

# **English for Science**

## **Unit 2: Links in Science**

## ***Student's File EFS 2.1 Which Subject?***

Below are the Aims and Objectives of the three main sciences, Biology, Chemistry and Physics. Try to decide which text goes with which subject. Just to make it a bit more difficult, all reference to the subject names has been removed and replaced by "the subject".

### **Text One AIMS AND OBJECTIVES**

The aims set out below describe the educational purposes of a course based on the AS the subject syllabus. Some of these aims are reflected in the assessment objectives; others are not because they cannot readily be translated into measurable objectives. All, however, are essential aims for the AS the subject course:

1. to develop students' appreciation of the wonders of the living world; and to promote respect for all living things;
2. to broaden and stimulate students' interest in learning the subject; to encourage their worthy use of leisure; and to help them to acquire self-initiative in the study of the subject;
3. to develop students' power to think creatively, analyse critically and scientifically on the subject issues, to make rational decisions and to communicate effectively;
4. to develop students' observational, manipulative and experimental skills;
5. to develop students' ability to retrieve appropriate information from proper sources; and to develop their confidence in self-learning and to give them a sense of achievement;
6. to develop students' appreciation of the importance of experimental and investigatory work in the study of the subject;
7. to enable students to acquire knowledge and understanding of basic the subject principles;
8. to develop students' awareness of and concern for the subject issues in personal, social, environmental and technological contexts; and
9. to prepare students to become responsible citizens in a changing world.

## **Student's File EFS 2.1 Which Subject? (cont...)**

### **Text two AIMS AND OBJECTIVES**

A major aim of the syllabus is to present the subject not only as a body of knowledge, but also as a field of enquiry, and to bring candidates to recognize the intellectual discipline which it provides. Abilities to be fostered include those of imagination and speculation as well as acquisition of knowledge and experimental skills.

Candidates should acquire a capacity to deal with the following:

#### **(a) Basic Concepts**

1. knowledge of the subject facts, principles, methods and terminology.
2. the ability to understand and interpret scientific information presented in verbal, mathematical, diagrammatic or graphical form and to translate such information from one form to another.
3. the ability to formulate and test hypotheses.
4. the ability to interpret phenomena in terms of models, laws and principles.
5. the ability to solve problems which are unfamiliar or presented in a novel manner.

#### **(b) Experimental Investigation**

1. the appropriate manipulative skills to carry out experimentation from written instructions either given or self-devised.
2. skill in observation and recording of observations.
3. the ability to suggest apparatus and procedures for carrying out experiments.
4. the ability to interpret experimental results in terms of the subject principles.
5. an appreciation of safety aspects when carrying out experimental work.

#### **(c) Interpretation and Application**

1. the ability to organise ideas and facts and present them clearly.
2. a critical approach to information and ideas.
3. the ability to understand and to appreciate the applications of the subject knowledge in other scientific and technological studies, in industries and in society.

### **Text Three AIMS AND OBJECTIVES**

A course of study based on this Syllabus should

1. provide a balanced course for further study and give an appreciation of the nature and the importance of the subject in daily life;
2. help students to develop interest, motivation and a sense of achievement in their study of the subject;
3. develop an appreciation of the developments in the subject and an awareness of the relationship of the subject to everyday life, and of the role of the applications of the subject in the fields of engineering and technology;
4. establish a conceptual framework for the subject and provide an understanding of its methodology;

**Student's File EFS 2.1 Which Subject? (cont...)**

5. encourage a balance between an experimental and a theoretical approach to the subject;
6. develop skills relevant to the application of the subject, such as experimental design, experimental technique, problem-solving, mathematical analysis, critical appraisal and communication;
7. to help candidates to acquire a sense of moral and social values and readiness to becoming responsible citizens in a changing world.

Candidates should acquire the ability to

1. recall and show understanding of factual knowledge, terminology, definitions, conventions, experimental methods, laws and models;
2. demonstrate experimental techniques: planning and execution of experiments, analysis and presentation of results and simple treatment of errors;
3. demonstrate the application of the subject knowledge in problem solving and experimental investigation, including qualitative and numerical, theoretical and practical techniques;
4. communicate by compilation of clear concise accounts of experimental work and theoretical treatments, including interpretation and transposition of data, and use of models to explain phenomena;
5. demonstrate evaluation and judgement by the analysis and assessment of situations or data, and decision making on the basis of such judgements.

## Student's File EFS 2.2 Passives and Processes

The passive is normally used when the person or thing which did the action is not important such as in the case of writing up an experiment report. The passive is also useful when you are talking about generalisations. Look at some of the examples below:

### Passive Verb Forms

Present Simple	am, are, is + past participle	The solution is poured into the container.
Present Continuous	am, are, is being + past participle	The experiment is being carried out in a clean room.
Past Simple	was, were + past participle	The radiation was measured using a Geiger counter.
Past Continuous	was, were being + past participle	The experiment was being shown live on television.
Present Perfect	have/has been + past participle	Safety precautions have been taken.
Past Perfect	had been + past participle	The solution had been cooled to 55°C.
Future	will be + past participle	The experiment will be shown live on television.
Future Perfect	will have been + past participle	The experiment will have been completed by midday.

### Active to Passive 1

Look at the sentences below. They are all active. In the space provided rewrite them in the passive. The first one has been done as an example.

- 1 I calculated the resultant energy as 400 mega watts.  
The resultant energy was calculated as 400 mega watts.
- 2 We poured the solution into the glass measuring cylinder.  
\_\_\_\_\_
- 3 I set up the apparatus as shown in the diagram.  
\_\_\_\_\_
- 4 The whole class carried out the same experiment for the final exam.  
\_\_\_\_\_
- 5 I left the solution to cool while I wrote up the experimental procedure.  
\_\_\_\_\_

## ***Student's File EFS 2.2 Passives and Processes (cont...)***

### Active to Passive 2

Below are two short sets of instructions. Rewrite them using the passive voice. You may use the table of verb forms on page 5 to help if necessary.

- 1 You add the crystals to the supersaturated solution. You then take temperature readings for five minutes. Then you dilute the solution with pure water until you notice a change in colour. Once you have seen a change in colour, measure the temperature. After five minutes measure the temperature again and remove 20 ccs. You test the solution for acidity using some litmus paper. If the pH of the solution is below 4, then take the temperature again. If the solution is not that acidic, then you leave the solution for another five minutes and repeat the test.

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**Student's File EFS 2.2 Passives and Processes (cont...)**Active to Passive 2

- 2 You set the lens holder onto the light bench. Turn on the light source. Place the screen at the end of the bench. Place the first convex lens in the lens holder and move it along the bench until the image on the screen is focussed. You then measure the distance from the holder to the screen and record the distance. Repeat the procedure for all five lenses. Record all the measurements and mark each lens with the focal length that you observed.

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## ***Student's File EFS 2.2 Passives and Processes (cont...)***

### Passive Correction

Finally in this section on the passives you need to do some error correction. The following passage contains some errors in the use of the passive. Indicate where the errors are by underlining them and write the correct version in the space provided on the right.

It can seen that the passive voice is very useful when 1 \_\_\_\_\_  
an experimental procedure being written up. It makes 2 \_\_\_\_\_  
the report sound more objective and the reader 3 \_\_\_\_\_  
understand that the experiment has been carry out by 4 \_\_\_\_\_  
the person writing the report. The passive voice is also 5 \_\_\_\_\_  
used in a lot of academic writing. For example which 6 \_\_\_\_\_  
of the following do you think sounds more official: I 7 \_\_\_\_\_  
asked 20 people what they liked about Hong Kong, or 8 \_\_\_\_\_  
20 people was asked what they liked about Hong 9 \_\_\_\_\_  
Kong. 10 \_\_\_\_\_

It can seen that the second one seems more official; it 11 \_\_\_\_\_  
could have been write for a newspaper or magazine. 12 \_\_\_\_\_  
That is another area of writing that uses the passive 13 \_\_\_\_\_  
voice. Journalism. Examples of the passive can seen 14 \_\_\_\_\_  
on the pages of the English language newspapers 15 \_\_\_\_\_  
every day, eg. "A taxi driver and two passengers were 16 \_\_\_\_\_  
slightly injury when falling masonry..." 17 \_\_\_\_\_

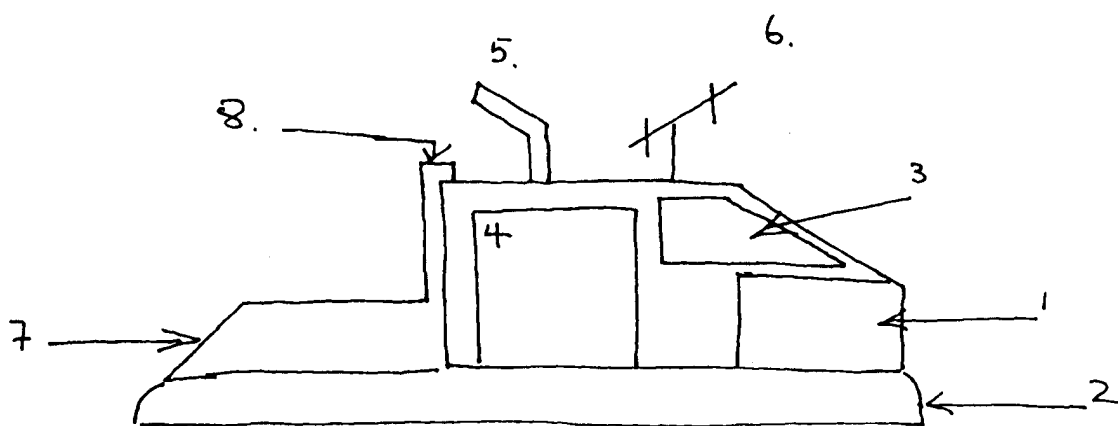
So for your report writing to be improve it is a good 18 \_\_\_\_\_  
idea to practise using the passive. 19 \_\_\_\_\_



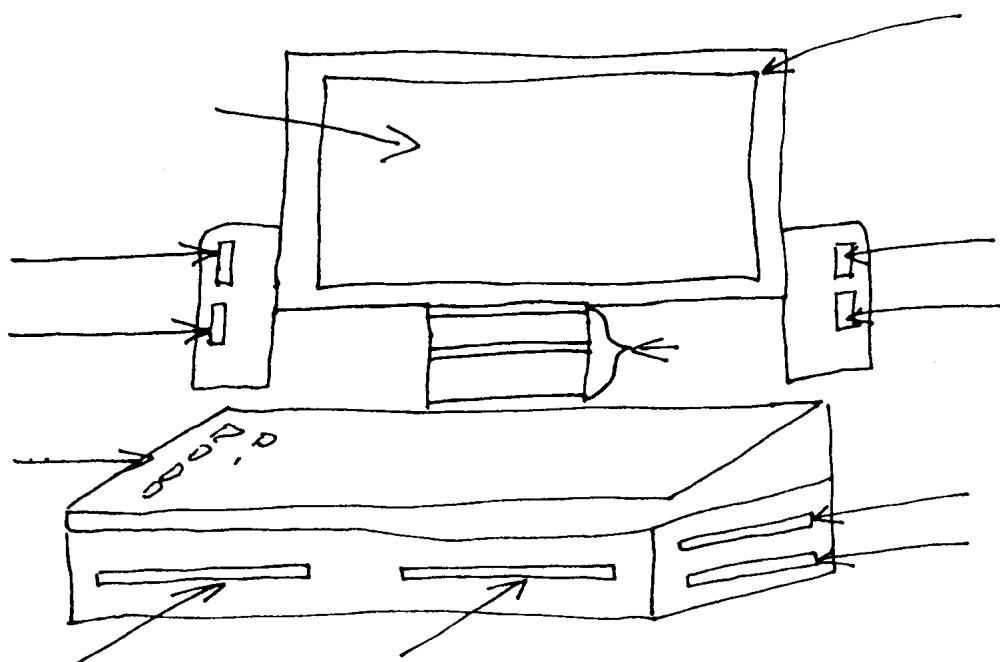
## Student's File EFS 2.3 Annotating Diagrams

Look at the two diagrams below. You are going to hear someone describe them both to you. What you need to do is annotate the diagrams so that you could name accurately the main features of each machine.

A: Annotated Diagram of \_\_\_\_\_



B: Annotated Diagram of \_\_\_\_\_



## **Student's File EFS 2.4 Pronunciation Spot**

Below are words and phrases that were used during the description of the two diagrams. Before you listen to them being read to you, look at them and try to pronounce each one.

Fluid Cushion  
Vehicle  
modular propulsion  
interchangeable  
durable  
polymer-toughened  
telescopic  
communication's cluster  
facilitate  
universal  
  
integrated modular design  
revolutionary  
ergonomically designed  
quadruple processors  
partial  
peripherals  
voice activated  
hinged

Now you will hear them pronounced on the tape. The first time just listen. The second time repeat the word or phrase that you hear.