the same. If both carbon dioxide and light intensity are raised together then the rate of photosynthesis would also eventually level out. Therefore the rate of photosynthesis is now limited, according to Blackman's law by the factor in least supply water or Temperature. In this graph you can see that at a lower temperature the rate of photosynthesis is increasing with increasing

light intensity and/or carbon dioxide availability. However the CPS/LSP is quickly reached.

So the plant cannot photosynthesis at an accelerating rate anymore. But at the higher temperature you can see that the rate of photosynthesis increases further and it takes more time to reach the CSP/LSP. Meaning that the temperature also affects the rate of photosynthesis, as the temperature increases the rate of photosynthesis also increases. So by looking at this information, I can see that if I only want to investigate the amount of light affecting the rate of photosynthesis in Elodea then I have to make sure that the amount of carbon dioxide and temperature is kept constant. PredictionI predict that as the light intensity is increased the rate of photosynthesis will also increase fairly constantly as long as it is the only factor affecting the rate of photosynthesis and all the other factors are kept constant. Until it gets to a stage where the rate of photosynthesis will stop increasing and be steady.

This will mean that the amount of light intensity will have no further affect on the rate of photosynthesis. This will only be the case as long as light intensity is the only variable. If there are other variables acting on the rate of photosynthesis at the same time as the changing amount of light intensity this would affect the rate of photosynthesis meaning that the experiment would not be accurate or a fair test.