

**Title:** Families on the Periodic Table

**Course Title:** Introduction to Chemistry (required, semester course)

**Grade Level:** 9th

**Time:** Two class meetings (one is 45 minutes, one is 75 minutes)

**Resources, Materials, Technology:**

- Students use their own laptops to research online (one to one laptop school).
- PowerPoint and Microsoft Publisher are used to create the infographic.
- Infographics are converted to PDF files.
- Microsoft word is used to create the MLA Work Cited document.

**Standards addressed:**

- NGSS Practices: 1, 3,7, 8
- NGSS Crosscutting concepts: Patterns
- NGSS DCI: HS-PS1-1, HS-PS1-2.

**Learning Objectives/ Outcomes:**

- Students will understand that different groups or families on the periodic table have different properties.
- Students will understand that members of the same family share characteristic properties.
- Students will recognize the patterns in the properties found of the elements within a group on the periodic table.
- Students will represent their understandings about the properties of families of elements using an infographic which contains images, statistical information in the form of graphics and minimal text.

**Previous lessons on which this builds:**

- Students, in the **Atom** unit will have learned that atoms of different elements have different properties.
- In a previous lesson in the current, **Periodic Table**, unit the students will have been introduced to the idea that the elements on the periodic table are arranged by their physical and chemical properties.
- Students have been trained in a required Digital Literacy course in how to carry out online searches, how to use Microsoft Word, PowerPoint and Publisher.
- Google docs and Google slide have also been introduced to the students and many choose to use this for sharing during group or team projects.
- Blackboard is used within the school to transmit files between teacher and student.
- Within this course previously the students have created line graphs and bar graphs.

## Lesson Structure and Procedures:

### Before the Lesson

- At the end of the prior day's lesson on the groups on the periodic table the students have selected their team members and family from the table that they will be researching.
- Students select a partner with whom they want to work on the project. Each team is given a number selected by random which determines their position in the choosing of families.
- Student teams are called up by number to select their family.

### Day 1: 45 minutes in length

- The focus of this period is the familiarization of the students with the project expectations.
- Students are introduced to the infographic assignment. They are given the student direction sheet (attached).
- They then brainstorm with their partner for a few minutes about their family of elements.
- The general format of an infographic is then described by the teacher.
- Examples of infographics are presented. At this point only a vague sense of the format, designing of an infographic is held by the students.
- The details of the content needed for their infographic is discussed using the student direction sheet (attached) as a guide.
- Students are then given the remainder of the period to begin researching their topic.
- During this time the teacher circulates to each team to verify that they understand the task at hand and are making progress on collecting information.
- At the end of the period they are encouraged to continue their research for homework and to bring the results of their searches to class the next day. They should arrive for class with all of the information and images that they feel they will need in order to create their infographic.

### Day 2: 75 minutes in length

- The focus for this class period is the creation of the infographic itself.
- Students are shown examples of previously created infographics on other topics using the PowerPoint and Publisher format.
- The logistics of sharing pictures and information with their partner are discussed and worked through.
- Students are given the entire period to create their infographic; compiling their information, creating graphs of their statistics and then working on the artistic design and presentation format.
- Students are directed to continue working on their collecting of content and now images with the teacher available to discuss any area of concern.
- During this period the teacher circulates to each team to help with formatting and design issues that arise.
- At the end of the period students are reminded that the completed infographic, along with the MLA formatted work cited are due before 8 AM on the next class period. This will allow the teacher time to print out the infographics for the Gallery Walk which will take place during the next class period.

- Students are also reminded of the teacher's availability to help with any issue which arises during the intervening days. (This project was set up to have a weekend of team work time available between the infographic work day and the due date).
- The finished infographics are turned in electronically to the teacher. They are printed out in color and hung on display in the classroom. The students are given time to look at the infographics and to select the one that they feel is the best.

### **Student directions/handouts:**

#### **Periodic Families Infographic**

#### **Objectives:**

- You will understand that different groups or families on the periodic table have different properties.
- You will understand that members of the same family share characteristic properties.
- You will recognize the patterns in the properties found of the elements within a group on the periodic table.
- You will represent their understandings about the properties of one family of elements using an infographic which contains images, statistical information in the form of graphics and minimal text.

#### **Student Directions:**

An Infographic combines textual information along with visual images and data to tell a story. You will be working in a creative team of 2-3 students to tell a story about one of the groups on the periodic table.

Your Infographic should focus on what everyone should know about your chosen family on the periodic table. It should focus on why it is important to know about the elements in your family: why are they important to life on our planet? Why should we be learning about them? It should also focus on the STARS of the family: those that are most important to humans.

The anticipated end product is an Infographic which can be printed in color and displayed in the classroom. This infographic will be presented to the class by the creative team during a Gallery Walk.

The family of elements for each creative team will be chosen by lottery from:

1. The alkali metals (which do not include Hydrogen).
2. The alkaline earth metals
3. The Boron Family
4. The Nitrogen Family
5. The Carbon Family
6. The Oxygen Family
7. The Halogens
8. The Noble Gases
9. Hydrogen



The intent, purpose of the infographic is made clear for the audience.		
The infographic tells a story through the use of graphics and text.		
Most information is represented by pictures or graphics		
The story flows with the main, most important ideas given prominence.		
Icons, symbols, graphs are used to represent quantitative values, statistics.		
An understandable legend is provided for icons/symbols.		
The mathematical relationship between quantities or properties is shown graphically.		
Understandable and accurate labels and units are included on graphs and tables		
Multiple credible sources of data and information are be used and cited.		
Sources of all non-original data, graphics are given attributions usually at the bottom of the infographic.		
The color, font, layout, icons/symbols are chosen to strengthen the message.		
The design adds to the message, does not detract from it.		

**Follow Up/Extensions:**

- Student projects can be displayed in the school and viewed by the school community.
- Students can be asked to write a reflection on what they found most memorable about their own topic of research and why.
- Students can be asked to write a reflection on which of the posters created by their peers was most memorable and why.

