A Level Biology

Yr 12 Transition Work

Tasks:

1. Fill in the questionnaire about your GCSE Biology knowledge (W1). Do this without reference to text books or other resources.
2. Read the passage on W2 then complete the questions and exercises that follow the passage. You may refer to text books or other resources for this activity if required.
3. Make a key word glossary of all the new words that you came across in the text on W2 – make sure you have written down clear meanings for each of the words that make sense to you. You may find this link helpful: http://www.biology-online.org/dictionary/Main_Page
4. On the diagrams of the generalised plant and animal cell, label as many features as you can. You should refer to text books or other resources for this activity. Check your answers using the links provided.
5. For each of the cell parts you have labelled write a description of the function of this part, then complete the organelles and their functions activity. You will need to refer to text books or other resources for this activity.
6. Complete the sections of the CGP Head Start to AS Biology book stated at the bottom of the assignment.

IMPORTANT:

YOU MUST COMPLETE ALL OF THESE ACTIVITIES AT THE START OF Y12. YOU ARE EXPECTED TO COMPLETE THEM IN YOUR INDUCTION LESSONS. THESE ACTIVITIES FORM THE FOUNDATIONS OF THE FIRST TWO BIOLOGY UNITS.
1 Well, what do you know?

Name: ______________________________________________________________

This is a questionnaire about your GCSE biology knowledge

1 Tick the compounds you heard about at GCSE, saying whether you heard about them as being components of the diet or as components of cells.

<table>
<thead>
<tr>
<th>Compounds</th>
<th>Components of diet</th>
<th>Components of cells</th>
<th>Haven't heard of them</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates</td>
<td></td>
<td></td>
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<tr>
<td>Fats and oils</td>
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<tr>
<td>Lipids</td>
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<td></td>
<td></td>
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<tr>
<td>Nucleic acids</td>
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<td></td>
<td></td>
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<tr>
<td>Proteins</td>
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</table>

2 Which description best fits your understanding of the term respiration? Circle the letter.

A  Breathing in and out
B  Exchange of oxygen and carbon dioxide in the lungs
C  Breakdown of food molecules to release energy
D  Don't understand the term

3 For each statement about enzymes, underline the word that agrees with your own understanding. If you're not sure, underline 'Don't know'.

(a) All enzymes are made of protein.
   True    False    Don't know

(b) All enzymes are found in the digestive system.
   True    False    Don't know

(c) Enzymes are found inside cells.
   True    False    Don't know

(d) All enzymes break down large molecules into smaller ones.
   True    False    Don't know

4 Here are some statements about cells. Tick the box if you agree with the statement.

☐ The outer covering of an animal cell is called the cell membrane.
☐ The outer covering of a plant cell is called the cell wall.
☐ Animal cells do not have a cell wall.
☐ Plant cells do not have a cell membrane.
5 Here are some statements about plants. Tick the box if you agree with the statement.

- Plants are alive.
- Green leaves photosynthesise in the light.
- Green leaves photosynthesise in the dark.
- Green leaves respire in the daytime.
- Green leaves respire at night.
- Non-green parts of plants respire in the daytime.
- Non-green parts of plants respire at night.
Read the following passage

The poet who wrote 'Sugar and spice and all things nice, that's what little girls are made of' was lying. Any biologist can tell you that little girls, and their brothers, are made of protein, carbohydrates, lipids, nucleic acids, some inorganic ions and a lot of water.

Now Walter de la Mare was telling the truth when he wrote: 'It's a very odd thing, as odd as can be, that whatever Miss T. eats turns into Miss T.' Whatever the associated delights of food may be, we eat for two reasons: to get energy and to acquire the raw materials for growth and metabolism.

Any organic material is food for something; it's all a matter of taste. Dung beetles find nourishment in what sheep leave behind, and sheep can gain from grass all the materials for making meat and wool. The macromolecules that make up our own cells are all derived from the macromolecules we consume. Whether we are omnivores or herbivores, the carbohydrates, proteins, lipids (fats and oils) and nucleic acids that we digest and absorb become the components of human cells.

Cells are mostly water, but if all the water is driven off by heating we are left with the organic content of the cells and some inorganic ions. The organic compounds are mostly polymers, particularly protein and, if we are talking of plant cells, cellulose.

The cytoplasm contains thousands of different soluble proteins known as enzymes, which play an important role in all metabolic processes. Proteins also have an important structural function because they form part of all cell membranes. The other major components of cell membranes are lipids. These are a heterogeneous group of substances, but one thing they all have in common is that they are insoluble in water. A cell surface membrane is more than just a bag holding everything in; it also exerts control over what enters and leaves the cell.

A cell wall is completely different from a cell surface membrane. A plant cell synthesises the cell wall on the outer surface of the cell surface membrane by linking together molecules of glucose to make cellulose. This polysaccharide is never found in animal cells, although glucose is.

Glucose is a carbohydrate and is the most commonly occurring monosaccharide. For almost all cells it is the starting point in respiration. Remember that food not only provides the materials to make cells, it also provides the energy to make cells work. Energy is released when glucose is broken down chemically inside cells in the process called respiration.

Cells are involved in all kinds of work. Watch a time-lapse film of animal cells and you can see how much they move. Under the microscope you can watch chloroplasts streaming around the cells of Canadian pond weed. Movement is only one of the energy-requiring activities of cells; making bigger molecules from smaller ones is another and so is the control of some substances entering or leaving through the cell surface membrane.

Respiration is one of the characteristics of living organisms. Plants are living organisms, so plants carry out respiration. But plants get their energy from sunlight, so why do they respire? For one thing, only the green parts of a plant photosynthesise, and all cells, green or not, require energy. Even the green cells respire, and this takes place all the time, not only at night. Photosynthesis in the chloroplasts makes glucose, and this travels to other parts of the cell, where it is broken down to release energy for jobs such as building up proteins or cellulose, controlling entry of molecules through the cell surface membrane and cell division.
1 Well, what do you know?

Your task...

Reading to get information is one of the essential skills for effective learning. The following questions and exercises are designed to help you analyse and understand what you have just read.

1 Find and underline in pencil all the words which you are unable to define.

Learning biology is like learning a new language; there are so many new words. Understanding what some of the prefixes mean will help you to learn some of the new words. 'Pre-' means before, so a prefix is the beginning part of a word. 'Poly-' means many, while 'mono-' means one. 'Hetero-' means different and 'macro-' means large.

2 Here are definitions of some of the technical words in the passage. See if you can match the definitions to the appropriate words in the text. Use the context and the information above to help you.

(a) Composed of different types
(b) Compounds which do not contain carbon, or if they do, they do not also contain hydrogen
(c) Molecules consisting of large numbers of atoms
(d) All the chemical reactions which occur in cells
(e) A sweet-tasting molecule consisting of a single unit
(f) A kind of acid abundant in the nuclei of cells; includes DNA and RNA
(g) Compounds which contain carbon and usually hydrogen
(h) Molecules consisting of chains of repeating units
(i) A chain of sweet-tasting molecules
(j) The chemical breakdown of organic molecules with the release of energy; occurs inside cells

Metabolism includes two types of processes: reactions which result in larger molecules being broken down into smaller ones and those which result in smaller molecules being built up into larger ones. The breakdown of large molecules into smaller ones is called catabolism (from a Greek word meaning to throw down). The building up of small molecules into larger ones is called anabolism (which means to throw up!). You may have heard of anabolic steroids. These are hormones that stimulate the building up of muscle protein.

3 In the text, two paragraphs refer to catabolism, two refer to anabolism and one paragraph refers to both. Find these paragraphs. Underline references to catabolism in red and references to anabolism in blue.

4 Give the names of two catabolic processes and one anabolic process.
1. **Well, what do you know?**

5. Do enzymes play a part in both anabolism and catabolism? Which line tells you the answer?

6. What is cellulose used for in cells?

7. What is cellulose made from?

8. Which of the following words describe cellulose? Underline your answers.
   - carbohydrate
   - macromolecule
   - polymer
   - polysaccharide
   - protein

9. Dietary fibre is mainly cellulose. Suggest an explanation of how ‘dung beetles find nourishment in what sheep leave behind’ (lines 7–8).

10. The passage refers to cell membranes and cell surface membranes. Suggest a distinction between these two terms.

11. Which substances are found in:
   - (a) Plant cell walls?
   - (b) Cell membranes?
Generalised Animal Cell

Check your answers here:
http://www.hobart.k12.in.us/jkousen/Biology/cell.htm#ancell_dia_ans
Generalised Plant Cell

Check your answers here:
http://www.hobart.k12.in.us/jkousen/Biology/cell.htm#plcell_dia_ans
# ORGANELLES & THEIR FUNCTIONS

Choose an organelle from the word bank for each description in #1-15.

<table>
<thead>
<tr>
<th>WORD BANK</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>cell membrane</td>
<td>1. liquid inside the cell, mostly water</td>
</tr>
<tr>
<td>cell wall</td>
<td>2. made of lipids &amp; proteins, it is the boundary of the cell; it controls what substances enter or leave the cell</td>
</tr>
<tr>
<td>chloroplast</td>
<td>3. &quot;control center of the cell&quot; where genetic material (DNA) is found</td>
</tr>
<tr>
<td>centrioles</td>
<td>4. nonliving border that surrounds plant cells, made of cellulose</td>
</tr>
<tr>
<td>centrosome</td>
<td>5. very small organelles that are the sites of protein synthesis</td>
</tr>
<tr>
<td>cytoplasm</td>
<td>6. system of tubes through the cytoplasm involved in transporting materials</td>
</tr>
<tr>
<td>endoplasmic reticulum</td>
<td>7. a flat stack of tubes involved in &quot;packaging&quot; materials that will exit the cell</td>
</tr>
<tr>
<td>golgi apparatus</td>
<td>8. site of cellular respiration (where energy is released from nutrients)</td>
</tr>
<tr>
<td>lysosome</td>
<td>9. storage sac for water or other materials</td>
</tr>
<tr>
<td>mitochondria</td>
<td>10. controls what enters or exits the nucleus</td>
</tr>
<tr>
<td>nuclear membrane</td>
<td>11. dark round structure within the nucleus that produces ribosomes</td>
</tr>
<tr>
<td>nucleolus</td>
<td>12. specialized vacuole that stores digestive enzymes</td>
</tr>
<tr>
<td>nucleus</td>
<td>13. structure in animal cells involved in cell division</td>
</tr>
<tr>
<td>ribosomes</td>
<td>14. spherical structure that contains the centrioles</td>
</tr>
<tr>
<td>vacuole</td>
<td>15. site of photosynthesis in plant cells</td>
</tr>
</tbody>
</table>

Check your answers here:

[http://www.hobart.k12.in.us/jkousen/Biology/cell.htm#org_func_ans](http://www.hobart.k12.in.us/jkousen/Biology/cell.htm#org_func_ans)