**Magnet Chemistry Syllabus**

Dr. John W. Cody

[john.cody@cobbk12.org](mailto:john.cody@cobbk12.org)

john.cody@wheelermagnet.com

www.drcodychem.weebly.com

This course is designed to be a general introduction to chemistry and covers the topics listed below. This course will provide a foundation of chemical concepts, vocabulary, and problem solving skills. The course outline shown below is intended to be a guideline for the topics covered and shows an approximate order in which they will be covered. The order of topics is subject to slight modifications if necessary.

**Course Outline:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit** | **Title** | **Chapters** | **Standards**  **Addressed\*** |
| 1 | Intro. to Chemistry and Matter | Safety; 1-2, 5 | SC1-2 |
| 2 | Atomic Structure | 3, 11, 19 | SC3 |
| 3 | Electrons, Atoms, and Periodic Trends | 11 | SC3-4 |
| 4 | Nomenclature & Chemical Bonding | 4, 12 | SC1,3 |
| 5 | Chemical Reactions | 7-8 | SC2 |
| 6 | The Mole: Chemical Composition | 6 | SC2 |
| 7 | Stoichiometry | 9 | SC2 |
| 8 | Energy, Kinetics, and Equilibrium | 10, 17 | SC5-6 |
| 9 | Gases, Solutions, Acids & Bases | 13-16 | SC1,7 |

***\*The Georgia Performance Standards are listed on page 2 of this syllabus. They can also be found at the following address: http://www.cobbk12.org/centraloffice/picasso/403.html***

***SC1 Nature of Matter***

The learner will analyze the nature of matter and its classifications.

Element: [SC1.a](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19413&CourseID=403)

Relate the role of nuclear fusion in producing essentially all elements heavier than hydrogen.

Element: [SC1.b](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=17848&CourseID=403)

The learner will identify substances based on chemical and physical properties.

Element: [SC1.c](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=17849&CourseID=403)

The learner will predict formulas for stable ionic compounds (binary and tertiary) based on balance of charges.

Element: [SC1.d](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=17850&CourseID=403)

The learner will use IUPAC nomenclature for transition between the chemical names and formulas of:

 Ionic compounds (Binary and tertiary)

 Covalent compounds (Binary and tertiary)

 Acidic compounds (Binary and tertiary)

***SC2 Chemical Reactions and Stoichiometry***

The learner will assess how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions.

Element: [SC2.a](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19414&CourseID=403)

The learner will identify and balance the following types of chemical equations:

 Synthesis

 Decomposition

 Single Replacement

 Double Replacement

 Combustion

Element: [SC2.b](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19415&CourseID=403)

Experimentally determine indicators of a chemical reaction specifically precipitation, gas evolution, water production, and changes in energy to the system.

Element: [SC2.c](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19416&CourseID=403)

The learner will apply concepts of the mole and Avogadro's number to conceptualize and calculate:

 Empirical/molecular formulas

 Mass, moles and molecules relationships

 Molar volumes of gases

Element: [SC2.d](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19417&CourseID=403)

Identify and solve different types of stoichiometry problems, specifically relating mass to moles and mass to mass.

Element: [SC2.e](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19418&CourseID=403)

Demonstrate the conceptual principle of limiting reactants.

Element: [SC2.f](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=21609&CourseID=403)

Explain the role of equilibrium in chemical reactions

***SC3 Atomic Theory***

The learner will evaluate the modern atomic theory.

Element: [SC3.a](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19420&CourseID=403)

The learner will discriminate between the relative size, charge, and position of protons, neutrons, and electrons in the atom.

Element: [SC3.b](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19421&CourseID=403)

The learner will use the orbital configuration of neutral atoms to explain its effect on the atom's chemical properties.

Element: [SC3.c](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19422&CourseID=403)

The learner will explain the relationship of the proton number to the element's identity.

Element: [SC3.d](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19423&CourseID=403)

The learner will relate the role of nuclear fusion in producing essentially all elements heavier that helium.

Element: [SC3.e](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19424&CourseID=403)

The learner will explain the relationship of isotopes to the relative abundance of atoms of a particular element.

Element: [SC3.f](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19425&CourseID=403)

The learner will compare and contrast types of chemical bonds (i.e. ionic, covalent).

Element: [SC3.g](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19426&CourseID=403)

The learner will relate light emission and the movement of electrons to element identification.

***SC4 Periodic Table***

The learner will use the organization of the Periodic Table to predict properties of elements.

Element: [SC4.a](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19428&CourseID=403)

The learner will use the Periodic Table to predict periodic trends including atomic radii, ionic radii, ionization energy, and electronegativity of various elements.

Element: [SC4.b](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19429&CourseID=403)

The learner will compare and contrast trends in the chemical and physical properties of elements and their placement on the Periodic Table.

***SC5 Chemical Kinetics***

The learner will explain that the rate at which a chemical reaction occurs can be affected by changing concentration, temperature, or pressure and the addition of a catalyst.

Element: [SC5.a](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19431&CourseID=403)

The learner will demonstrate the effects of changing concentration, temperature, and pressure on chemical reactions.

Element: [SC5.b](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19432&CourseID=403)

The learner will investigate the effects of a catalyst on chemical reactions and apply it to everyday examples.

***SC6 Chemical Thermodynamics***

The learner will assess the motion and behavior of atoms and molecules in chemical and physical processes.

Element: [SC6.a](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19434&CourseID=403)

The learner will compare and contrast atomic/molecular motion in solids, liquids, gases, and plasmas.

Element: [SC6.b](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19435&CourseID=403)

The learner will collect data and calculate the amount of heat given off or taken in by chemical or physical processes.

Element: [SC6.c](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19436&CourseID=403)

Analyzing (both conceptually and quantitatively) flow of energy during change of state (phase). Teacher note: The use of Gas Laws to achieve this standard is permissible, but not mandated.

***SC7 Solutions, Acids, & Bases***

The learner will evaluate properties that describe solutions and the behavior of acids and bases.

Element: [SC7.a](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19438&CourseID=403)

The learner will explain solubility in terms of substances involved (i.e. solute, solvent) and the process of dissolving a solute by:

 Observe factors that effect the rate at which a solute dissolves in a specific solvent

 Express concentrations in molarity

 Prepare and properly label solutions of specified molar concentration

 Relate molality to colligative properties.

Element: [SC7.b](http://picasso.cobbk12.org/units/index.php?module=curriculum&type=standards&func=display&StandardID=19439&CourseID=403)

The learner will compare, contrast, and evaluate the nature and behavior of acids and bases in terms of:

 Arrhenius, Bronsted-Lowry Acid/Bases  Strong vs weak acids/bases in terms of percent dissociation

 Hydronium ion concentration

 pH

 Acid-Base neutralization

**Course Requirements**

1. Be diligent in your efforts to stay current in the course. It is in your best interest

to develop and maintain a system that works best for YOU. I do not perform

notebook checks, but it would be to your advantage to organize your class

materials in some form or fashion.

2. Keep up with all your graded assignments. Homework problems and

problems discussed in class will reappear on quizzes and tests.

3. Lab safety is very important!! We will be covering safety rules at the very

beginning of the semester. Once these rules have been mastered, I will

expect you to abide by them at all times while in the laboratory area.

Failure to do so will result in a lowering of your grade and a possible

administrative referral!!

4. Calculator! By the second Monday of class, you need to have a scientific

calculator. You need to bring your calculator to class EVERYDAY!!!!

**Course Resources**

1. *Textbook*. You will be offered a textbook for this course; however, we will not

use this as a primary resource. The textbook is primarily to be used as a

supplementary resource for you. Should you prefer, you can receive a copy for the

online textbook as opposed to the traditional printed text.

2. *In-class Handouts*. I will be providing you many materials in class in the form of

handouts that will contain valuable information. These will also be available in

electronic format. (See below)

3. *Class website (www.drcodychem.weebly.com)*. On this website you will be able to

view and download all content for this course including PowerPoint presentations,

in-class handouts, and worksheets. My goal is to update the site unit by unit so

that all materials will be available to you on the first day of the new unit.

4. *WebAssign*. Most of your homework assignments will be assigned via this online

homework platform. The purpose of WebAssign is for you to be able to do your

homework and receive feedback at any time. Please bombard me with questions

relating to your homework. The purpose of homework assignments is for you to

better understand the material, not to penalize you.

**Freshmen Focus Initiative**

*Hall Passes*

Students who leave a class for any reason are responsible for asking their teacher for a pass. Each teacher may have their own pass system which may include a limited number of passes. The pass should include the date, time, and destination, as well as the teacher’s signature. Students must also have their agenda with them whenever they leave the classroom. No passes will be written during the first or last ten minutes of class.

*Electronic Device Policy*

Students shall not use cellular phones, smart watches, laptops/tablets or any other electronic devices during instructional time unless specifically authorized by individual teachers for instructional purposes during school day. Otherwise, communication and electronic devices must be off during instructional time and during class changes. Headphones may be used at the teacher’s discretion.

*The use of electronic devices is prohibited during tests and quizzes, all devices must be off and put away.*

*Food and Drink*

No food is allowed in the classroom. Water is allowed in a covered container.

*Communication*

Wheeler Webpage: [www.wheelerhigh.com](http://www.wheelerhigh.com)

Wheeler Twitter: @wheeler\_high

Freshmen Focus Twitter: @whs2020vision

Mr. Church’s Twitter: @davehchurch

*Academic Integrity Policy*

Academic integrity within the school and within the Magnet program in

particular is taken very seriously. Any case of academic misconduct will

result in academic referral and possible expulsion from the Magnet program.

This includes all assignments given for academic credit (e.g. lab reports,

tests, quizzes, homework/classwork assignments, etc.)

**Makeup Policy**

If you are absent, the following policy is in place with regards to making up any missed assignments. You have two (2) days to meet with me upon returning to class to set a date to make up any work that you have missed during your absence. If you do not meet with me during this two day window your grade will be lowered 10 points per day (this includes all assignments: tests, labs, HW/CW, etc.). *It is your responsibility to meet with me, I will not seek you out in order to set a date to make up any missing assignments*.

**Grading Scale:**

|  |  |
| --- | --- |
| Homework & class work | 10% |
| Labs & Quizzes | 30% |
| Tests | 45% |
| Final Exam | 15% |

**Cobb County Schools Grading Scale:**

90-100 = A 80-89 = B 74-70 = C 70-73 = D 69 and below = F

**Lab Safety:**

This is the only area of class management where the student has no second chances. I take the safety of every student very seriously, and expect each lab participant to do the same. Safety requirements for each lab will be discussed prior to the start of each lab. If a student fails to act or conduct their experiment in a safe manner, it is grounds for detention and a parent/teacher conference (phone or physical). If the action is grave, the student will be immediately referred to administration.

If you have any problems, concerns, or questions, please do not hesitate to ask. I am here to help!!! The success of ALL my students is a priority for me. I look forward to a great semester.

**Questions I Should Ask Myself to Ensure Maximum Success in Magnet Chemistry:**

1. Do I have copes of notes from class lectures?

2. Have I compiled answers for worksheets given in class and checked them for

accuracy?

3. Have I completed all WebAssigns? Do I understand all the questions and answers?

4. Have I asked questions in class and received satisfactory answers to them?

5. Have I come in for extra help before or after school for things I am still unsure

about?

6. Have I consulted the textbook for additional information on concepts and for

additional practice problems to work on?

I have read this course syllabus and understand the student is responsible for knowing the information and following all of the course rules and regulations.

The course syllabus must be signed by the student and a parent, then returned to Dr. Cody by **08/05/16.**

Student’s Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student’s Email\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent/Guardian’s

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent/Guardian’s

Email \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent/Guardian’s

Best Contact Phone Number (days) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Best Contact Phone Number (nights)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_