

## ASSIGNMENT FOR IB BIO – JUNIOR AND SENIOR YEAR

### Lamarck vs Darwin

For several years the scientific community believed in the theory of Use and Disuse and the Transmission of Acquired Characteristics, developed by Jean Baptiste de Lamarck. Then Charles Darwin introduced his theory of Variation and Natural Selection. This new development upset the scientific community. Through a classroom court case we will investigate how theories are challenged, changed, or discarded. It is never an easy process. It is human nature to fear change. Many scientists feared for their reputations. It is a process that has repeated itself many times throughout history. Each student must investigate the two theories, how the men came up with the theories and the evidence that supported it. You must also find the flaws in both theories.

#### **Roles:**

##### **Opening prosecuting attorney:**

##### **Closing prosecuting attorney:**

It is your job to support Lamarck's theory. Opening attorney, you must set the stage for the jury. You need to inform the jury that you have called respected authorities to give evidence that supports Lamarck's theory. Closing attorney – you must give the closing that wraps up everything and convinces the jury that Darwin is misguided, and Lamarck is older and wiser with more experience. Remember, use your investigations to emphasize your point. Your jurors will be informed and will recognize B.S. (Bad Science) when they hear it.

**Questioning Prosecuting Attorney(s)** – You will need to come up with a list of questions to ask the different witnesses. Remember you must guide the prosecution witnesses into telling their stories in favor of Lamarck, while asking probing questions of the defense witnesses. You must write a complete and thorough list of questions for each witness. You must be prepared to turn over your questions to the defense attorney and his/her witnesses before we begin the trial. The defense will do the same for you. If while you are investigating Lamarck and Darwin, you find another credible witness, you may ask to include this witness in the trial. With permission, you may add witnesses, but so may the defense.

##### **Opening Defense Attorney**

##### **Closing Defense Attorney**

It is your job to support Darwin's theory. Opening attorney it is your job to set the stage for the jury. It will be your job to explain what a theory is and how they are supported, disproved, or modified with new evidence. You will need to explain why the science community came up with theories in the first place. (think Galileo) You will need to briefly point out that you will call witnesses that will point out the flaws in Lamarck's theory while being sensitive to the fact that he is well respected. You will need to briefly discuss the scientific method. Closing attorney, you will need to remind the jury about what the opening attorney discussed. You must also sum up the facts presented by the different witnesses that support your argument.

**Questioning Defense Attorney(s)** – It is your job to support Darwin's theory. You will need to write a complete list of questions for all witnesses (see questioning prosecutor.)

You will need to supply this list to the witnesses and the prosecutors. They in turn will supply you with a list before the trial begins. If during your research, you find another witness that will support your point of view, you may ask to include this witness with teacher approval.

### **Prosecution witnesses**

**Lamarck** – You must investigate Lamarck and his research. You will play the role of Lamarck. Be familiar with his education and be able to explain your theory of use and disuse and the transmission of acquired characteristics.

**Paleontologist** – You will support Lamarck's theory with fossils, animal studies etc. Think giraffe.

**Farmer** – You need to explain common sense. Be familiar with Lamarck's theory, especially use and disuse.

add other witnesses with approval of teacher

### **Defense Witnesses**

**Darwin** – You must investigate the education, travels, and studies of Darwin. Then you will play the role of Darwin. You will need to explain the theory of Natural Selection and how you came by it. (prickly pears, tortoises, finches etc.) Great source is book called HMS Beagle.

**Paleontologist** – Support Darwin with fossil evidence, animal studies etc. Be ready to refute prosecution witnesses' testimony.

**Wallace** – You must investigate the education and studies of Wallace. You will then play the role of Wallace. You will need to explain your studies of birds in South America and how you came up with your theory. Be ready to refute prosecution's witnesses.

**August Weisman** – You must investigate the education and studies of August Weisman. You will then play the role of August Weisman. You will need to explain your studies of mice and the scientific methodology behind it. Be ready to refute prosecution witnesses' testimony.

Other witnesses with the approval of the teacher.

**Jurors** – You must research both theories. You are required to turn in a summary of your research with a bibliography. There should be at least 5 different sources. You will be required to score the performance and preparation of each participant of the trial. Your summary must include a synopsis of the each theory and the drawbacks of each theory as well as its strengths.

**Syllabus Questions:**

5.41 Define Evolution

5.42 Explain how fossils, selective breeding of domesticated animals and homologous structures provide evidence of evolution.

5.4.3 State that populations tend to produce more offspring than the environment can support.

5.4.4 Using the statement in 5.4.3, explain the consequences of overproduction of offspring.

5.4.5 Discuss link between the variation within species and natural selection.

5.4.6 Explain how sexual reproduction promotes variation within a species.

5.4.7 Explain how natural selection can lead to evolution.

5.4.8 Explain two examples of evolution in response to changes in the environment. One example must be antibiotic resistance in bacteria.

*See reverse side*

Due on the first day of school:

A clear outline of Darwin's theory.  
Strengths and weaknesses of the theory.  
Examples that support his theory.

A clear outline of Lamarck's theory.  
Strengths and weaknesses of the theory  
Examples that support his theory.

Answers to the syllabus questions.

The outlines of the two different theories should be no more than 1 – 2 typed pages. If it is longer than 2 pages you are spending way too much of your summer writing this paper. Go outside and take a hike!

If you have any questions and need to reach me over the summer, my e-mail address is [calderwoodbio@yahoo.com](mailto:calderwoodbio@yahoo.com). My phone number is 868-3506.

The prosecution and defense will have a couple of days to confer and then we will hold the trial on the first or second long period.

See you next fall!

Mrs. C