Blog resource: <http://tinyurl.com/4ckten2> Click4Biology: <http://tinyurl.com/4ek7thd>

Cite all sources using the CSE method (or ISO 690 Numerical in Word). The first example has been done for you. Highlight all objective 1 command terms in yellow and complete these **before class**. Highlight all objective 2 and 3 command terms in green – these will be part of the discussions in class. After class, *go back and review them*.

Complete the **self-assessment rubric** before submitting.

1. Define *photosynthesis*

*The conversion of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in plants.* (1 p. 65)

1. Write a word equation and balanced symbol equation for the process of photosynthesis.

Word:

Symbol

1. *Glucose* is a product of photosynthesis. It can be used directly in respiration, stored as starch or converted to glucose.
2. Distinguish between the functions of starch and cellulose.

Starch:

Cellulose:

1. Identify and outline the process of condensation to form a disaccharide.
2. Explain why a plant which is left in the dark for a long period of time will test negative for starch.
3. **Light from the Sun is composed of a range of wavelengths (colours).**
4. Outline the properties of these wavelengths of light:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Wavelength (nm) | 10-400 | **400-500** | **500-650** | **700-800** | 0.8-1000µm |
| Name | Ultraviolet |  |  |  | Infra-red |
| Photosynthesis? | No |  |  |  | No |
| Visible? | No | Yes | Yes | Yes | No |
| Energy | Very High |  | Low |
| Frequency | Very High |  | Low |

1. State the name of the photosynthetic pigment and its location in green plants.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Distinguish between *action* and *absorption* spectra for photosynthesis.

Action:

Absorption:

1. Use the spreadsheet here to produce action spectrum for photosynthesis and absorption spectrum for chlorophyll: <https://www.box.net/shared/cs6jvzv8n4>
2. In the space below, draw a graph showing the action and absorption spectra for chlorophyll. Annotate the diagram to show why leaves appear green.



Leaves appear green because…

1. Summarise the two main stages of photosynthesis:

|  |  |  |
| --- | --- | --- |
|  | **Input** | **Outcome** |
| Light-dependent reactions | Light energy is used to… |
|  |  |
| Light independent reactions |  |  |

1. Define *rate*, with regard to reactions.
2. Explain how the **rate** of photosynthesis can be measured *directly* and *indirectly*.

|  |  |  |
| --- | --- | --- |
| Direct Measurement 1 | Product: |  |
| Explanation: |  |

|  |  |  |
| --- | --- | --- |
| Direct Measurement 2 | Product: |  |
| Explanation: |  |

|  |  |  |
| --- | --- | --- |
| Indirect Measurement | Outcome: |  |
| Explanation: |  |

1. Outline the effects of the following variables on the rate of photosynthesis.

*Sketch and annotate a graph for each one.*

|  |  |
| --- | --- |
| Light intensity |  |
|  |
|  |
|  |
|  |
| *Note: light intensity is not the same as wavelength or frequency. Light intensity refers to the amount of light of a given wavelength which is available to the plant. Light intensity is high at the equator, in the summer or at midday.*  |
| Temperature |  |
|  |
|  |
|  |
|  |
|  |  |
| Carbon dioxide concentration |  |
|  |
|  |
|  |
|  |

# Works Cited

1. **IBO.** *Biology Subject Guide.* [Online] 2007. http://xmltwo.ibo.org/publications/migrated/production-app2.ibo.org/publication/7/part/2/chapter/1.html.

2. **Allott, Andrew.** *IB Study Guide: Biology for the IB Diploma.* s.l. : Oxford University Press, 2007. 978-0-19-915143-1.

3. **Mindorff, D and Allott, A.** *Biology Course Companion.* Oxford : Oxford University Press, 2007. 978-099151240.

4. **Clegg, CJ.** *Biology for the IB Diploma.* London : Hodder Murray, 2007. 978-0340926529.

5. **Campbell N., Reece J., Taylor M., Simon. E.** *Biology Concepts and Connections.* San Fransisco : Pearson Benjamin Cummings, 2006. 0-8053-7160-5.

6. **Taylor, Stephen.** *Science Video Resources.* [Online] Wordpress, 2010. http://sciencevideos.wordpress.com.

7. **Burrell, John.** *Click4Biology.* [Online] 2010. http://click4biology.info/.

**Self Assessment:**

|  |  |  |
| --- | --- | --- |
|  | **Essential Biology** | **Assessment** |
| **Criterion** | **Complete (2)** | **Partially complete (1)** | **Self** | **MrT** |
| Presentation & Organisation | NA | Complete and neat. All command terms highlighted, tables and diagrams well presented.  |  |  |
| Academic Honesty | NA | Sources cited using the CSE (ISO 690 numerical) method, with Works Cited section complete and correct.  |  |  |
| **Objective 1** understanding | **All** answers for the following command terms correct: | Most answers for the following command terms correct: |  |  |
| **Define Draw Label List Measure State** |
| **Objective 2** understanding | **All** answers for the following command terms correct: | Most answers for the following command terms correct: |  |  |
| **Annotate Apply Calculate Describe Distinguish Estimate Identify Outline** |
| **Objective3**understanding | **All** answers for the following command terms correct: | Most answers for the following command terms correct: |  |  |
| **Analyse Comment Compare Construct Deduce Derive Design Determine Discuss****Evaluate Explain Predict Show Solve Sketch Suggest** |
| Logic, notation, mathematical working | NA | Answers are presented in a logical and concise manner. SI units used most times, with correct unit symbols and definitions of terms. All mathematical working shown. |  |  |
| Further research | NA | *Evidence* is apparent of research and reading beyond the textbook and presentations to find correct answers to challenging questions. **If any questions are unanswered, this criterion scores zero.**  |  |  |
|  | **Total (max 10):** |  |  |