

PHSC 1000 – Professor David Black
Final Exam Review Sheet, 2014

Here are some of the things I mentioned as being important for you to remember. It's not a complete list of concepts that might be on the test, but it should be helpful for you. You should also look at your worksheets as well as our in-class quizzes. If you need to focus on something, focus on this sheet.

A quick reminder that our final will be on
Wednesday, December 10, 2014 from **9:30 am – 11:30 am**
and will be held in **your classroom**

For you at Snow, that means the classroom in the science building where we've met all semester. For those of you at the high schools, you'll meet in the classrooms where you've received the broadcast.

Good luck!

GENERAL SCIENCE

Scientific Method – Know the five steps from the book and what they mean.

- Observe
- Question
- Predict
- Test predictions
- Draw a conclusion

Testable – Know what it means. Be able to recognize if something is testable or not.

- Can be experienced by one of the five senses or detected by a machine.
- Must be something that's able to be proven wrong.
- Opinions and emotions are NOT testable.

The four sciences we studied this semester – Know what they are and be able to describe them.

- Astronomy
- Earth Science
- Chemistry
- Physics

CHEMISTRY

Atoms are made up of protons (positive,) neutrons (neutral,) and electrons (negative.) The interactions of atoms—especially their electrons—can lead them to emit light. Depending on how the interactions happen, the light can be different colors.

Periodic table

- How we get each of the different rows: number of electrons in a “shell”

- 2, 8, 8, 16, 16, 32, 32

- Understand the number of protons in each element (the atomic number)

Each column has similar properties.
Be able to name at least ten elements from memory.

Isotopes are atoms with the same number of protons but different numbers of neutrons.

Understand how elements get separated – the problems with the “cups” full of different amounts of elements from a molecule.

In a covalent bond, atoms share electrons.

An ion is an atom that has gained or lost an electron (or multiple electrons.)

In an ionic bond, electrons are transferred, and then the resultant charged ions are attracted to each other.

In general, ionic bonds are stronger.
Ionic bonds are found in salts.

The difference in strength between chemical (electromagnetic) and nuclear forces – a dynamite explosion vs. a nuclear bomb.

PHYSICS

Newton’s three laws.

Be able to name them and recognize examples of them.

- I. An object at rest will stay at rest unless acted upon by an outside force. An object in motion will stay in motion unless acted upon by an outside force. This is called “inertia.”
- II. $F = ma$. The amount an object accelerates becomes bigger with a bigger force. The amount of acceleration will become smaller when the object is bigger.
- III. For every action there is an equal and opposite reaction

Conservation principles – you have the same amount at the end as you do at the beginning.

Conservation of momentum – the combination of mass and velocity of all the objects must stay the same both in size and direction unless some outside force affects things.

Conservation of energy – the amount of energy in some system will remain the same unless some outside force affects things.

Mechanics – the principles in Newton’s laws as well as the conservation principles can help us to understand why things move the way they do.

Heat – heat is the motion of atoms. The faster the atoms move, the hotter it is.

Gravity – all objects with mass “pull” on all other objects with mass. Things accelerate as they fall.