

## SCI122: Chemistry w/LAB

**THIS COURSE DOES NOT REQUIRE A FINAL EXAM**

# SYLLABUS

**READ THESE INSTRUCTIONS NOW!**

Keep work organized by week, clearly labeled and typed or copy/paste onto your syllabus. Math and hand done projects: photograph, scan or screenshot and copy/paste to your syllabus. Keep images small so your file isn't too large to submit or save work as a PDF. Go to "Student Services" online for any issues with this course. If you need Microsoft Word, request an email from Student Services and follow the steps given to you.

- **SUBMITTING WORK: YOU MUST SUBMIT ALL WEEKS AT ONCE on one file.** Your syllabus may be submitted separately if you chose not to add your work to it. Go to the website and select "Submit Work", complete the form and attach your work. You may also share a public link such as Gdocs. You have two attempts at receiving a passing grade of "C" or better so submit your full effort original work. Do not mail work. You will receive a reply in about 5 business days. Do not call or email asking for us to verify your work. All components of your course must be completed by the end of the 8<sup>th</sup> week from the time of your registration; 12 weeks for a 2 credit class. If you have a medical emergency or disability preventing you from completing your class, contact "Student Services" and send an email to request up to a 2-week extension.

### Key Info – When doing your LABS

- The scientific method is a way to ask and answer scientific questions by making observations and doing experiments.
- The steps of the scientific method are to:
  - **Ask a Question**
  - **Do Background Research**
  - **Construct a Hypothesis**
  - **Test Your Hypothesis by Doing an Experiment**
  - **Analyze Your Data and Draw a Conclusion**
  - **Communicate Your Results**
- It is important for your experiment to be a fair test. A "fair test" occurs when you change only one factor (variable) and keep all other conditions the same.

#### Week 1

Your Textbook is: **CHEMISTRY Textbook – Holt (with your class downloads)**

Read and use your downloads and links as directed – to learn and complete your assignments

**Chapter 1: The Science of Chemistry**

**SUBMIT: Page 14 Practice; Page 30 Chapter 1 Review #13 – 17, 21, 29, 39, 40, 44, 47**

**ADD RESPONSE/S/ HERE (Including LAB Photos)**

## **Chapter 2: Matter and Energy**

**SUBMIT: Start Up Activity Page 37 – Responses and at least 1 photo of YOU completing your LAB.; Quick Lab Page 47 – Responses and at least 1 photo of YOU completing your LAB; Page 53 Practice Answers #1; Page 61 Practice #3 Answer; Chapter Review Page 66 #9, 13, 21, 45, 60 and 71**

**ADD RESPONSE/S/ HERE (Including LAB Photos)**

### **Week 2**

**Your Textbook is: CHEMISTRY Textbook – Holt (with your class downloads)**

**Read and use your downloads and links as directed – to learn and complete your assignments**

## **Chapter 3: Atoms and Moles**

**SUBMIT: Start Up Activity Page 73 – Responses and at least 1 photo of YOU completing your LAB; Page 86 Practice #3 Answer; Page 99 Practice #1 Answer; Chapter Review Page 107 #57 – 63; 88, 91**

**ADD RESPONSE/S/ HERE (Including LAB Photos)**

## **Chapter 4: The Periodic Table**

**SUBMIT: Page 123 Questions #1 – 2; Chapter 4 Review Page 150 #14 – 18; 49 and 51**

**ADD RESPONSES HERE**

## **Chapter 5: Ions and Ionic Compounds**

**SUBMIT: Page 180 Practice Answers; Chapter 5 Review Page 183 #10, 16, 19, 25, 28, and 43**

**ADD RESPONSES and REPORT HERE**

### **Week 3**

**Your Textbook is: CHEMISTRY Textbook – Holt (with your class downloads)**

**Read and use your downloads and links as directed – to learn and complete your assignments**

**Chapter 6: Covalent Compounds**

**SUBMIT: Page 202 Practice #1 and 2 Responses; Page 207 #7; Page 214 #1; Chapter Review Page 216 #14, 20, 28, and 63**

**ADD RESPONSES HERE**

**Chapter 8: Chemical Equations and Reactions**

**SUBMIT: Start Up Activity Page 259 Response and at least 1 photo of YOU completing your LAB; Page 266 #1-4; Page 269 # 1 – 2; Page 285 #9; Chapter 8 Page 291 #9, 12, and 45**

**ADD RESPONSE/S/ HERE (Including LAB Photos)**

**Week 4**

**Your Textbook is: CHEMISTRY Textbook – Holt (with your class downloads)**

**Read and use your downloads and links as directed – to learn and complete your assignments**

**Chapter 10: Causes of Change**

**SUBMIT: Page 342 Practice #1, 2; Page 368 #1; Page 370 Chapter Review #1 – 10, 26 and 57**

**ADD RESPONSES HERE**

**Chapter 11: States of Matter and Intermolecular Forces**

**SUBMIT: Page 380 Quick LAB (If you do not have plates – just substitute using a similar item) – give responses and at least photo of you doing your LAB; Page 384 Section Review #1, 2, 4, 13; Page 392 #4, 5; Chapter Review 407 #12, 21, 40**

**ADD RESPONSE/S/ HERE (Including LAB Photos)**

## **Weeks 5/**

**Your Textbook is: CHEMISTRY Textbook – Holt (with your class downloads)**

**Read and use your downloads and links as directed – to learn and complete your assignments**

### **Chapter 12: Gases**

**SUBMIT: Page 422 Section Review #1 – 8; Page 444 Chapter Review #1, 2, 11**

**ADD RESPONSES HERE**

### **Chapter 13: Solutions**

**SUBMIT: Page 459 Section Review # 1 – 12**

**ADD RESPONSES HERE**

## **SIMPLE REVIEW LAB I**

### **Purpose**

To physically see the water that exists in the air through the process of condensation.

### **Additional information**

The atmosphere is like a river full of water, only we can't see it. Water exists in a gaseous state in the atmosphere, almost like it's shrouded in a cloak of invisibility. Even though we can't see it, it's still there! What if there was a way to pull the water from the air and physically see it? We can through the process of condensation!

Condensation is the change of the physical state of matter from gaseous phase into liquid phase. As a naturally occurring phenomenon, condensation can be used to generate drinkable water for human use. In fact, there have been a large number of devices created to extract water from the air, including a device that produces 600 gallons of drinkable water per day for US soldiers serving in high-heat military zones, such as IRAQ and Afghanistan.

### **Required materials**

Glass jar with lid  
Several ice cubes  
Table salt  
Tissue paper

### **Estimated Experiment Time**

Less than 5 to set-up, about 30 minutes to conduct

### **Step-By-Step Procedure**

1. Fill the jar with your ice cubes. There should be enough ice cubes so that they reach the top, but leave enough room so you can securely tighten the cap.
2. Add to heaping tablespoons of salt into the jar, covering the ice. Screw on the lid of the jar tightly.
3. Shake the jar vigorously for about 30 seconds.
4. Place the jar on a solid surface, such as a table. Leave the jar for a short while (about 10 minutes).
5. When you return to your jar, observe if your jar has water droplets on the outside. If it does not, leave the jar undisturbed for a while longer. When the jar does finally have visible water droplets on the outside, proceed to step 6.
6. Wrap your tissue around the outside of the jar, then take it off and observe how wet it is!

### Note

The rate at which the droplets (known as condensation) begin to form on the outside of the jar will vary depending on the environmental conditions where the experiment is taking place.

### Observation

At what point did you start to see water droplets? Can you explain what's happening? How could the water droplets be forming on the OUTSIDE of the jar when the ice is on the INSIDE of the jar, and the cap is screwed on tight? Where have you seen other natural occurrences of condensation? (here's a hint... think of what's on the ground on a cold morning).

**Result: SHARE YOUR OBSERVATIONS/ DATA AND RESULTS HERE \*Along with at least 1 photo of YOU doing your LAB**

### **SIMPLE REVIEW LAB II:** What Happens When You Weaken the Hydrogen Bonds in Water?

#### **READ ABOUT: Water and Hydrogen Bonding**

<http://www.chem1.com/acad/webtext/states/water.html>

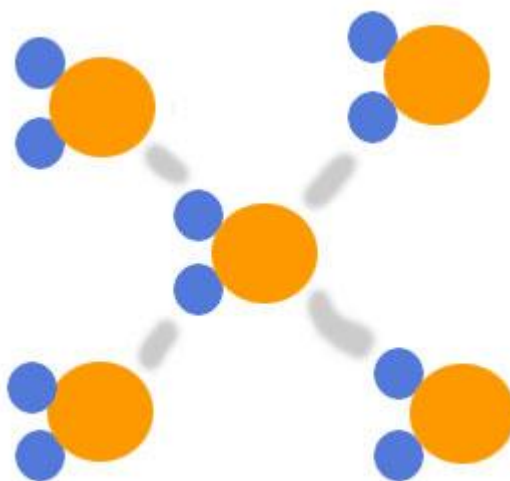
Water is a miracle liquid. All living things need it to survive and it has some unique properties unto itself. Hydrogen bonds are responsible for the unusual characteristics of water. These strong intermolecular forces are formed between water molecules and are responsible for the high boiling point and wide range of temperatures in liquid water.



Water is known as the Mickey Mouse molecule because two hydrogen atoms bond with one oxygen atom to form a molecule – H<sub>2</sub>O. When the two hydrogens bond with the oxygen, the electrons are not shared equally. (Pull out that high school chemistry for this lesson.) Because of this, the oxygen has a partial negative charge, and the hydrogen has a partial positive charge.

The opposite charges attract each other like magnets and form a hydrogen bond.

Hydrogen bonds are not strong bonds, but they make the water molecules stick together. The bonds cause the water molecules to associate strongly with one another. But these bonds can be broken by simply adding another substance to the water.



How does a piece of ice float on top of water? Or a lizard or water bug run across it? Hydrogen bonds pull the molecules together to form a dense structure. The molecules want to stay together and hold up the ice or the bug. Surface tension gives the water enough structure to hold somethings on top. If you break the surface tension, the item will sink.

What happens when you weaken or change the amount of surface tension of the water? Adding only one additional substance to water can greatly affect the hydrogen bonds, determining whether something floats or sinks.

Try this simple experiment to test the strength of hydrogen bonds in water –

## Experiment

1. Fill two glasses equally full with water.
2. In one of the cups, add about 1 oz (30 mL) of dish soap and gently stir the solution.
3. Create two identical balls of paper that can fit into your glasses of water.
4. Gently drop one paper ball into the plain water and drop the other paper ball into the glass with the soapy water solution.
5. You will quickly observe that the paper balls react differently to the two fluids. In fact, one paper ball begins to sink while the other sits atop the water!

**OBSERVATIONS: Share your observations here along with at least 1 photo of YOU doing your LAB**

### Week 6

**Worth 20% of your grade – DO YOUR BEST!**

#### **INDEPENDENT PROJECT (YOUR PROJECT MUST BE AT A HIGH SCHOOL LEVEL)**

Chemical reactions occur every day all around us. A chemical reaction is a process where one type of substance is chemically converted to another substance. That fizzling toilet bowl cleaner is a chemical reaction. The fire in your fireplace is another type of chemical reaction. Conduct your own experiment which demonstrates a chemical reaction that's fairly common all around us. Share your steps in the scientific method.

## Key Info

- The scientific method is a way to ask and answer scientific questions by making observations and doing experiments.
- The steps of the scientific method are to:
  - **Ask a Question**
  - **Do Background Research**
  - **Construct a Hypothesis**
  - **Test Your Hypothesis by Doing an Experiment**

- Analyze Your Data and Draw a Conclusion

- Communicate Your Results **(and you must show digital photographs of yourself doing the experiment)**

- It is important for your experiment to be a fair test. A "fair test" occurs when you change only one factor (variable) and keep all other conditions the same

**ADD RESPONSE/S/ HERE**