

Expectations

This paper will tell you a bit about what you can expect from this class, and a bit about what kind of behavior and thinking this class will require from you.

What will we be studying?

Fundamentals of Science: The ideas that we will study are ones that you will use in every science class for the rest of your life: measurement, units, energy, basic chemistry.

Critical Thinking: The goal of this class is not to fill you with information, but to train you in thinking in a scientific way. The facts we will study and learn are just the building blocks; the exciting part is what you will learn to build with them.

Creative Projects: We will do several engineering projects in which apply what you have learned to build something to solve a particular problem:

- Boats and submarines
- Hot air balloons
- Stirling engines and Rube Goldberg machines
- many more...

What will we do in class?

Laboratory Activities: Often you will be asked to do an activity to collect information, and then analyze that information based on what you know about the subject.

Discussion: Other classes will be devoted to discussing ideas and trying to solve problems either in a small group, or with the whole class together.

Note Taking: In order to be able to discuss or do activities, we need to know what we are talking about. I try to spend as little time as possible in lecturing, since it is by doing and discussing that you actually learn.

What will tests be like?

You will not see: Questions that ask you to regurgitate a memorized definition:

1. Define a horse.

Quadruped. Graminivorous. Forty teeth, namely twenty-four grinders, four eye-teeth, and twelve incisive. Sheds coat in the spring; in marshy countries, sheds hoofs too. Hoofs hard, but requiring to be shod with iron. Age known by marks in mouth...

(Dickens — *Hard Times*)

You will see: Questions that require you to think about things in a new way.

2. Why does a cat move with so many different gaits?

A gallop is useful when the cat needs to go quickly, but uses up energy very quickly, so a walk is more relaxing at slow speeds. It would be silly to gallop at a slow speed, since most of the energy in a gallop goes into jumping, and it would be impossible to walk at a high speed, since the legs move only a short distance with each step and therefore would have to be taking very, very rapid steps.

Grading system: Discussed on the back of this sheet.

What kind of behavior is expected?

Safety: Proper behavior in lab is necessary to keep you and your classmates safe. If lab behavior becomes an issue, we will do fewer labs.

SLANTing: Remember to slant toward me, but also toward your classmates. Speaking in class takes courage, and you can encourage a classmate by listening with respect.

Discipline: If you are having trouble focusing, or are showing disrespectful frustration toward me or a classmate, I may ask you to do push-ups or jumping jacks to wake your mind up and release some energy. You can call me out on disrespect too.

Working Together: You are expected to complete all homework on your own, without help from your classmates, although it is OK to have a parent or tutor help you figure out what a problem is asking for. If you have questions, you can call me at (617) 501-4559. I go to bed at 9:00, so you have to call before that.