

Principles of Biomedical Sciences (PBS)

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Fort Zumwalt South

PROJECT LEAD THE WAY

PLTW

Principles of the Biomedical Sciences (PBS) Course Description:

This course provides an introduction to the biomedical sciences through exciting hands-on projects and problems. Students investigate concepts of biology and medicine as they explore health conditions including heart disease, diabetes, sickle-cell disease, hypercholesterolemia, and infectious diseases. They will determine the factors that led to the death of a fictional woman as they sequentially piece together evidence found in her medical history and her autopsy report. Students will investigate lifestyle choices and medical treatments that might have prolonged the woman's life and demonstrate how the development of disease is related to changes in human body systems. The activities and projects introduce students to human physiology, basic biology, medicine, and research processes and allow students to design experiments to solve problems. Key biological concepts including maintenance of homeostasis in the body, metabolism, inheritance of traits, and defense against disease are embedded in the curriculum. This course is designed to provide an overview of all the courses in the biomedical sciences program and lay the scientific foundation for subsequent courses

CLASSROOM EXPECTATIONS

I expect my students to...

- Have integrity!
- Be respectful.
- Be ready.
- Be responsible for his or her own learning. (This is YOUR education; you will get as much or as little from this class as you choose.)
- Put forth 100% effort at all times—stay focused and pull your own weight.
- Learn something new every day and have a great time doing it.
- Make good choices.
- Ask questions!
- Have a good attitude!

PLTW: Project Lead the Way (PLTW) is a national, not-for-profit educational program that assists high-school students in developing strong backgrounds in science and engineering. The following is the link to Project Lead the Way online:
<http://www.pltw.org/>

I expect that this class will motivate you to work hard, help you learn to work well with others, improve your higher-level thinking skills and will ultimately result in you having a deep understanding of how the human body is organized, how it works, what can go wrong and how medical interventions can help. ***Make no mistake. This is a college level course and you should be prepared to put forth that level of effort. It will be like no other class you have taken. You will love it!***

Required Materials

- *Three-ring binder for PBS only (3-inch)
- *Three-ring binder for PLTW (1-inch)
- *Loose-leaf notebook paper for binders
- *Pencils and BLACK/BLUE pens
- *Gloves
- *Calculator (simple)

- *Lab Notebook – provided by SHS
- *Dividers for binder (8-10)
- *Ear buds or head phones for class
- * **OPTIONAL: USED BIO BOOK**
- *OPTIONAL: Lab coat
- *OPTIONAL: Index cards

Principles of Biomedical Sciences (PBS)

Scope and Sequence

Unit One: The Mystery

Lesson 1.1: Investigating the Scene Lesson 1.2: DNA Analysis
Lesson 1.3: The Findings

Unit Two: Diabetes

Lesson 2.1: What Is Diabetes?
Lesson 2.2: The Science of Food Lesson 2.3: Life with Diabetes

Unit Three: Sickle Cell Disease

Lesson 3.1: The Disease Lesson 3.2: It's In the Genes Lesson 3.3: Chromosomes
Lesson 3.4: Inheritance

Unit 4: Heart Disease

Lesson 4.1: Heart Structure
Lesson 4.2: The Heart at Work
Lesson 4.3: Heart Dysfunction
Lesson 4.4: Heart Intervention

Unit 5: Infectious Disease

Lesson 5.1: Infection

Unit 6: Post Mortem

Lesson 6.1: Analyzing Anna

*The scope and sequence represents a guideline. The timeline varies from class to class.

College Credit Option

Missouri S&T requires students to earn an A or a B in class to apply for 3 credit hours for each semester, plus earning a "6" or higher on the EOC. The application for college credit will be available after the course is completed.

Other college credit options exist through other universities; however, requirements vary with each institution.

There is an additional cost for college credit.

Entering the Classroom	Remember our classroom is a laboratory. Enter in a responsible manner. Check the board for the daily learning objective(s) and upcoming due dates. Make sure you have your supplies ready—sharpen your pencil, have a seat and login to Canvas and begin the posted assignment. You will always have some type of assignment / question / activity to begin working on as soon as you enter our classroom. I expect you to begin promptly.
Food / Drink	This is a laboratory classroom with computers. Please keep all food and open containers out of the class-room for your own safety. It is acceptable to have a closed container (screw-on lid) for a drink.
Cell Phones / Electronic Devices	We have a lot of important work to do each day. Cell phones are wonderful, but they are a huge distraction. During class, we will all put our cell phones away in the appropriate location. Cell phones are not to be used during class. Students may not call or text during class. Some days you will have permission to listen to music as you work — this is a privilege. Don't make me babysit you or your device.
Group Work	Students will work in groups to produce presentations, develop experiments, explain problems and suggest ideas. Working with a group does not mean it is acceptable to copy other's work. Pull your own weight! Do your part as you would in a professional facility.
Restroom	After checking with me, you may quietly excuse yourself to use the restroom as needed one at a time.
PBS Binder	Your PBS binder is a 3-inch 3-ring binder. You are responsible for your PBS binder and will need it every day. The binder will contain all work and is essential to review for the end of unit exam. Your note-book essentially becomes a textbook! You may choose to create an electronic portfolio.
Career Journal	Your career journal is a 1-inch 3-ring binder. This binder will hold all career journal entries and career explorations. This journal will follow you throughout all of the PLTW courses. I suggest storing this journal in our classroom.
Lab Notebook	This notebook is the place to write ideas and notes, to record data from activities, and to reflect on observations or information. Please use a blue or black ink pen. Mark through mistakes with a single straight line. You will turn in the originals with your final products and keep the carbon copies for your own records.
Assignments	Expect homework. Even when there is no formal homework assigned, quizzes may come up at any time. Expect the need to study—especially when it comes to new vocabulary terms.
Extra Credit	Extra credit opportunities will be given for exceptional work and extended projects at various times throughout the school year. The amount of extra credit given will not be significant enough to offset poor performances on assignments, labs or tests.
Writing Component	For each unit, there will be notes, activities, homework, classwork, labs, lab write-ups, projects, notebook work, career journals, etc., in which the students will demonstrate their mastery of the writing process. You will be asked to write professional level discussions and conclusions. This is often one of the hardest tasks to get used to in the beginning. Make sure you are putting forth your best effort at all times; points from poor writing add up quickly!

Assignment Policy

Due to the nature of PLTW and PBS it is essential for you to remain caught up in class. This is a project and problem-based course where much of your work is collaborative. Remember, this is a college credit class, and your work will be of a higher level expectation. Anticipate the work load to honor this fact. Each and every assignment is important and should be treated as such. All electronic homework must be turned in by midnight on the due date. All traditional paper assignments are due at the beginning of the class period on the due date. ***Any homework that comes in after this time is late.***

Late Assignments

Any assignment not turned in at the specified time on the due date will be considered late. Students may turn in late work, but 50% will be deducted from the total score. Any assignment not turned in by the time of the unit test will be recorded as a zero and may not be made up.

Special Concerns Regarding Attendance

This class is a hands-on science class. Missing three days of school means missing a lot of class! It is important that you are here to get your hands on the lab equipment and participate in the student-led discussions. Activities missed must be made up in order to earn a grade. Some assignments cannot be made up since the materials are used up during class; therefore, alternate assignments will be provided. Discussing, presenting and problem solving with your peers are important parts of this class and there is no way to make up those valuable experiences.

Makeup Work

It is the student's responsibility to obtain missed assignments from Canvas or from the make-up crate. Since this is a lab-based course, if a student is absent, he or she will be required to make arrangements to make up the lab. In order to receive full credit for a missed lab, you must make time to complete the lab – ***simply copying another student's result is unacceptable and a form of cheating.*** All assignments and test dates are clearly posted in advance. Be responsible. Avoid excuses.

The student will have one school day to make up work for each day missed. For example, if Billy is out sick Monday through Wednesday, Billy will have three days to make up the work he missed. All of Billy's work is due no later than the beginning of the day on Tuesday, or it will be considered late.

Please note: If a student will miss class due to school related calendar conflicts or activities, it is the student's responsibility to notify the instructor and make arrangements PRIOR to the absence. This includes getting work ahead of time and taking tests early to avoid falling behind.

Academic Honesty

Academic Honesty is of the utmost importance. I expect my students to have integrity. We will discuss in class how to avoid plagiarism and academic dishonesty. If you are ever unsure about what is or is not allowed, ask! Academic honesty is essential to ensure that each student submits credible work that demonstrates his or her mastery of the content. Students should seek to be totally honest and transparent in their dealings with others. You should strive to complete your own work and submit your work to be evaluated based upon its originality. Avoid academic dishonesty and misconduct in all its forms, including plagiarism, fabrication and cheating. In the case of academic dishonesty, the student will earn a "0" on the assignment and the teacher will make contact with parents and administrators.

Online Access

Each student has constant access to our online classroom by visiting (<https://my.pltw.org/user/login>). This website provides access for the entire curriculum, and assignments. Students will receive their user name and password on the first few days of school.

Grading Policy

Computer Usage

Computer and technology usage is an important part of this course.

All work on your assigned computer will be monitored electronically. I have the ability to see and record everything you do on your computer. Follow all guidelines addressed in the Computer/Internet Usage Agreement from the school.

Anyone found misusing technology

will face consequences as out-lined in that agreement.

Please remember that your laptop is a privilege to use —not a right.

Please refrain from using websites that are not part of our curriculum for that day. This includes Facebook, Pinterest, YouTube, Pandora, etc.).

OPTIONAL & FUN!

All block days will be our “messier” labs. With that, you are welcome to wear a set of scrubs & tennis shoes!

Details coming in class😊

Grades will be allocated as follows:

- *Tests – 30%
 - *Presentations & Career Journal – 15%
 - *Classwork – 10%
 - *Labs – 20%
 - *Quizzes – 25%
- ((Final Exam – 15%))

PLANNING FOR THE FUTURE

Enrollment in Principles of Biomedical Sciences carries the hope that you plan to continue in the PLTW Biomedical Sciences courses in the upcoming years. It is our goal to be able to offer all courses simultaneously by the 2017-18 school year.

- Year 1: Principles of Biomedical Sciences (PBS)
- Year 2: Human Body Systems (HBS)
- Year 3: Medical Interventions (MI)
- Year 4: Biomedical Innovations (BI)

Student Lab Safety Contract

This is a hands-on course where laboratory activities will be highly utilized. You will be doing many activities which require the use of hazardous chemicals, heat and/or fire, sharp tools and potentially dangerous equipment. Safety in the science classroom is the #1 priority for students and teachers. To ensure a safe science classroom, a list of rules has been developed and provided to you in this student safety contract. These rules must be followed at all times. Any violation of these safety rules will result in the removal of your laboratory privileges. Once you have read this contract, please answer the questions, then sign and date the form. A copy of this form will be kept by the teacher to be used in the case of an emergency.

General Rules

1. **Conduct yourself in a responsible manner at all times in the laboratory. No Horseplay!**
2. Know the locations and operating procedures for all safety equipment in the laboratory.
3. Do not eat food or drink beverages in the laboratory. Do not use laboratory glassware as containers for food or beverages.
4. When first entering a science room, do not touch any equipment, chemicals, or other materials in the laboratory area until you are instructed to do so.
5. Be respectful of all school equipment and only use it in the appropriate manner.
6. Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ask the instructor before proceeding. **Do NOT guess at what to do next.**
7. Be prepared for your work in the laboratory. Read all procedures thoroughly before entering the starting the activity.
8. Keep aisles clear. Push your chair under the desk when not in use.
9. Clean up all areas of the room when you are finished with the activity.
10. Students are never permitted in the science storage rooms or preparation areas unless given specific permission by their instructor.

Clothing

1. **Goggles must be worn at all times when working with chemicals, heat, or glassware.**
2. Shoes that completely cover all parts of the feet must be worn during activities involving chemicals, heat or glassware. Do not wear: sandals, flip-flops, crocs, etc.
3. Long hair must be tied back away from the face and out of reach of chemicals and flames.
4. Loose clothing including: sweaters, shirts with drooping cuffs, hooded sweatshirts, bracelets, etc. will not be allowed in labs involving chemicals, heat or fire.
5. Many laboratory activities involve chemicals that could stain clothing. On lab days, be sure to wear clothing that is okay to be stained. Lab aprons may be provided upon request.
6. If you fail to wear the appropriate clothing on lab days, you will not be participating in lab.

Accidents and Injuries

1. **All accidents, injuries and spills need to be reported to the instructor as soon as they occur!**
2. There is no accident, injury or spill that is too small to report. Consult the instructor for instructions on cleanup and treatment.
3. If there is a chemical splashed in your eyes, immediately move to the eye wash station and have your partner report the accident.
4. If there is a fire in the laboratory, alert the instructor immediately!

Equipment, Glassware and Chemicals

1. **Only use laboratory equipment and materials as instructed and when instructed to do so.**
2. Never remove chemicals or equipment from the laboratory!
3. If you do not understand how to use a piece of equipment, ask the instructor for help.
4. Examine glassware before each use. Never use chipped or cracked glassware. Never use dirty glassware.
5. Hot glassware looks exactly like cool glassware. Always use "hot" gloves or "hot hands" when handling glassware that has been heated.
6. Never put your face directly above a substance that is being heated.
7. Do not put hot glassware in contact with water, it may shatter.
8. Be sure to wash all glassware and wipe down your area when finished. Return all equipment back to its original condition and location.
9. Laboratory equipment and materials are expensive! Please do not waste materials.
10. Detailed instructions for the safe use of chemicals and equipment will be provided at the beginning of each laboratory activity.

Principles of Biomedical Sciences Contract

Student Agreement:

I, _____ (PRINT name legibly)
am aware that this is a demanding course that will require college level work on my part. I will put my best effort forth every day including, being organized, efficient, hardworking, cooperative and active group member, and showing a willingness to put in time and energy in and out of class to make this class as fun and challenging as it can be. I have also read and agree to follow all of the classroom policies and safety rules set forth in this document. I agree to obtain all necessary materials for the course and tell Mrs. Hinchsliff as soon as possible if I am unable to get any of the necessary materials. I realize that I must obey the safety rules listed above and any other rules that may be verbalized in class in order to ensure my own safety and the safety of all others in the room. I will cooperate to the fullest extent with my instructor and fellow students to maintain a safe lab environment. I will also closely follow the oral and written instructions provided by my instructor.

I am aware that any violation of this contract (including the Flinn safety contract) may result in any of the following: being removed from the laboratory, detention, and/or involvement of the administration.

Student Signature _____ Date _____

Dear Parent or Guardian:

I feel that you should be fully informed about your child's opportunities and experiences in my class, as well as my expectations of him/her. Please read through this syllabus and the accompanying attachment so that you are fully aware of my general policies, expectations and safety requirements.

No student will be allowed to perform laboratory activities until this contract (which includes the Flinn safety contract) is signed by both you and your student and are on file with me.

Your signature on this contract indicates that you have read this document and its attachments, are aware of the expectations of being a part of the PLTW Biomedical Science program, the measures taken to ensure the safety of your child in the science laboratory, and will support the Biomedical program by instructing your son/daughter to uphold all rules and expectations discussed here. This program will be very exciting and intriguing but will also be very rigorous and work intensive. A strong educational support system at home will help ensure a good foundation on which knowledge can be built. Thank you in advance for your support!

Parent Signature _____ Date _____