MYP Unit Planner

Unit Title: The Periodic Table - Introductory Chemistry*

Teacher(s)	**Subject and Grade Level**	**Time frame and Duration**
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Significant Concept (Enduring Understanding)

The natural world is full of patterns made evident by observation.

Content Knowledge / Big Ideas	Skills
1. The trend in chemistry after Dalton was the discovery of new elements. 2. Before Mendeleev, elements were organized by their atomic mass and properties. 3. Comparing a group of objects by mass leads to the concept of relative mass 4. Mendeleev used properties to organize elements and predict undiscovered elements based on his Periodic Law. 5. The periodic table contains periods and families which are groups that contain similar chemical and physical properties. 6. Using relative mass numbers equal numbers of objects/atoms are obtained. The gram relative mass of any element equals the same number of atoms; Avogradro's number 6.02x10 23 is the number of atoms in one mole of atoms. In chemistry the counting unit, the mole, is used to count atoms. **Vocabulary** Mole, periodic table, halogens, noble gases, alkali metals, alkaline earth metals, transition metals, lanthanides, actinides, density	1. I can describe Dalton's atomic theory. 2. I can relate my investigations with puzzles to Mendeleev's struggle to determine the Periodic Law. 3. I can describe the different families of the periodic table and their chemical/physical properties (alkali metals alkaline earth metals, transition metals, halogens, noble gases, lanthanides/actinides, etc). 4. I can calculate density using the (mass/volume) equation. 5. I can predict the properties of elements using the Periodic Law (density, solubility, and reactivity). 6. I can apply the Periodic Law to explain patterns in the periodic table. 7. I can connect the concept of relative mass to the Bean Lab. 8. I can determine the number of atoms by measuring the mass of any element - Avogadro's # = (6.02 x 1023 things = 1 mole). 9. I can investigate properties of elements. 10. I can identify the names and symbols of 30 of the most common elements.

Approaches to Learning

ATL Skill & Student Learning Outcome

Organization
Collaboration
Communication

Information Literacy

- Accessing information
- Selecting and organizing information

Thinking
Transfer
Working to understand the patterns in the periodic table and how to interpret the patterns.

Reflection

MYP Area of Interaction Focus / DP ToK Links

Human Ingenuity
The modern periodic table is standing on the shoulders of giants; meaning a compilation of discoveries made by many people over time. The periodic table is the most important tool of a chemist.

Unit Question (Essential Question)

How do you use patterns?

FROM ASSESSMENT TO TEACHING AND LEARNING ACTIVITIES THROUGH INQUIRY

Assessment Reflections

- What exemplars will students see so that they understand what is required?
- What will allow students the opportunity to answer the unit question using what they have learned?
- What considerations have you given the nature of the assessment (e.g. given in class, take-home, time allowed for completion)
- At what level of Bloom's Taxonomy does this task ask the student to engage?
- Where in the assessment task(s) are students invited to achieve at all levels of the descriptors?

What MYP task will be most appropriate?

Assessments

Element Symbols Quiz
Formative: Quiz
Quiz, students have the option to retake depending on their understanding of particular learning targets.

This first quiz is a summative quiz with formative purposes.

MYP Assessment - Periodic Table Test
Summative: Written Test
Students complete a final assessment about the periodic table that draws from the various lab activities and the patterns derived in class.

Element Facebook (optional)
Summative: Exhibition
Students choose one element to create a Facebook page about. The element Facebook does not have to be done on the Internet (most people will create a paper profile). This is the student's opportunity to research and explain to the class about one of the elements from the periodic table.

MN Standards & IB Objectives

-Minnesota State Standards or National Standards that are being addressed
-Which MYP assessment criteria will be used?

Science 2009, Grades 9-12 , Physical Science
1. Matter
1. The structure of the atom determines chemical properties of elements.

- 9.2.1.1.3 Explain the arrangement of the elements on the Periodic Table, including the relationships among elements in a given column or row.

Science 2009, Grades 9-12 , Chemistry
2. Physical Science
1. Matter

1. The periodic table illustrates how patterns in the physical and chemical properties of elements are related to atomic structure.

- 9C.2.1.1.1 Explain the relationship of an element's position on the periodic table to its atomic number and electron configuration.
- 9C.2.1.1.2 Identify and compare trends on the periodic table, including reactivity and relative sizes of atoms and ions; use the trends to explain the properties of subgroups, including metals, non-metals, alkali metals, alkaline earth metals, halogens and noble gases.

MYP: Sciences (For use from Sept. 2010/Jan. 2011), MYP Year 5, Assessment Criteria
Criterion C: Knowledge and understanding of science

- recall scientific knowledge and use scientific understanding to construct scientific explanations
- apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations
- critically analyse and evaluate information to make judgments supported by scientific understanding.

-Which MYP objectives will be addressed during this unit?

LEARNING EXPERIENCES AND TEACHING

- How will I incorporate international mindedness throughout the unit?
- How will students learn the knowledge and practice the skills required?
- How will we use formative assessment to give students feedback during the unit?
- What different teaching methodologies will we employ?
- How are we differentiating teaching and learning for all?

Learning Activities

Timeline of element discovery with blank periodic table

Organize cards activity/Puzzle Activity

Mendeleev reading – his struggle with organizing the elements

Properties of Elements (metal, metalloid, nonmetal), use mini-version of blank periodic table

Element BINGO

Element Symbols Quiz

Relative Mass (Bean) Lab Part 1 – mention the mole

Families of the periodic table jigsaw activity – work in groups, each group presents a family to the class

Demonstration of reactivity of alkali metals

Show video clip from World of Chemistry – demo of alkali metals, density of noble gases

Alkaline Earth Metals Lab – properties of alkaline earth metals

Introduce density concept and calculation – use density blocks/balls from Science House

Density of Gallium Lab

Relative Mass (Bean) Lab Part 2

The Mole discussion and Mole Day Festivities

Mystery Mole Baggies Lab

Periodic Table Test

Optional – Element Facebook

Differentiations

Modifications

Resources

Word of Chemistry Periodic Table Video
Nature's Building Blocks Books
Flinn Scientific ChemTopic Labs – Periodic Table
www.periodicvideos.com
They Might Be Giants songs - Know the Elements (youtube also available)

ONGOING REFLECTIONS AND EVALUATION

Students and Teachers

- What did we find compelling?
- What learner-initiated inquiries arose during the learning?
- From the evidence, what understandings may have been constructed?
- How did we deepen our understanding of AOI?
- What opportunities exist for reflection - both on the unit and on our own learning?
- What, if any, extension activities arose?

Collaboration

Unit Reflections

Students use their periodic tables that have been constructed for reference.

Periodic Table Archives.doc

- How successful was the collaboration with other teachers within my subject group and/or form other subject groups?
- What interdisciplinary, if any, understandings were forged with other units?

Assessment

- In what ways did the assessment task allow students to achieve at the highest descriptors?
- How are skills that were taught articulating to the next level?

Data Collection

- What data am I collecting?
- For what purpose will the data be used?

<< Previous Year

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