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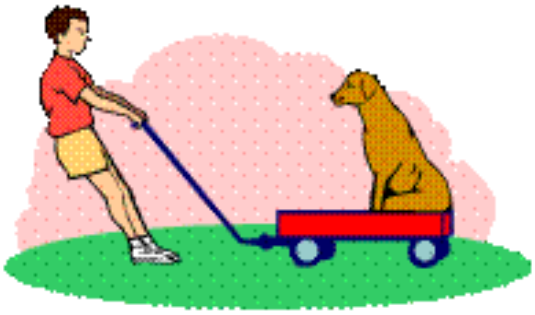
Our Father's Design through Honors Biology

Student Materials Notebook

This notebook contains thirty-two links to web-based RWT1 video lesson content. Additionally, over 200 pages of excellent supplement materials are provided. Also included are links to extended course materials. Finally, sixteen module tests and five exams are integrated for student content assessment. This product is currently designed to be used with the Apologia Exploring Creation with Biology, 2nd Ed., (ECB2) textbook. No Apologia Solutions Manual is required, but may provide optional enrichment.

Our Father's Design through Honors Biology:



Student Materials Notebook

By Steven M. Rosenoff

We would like to acknowledge the inspiration of Dr. Jay L. Wile in the production of this product. As my former employer and longtime friend, his encouragement and mentorship helped make this publication possible. Although he did not directly contribute to this work, nor has he received any financial reward from it, we feel that his influence in our lives is worthy of mention and that he deserves our utmost respect as a co-laborer in Christ.

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Our Father's Design through Honors Biology:
Student Materials Notebook

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Our Father's Design through Honors Biology: Student Materials Notebook

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Start

Assignment Supplement

A. Steps for Success

These are the steps taken by successful students last year for completing the required Module work. Please note: these are the steps I am suggesting you take also!

As per stated policy, any assignment submitted is assumed to be supervised and proctored by the student's parent.

First Week:

1. Read the assigned reading indicated in your schedule, including labs, before coming to class.
2. Answer the *On Your Own* questions when you come to them. (These are not turned in. They are for your benefit. The answers are at the end of your Module.)
3. Attend Class: ask questions about reading assignment and labs. Participate, listen and learn. *Fill in the blank notes* should be completely filled in by end of class: you may want to work math problems ahead of time and come with answers prepared.
4. General and Honors-credit students: Perform the labs included in the week's reading. Write the required informal lab report for each lab completed. Place them in your notebook for safe keeping. (If you are doing the optional microscope experiments these should be completed also.)

Second Week:

1. Read the assigned second reading, including labs, before coming to class.
2. Answer the *On Your Own* questions when you come to them. (Again, do not turn these in.)
3. Attend Class: ask questions about reading assignment and labs. Participate, listen, and learn. *Fill in the blank notes* should be completely filled in by end of class: you may want to work math problems ahead of time and come with answers prepared.
4. General and Honors-credit students: Perform labs included in the week's reading. Write the required informal lab reports. Place them in your notebook for safe keeping. (If you are doing the optional microscope experiments these should be completed also.)
5. Optional: Answer the *Study Guide* questions at the end of the module. (This is an open book assignment. I have provided you an example of a completed assignment below.)
6. Optional: Parents use your *Solutions Manual* to correct your student's *Study Guide* answers.

7. Optional: Have the student correct any error they may have made in the *Study Guide* assignment.

Third Week:

1. Overlap week. You will need to begin the next Module in your book during this week. Follow the steps above.
2. Ask questions in class about your reading assignment, *On Your Own* questions, and lecture notes. I will give you a review for your *Module Test* during class this week. If you miss class this week, you will need to listen to the class recording for Test prep assistance.
3. Take the online *Module Test* by the date indicated in your *Course Schedule*. This assignment is *closed book and closed notes*. The *Module Tes*t will be forwarded to me automatically once you click on "*Finished*" on the Student Portal site.

Fourth Week:

1. Ask questions in class about your *Module Test* grade and your finished experiment reports.
2. Continue on with next Module work.

B. Assignment Guidelines

1. Honors-level students only: Formal Experiment Reports MUST BE TYPED (MS Word 2010 docx or Adobe PDF, Times New Roman, 12 font, black print on a white background, 1" margins, single-spaced) AND SPELL CHECKED before the report is forwarded to me as an e-mail attachment: the e-mail address for submission is ccr101@comcast.net. The document file size cannot exceed 2 MB. The subject line of the e-mail MUST read Honors Biology Draft Report for a draft paper and Honors Biology Final Report for a final assignment. There is one formal report required per quarter for Honors-level students.

2. Honors-level students only: Formal Experiment Report assignment requirements are outlined in detail in your *Assignment Supplement*. Remember, I expect honors biology students to have had two years prior practice writing experiment reports. I do allow revisions of the experiment report and will tell your student how to improve their assignment before final report submission. If you plan to use graphs or other graphics as part of your report Observations section, YOU MUST E-MAIL these to me as an e-mail attachment in MS Word 2010 docx format, Rich Text Format, Adobe PDF, or as a whiteboard presentation. As stated in the *Assignment Supplement*, when seeking help from someone or quoting facts from a book, internet source, or other media, you must include them in your bibliography in the required format.

3. Module Tests are taken online through the Student Portal site:

http://www.redwagontutorials.com/php/.

Module Test assignments ARE CLOSED BOOK AND CLOSED NOTES assignments. As per stated policy, any assignment submitted is assumed to be supervised and proctored by the student's parent. We have a zero tolerance policy toward cheating or plagiarism. Vocabulary

words for the Module MUST BE SPELLED CORRECTLY if used to answer a test question. USING SPELL CHECK DURING A TEST IS NOT ALLOWED.

4. All Test assignments, except your semester exams, must be completed within 60 minutes of logging onto the Student Portal site. Semester exams must be completed within 90 minutes. After 60 or 90 minutes, depending on the assignment, the Student Portal WILL DISCONNECT YOU AND NOT FORWARD your assignment, which could result in a zero being given on an assignment.

5. Upon submission of any assignment through the Student Portal, the Portal site will forward a copy to my e-mail address and forward a receipt copy to your e-mail address of record on the site. IT IS YOUR RESPONSIBILITY TO OBTAIN A RECEIPT FROM THE PORTAL COMPUTER AND TO MAINTAIN THE CORRECT E-MAIL ADDRESS on the Portal computer. The assignment receipt is your proof that the assignment was submitted on time and in good order. I will ask to see the receipt copy for any assignment when there is a question about the timely submission of the assignment: NO RECEIPT COPY MEANS NO CREDIT GIVEN.

6. Students must be disciplined enough to submit required work on time. As per stated policy, I will deduct 10% per day from the score received on the assignment on all late work, including the Parent Notebook Report, unless the lateness results from personal illness, family emergency, or computer problem of a non-reoccurring nature. In these instances, I will grant full points. A schedule for the course, providing due dates for all assignments for the entire year, has been provided in this e-Notebook. If you are leaving on vacation or some other personal choice holiday, please adjust your study schedule to submit the assigned work before leaving. I will always accept an assignment early. I am available during my office hours to help you complete assignments before the due date, when and if necessary, during the school year.

7. All class assignments are due by *6:00 PM, Eastern Time, on the date indicated in the Course Schedule*. The Student Portal time stamp on your work is the final authority on whether something is submitted on time or not. *NOTE: 6:01 PM, Eastern Time, starts a new day, and I will subtract 10% if your work arrives at or after that time*.

8. Students should keep hard copies of all their work (labs, optional study guides, notes, tests, etc.), not just computer saved work. Doing so will allow the student to keep a good portfolio of their class assignments should they be asked to demonstrate their work at some later date. Please note, I do not maintain copies of a student's work beyond the end of the school year. I will maintain a copy of a student's final semester grades for seven years beyond the end of our class together.

C. Optional Study Guide Assignment

The following is an example of the properly-completed, optional *Study Guide* assignment. The completed assignment is parent corrected or student self-correct. It is not turned in for grade and is optional work. Your student's completed assignment document (if done) should be handwritten or typed and saved in your student's notebook. The *Study Guide* assignment and

Practice Test in the solutions manual are not used for testing. Tests and Exams questions are based on the assigned reading, *On Your Own* questions, instructor lecture notes, figures in the text, web pages visited, and assigned lab work.

As per stated policy, any assignment submitted is assumed to be supervised and proctored by the student's parent.

Mr. Biology Bugs
Honors Biology
Module 1 Study Guide

Answers to #1: Please be sure to answer all the study guide questions as complete sentences.

a. Metabolism is the process by which a living organism takes energy from its surroundings and uses it to sustain itself, develop, and grow.
b. Photosynthesis is the process by which a plant uses the energy of sunlight and certain chemicals to produce its own food. Oxygen is often a by-product of photosynthesis.
c. Herbivores are organisms that eat plants exclusively.
d. Carnivores are organisms that eat only organisms other than plants.
e. Omnivores are organisms that eat both plants and other organisms.
f. Producers are organisms that produce their own food.
g. Consumers are organisms that eat living producers and/or other consumers for food.
h. Decomposers are organisms that break down the dead remains of other organisms.
i. Autotrophs are organisms that are able to make their own food.
j. Heterotrophs are organisms that depend on other organisms for food.
k. Receptors are special structures or chemicals that allow living organisms to sense the conditions of their surroundings.
l. Asexual reproduction is reproduction accomplished by a single organism.
m. Sexual reproduction is reproduction that requires two organisms, a male and a female.
n. Inheritance is the process by which physical and biological characteristics are transmitted from the parent (or parents) to the offspring.
o. A mutation is an abrupt and marked difference between offspring and parent.
p. A hypothesis is an educated guess that attempts to explain an observation or answer a question.
q. A theory is hypothesis that has been tested with a significant amount of data.
r. A scientific Law is a theory that has been tested by and is consistent with generations of data.
s. Microorganism is a living creature that is too small to see with the naked eye.
t. Abiogenesis is the theory that, long ago, very simple life forms spontaneously appeared through random chemical reactions.
u. A prokaryotic cell is a cell that has no distinct, membrane-bound organelles.
v. A eukaryotic cell is a cell with distinct, membrane-bound organelles.
w. Species are a unit of one or more populations of individuals that can reproduce under normal conditions, produce fertile offspring, and are reproductively isolated from other such units.
x. Binomial nomenclature is naming an organism with its genus and species name.
y. Taxonomy is the science of classifying organisms.

2. The four criteria for life: (1) All life forms contain deoxyribonucleic acid, which is called DNA. (2) All life forms have a method by which they extract energy from the surroundings and convert it into energy that sustains them. (3) All life forms can sense changes in their surroundings and respond to those changes. (4) All life forms reproduce.

3. The carnivore is a heterotroph and a consumer. Carnivores do not eat plants.

4. If a living organism's tentacles were cut off in an accident, it would not be able to survive long because it no longer has the ability to sense and respond to changes in its surrounding environment. Its receptors (tentacles) were destroyed and therefore no longer able to sense the conditions of the environment.

5. The parent and off springs will reproduce sexually.

6. The statement is wrong because science cannot prove anything. The best science can say is that all known data support a given statement.

7. The scientific method represents the best conclusions that science has to offer, but they are nevertheless not completely reliable. The scientific method cannot be proven and is limited. The scientific method starts out with a person making observations. Observation allows the scientist to collect data. Once enough data has been collected, the scientist forms a hypothesis to explain those observations or to answer a question. The person (often with the help of others) then designs experiments to test the hypothesis. After the hypothesis has been tested by a significant amount of data and is consistent with all of it, then it becomes theory. After more testing with generations of data, the theory could become a scientific law.

8. The story of spontaneous generation illustrates the limitations of science because it proves that scientific laws are not 100% reliable. Because it is impossible to fully test a scientific law, and because laws are tested by experiments that might be flawed, scientific laws are not necessarily true. All 1900 years of executing the scientific method resulted in a law that was clearly wrong. Thus, putting too much faith in scientific laws and theories will end up getting you in trouble, because many of the laws and theories in science today will eventually be shown to be wrong.

9. A wise person should place his/her faith in the Bible because it is %100 reliable and infallible.

10. The theory of abiogenesis is another example of the idea of spontaneous generation. Abiogenesis is a theory that states that life sprang from non-living chemicals eons. If you look at the track record of spontaneous generation throughout the course of human history, it is safe to conclude that at some point, the version of spontaneous generation known as abiogenesis will also be shown to be quite wrong. We now know that this law is wrong.

11. The classification groups in order are: Kingdom, Phylum, Class, Order, Family, Genus, and Species.

12. This organism belongs to the kingdom Animalia.

13. This organism belongs to kingdom Monera.

14. 1. macroscopic, proceed to key 3
    3. heterotrophic, proceed to key 5
    5. decomposer, kingdom Fungi

D. Informal Laboratory Report Format

General and Honors credit students are required to write an informal report on every required experiment completed. The experiments in this course are designed to be done as you are reading the text. I recommend that you keep a notebook of these experiments. This notebook serves two purposes. First, as you write about the experiment in the notebook, you will be forced to think through all of the concepts that were explored in the experiment. This will help you cement them into your mind. Second, certain colleges might actually ask for some evidence that you did, indeed, have a laboratory component to your honors biology course. The notebook will not only provide such evidence but will also show the college administrator the quality of your honors biology instruction. I recommend that you perform the experiments in the following way:

- When you get to an experiment, read through it in its entirety. This will allow you to gain a quick understanding of what you are to do.

- Once you have read the experiment, start a new page in your laboratory notebook. The first page should be used to write down all of the data taken during the experiment. What do I mean by "data"? Any observations or measurements you make during the experiment are considered data. Thus, if you see an organism during an experiment, you need to either describe it or draw it. If you measure the length of something during the experiment, that is part of the experiment's data and should be written down. In addition, any data analysis that you are asked to do as a part of the experiment should be done on this page.

- When you have finished the experiment and any necessary analysis, write a brief report in your notebook, right after the page where the data and calculations were written. The report should be a brief discussion of what was done and what was learned. You should not write a step-by-step procedure. Instead, write a brief summary that will allow someone who has never read the text to understand what you did and what you learned.

PLEASE OBSERVE COMMON SENSE SAFETY PRECAUTIONS! The experiments in this course are no more dangerous than most normal, household activity. Remember, however, that the vast majority of accidents do happen in the home. Chemicals used in the experiments should never be ingested; hot beakers and flames should be regarded with care; and all experiments should be performed while wearing eye protection such as safety glasses or goggles.

E. Formal Laboratory Report Format

These are written by Honors-credit students only. Standard six-step, typewritten formal laboratory write-up should include the following: (You do not have to follow this format for your penciled, handwritten, laboratory notebook. There is information on how to prepare an informal lab notebook report included above.) You are required to produce one formal report per quarter. Formal Experiment Reports MUST BE TYPED (MS Word 2010 docx or Adobe PDF, Times New Roman, 12 font, black print on a white background, 1" margins, single-spaced) AND SPELL CHECKED before the report is forwarded to me as an e-mail attachment: the e-mail address for submission is ccr101@comcast.net. The document file size cannot exceed 2 MB. The subject line of the e-mail MUST read Honors Biology Draft Report for a draft paper and Honors Biology Final Report for a final assignment. There is one formal report required per quarter. (Non-Honors students do not have to complete formal reports.) Your formal report must be formatted as follows and included the following sections:

Name Date

Title of the Experiment

A. Purpose

You must tell what the experiment is about and what area it will test. Background on the area is expected. (In other words, provide details about what is being experimented on.) You must use your textbook and two outside resources preparing your report background. You must also include a statement of what the experiment hope to show and why this topic is of interest. You must also include a hypothesis statement in the standard "If, then" format for scientific research work. First person pronouns are not used in scientific writing.

B. Equipment

Provide a complete list of equipment necessary to conduct the experiment. Equipment should be listed in a 1, 2, 3, 4, 5, etc., fashion down the page.

C. Procedure

Provide a complete list of the procedure used. Procedure should be written in a cookbook fashion and be numbered 1, 2, 3, 4, 5, etc., fashion down the page.

D. Observations

Provide a detailed, objective report of observations -- what was seen, heard, felt, tasted, smelled -- when the experiment was performed. Charts and graphs which provide detail are encouraged, but these do not take the place of the narrative observations.

E. Conclusions

Provide analysis of the experiment: try to explain what was seen, heard, felt, tasted, or smelled while the experiment was happening. Be sure to provide ways that the experiment could be improved if the experiment was done again and any ideas for further research the experiment might have generated. Note: there are ALWAYS ways to improve how an experiment is done and ideas further research generated.

F. Bibliography

If you seek help from someone or quote facts from a book, internet source, or other media you should include them in bibliography in using the format I provide. You are required to research two outside resources other than your textbook and use them in the background of your report. Additionally, you must cite your textbook and me as a "class source" or "personal interview" on every lab report.

The completed Word 2010 docx or Adobe PDF document of the formal experiment report should be printed and saved to your student's notebook. The completed and spell-checked Experiment Report is then forwarded to me as an e-mailed attachment. An example of a completed honors biology experiment follows. Please note -- I expect you as incoming honors biology students to be able to produce a quality lab report similar to the one below:

Miss MW 10/18/16

Pond Observation

A. Purpose:

The objective of this experiment is to become more familiar with the life that inhabits areas such as a pond. It is important to perceive and try to understand the nature and life around us. This experiment is specifically concerned with the life that thrives in ponds and similar areas. After completing this experiment, the student should be able to identify, or at least have a rough idea, of the types of animals and plants that live and grow in a pond environment.

Ecology is "the branch of biology that deals with the relations of organisms to one another and to their physical surroundings."(Dictionary), which includes the study of ecosystems. Ecosystem is a "biological community of interacting organisms and their physical environment" (Dictionary). The particular environment concentrated on in this experiment is the pond environment. A pond is "a small body of still water formed naturally or by hollowing or embanking" (Dictionary). Animals such as Mallard ducks and plants such as algae are typical of a pond environment, however the reverse is not always strictly true. Mallard ducks like shallow water, and but are flexible as to what they eat and their surroundings. They migrate just the same as many other birds when weather becomes too harsh for them (Handbook). Algae are "simple non-flowering plants of large groups that include seaweeds and many single-celled forms. Algae contain

chlorophyll but lack true stems, roots, leaves, and vascular tissue." (Dictionary) Green surface algae is common in ponds, and is actually the best type of algae to have in a pond. It is a good source of food for snails, fish, tadpoles, and other such creatures that inhabit a pond. As long as it is controlled, algae is a good thing, but control is important for the health of the pond and its inhabitants (Niagara). Other kinds of bacteria can be used for the good of man, such as the kinds of bacteria used to make antibiotics, or foods such as cheese (Wile).

This experiment hopes to show not only how the ecosystem of pond life works, but also the relationship between life and the environment it thrives in. Learning about science is not confined to complicated definitions and graphs. Many of the topics a student learns about while studying the science of life come alive through visual, hands-on experiments such as this one. It is advisable for every living being to try to familiarize his/herself with his/her surroundings. Even through studying the plant and/or animal that inhabit the area the student lives in or near. Life and its complications and significance can be better understood through just being observant and aware of the circumstances, changes, and inhabitants of our environment.

This topic is of interest to science because exploring the environment can lead to appreciation of the complexity of organisms and how dependent they are on each other. Through observation and experimentation, organisms can be used to benefit man. Organisms (bacteria), some even thought to be harmful, have been used to make new foods and medicines (such as antibiotics). This, again, illustrates how important it is for a student or scientist to keep an open mind, absorb, and analyze the nature surrounding him/her.

Hypothesis: If a student is curious and observant, then much can be learned about the variety of the plant and animal life of a pond environment in a field trip of one-two hours.

B. Equipment: (5 points possible)

1. A pond.
2. A lab notebook
3. A long stick attached to a ladle with duct tape
4. A camera with a zoom lens
5. Something to rest the lab notebook on while drawing in it.
6. Colored pencils.

C. Procedure: (5 points possible)

1. After locating a proper body of water, plan a field trip of one to two hours.
2. Use the ladle attached to the stick and scoop some muck from the bottom of the pond.
3. Walk slowly around the pond, sitting occasionally to observe everything that is around. Make sure not only to look, but also listen carefully.
4. Use the camera to observe surrounding nature better. Take some pictures of things around to better remember observations made.
5. Draw each of them in a lab notebook as noted. Don't forget to look under rocks and other hiding places.

D. Observations: (10 points possible)

1. It was noted that the water that was scooped from the bottom of the pond with a ladle smelt worse than the water on top.
2. No mosquitoes were noticed.
3. It was noted that the pond was in general not as smelly, and not as covered with green and yellow scum (algae?) as observed during the previous summer.
4. No birds were noticed flying overhead over a span of 1 hour of observation, however many ducks were seen swimming in clusters, 6 mallard ducks and 2 female ducks all in a group together.
5. Two birds of questionable identity were seen together on a tree branch. Both were identical in design and color, so it is noted to be possible that both were female or both were male.
6. A painter's turtle was observed swimming, poking his yellow striped head out of the water.
7. No water-bugs were noticed, though they have been present in past visits to this same pond during the previous summer.
8. Many empty snail shells, mostly white, cream, or brown, along the shore of the pond were noticed, whereas snail shells that still housed slimy, blackish brown snails were seen floating in the water. The shells observed on the shore were various sizes, but mostly large. The shells floating in the water were small: about the size of a dime.
9. Definitely gooier, brownish green muck and sediment was noticed on the bottom of the pond as opposed to closer to the surface.
10. The two water sources for the natural pond under observation were rain and run off from streets through culverts. The pond eventually trickles down to a creek.
11. The end of a worm was noticed sticking out of the dirt under a rock about the size of a fist.

E. Conclusions: (10 points possible)

The data collected during the course of this experiment supported the previously stated hypothesis. During this experiment, the student, by remaining attentive to his/her habitat and being curious about the environment surrounding him/her, can find that science isn't found only in books. In fact, the study of science begins with observation. It is amazing how much a student can learn about his/her locality within a short span of 1 hour!

There are a probably many ways to improve the experiment as performed by the student. One would be to set more time aside for the field trip to the pond. The student only stayed for 1 hour, and said student would recommend that more time be spent on this interesting experiment, perhaps 2 or 3 hours. Another way would be to locate a less public pond for this experiment, thus having the chance to see more life normally hidden from inquisitive eyes. Experiments are never infallible, and can always be improved in some way - the above examples are merely two of these ways.

Here are some ideas the experiment generated for further research as occurred to the student. The student wondered whether or not dead snail shells usually collect on the shore, and the living float in the water, never landing on the shore, as supported by collected data. The student also wondered whether or not the smaller amount of scum and smell on the top of the water was due to the dropping temperature as the year matures. Also whether or not all the bacteria contained in the pond water collects at the bottom of the pond when the water freezes, as suggested by collected data. There are many interesting topics to be investigated that were suggested by this

experiment, and hopefully, if the student was sufficiently inspired by the former experiment, he/she may continue on to research these questions raised in his/her mind.

F. Bibliography: (10 points possible)

Comstock, Anna Botsford. "Handbook of Nature Study". Comstock Publishing Associates, 1967.

"Dictionary"
Version 2.0.3 (51.5)
Copyright 2005-2007 Apple Inc.

"Niagara Frontier Koi and Pond Club"
Domain: http://www.nfkpc.org
Document: /html/algae.html

Rosenoff, Steven. Classroom Lecture. October 2016.

Wile, Dr. Jay. L. and Durnell, Marilyn F. "Exploring Creation with Biology", 2nd Ed. Apologia Educational Ministries, Inc. 2005.

An example of lab report grading criteria follows:

A. Purpose (10 points possible) (10 points earned)

You must include the following five paragraphs (minimum) and present them in this sequence:

Para 1 - What the experiment is about: the objective
Para 2 - Background information on the experiment from your textbook and two other sources. You may need more than one paragraph here, which is okay
Para 3 - What the experiment hopes to show
Para 4 - Why this topic is of interest to science
Para 5 - A hypothesis statement in the proper "If, then" format

SUPERIOR (I will include comments in all capitals here. Please note: I am not shouting at your student! I am simply trying to set my comments apart from the template information. Remember: no personal pronouns can be used in your lab report!)

B. Equipment (5 points possible) (5 points earned)

You may copy/paste this from the online textbook, but you must make the following changes to the textbook list:

1. Provide a complete list of equipment necessary to conduct the experiment. If you substituted or changed anything, please list it here also.

2. Equipment should be listed in a 1, 2, 3, 4, 5, etc., fashion down the page; not in the A, B, C, D, etc., fashion used in your textbook.

PERFECT.

C. Procedure (5 points possible) (5 points earned)

You may copy/paste this from the online textbook, but you must make the following changes to the textbook list:

1. Provide a complete list of the procedure used. If you change any, be sure to note it.
2. Procedures should be written in a cookbook fashion
3. Procedures must be numbered 1, 2, 3, 4, 5, etc., down the page, use a, b, c, d, etc. for sub-items

PERFECT.

D. Observations (10 points possible) (10 points earned)

1. Provide a detailed, objective report of observations -- what you saw, heard, felt, tasted, smelled, etc -- when the experiment was performed. (Charts and graphs which provide detail are encouraged. These MUST be e-mailed as an attachment to me as stated in your assignment guidelines.) A numbered list of observations works well here: a well-detailed list may be as many as 10 observations or more long. You can also provide me with a narrative of your observations in paragraph form if you desire.

GREAT JOB.

E. Conclusions (10 points possible) (10 points earned)

You must include:

Para 1 - An analysis of the data
Para 2 - Ways to improve the experiment
Para 3 - Ideas the experiment generated for further research

OUTSTANDING.

F. Bibliography (10 points possible) (10 points earned)

You must include the following four citations in alphabetical order:

Cit 1 - A reference for me as a class lecture or interview note in proper format as given in examples
Cit 2 - A reference for your textbook in proper format as given in examples

Cit 3 - A reference for your first outside resource
Cit 4 - A reference for your second outside resource

WONDERFUL BIBLIOGRAPHY

ASSIGNMENT GRADE: 50/50 100% Excellent.

F. Laboratory Notebook Requirements

General and Honors-credit students only need keep this. Please note: Experiment 2.1 requires pond water collection, Experiment 8.4 requires the student to grow radishes, and Experiment 14.1 requires the student to collect leaves. If you live in cold weather environments, you should plan for collection or growth of these items during warm weather conditions. You may need to accomplish these Experiments when weather permits *before the due date, which may require you to complete these experiment during summer*.

As per stated policy, any assignment submitted is assumed to be supervised and proctored by the student's parent.

Students should keep hard printed copies of all their work (labs, study guides, formal reports, notes, tests, etc.), not just computer saved work. I would divide the notebook into sixteen sections, one for each Module of the Wile's text. Doing so will allow the student to keep a good portfolio of their class assignments should they be asked to demonstrate their work at some later date. Please note, I do not maintain copies of a student's work beyond the end of the school year. I will maintain a copy of a student's final semester grades for seven years beyond the end of our class together. Please note that some of the experiments require long periods of time to complete. As I do not set the lab schedule in your home school, you will need to look ahead and adjust your lab time accordingly. I require a Parent Notebook Report to be submitted at the end of first and second semesters which states how many of the required experiments have been completed by your student. The student should have the following completed and in his or her notebook for each semester listed:

First Semester:

Experiment 1.1
Experiment 2.1, Part A – Formal Report Required
Experiment 5.1
Experiment 5.2
Experiment 5.3
Experiment 7.1 – Formal Report Required
Experiment 8.1
Experiment 8.2
Experiment 8.3
Experiment 8.4 (Extremely long experiment. Plan ahead!)

Second Semester:

Experiment 10.1
Experiment 11.3 – Formal Report Required
Experiment 12.1
Experiment 12.2
Experiment 13.1
Experiment 13.2 – Formal Report Required
Experiment 14.1
Experiment 14.2
Experiment 15.1
Experiment 15.2

No assigned lab work due for Module 16.

G. Module Tests and Exams

Module Tests and Semester Exams are taken online through the Student Portal site. Module Tests and Semester Exams ARE CLOSED BOOK AND CLOSED NOTES assignments. As per stated policy, any assignment submitted is assumed to be supervised and proctored by the student's parent. I have a zero tolerance policy toward cheating or plagiarism. Vocabulary words for the Module MUST BE SPELLED CORRECTLY if used to answer a test or an exam question. USING SPELL CHECK DURING A TEST IS NOT ALLOWED.

All Module Test assignments must be completed within 60 minutes of logging onto the Student Portal site. Semester exams must be completed within 90 minutes. After 60 or 90 minutes, depending on the assignment, the Student Portal WILL DISCONNECT YOU AND NOT FORWARD your assignment, which could result in a zero being given on an assignment. Please time yourself during your Module Test or Semester exam to ensure completion within the time limit.

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RED WAGON TUTORIALS

Course Schedule

Welcome to Honors Biology class. I am excited about the new school year for two reasons: (1) our class will be live-feed Internet. Unlike some Internet courses that require you to send in assignments, which I would score then return, you and I will be communicating directly with each other on at least a weekly basis. This arrangement gives us greater opportunity to interact and learn from each other because we will be together for ninety minutes each week; (2) our curriculum will be challenging and exhilarating. Sixteen major topics will be covered during the course of this year. These units are all outlined in the following schedule and in the book *Exploring Creation with Biology*, 2nd Edition, by Dr. Jay Wile and Marilyn F. Durnell, which will also be our classroom text. As a former medical and industrial research scientist, you can be certain I will bring a depth of knowledge to the topics we will study together. I am eager to share my experience with you in a tutorial capacity.

This document in conjunction with other stated requirements, the *Assignment Supplement*, and the *Parent Agreement* outline and detail the requirements for the Honors Biology Course.

Schedule:

FIRST SEMESTER

Module 1: Biology, The Study of Life

Class discussions: Week of 9-11, Week of 9-18

For the first class meeting (Week of 9-11), you need to have read up to and including the section called "Biological Classification."

For the second class meeting (Week of 9-18), you need to have finished reading Module 1.

Formal Experiment report to be turned in to Mr. Rosenoff:

None

(General and Honors-level students only: All required experiments in the textbook are to be completed as they are encountered. Experiment reports are to be handwritten in the informal format provided at the front of your textbook, completed on notebook paper, and kept in a 3-ring binder. I will ask each parent at the end of each semester for a count of the number of experiments completed during the semester. Failure to complete the all the required experiments may keep your student from continuing on into the next semester of science.)

Assignments Due:

Fill in the Blank Notes: Due by 9-25
Required Experiment: Due by 10-2: Experiment 1.1 informal report in notebook
Online Module Test: Due by 10-2

Module 2: Kingdom Monera

Class discussions: Week of 9-25, Week of 10-2

For the first class meeting (Week of 9-25), you need to have read up to and including the section called "Endospore Formation."

For the second class meeting (Week of 10-2), you need to have finished reading Module 2.

Formal Experiment report to be turned in to Mr. Rosenoff:

Experiment 2.1, Part A Draft Report

Assignments Due

Fill in the Blank Notes: Due by 10-9
Required Experiment: Due by 10-16: Experiment 2.1, Part A Draft Report to Mr.R
Online Module Test: Due by 10-16

Module 3: Kingdom Protista

Class discussions: Week of 10-9, Week of 10-16

For the first class meeting (Week of 10-9), you need to have read up to and including the section called "Phylum Sporozoa."

For the second class meeting (Week of 10-16), you need to have finished reading Module 3.

Formal Experiment report to be turned in to Mr. Rosenoff:

Experiment 2.1A Corrected Report

Assignments Due:

Fill in the Blank Notes: Due by 10-23
Required Experiments: Due by 10-30: Experiment 2.1A Corrected Report to Mr.R
Online Module Test: Due by 10-30

Module 4: Kingdom Fungi

Class discussions: Week of 10-23, Week of 10-30

For the first class meeting (Week of 10-23), you need to have read up to and including the section called "Other Members of Phylum Ascomycota."

For the second class meeting (Week of 11-30), you need to have finished reading Module 4.

Formal Experiment report to be turned in to Mr. Rosenoff:

None

Assignments Due:

Fill in the Blank Notes: Due by 11-6
Required Experiment: None
Online Module Test: Due by 11-13

Module 5: The Chemistry of Life

Class discussions: Week of 11-6, Week of 11-13, Thanksgiving Break: 11/18 thru 11/26

For the first class meeting (Week of 11-6), you need to have read up to and including the section called "Chemical Change."

For the second class meeting (Week of 11-13), you need to have finished reading Module 5.

Formal Experiment report to be turned in to Mr. Rosenoff:

None

Assignments Due:

Fill in the Blank Notes: Due by 11-27
Required Experiments: Due by 12-4: Experiment 5.1, Experiment 5.2, and Experiment 5.3 informal reports in notebook
Online Module Test: Due by 12-4

Module 6: The Cell

Class discussions: Week of 11-27, Week of 12-4

For the first class meeting (Week of 11-27), you need to have read up to and including the section called "How Substances Travel In and Out of Cells."

For the second class meeting (Week of 12-4), you need to have finished reading Module 6.

Formal Experiment report to be turned in to Mr. Rosenoff:

None

Assignments Due:

Fill in the Blank Notes: Due by 12-11
Required Experiments: None
Online Module Test: Due 12-18

Module 7: Cellular Reproduction

Class discussions: Week of 12-11, Christmas Break: 12/20/2017 thru 1/2/2018, Week of 1-1-18

For the first class meeting (Week of 12-11), you need to have read up to and including the section called "Mitosis: Eukaryotic Asexual Reproduction."

For the second class meeting (Week of 1-1-18), you need to have finished reading Module 7.

Formal Experiment report to be turned in to Mr. Rosenoff:

Experiment 7.1 Draft Report

Assignments Due:

Fill in the Blank Notes: Due by 1-8
Required Experiment: Due by 1-15: Experiment 7.1 – Draft Report to Mr.R
Online Module Test: Due by 1-15

Module 8: Genetics

Class discussions: Week of 1-8, Week of 1-15

For the first class meeting (Week of 1-8), you need to have read up to and including the section called "Experiment 8.1: Making Your Own Earlobe Pedigree."

For the second class meeting (Week of 1-15), you need to have completed Module 8.

Formal Experiment report to be turned in to Mr. Rosenoff:

Experiment 7.1 Corrected Report

Assignments Due:

Fill in the Blank Notes: Due by 1-22
Required Experiments: Due by 1-29: Experiment 7.1 Corrected Report to Mr.R, and Experiment 8.1, Experiment 8.2, Experiment 8.3, and Experiment 8.4
First Semester Exam: Due by 1-29 (Online: Exam will cover Modules 1 thru 8 information.)

Parent Notebook Report -- Due 01/26/2018

SECOND SEMESTER (Order your dissection specimens now!!!!!)

Module 9: Evolution – Part Scientific Theory, Part Unconfirmed Hypothesis

Class discussions: Week of 1-22, Week of 1-29

For the first class meeting (Week of 1-22), you need to have read up to and including the section called "The Details of the Fossil Record: Evidence against Macro-evolution."

For the second class meeting (Week of 1-29), you need to have finished reading Module 9.

Formal Experiment report to be turned in to Mr. Rosenoff:

None

Assignments Due:

Fill in the Blank Notes: Due by 2-5
Required Experiment: None
Online Module Test: Due by 2-12

Module 10: Ecosystems

Class discussions: Week of 2-5, Week of 2-12, Winter Break: 2/17 thru 2/25

For the first class meeting (Week of 2-5), you need to have read up to and including the section called "The Physical Environment."

For the second class meeting (Week of 2-12), you need to have finished reading Module 10.

Formal Experiment report to be turned in to Mr. Rosenoff:

None

Assignments Due:

Fill in the Blank Notes: Due by 2-26
Required Experiment: Due by 3-5: Experiment 10.1 informal report in notebook
Online Module Test: Due by 3-5

Module 11: The Invertebrates of the Kingdom Animalia

Class discussions: Week of 2-26, Week of 3-5

For the first class meeting (Week of 2-26), you need to have read up to and including the section called "Feeding Habits of the Earthworm."

For the second class meeting (Week of 3-5), you need to have finished reading Module 11.

Formal Experiment report to be turned in to Mr. Rosenoff:

Experiment 11.3/Earthworm Dissection Draft Report

Assignments Due:

Fill in the Blank Notes: Due by 3-12
Required Experiment: Due by 3-19: Experiment 11.3/Earthworm Dissection Draft Report to Mr.R
Online Module Test: Due by 3-19

Module 12: Phylum Arthropoda

Class discussions: Week of 3-12, Week of 3-19

For the first class meeting (Week of 3-12), you need to have read up to and including the section called "Experiment 12.1: Crayfish Dissection."

For the second class meeting (Week of 3-19), you need to have finished reading Module 12.

Formal Experiment report to be turned in to Mr. Rosenoff:

Experiment 11.3/Earthworm Dissection Corrected Report

Assignments Due:

Fill in the Blank Notes: Due by 3-26
Required Experiments: Due by 4-9: Experiment 11.3/Earthworm Dissection Corrected Report to Mr.R, and Experiment 12.1, and Experiment 12.2 informal reports in notebook
Online Module Test: Due by 4-9

Module 13: Phylum Chordata

Class discussions: Week of 3-26, Spring Break: 3/31 thru 4/8, Week of 4-9

For the first class meeting (Week of 3-26), you need to have read up to and including the section called "Class Chondrichthyes."

For the second class meeting (Week of 4-9), you need to have finished reading Module 13.

Formal Experiment report to be turned in to Mr. Rosenoff:

Experiment 13.2/Frog Dissection Draft Report

Assignments Due:

Fill in the Blank Notes: Due by 4-16
Required Experiments: Due by 4-23: Experiment 13.2/Frog Dissection Draft Report to Mr.R and Experiment 13.1 informal report in notebook
Online Module Test: Due by 4-23

Module 14: Kingdom Plantae – Anatomy and Classification

Class discussions: Week of 4-16, Week of 4-23

For the first class meeting (Week of 4-16), you need to have read up to and including the section called "Roots."

For the second class meeting (Week of 4-23), you need to have finished reading Module 14.

Formal Experiment report to be turned in to Mr. Rosenoff:

Experiment 13.2/Frog Dissection Corrected Report

Assignments Due:

Fill in the Blank Notes: Due by 4-30

Required Experiments: Due by 5-7: Experiment 13.2/Frog Dissection Corrected Report to Mr.R, and Experiment 14.1and Experiment 14.2 informal reports in notebook
Online Module Test: Due by 5-7

Module 15: Kingdom Plantae – Physiology and Reproduction

Class discussions: Week of 4-30, Week of 5-7

For the first class meeting (Week of 4-30), you need to have read up to and including the section called "Experiment 15.1: Flower Anatomy."

For the second class meeting (Week of 5-7), you need to have finished Module reading 15.

Formal Experiment report to be turned in to Mr. Rosenoff:

None

Assignments Due:

Fill in the Blank Notes: Due by 5-14
Required Experiments: Due by 5-21: Experiment 15.1 and Experiment 15.2 informal reports in notebook
Online Module Test: Due by 5-21

Parent Notebook Report -- Due 05/25/2018

Module 16: Reptile, Birds, and Mammals

Class discussions: Week of 5-14, Week of 5-21

For the first class meeting (Week of 5-14), you need to have read up to and including the section called "Class Aves."

For the second class meeting (Week of 5-21), you need to have finished reading Module 16.

Formal Experiment report to be turned in to Mr. Rosenoff:

None

Assignments Due:

Fill in the Blank Notes: Due by 5-28
Required Experiments: None

Exam Review: During class week of 5-21

Final Assignments:

Second Semester Exam: Due by 6-1 (Exam covers Modules 9 thru 16. There WILL be questions over Module 16 on the Exam.)

Please note that 6-1-18 is the LAST POSSIBLE DAY to turn in assignments for the school year. I will close my grade book at 6:01 PM, Eastern, and finalize grades. Please do not be late with your final assignments.

To you, the parent, I promise that I will make every effort possible to keep in close contact with you; however, in order to do that, I need to be able to find you! Please keep the school and me advised of a daytime phone number where you can be reached, and provide me with an e-mail account address to which only you have access. I do not make evening or weekend phone calls or answer or send e-mails on the weekends. (My family needs my time during these hours.) Therefore, it is imperative that I be able to contact you during daylight hours. If you have any questions or concerns, please feel free to contact me at 360-347-1799 during my school year office hours, which are 3:00 – 6:00 PM, Eastern Time, Monday, Wednesday, or Friday or e-mail me at rwt1@comcast.net.

God Bless your efforts this year and always,

Steve Rosenoff
Honors Biology Instructor
Cleo's Classroom

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Parent Agreement

Thank you for your interest in this Cleo's Classroom Honors Biology class. I am excited about the new school year for two reasons: (1) our class will be live-feed Internet. Unlike some Internet courses which require you to send in assignments which I grade and then return, you and I will be communicating directly with each other on at least a weekly basis. This arrangement gives us greater opportunity to interact and learn from each other because we will be together for ninety minutes each week; (2) our curriculum will be challenging and exhilarating. Sixteen major topics will be covered during the course of this year. These units are all outlined in the book ***Exploring Creation with Biology, 2nd Edition***, by Dr. Jay Wile and Marilyn F. Durnell, which will also be our classroom text. As a former medical and industrial research scientist, you can be certain I will bring a depth of knowledge to the topics we will study together. I am eager to share my experience with you in an educational capacity.

In order to start out with a firm understanding of my expectations for this class, I would ask that you please review the following requirements with your student:

1. Students entering biology should be concurrently enrolled in or have already completed Algebra I prior to the start of the academic school year. (Success in biology at this level and math ability go hand-in-hand, according to research.)

2. Incoming biology students should have mastered the introductory concepts covered in a basic general and physical science course, including basic laboratory procedures and experiment report writing. (Please see ***Exploring Creation with General Science*** and ***Exploring Creation with Physical Science*** by Dr. Jay Wile for guidance as to basic curriculum covered in these courses.)

3. Honors-level students only: Students should have a basic understanding of document citation and have the ability to produce a two-to-three-page formal laboratory experiment report following a standardized documentation style I will provide.

4. Students or their parents should have basic computer literacy, including knowledge of how to download files, load web pages, open and create e-mail attachments in Word 2010 docx or Adobe PDF format, and how to copy from a Word 2010 docx or Adobe PDF document and paste to a website template. (These are not skills I teach in class.)

5. The text we will be using for our course, as stated earlier, is ***Exploring Creation with Biology*, 2nd Edition**, by Dr. Jay Wile and Marilyn F. Durnell. You are not required to purchase the textbook *Solutions Manual*. The textbook and optional manual, or a complete CD-ROM version of the text/manual, and other support materials are available through Christian Book Distributors, http://www.christianbook.com/. The text is divided into 16 modules. Unless otherwise noted in the biology course schedule: (1) a Fill in the Blank Notes set; (2) a paper-and-ink informal report (following an informal format I will provide) for each required module experiment; and (3) an instructor-graded online module test MUST all be completed for each module. Each student seeking Honors-credit will also produce a formal lab report each quarter following the formal report format that I will provide. There will also be an instructor-graded semester exam given at the end of 1st and 2nd semesters. I will also require that General and Honors-credit students maintain a penciled lab notebook of all lab experiment work completed: I will post a list of the required experiments to be completed for each semester. **Remember**: these assignments MUST BE COMPLETED BY THE DUE DATES LISTED in the course schedule, which I will post online.

6. Students must complete the module tests and the semester exams ONLINE on the Student Portal. Parents MUST post their parent notebook report on the Student Portal site also. Completing this assignment submission process provides the student/parent with a receipt for the assignment which is time stamped and gives me a computer-stored copy to look back on. There is a link for posting each one of these assignments available on the Student Portal site. Honors-level students will forward their formal experiment report as a Microsoft Word 2010 docx or Adobe PDF document. Please note: I require that you word process (using Word 2010 docx or Adobe PDF, Times New Roman, 12 font, 1" margins) and spell check the formal experiment report prior to its being sent as an e-mailed attachment. I will provide you with a *Steps to Success* handout (in your *Assignment Supplement*) which will detail the best method to accomplish all this assignment work.

7. Laboratory work is an important endeavor in your child's overall grade and education and should be completed to continue on to chemistry. *A microscope is not required for this course; however, if available, it will enhance the student's overall comprehension of the materials*. General and Honors-level students only: Please be sure to be diligent in completing ALL the required lab assignments indicated in the *Course Schedule*. Laboratory supplies for this course are obtained from common household and pantry items, hunting and gathering activities, and by purchasing a dissection kit and specimens through a commercial source specified in the Laboratory Equipment section at the front of Dr. Wile's text. I will require a parent notebook report be submitted each semester stating the total number of experiments completed per number required. This report will amount to one third of your General or Honors-level student's laboratory grade. Please do not be late.

(Those of you living and working overseas may have special needs regarding completion of laboratory work. Please feel free to contact me on an individual basis so that I can help with any concerns you may have.)

8. Students should be disciplined enough to submit required work on time. As per stated policy, I will deduct 10% per day from the score received on the assignment on all late work (**including**

the parent notebook report), unless the lateness results from personal illness, family emergency, or computer problem of a non-reoccurring nature. In these instances, I will grant full points. A schedule for the course, providing due dates for all assignments for the entire year, will be posted online before the start of the academic year. (If you are leaving on vacation or some other personal-choice holiday, please adjust your study schedule to submit the assigned work before leaving. I will always accept an assignment early. I am available during my office hours to help your student to complete assignments before the due date, when and if necessary, during the school year.)

All class assignments are due by *6:00 PM Eastern Time on the date indicated in the Schedule I will post online*. (The Student Portal time stamp on your work is the final authority on whether something is submitted on time or not.) *NOTE: 6:01 PM Eastern Time starts a new day, and I will subtract 10% if your work arrives at or after that time.*

9. In order to begin class immediately, students are expected to be signed on to their computers at the class start time with materials ready. Technology is often a fickle thing. Many students have to log in several times to get a decent connection. *Try to log into class five minutes early to avoid being late*. (This also provides the student time to chat with classmates prior to the start of our session.) Those students who are habitually tardy for no valid reason will be locked out of the system until a parent conference can be scheduled.

(Those of you living and working overseas may have special problems regarding absences and tardiness. Please feel free to contact me on an individual basis so that I can help with your needs.)

10. Students are expected to come to class prepared every day, which means all assigned reading, exercises, and labs (if required) have been completed.

The following rules and procedures have been established to create an environment conducive to learning:

a. Be Prepared -- have assignments finished prior to class.
b. Be Prompt -- turn in all work on the date it is due.
c. Be Respectful -- to yourself, other students, and your tutor.
d. Be Involved -- daily participation is required.

Those students who follow the rules stated above will receive positive reinforcement through the use of participation points. These points will be given at my discretion to students who are organized, complete work on time and to the best of their ability, and behave in an appropriate manner.

11. Daily participation in class is also required. Students are expected to have a working microphone for this purpose. Students are expected to ask questions, participate in discussions, and generate and share ideas. Often participation is the deciding factor when figuring grades (an 'A' vs. an 'A-' or perhaps a 'D' vs. an 'F'). You need to do more than show up to class and complete your assignments to succeed -- you need to be an *active participant* in your education.

(Please note: I cannot and will not, in good conscience, pass a student who does not participate in his or her education.)

12. The following grade scale will be used for the course:

A	93 - 100%	C+	77 - 79%	F	59% and below
A-	90 - 92%	C	73 - 76%		
B+	87 - 89%	C-	70 - 72%		
B	83 - 86%	D+	67 - 69%		
B-	80 - 82%	D	60 - 66%		

The two honors-level, typewritten, formal laboratory write-ups (one required each quarter) and the parent notebook report detailing completion of all required experiment work comprise 25% of the student's semester grade; seven module tests each semester make up an additional 50% of the student's grade; the end-of-semester exam comprises 25% of the total score for each semester. (Note: Laboratory grades for General-credit students will be comprised solely from the parent notebook check. No laboratory grade will be included for Survey-credit seeking students.)

A perpetual grade report for each semester for every student is available on the password protected Student Portal web site for viewing at any time during the school year.

If you have further questions regarding course requirements, my e-mail address is rwt1@comcast.net. Please feel free to contact me on Monday, Wednesday, or Friday afternoons between 3:00 PM – 6:00 PM Eastern Time. My phone number is 360-347-1799.

Looking forward to seeing you in September!

God Bless,

Steve Rosenoff
Honors Biology Instructor
Cleo's Classroom

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Module 01

Lesson 01:

Reading Assignment: ECB2, pp. 1 - 18

Lesson Video: Play Lesson 01 from the Video File. (Print off notes below before playing.)

Lesson Starts: 7:00 (Fast forward to this point for lecture.)

Biology: The Study of Life, Part 1

Please watch this video before class starts or the session video is viewed:

http://www.youtube.com/watch?v=CBeCxKzYiIA

(Parents: Please be advised that these are You-Tube videos. We have no control over the ads that are presented. We do our best to screen the presentations, but ads change daily. Please preview the video environment before your student views the links. We feel that Google Chrome is the best browser for students to watch videos. It screens content very well.)

https://www.google.com/chrome/browser/

The four criteria for life are as follows:

a. All life forms contain deoxyribonucleic acid, which is called _____.

b. All life forms have a method by which they extract _____ from the surroundings and convert it into energy that sustains them.

c. All life forms can sense _____ in their surroundings and respond to those _____.

d. All life forms _____.

1. According to Dr. Wile, all live forms contain what? _____

2. A mule is a cross between a male ass (a jackass) and a female horse (a mare). It is usually sterile. This means it cannot produce offspring. Is the mule alive? _____

3. A virus is composed of genetic material (sometimes DNA, sometimes RNA). It invades a cell,

hijacks the cell's reproductive machinery and makes the cell start reproducing viruses. The cell eventually explodes due to the huge number of viruses inside. Is a virus alive? _____

4. A Euglena has an eyespot which allows it to sense light and respond to the light. Is the Euglena living? Why?

_____

5. The process by which a living organism takes energy from its surroundings and uses it to sustain itself, develop, and grow is called what? _____

a. _____ is the sum total of all processes in an organism which use energy and simple chemical building blocks to produce large chemicals and structures necessary for life

b. _____ is the sum total of all processes in an organism which break down chemicals to produce energy and simple chemical building blocks

6. Where does the process of metabolism begin?

It begins with the _____.

7. The process by which a plant uses energy of sunlight and certain chemicals to produce its own food is called what?

_____

8. There are two words given in your text that signify an organism that makes its own food. What are they?

_____ or _____

9. Heterotrophs are organisms that depend on other organisms for food. What are the two kinds mentioned in your book?

_____ and _____

10. There are three kinds of consumers listed in your book. What are they and what do they eat?

_____ are organisms that eat plants exclusively.

_____ are organisms that eat only organisms OTHER than plants.

_____ are organisms that eat both plants and other organisms

11. Plants are autotrophs. Are they carnivores or omnivores? Are they producers or consumers?

Plants are _____; therefore the words _____ or _____ do not apply.

12. I have an article about a lion that WILL NOT eat meat. This animal would literally starve to death before it would eat meat. It only eats oats, grain, etc. Is it an omnivore, carnivore, or herbivore?

_____ Because this animal has been bred to only eat grains and will never eat meat, it is a herbivore.

13. Can you name some omnivores other than humans?

14. A fungus is a decomposer. Would you classify it as an omnivore or carnivore?
_____

15. Are decomposers autotrophs or heterotrophs?

a. They are _____.

b. They are also called _____.

16. Are there any living organisms that have no receptors? _____

17. Do humans asexually reproduce? On a cellular level, _____, they do.

18. In asexual reproduction, there is no need for a _____; hence, no chance for genetic disorders being passed. What is in the parent will be in the offspring.

A disadvantage is that there is no _____; hence, no exchange of genetic material. If the parent has a mutation, the mutation will be in the offspring. There is no chance of getting a bad trait out in asexual reproduction.

19. An advantage in sexual reproduction is that there is a partner; hence, _____ of genetic material. If one parent has a genetic defect, there is a chance of getting a bad trait out of the gene pool in sexual reproduction.

In sexual reproduction, there is a need for a partner; hence, there is a chance for genetic _____ to be passed. For example, if both parents have the trait for sickle cell anemia, there is 50-50 chance that the off-spring will have the disease. If one parent was able to asexually reproduce, then all the offspring would have the trait, but never have the disease.

20. Scientists have successfully cloned several organisms. Is this creating life?

Cloning _____ creating life.

21. Is Dolly an exact replica of her “mother?” _____

22. The discovery of Neptune is excellent example of the scientific method in use. Scientists had noticed that the planet Uranus did not orbit around the sun exactly as Newton's Universal Law of Gravitation predicted. French scientist Urbain Jean Joseph Leverrier assumed that this was because a previously undiscovered planet was interfering with Uranus' movement. He made some calculations using Newton's Universal Law of Gravitation and determined where this undiscovered planet had to be in order for Uranus's motion to be consistent with Newton's law. German scientist Johann Gottfried Galle used a telescope to look in the sky at the position that Leverrier predicted, and he saw the planet on the very first night of the search! The planet was named Neptune.

a. What was the observation that started the use of the scientific method in this instance? Scientists had noticed that the planet Uranus did not _____ around the sun exactly as Newton's Universal Law of Gravitation predicted.

b. What was the hypothesis?

French scientist Urbain Jean Joseph Leverrier assumed that this was because a previously undiscovered _____ was interfering with Uranus' movement. He made some calculations using Newton's Universal Law of Gravitation and determined where this undiscovered planet had to be in order for Uranus's motion to be consistent with Newton's law.

c. What was the experiment to confirm the hypothesis?

German scientist Johann _____ Galle used a telescope to look in the sky at the position that Leverrier predicted, and he saw the planet on the very first night of the search!

d. At the end of the story as written here, was the presence of Neptune in space a scientific law or a theory? _____

23. In terms of the scientific method, where is the idea of evolution?

Evolution is still a _____ because its assumption of macroevolution as fact has not been proven.

24. What lessons can we draw from the story of spontaneous generation?

a. Even though a scientific law seems to be supported by hundreds of years of experiments, it might very well still be _____ because the original experiments might be flawed.

b. Scientific laws are not _____ reliable.

25. Does the current version of spontaneous generation have experimental evidence? _____

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Lesson 02:

Reading Assignment: ECB2, pp. 18 - 32

Lesson Video: Play Lesson 02 from the Video File. (Print off notes below before playing.)

Lesson Starts: 4:30 (Fast forward to this point for lecture.)

Biology: The Study of Life, Part 2

Please watch this video before class starts or the session video is viewed:

http://www.youtube.com/watch?v=OU8MsykzAKQ

1. Semmelweis noticed that his patients were _____ at a rate which far exceeded the _____ rate of other patients on other wards in the hospital. Additionally, he notice that the doctors that visited his ward came to visit after doing _____ and visited living patients without washing their hands after doing autopsies.

2. He hypothesized that the doctors were carrying something _____ from the corpses upon which they had done the autopsies to his patients on the ward.

3. He had the doctors _____ their _____ after doing autopsies before they visited his patients.

4. The infect rate on his ward _____ to the _____ in the hospital. He was subsequently fired by the hospital. But even though he lost his job, his research into infection control continues to today at the University which bears his name:

5. What do we call Aristotle's idea that living organisms can be formed from non-living substances?

_____ _____

6. Aristotle observed that if one left _____ out in the open and allowed it to decay, maggots would appear on the meat within a few days.

7. Jean Baptiste van Helmont performed an experiment in which he placed a _____ shirt and some grains of _____ in a closed wooden box. Every time he performed the experiment, he found at least one mouse gnawing out of the box within 21 days.

8. Francesco Redi performed experiments in which he put several different types of meat in _____ jars and allowed the meat to decay. No maggots appeared on the meat. He claimed that this showed that maggots appear on meat not because they are formed by the meat, but instead because they get onto the meat.

Of course, the scientists of his day said that by sealing the jars, Redi was cutting off the_____ _____, which would stop the maggots from forming. Thus, Redi redesigned his experiment. Instead of sealing the jars, he covered them with fine _____. The _____ was fine enough to keep maggots out but allow air in. Still, no maggots formed on the meat, even long after it was decayed. What these experiments showed was that the previous experiments which purportedly demonstrated that maggots could form from decaying meat were simply flawed. If one were to adequately isolate the meat from the surroundings, maggots would never form.

9. Who finally demonstrated that even microorganisms cannot spontaneously generate?

_____ _____

10. The _____ of the author (Aristotle), not the scientific evidence, was the reason people believed in the idea. It took _____ years for Aristotle to be proven wrong. In that time people believe spontaneous generation to be true, even though there was evidence that is not true simply because Aristotle said it was so.

11. What are the limits of science and the scientific method?

a. Scientific laws are not _____ reliable

b. The best scientific experiments might have undiscovered _____

c. Putting too much _____ in a scientific law can get you into trouble

d. The only thing in the universe which is 100% reliable is the _____ of _____

12. _____ says that, “long ago, very simple life forms spontaneously appeared through random chemical reactions.”

13. Abiogenesis says that long ago, very simple life forms spontaneously appeared through _____chemical reactions. Spontaneous generation says “life from _____ matter.” Both deal with life coming from non-living substances.

14. Do you think that abiogenesis is possible? Yes or No

15. What are the 7 levels of the classification scheme?

_____, _____, _____, _____, _____, _____, _____,

and _____.

16. What is important about their order?

In a hierarchical classification scheme, the further one goes _____ the classification groups, the more _____ the organisms within the groups become.

17. Which contains more organisms: a class or a family? _____

18. Which organisms more closely resemble one another: members of the same phylum or members of the same genus?

_____ would be more similar.

19. Why are bacterium considered the simplest life form on the planet?

They all have _____ cells: a cell that has no distinct, membrane-bound organelles. Calling them “simplest” is a disservice. _____ cells do every function of life that eukaryotic cells do, but they do it without organelles!!

20. What can eukaryotic cells do that prokaryotic cells cannot? _____

21. An organism is a multicellular consumer made of eukaryotic cells. To which kingdom does it belong?

Kingdom _____

22. An organism is a single-celled decomposer made of prokaryotic cells. To which kingdom does it belong?

Kingdom _____

23. An organism is a single-celled producer made of eukaryotic cells. To which kingdom does it belong?

Kingdom _____

24. An organism is a multicellular producer made of eukaryotic cells. To which kingdom does it belong?

Kingdom _____

25. An organism is a multicellular decomposer made of eukaryotic cells. To which kingdom does it belong?

Kingdom _____

26. Of the three creatures listed, indicate the two that are most similar: Entamoeba histolytica, Escherichia coli, or Entamoeba coli.

Those having the same genus name, _____, would indicate that they are most similar.

27. A _____ is the term for "a unit of one or more populations of individuals that can reproduce under normal conditions, producing fertile offspring, and are reproductively isolated from other such units."

28. What is the science of classifying organisms called? _____

29. _____ _____ is naming an organism by its genus and species name.

30. To what genus and species does man belong?

_____ _____

31. What are the three domains of the Three-Domain System?

_____, _____, and _____

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Formal Report Example #01**:**

Miss AF 03/16/17

Centripetal Force

A. Purpose:

The objective of this experiment is to demonstrate the properties of centripetal force. The experiment is supposed to provide a real-life situation in which the centripetal force is illustrated. This experiment applies Newton's first law of motion to real life. In this experiment, the person performing the experiment will test whether the washer, when cut off from the rest of the string, will continue traveling in a circle, go the opposite direction that it had been traveling in, drop to the ground, or, finally, continue in a straight line from the point that it was cut from the string.

This experiment illustrates the centripetal force. Centripetal force is "the force necessary to make an object move in a circle. It is directed perpendicular to the velocity of the object, which means it points toward the center of the circle." (Wile). In Latin, the word "centripetal" means "center seeking," This illustrates what the centripetal force is. It is a center seeking force. While an object is under centripetal force, the object's velocity is constantly changing, which results in a change of acceleration (Regents Prep). The centripetal force follows the first law of motion laid down by Newton that says, "An object in motion (or at rest) will tend to stay in motion (or at rest) until it is acted upon by an outside force." (Wile) This law of motion comes out in the law of centripetal force in that the object is traveling in a straight line until it is acted upon by the centripetal force in the center of the circle. Without a centripetal force, an object cannot travel in a circle (Physics Classroom). In this experiment, the string was cut, stopping the centripetal force, which resulted in the washer flying away from the center of the circle.

This experiment hopes to provide an example of the centripetal force. Since the centripetal force follows Newton's first law of motion, this experiment is showing Newton's first law of motion. This experiment provides a real situation in which the centripetal force is demonstrated. This experiment hopes to show what an object does when it is being acted upon by the centripetal force and then what the object does when that centripetal force stops acting on it. This is illustrated in this experiment as the washer is spinning in a circle until the string is cut. This experiment hopes to show what the washer does after the string is cut.

What this experiment is about is an interest to science not only because it shows the centripetal force, but also because the centripetal force follows Newton's first law of motion. All the work of Newton is an interest to science because he was one of the greatest scientists of all time. Centripetal force is an interest to science because it relates to a lot of circumstances in life. Centripetal force is demonstrated in our solar system by the orbits of the

planets. Centripetal force is illustrated even when a car is going around a curve on a road.

Hypothesis: If the experiment is performed correctly, then at the end of the experiment, the washer will fly in a straight line and will not continue to spin in a circle.

B. Equipment:

1. A mechanical pen
2. A thick black marker
3. White thread
4. Five metal washers that are the same size
5. A stopwatch
6. Scissors
7. A helper

C. Procedures:

1. Collect the supplies for the experiment.
2. Take the mechanical pen apart and set aside all of the parts except for the casing.
3. Thread about a foot of thread through the casing.
4. Tie one of the washers on the string coming out the pointed end of the casing and tie two washers to the string coming out the other side of the casing.
5. Make a mark on the string coming out of either side of the casing so that the mark on the string coming out the pointed end marks 6 inches from the pointed end of the casing to the washer tied on the string on the same side of the casing.
6. Have your helper hold the device by grasping the casing. Make sure that the pointed end of the casing points up. Begin twirling the single washer on the end so that it moves in a circle.
7. Adjust the speed of the washer until the mark marking the 6 inch point is right at the top of the casing.
8. Watch the washer as it moves in a circle. Get used to the motion of the washer, keeping the black mark just at the bottom of the casing.
9. Start the stopwatch and time how long it takes for the washer to make 20 full circles. Repeat this step 5 times and average the result.
10. Next, tie two more washers onto the end of the string that already has two washers on it. Now there is one washer tied to the string coming out the pointed end of the casing and four washers tied to the string coming out the other side of the casing.
11. Repeat step 8.
12. Try to twirl the washer so that the time it takes the washer to make 20 full circles is equal to the time it took when there were only two washers on the end.
13. Notice where the black mark is when the washer is spinning with the same speed as it had in step 8.
14. Finally, while the washer is still twirling around, cut the four washers off the sting with the scissors. Note what happens.
15. Clean up the supplies.

D. Observations:

1. Finding a mechanical pen that could be taken apart was hard.
2. Light blue thread was used instead of white thread.
3. The length of the thread in the casing was a little under a foot.
4. The marker used was thick, so the marks on the thread at each end of the casing were not very precise.
5. At first, the device was hard to spin without getting the thread tangled up.
6. For the first set of times, when there were two washers on the end of the string, the first time it took for the washer to make 20 rotations was 8.85 seconds, the second time was 9.46 seconds, the third time was 8.74 seconds, the fourth time was 9.39 seconds, and the fifth time was 8.86 seconds.
7. The average of the times for when there were two washers on the end of the string was 9.06 seconds.
8. The times for when there were two washers on the end of the string were not very consistent.
9. For the second set of times, when there were four washers on the end of the string, the first time was 6.66 seconds, the second time was 6.90 seconds, the third time was 6.72 seconds, the fourth time was 6.64 seconds, and the fifth time was 6.36 seconds.
10. The average of the times for when there were four washers on the end of the string was 6.656 seconds.
11. The times for when there were four washers on the end of the string were more consistent than the times for when there were two washers on the end of the string.
12. The times for when there were four washers on the end of the string were shorter than the times for when there were only two washers on the end of the string.
13. When the attempt was made to spin the washer with four washers on the other end of the string at the same rate as when there were two washers on the string, it could not be accomplished.
14. When the washer was spun so slowly, it always fell to the top of the casing. Before the washer fell all the way, the black 6 inch mark was lower than it previously was.
15. When the string was cut, the spinning washer flew off in a straight line in the direction it had been traveling at the moment the string was cut. The four washers on the end of the string dropped to the floor.
16. At the time when the string was cut, the washer was not spinning very fast.

E. Conclusions:

In this experiment, the first set of times for the washer to make 20 rotations was longer than in the second set of times. This is a result of the weight pulling down on the washer. Since the washer was supposed to spin so that the radius of the circle was 6 inches, if there is a heavier weight pulling on the washer one time, then the person performing the experiment would have to spin the washer faster the second time in order for the radius of the circle to be the same. In this experiment, when the string was cut the washer flew off in a straight line. That is because the centripetal force was no longer exerting a pull on the washer. Since there was no longer a force pulling the washer to the center of the circle, the washer went in a straight line because that was the direction it had been going at that moment. In this experiment, the hypothesis was shown to be correct.

One way to improve this experiment would be to perform the experiment more than 5 times for

each different weight of washers. This would result in a more accurate estimation of how long it took for the washer to spin around 20 times. Another idea for improvement would be to take the contraption outside when the string was supposed to be cut. That way there would be almost no chance for the washer to hit something breakable.

One idea for further research on the experiment would be to weigh the washers used and to use those weights and the average times it took for the washer to make 20 rotations to make a graph based on those observations. That way, the person performing the experiment could use that graph to predict what the time it took the washer to make 20 rotations would be for a certain weight on the end of the string. Another way for further research on the experiment would be to measure how fast the washer was moving in the circle and then see how fast it moved in the air when cut off from the other washers. The person performing the experiment could also hold a strong magnet near the rotation of the metal washer and see if the magnet interfered with the centripetal force.

F. Bibliography:

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Module 01 Test Review**:**

15 - Matching
10 - Multiple Choice
15 - True or False
10 - Illustration
50 - Total

Questions are taken from the reading assignments, OYO questions, class lecture notes, textbook figures, and web pages visited.

60 minutes to take the Test. It is closed book and closed notes. Example questions follow:

A. Matching - Match the term with its definition:

A. eukaryotic
B. taxonomy
C. herbivores

1. A cell with distinct, membrane-bound organelles.

B. Multiple Choice - Select the best possible answer for the following:

2. The correct order for classifying groups is

a. Kingdom, Phylum, Order, Class, Family, Genus, and Species
b. Order, Kingdom, Family, Class, Genus, Phylum, and Species
c. Kingdom, Phylum, Class, Order, Family, Genus, and Species
d. Genus, Species, Class, Order, Family, Kingdom, and Phylum

C. True or False - Indicate which of the following are true (T) or false (F):

3. The first step in the scientific method is to design an experiment to test an idea.

D. Illustrations - Use the biological key in your textbook appendix to classify the organisms pictured below:

4. Example answer: Keys 1, 3, and 5 = Kingdom Fungi

Module 01 Test

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