AACPS Unit Title *(Taken from AACPS Pacing Guide)*	**MYP Unit Title** *(Kid friendly speak)*	
Lab Safety and Atomic Structure	Power in Small Things	
Teacher(s)	**Subject**	
Gail Tucker	Chemistry (Honors)	
Grade level	**Duration of Unit** *(How many days? How many hours?)*	
Grade 10 primarily	7 days / 10 hours	
Significant Concept *(This should be stated in a simple declarative sentence and should not be content specific.)*		**Area of Interaction** *(Through which lens will the students view the significant concept?)*
Small things are powerful. (Subatomic particles determine chemical and physical properties.)		Environment
	Unit Question *(This should be a short inverted version of the significant concept using first person. The question should begin with "how" or "why.")*	
	How can something so small be so powerful?	

Assessment *(Comes from prescribed minimum located in MYP subject guide)*		
Design an experiment using lab safety and the scientific method to investigate the effect of the boiling point of water. Communicate how small things are powerful.		
MYP Assessment Criteria *(Select one or two criteria that will be used to assess student understanding of the significant concept.)*		
D: Scientific inquiry E: Processing data B: Communication in science		
VSC Outcomes *(Taken from AACPS Pacing Guide. Select only those that align with NEW content.)*	**MYP Objectives** *(Taken from MYP Subject Guide. Must align with a VSC Outcome.)*	**Main Student Activities** *(Each activity must align with a VSC outcome.)*

1.3.2 The student will recognize safe laboratory procedures. 1.3.3 The student will demonstrate safe handling of the chemicals and materials of science.	Work safely and use material and equipment competently. Work responsibly with regards to the living and non-living environment. Work effectively as individuals and as part of a group by collaborating with others.	Students identify the unsafe practices and generate a list of safety rules from teacher's demonstration on safe/unsafe methods in labs.
1.2.6 The student will identify appropriate methods for conducting an investigation (independent and dependent variables, proper controls, repeat trials, appropriate sample size, etc.). 4.3.1 The student will explain that thermal energy in a material consists of the ordered and disordered motions of its colliding particles (physical changes from solid ßà liquid ßà gas). 1.3.1 The student will develop and demonstrate skills using lab and field equipment to perform investigative techniques.	State a focused problem or research question to be tested by a scientific investigation. Formulate a testable hypothesis and explain it using scientific reasoning. Design and carry out scientific investigations that include variables and controls, material and/or equipment needed, a method to be followed, and the way in which data is to be collected and processed. Evaluate the validity and reliability of the method. Judge the validity of a hypothesis based on the outcome of the investigation. Suggest improvements to the method or further inquiry, when relevant.	Model with students how temperature affects the elasticity of a rubber band. Design and conduct an experiment: Working in small groups, design a laboratory investigation to determine the effect of salt on the boiling point of water. Students will conduct mini-labs and learn to use the variety of lab equipment available in the classroom.
4.4.1 The student will illustrate that substances can be represented by formulas. 4.3.1 The student will explain that thermal energy in a material consists	Use appropriate communication modes such as verbal (oral, written), visual (graphic, symbolic) and communication formats (laboratory reports, essays, presentations) to effectively communicate theories,	Students will identify the differences in physical and chemical changes through an experiment analyzing a burning candle.

of the ordered and disordered motions of its colliding particles. 4.5.2 The student will balance simple equations. 1.4.2 The student will analyze data to make predictions, decisions, or draw conclusions.	ideas and findings in science. Analyze and interpret data. Draw conclusions consistent with the data and supported by scientific reasoning.	Distinguish between elements and compounds by designing a thinking map.
4.1.1 The student will analyze the structure of the atom and describe the characteristics of the particles found there. 1.4.7 The student will determine the sources of error that limit the accuracy or precision of experimental results. 1.6.3 The student will express and/or compare small and large quantities using scientific notation and relative order of magnitude. 1.6.5 The student will judge the reasonableness of an answer.	Use scientific language correctly. Evaluate the validity and reliability of the method. Organize, transform, and present data using numerical and visual forms.	Students will investigate the nucleus using the JINA/NSCL marble nuclei activity and visuals of current research at NSCL and future research at FRIB. The students will build models of different atoms using classroom materials. Students will create a timeline of the development of the atomic model throughout history using a jigsaw cooperative learning strategy. The students will view an interactive model of the Rutherford experiment to learn about the discovery of the nucleus. Students will utilize the media center to receive training in academic databases and APA format citations.

Approaches to Learning *(Identify the skills that will be taught and practiced throughout the unit:* *Organization, Collaboration, Communication, Information literacy, Thinking, Reflection, Transfer. Cite sample activities that support these skills.)*		
Organization: Students will create a timeline and thinking maps about atomic structure. **Transfer**: Students' laboratory skills working with different apparatus will be applied for various experiments. **Collaboration**: Students work in groups with mutual respect, demonstrating teamwork. **Thinking**: Students formulate a specific problem when given a general topic to investigate.		
Learner Profile *(How will students be asked to exemplify the traits of the Learner Profile? Select one or two and explain specific activities which will lend themselves toward greater LP understanding.)*		
Inquirer: Students will engage in experimental design being inquirers by developing a scientific experiment with a general aim or question. From that, students will develop a more specific problem and a relevant hypothesis designed to answer the specific problem, as well as a coherent procedure by which to test that hypothesis. **Risk Taker**: This activity will also lend itself to students becoming risk-		

takers as they need to rely on their own abilities to design the experiment and acknowledge where they might improve their experiment. **Knowledgeable**: Students will implement and follow all safety guidelines in their procedural method.		
Fundamental Concept: Holistic Learning *(What" real life" connections will students make to enhance their grasp of the content?* *What interdisciplinary connections will be made during the unit? Explain.)*		
Students will observe that to solve a problem, they must come up with a series of steps to investigate a problem and come up with a solution. Students will learn the historical development of the atomic model and understand how theories develop over time.		
Fundamental Concept: Communication *(How will speaking, listening and writing skills be developed throughout the unit?)*		
Students will communicate information in science by researching, writing, and documenting how something so small can be so powerful.		
Fundamental Concept: Intercultural Awareness		

(How will students be asked to view the content through different cultural perspectives?)		
Through constructive criticism (sharing) of their reports, students will see that a problem may be addressed in multiple ways and that there can be multiple solutions to a problem. Students will learn about the historical people/figures in the world of chemistry and see that many perspectives can be taken when viewing the same situation.		
Resources / Materials of Instruction *(What resources do we need to teach this unit in terms of: differentiation, equipment, materials?)*		
Computers, laboratory equipment, chemicals, laboratory notebooks, textbooks		
Post Unit Reflections *(This reflection will take place after the completion of the unit. Please respond to each of the questions below.)*		
• In which activities were students most engaged?	Students were most engaged when they were creating the atomic structures of their specific elements designing the laboratory investigation to determine the effect of salt on the boiling point of water.	
• How did we deepen our understanding of the focus AoI?	By using hands on, demonstrations, models, and research.	

• What opportunities were provided to students to allow them to reflect upon their own learning?	Students use report writing, exit ticket, parking lot, summarization, conclusion, and presentations to reflect on their learning.	
• What, if any, extension activities arose?	None	
• How successful was the collaboration with other teachers within my subject group and/or from other subject groups?	Our collaboration as a team was good and productive. As a team we were able to share lab materials between teachers, so all the students had the opportunity to complete their labs in a timely manner.	
• What do we need to adjust in our assessment task to allow more student success?	Research and citation skills obtained in this unit will increase student performance on the One World Essay.	
• What data are we collecting and how will it be used?	Formative assessments include drills and closures. Summative assessments include test, lab report, and research report. Based on students' performance on each standard, we can change our teaching strategies, reorganize our groupings, and revise our lessons, to maximize student performance.	