


COURSE SYLLABUS
Department of Natural Sciences



Pisgah High School
P.O. Box 70
Sandhill, MS 39161
601-829-2858

Instructor: W.R. McCammon
Office Location: Rm 115 – Science Lab
Office Phone: 601-829-2825
Office Hours: Mon-Fri 2:35 to 3:00
E-mail Address: wmccammon@rcsd.ms
Website: <http://www.pisgahscience.com> and
<http://rcsd.ms/moodle>



Course Description:

Biology I

Biology I is a laboratory-based course designed to study living organisms and their physical environments. Students should apply scientific methods of inquiry and research in the examination of the chemical basis of life, cell structure, function and reproduction, energy, natural selection and diversity, and ecology. Laboratory activities, the use of technology, and the effective communication of results through various methods are integral components of this course.

Instructional Philosophy:

Welcome to your first exciting adventure into the world of science. You must put forth effort to get results. I try to live by rules of the game of life: *If you do for me, I'll do for you. If you make me happy, I'll make you happy.* If you remember these simple rules, your trip through life will be rewarding. I have found that if you do 3 simple things, you will have no problem passing my class: 1) Study, 2) Do all your work every time, on time, and 3) Be quiet and respectful. If you slip on any one of these, you will probably have difficulty passing this course or indeed any other course you ever take.

Course Goals:

1) The Nature of Science, 2) The Chemical Basis of Life, 3) The Cell, 4) Genetics and the Molecular Basis of Heredity, 5) Natural Selection and 6) Diversity, Ecology

Course/Department Grading Scale:

- A** = 90 - 100 (Advanced)
- B** = 80 – 89 (Proficient)
- C** = 70 – 79 (Basic)
- D** = 60 – 69 (Minimal)
- F** = Below 59 (Unacceptable)

Methods of Evaluation:

Formative Assessments	Computer activities, Daily work, quizzes, Outlines	40%
Summative Assessments	Unit Tests, Lab Reports, Portfolios, Projects	60%

Special Arrangements on Penalties for Make-Up Exams/Late Assignments:

Make up tests must be made up within the RCSD policy guidelines. You can not redo or make up missed labs. All other late work will be deducted at a rate of 10 points per day (not per class meeting) that it is late. You can only redo certain assignments. All redo work must be completed after school at the teacher's discretion.

Projects and Presentations Required:

You will be responsible for completing a project for each 9-weeks period: 1) A cell model project, 2) A pedigree project, 3) an independent experiment project, and 4) an environmental project. You will turn your binder in each 9-weeks for a formal evaluation.

Attendance/Tardy/Withdrawal Policy:

We strictly follow the RCSD attendance and tardy policy. It is to your advantage to be present for each class. Three tardies equal one absence. If you are absent on a day when we are doing a lab or a test, you must come at my convenience to make up the assignment. Also, missing (15) minutes or more of class or sleeping during class is considered an absence.

Policy on Cheating/Plagiarism:

Cheating will not be tolerated. A student will be severely punished if it is determined that he/she has done one or more of the following: 1) plagiarized from any source, 2) cheated in any manner for tests, papers, reports, or any other work, 3) turned in work as their own when, in fact, it was not their work. Not only will he/she be dismissed from class, but also they will receive a grade of zero.

Starting Class

Class will always start on time and will not end until the bell rings. DO NOT come into the classroom and then ask to leave to go to the bathroom. Go on the way or not at all. When you enter class you will ALWAYS have an assignment to complete. This will be most likely a writing assignment, but could either be, a quiz, a journal entry, a reading assignment or any other activity. You will have a few minutes after the tardy bell to finish it. You will immediately begin working on the "bell ringer" as soon as you enter class.

Policy on Student Conduct:

Refer to your student handbook for the rules that need to be followed. *I have the right to teach and you and your classmates have the right to learn.* I will not allow you to interfere with your classmates' ability to learn. I DO NOT tolerate classroom disruptions.

Hall Passes

You have one time per month to leave the class and go to the bathroom or any other destination. You must keep up with your hall pass card to leave the classroom. You must get permission to leave the class. If I give you permission, I will fill out your card and you MUST carry the card with you in the hallway. The card IS your hall pass. DO NOT LOSE IT. You won't get another one.

Test Tracking Sheet

On the back of your Hall Pass Card is your test tracking sheet. You will fill this card out, WITH YOUR PARENT'S SIGNATURES, every time we have a test. It is very important to have this completed. It will count toward your binder grade each 9-weeks.

BIOLOGY I STATE TEST

The Biology I State Test will be April 26, 2010. If you do not pass the Biology I Test, you will not graduate, you will not receive a diploma, and you will not walk on graduation night with your classmates. No one has failed this test at Pisgah High School in the last 5 years. DON'T BE THE FIRST. YOUR GOAL = Score over 400!!!

Important Rules

1. Bring all your materials to class each day (pen, journal, workbook, paper)
2. Do not use the water or gas without permission.
3. Be respectful of other peoples property (including MINE)!
4. If you are not working when the tardy bell rings, you are tardy!
5. Absolutely no cell phones in class. If I see it or hear it, I will take it.
6. If you score an "A," "B," or "C" on a test, you may eat and drink in class (not full meals, snacks only). I will be keeping a list. If you are caught eating or drinking while not on the list, you will be punished.
7. Computers are for educational use only.
8. If you break it, you must buy it.
9. Always be quiet and respectful.
10. Obey and pay attention.

BIOLOGY I

Use this as your Study Sheet for the Biology I Test

1. Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.

- a. Demonstrate the proper use and care for scientific equipment used in biology.
- b. Observe and practice safe procedures in the classroom and laboratory.
- c. Apply the components of scientific processes and methods in the classroom and laboratory investigations.
- d. Communicate results of scientific investigations in oral, written, and graphic form.

2. Investigate the biochemical basis of life.

- a. Identify the characteristics of living things.
- b. Describe and differentiate between covalent and ionic bonds using examples of each.
- c. Describe the unique bonding and characteristics of water that makes it an essential component of living systems.
- d. Classify solutions using the pH scale and relate the importance of pH to organism survival.
- e. Compare the structure, properties and functions of carbohydrates, lipids, proteins and nucleic acids in living organisms.
- f. Explain how enzymes work and identify factors that can affect enzyme action.

3. Investigate cell structures, functions, and methods of reproduction.

- a. Differentiate between prokaryotic and eukaryotic cells.
- b. Distinguish between plant and animal (eukaryotic) cell structures.
- c. Identify and describe the structure and basic functions of the major eukaryotic organelles.
- d. Describe the way in which cells are organized in multicellular organisms.
- e. Relate cell membrane structure to its function in passive and active transport.
- f. Describe the main events in the cell cycle and cell mitosis including differences in plant and animal cell divisions.
- g. Relate the importance of meiosis to sexual reproduction and the maintenance of chromosome number.
- h. Identify and distinguish among forms of asexual and sexual reproduction.

4. Investigate the transfer of energy from the sun to living systems.

- a. Describe the structure of ATP and its importance in life processes.
- b. Examine, compare, and contrast the basic processes of photosynthesis and cellular respiration.
- c. Compare and contrast aerobic and anaerobic respiration.

5. Investigate the principles, mechanisms, and methodology of classical and molecular genetics.

- a. Compare and contrast the molecular structures of DNA and RNA as they relate to replication, transcription, and translation.
- b. Identify and illustrate how changes in DNA cause mutations and evaluate the significance of these changes.
- c. Analyze the applications of DNA technology (forensics, medicine, agriculture).
- d. Discuss the significant contributions of well-known scientists to the historical progression of classical and molecular genetics.
- e. Apply genetic principles to solve simple inheritance problems including monohybrid

- crosses, sex linkage, multiple alleles, incomplete dominance, and codominance.
 f. Examine inheritance patterns using current technology (gel electrophoresis, pedigrees, karyotypes).

6. Investigate concepts of natural selection as they relate to diversity of life.

- Analyze how organisms are classified into a hierarchy of groups and subgroups based on similarities and differences.
- Identify characteristics of kingdoms including monerans, protists, fungi, plants and animals.
- Differentiate among major divisions of the plant and animal kingdoms (vascular/non-vascular; vertebrate/invertebrate).
- Compare the structures and functions of viruses and bacteria relating their impact on other living organisms.
- Identify evidence of change in species using fossils, DNA sequences, anatomical and physiological similarities, and embryology.
- Analyze the results of natural selection in speciation, diversity, adaptation, behavior and extinction.

7. Investigate the interdependence and interactions that occur within an ecosystem.

- Analyze the flow of energy and matter through various cycles including carbon, oxygen, nitrogen and water cycles.
- Interpret interactions among organisms in an ecosystem (producer/consumer/decomposer, predator/prey, symbiotic relationships and competitive relationships).
- Compare variations, tolerances, and adaptations of plants and animals in major biomes.
- Investigate and explain the transfer of energy in an ecosystem including food chains, food webs, and food pyramids.
- Examine long and short-term changes to the environment as a result of natural events and human actions.

Topic Tested	Number of Questions
The Chemical Basis of Life	8
The Cell	15
Genetics and the Molecular Basis of Heredity	10
Natural Selection and Diversity	12
Ecology	10
Nature of Science	15

300 is a passing score. You need to score above 400!
FAILURE IS NOT AN OPTION!
GOAL: Score Above 400!!!

SAMPLE LAB REPORT

Mr. McCammon

This is only a sample of what I expect to be turned in as your formal lab reports. Please follow the format, but do not COPY this report. The sections in parenthesis are for your information and are not to be included in the lab report.

YOUR NAME

TITLE: The Effects of pH on Allium Seed Germination

DATE: August 12, 2004 (This is the date the lab was done, not the date it was turned in)

COURSE: BIO 1114: Biology I for Non-Majors (Use the correct subject)

(Name, Title, Date, and Course are worth 5 points.)

PURPOSE: The purpose of this lab is to examine the effect of solutions with various pH measurements on the germination of seeds in the genus Allium. (This should be only one sentence that states plainly why we did the lab. This is the major question we are investigating.) (5 Points)

RESEARCH: (You need to determine what other has been done in this area. This sections needs to be a one-paragraph description about the topic of the lab. It could be found by doing research on the Internet, magazines, encyclopedias, textbooks, or other sources. For example, I would include information about Alliums, pH, and other information about seed germination that I looked up.) (10 points)

HYPOTHESIS: (10 points)

H_0 = The pH will have no effect on the germination rate of Allium seeds.

H_1 = The more acidic a solution the higher the seed germination rate will be.

H_2 = The less acidic a solution the higher the seed germination rate will be.

(A hypothesis is an educated guess based on research and observations. After you have done research, you should be able to construct a correctly written hypothesis. It will become easier with time. Remember a hypothesis must be a statement, not a question and must be testable. H stands for hypothesis. H_0 means null hypothesis. A null hypothesis is a hypothesis that states that the variables will not have an effect the outcome. Null hypothesis will usually always include the words no or none. H_1 is the first alternative hypothesis and H_2 is the second alternative hypothesis. These give alternate possibilities for the way the variables effect the outcome. You can have any number of alternative H's. The important thing to remember when constructing alternative hypothesis is that only one part of the sentence changes. For example in the H_1 and H_2 from above, the only word that changes is "more" and "less." The mistake some people make is changing more than one part on both statements such as changing not only the "more and less" part of the hypothesis, but also changing the higher to lower. Changing two parts of a hypothesis is wrong. If invalidates both hypothesis. Check to make sure only one this is different from your H_1 and H_2 .)

MATERIALS: (This should be a simple list of materials used in the lab. If you didn't use it, even if it is listed in the lab handout, do NOT list it here.)(5 points)

1. Various pH solutions (pH 2, 4, 7(water), 8, 10, 12, and 14)
2. Paper towels
3. Allium seeds
4. Growth lamp
5. Seven beakers
6. Petri dishes

PROCEDURE: (This section is very important and needs to be very specific. Think of it this way. If a scientist were to pick up this lab report, could he or she repeat this experiment EXACTLY?) (10 points)

1. Carefully pour 20 mL of each pH solution into separate labeled petri dishes.
2. Count 15 seeds out and place them in each petri dish.
3. Let the seeds soak for 24 hours in the dark.
4. After 24 hours, carefully remove the seeds and place them in moist paper towels.
5. Allow the seeds to stay in the paper towels. Each day, check your paper towels for germination.
6. Record the date and amount of seeds germinated for each pH.

DATA: (Here is where you would include ONLY your drawing, tables, graphs, charts, etc.) (10 points)

INDEPENDENT VARIABLE (5 points) (The **independent variable** is the one that is changed by the scientist. To insure a fair test, a good experiment has only one independent variable. As the scientist changes the independent variable, he or she **observes** what happens.)

DEPENDENT VARIABLE (5 points) (The scientist focuses his or her observations on the **dependent variable** to see how it responds to the change made to the independent variable. The new value of the dependent variable is caused by and depends on the value of the independent variable.)

CONTROLLED VARIABLES (5 points) (Experiments also have **controlled variables**. Controlled variables are quantities that a scientist wants to remain constant, and he must observe them as carefully as the dependent variables. For example, if we want to measure how much water flow increases when we open a faucet, it is important to make sure that the water pressure (the controlled variable) is held constant. That's because both the water pressure and the opening of a faucet have an impact on how much water flows. If we change both of them at the same time, we can't be sure how much of the change in water flow is because of the faucet opening and how much because of the water pressure. In other words, it would not be a fair test. Most experiments have more than one controlled variable. Some people refer to controlled variables as "constant variables.")

CONCLUSION: (Here is the section where you would tell me about your findings and what they mean. Was your hypothesis true or false? What can you conclude from your data? The three things I will be looking for in your conclusion is (1) describe your data in words, (2) evaluate each of your hypothesis and why they are true or false, and (3) evaluate the lab – tell me what you thought of the lab. The conclusion is the MOST IMPORTANT PART OF YOUR LAB REPORT. Don't skip it. It should be at least 2 or 3 paragraphs long. (20 points)

The data clearly showed that pH has an effect on the rate of seed germination therefore the null hypothesis is false. The neutral solution (pH 7) had the highest level of seed germination. This shows that pH (both high and low) has a negative affect on seed germination. It appears that all three hypotheses in this lab were false. I enjoyed doing this lab. (Don't forget in addition to this information you need to describe ALL your data in words in the conclusion. The conclusion is worth 20 POINTS. You MUST do a good conclusion to get a good grade.)

END OF SAMPLE LAB REPORT

OTHER NOTES ON FORMAT (10 Points)

1. Make sure all lab reports are hand written. Typed lab reports will not be accepted.
2. If you don't have a lab report, you will report to the office until one is turned in.
3. Initial and date each page of the lab report at the lower right hand corner in pen.
4. You must include these labs in your portfolio.

Teacher, Student, and Parent Contract

PARENT:

By signing below, I **acknowledge** that I **have read** this **entire** course syllabus and I **understand** my obligations to this course. I pledge to do my best to ensure that my child **will complete all the assignments given to them**.

Parent's Signature

Parent's E-mail Address

Date

STUDENT:

By signing below, I acknowledge that I have read this entire course syllabus and I will:

1. Be **respectful** to my classmates.
2. Put my **best effort** into my school work.
3. **Obey all rules** both at home and at school.
4. Come **prepared** to school with **homework** and materials.
5. Spend at least **15 minutes a day studying** for each subject. (At least **one hour for AP Biology**.)
6. Complete all online **Moodle** activities that are assigned.

Student's Signature

Student's Email Address

Date

TEACHER:

By signing below, I acknowledge that I will:

1. Provide a **safe**, comfortable environment for my students.
2. Provide ample time for my students to receive **extra help** after school.
3. **Enforce school rules** consistently.
4. Provide students with **clear and concise expectations**.
5. Work to make learning an **enjoyable** experience.

Teacher's Signature

wmccammon@rcsd.ms

Teacher's E-mail Address

Date