

## The Periodic Table Kit Lesson Plan

**Lesson Plan Creator:** Alyssa Horpedahl

**Lesson Topic:** Atoms & Elements

**Grade Level:** 5-6th Grade

**Duration:** Two 50 minute class periods

**Purpose:** Students will understand the parts of an atom and the elements on the periodic table.

### Standards:

SCIENCE:

MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

PS1.A: Structure and Properties of Matter

\*Each pure substance has characteristic physical and chemical properties that can be used to identify it.

MATH:

MP.2 Reason abstractly and quantitatively.

**Objectives:** Students will be able to identify the parts of an atom, analyze their structure using the periodic table of elements, and calculate atomic math.

### Materials Needed:

- \*ActiveBoard/SmartBoard with internet access & sound
- \*The Atom's Family PowerPoint
- \*The Photographic Card Deck of The Periodic Table
- \*Book - The Elements: A Visual Exploration of Every Known Atom in the Universe
- \*Diagram of an Atom (attached at the bottom of this document)
- \*Atoms & Elements Worksheet (attached at the bottom of this document)
- \*Rubric for Atom Model (attached at the bottom of this document)
- \*Challenge Cards (attached at the bottom of this document)
- \*Review Stations Worksheet (attached at the bottom of this document)

### Day 1:

**Hook:** Have the instrumental version of the Addams Family theme song playing in the background with the attached PowerPoint ready on your Smart or Active Board. The room should be dark to add to the mood.

The music can be found here: <https://www.youtube.com/watch?v=CiYIva36vLM>

Once students have settled into their seats, read through the PowerPoint “The Atom’s Family” story to introduce the concept of the parts of an atom. There are two “Challenge” slides in which students have to figure out the “morale” of Matterville if something happened to their electrons. Then it is time to sing the song! The words go along with the music so make sure to restart the instrumental music so you are on track. Once the kids start to get the hang of the lyrics you can repeat a few times for fun.

\*The last few slides have students figuring out atomic math – this comes later in this lesson plan so you can go back to it or leave it out all together.

### **Procedure:**

1. Explain to the students that atoms make up everything around us. Give the fun fact that just the thickness of a sheet of paper has 445,455 atoms. Show a diagram of an atom and explain how all atoms consist of those subatomic particles that were explained in the Atom’s Family PowerPoint.
2. Discuss how we have a periodic table of elements which shows us every known substance on the planet and that everything else is made up of these basic elements.  
\*Elements are substances that contain one kind of atom.
3. Display the periodic table of elements on the Active/SmartBoard using the website <http://periodictable.com/> Discuss how they are arranged. Show the students how each element has a symbol, an atomic number, and an atomic weight. Refer to the worksheet to instruct the students on how to figure out the atomic makeup of the atom by looking at its atomic number and weight. Go through the front side of the worksheet together.  
\*Use the Photographic Card Deck of The Periodic Table to show the students the elements as you work through them on the worksheet.
4. Work on Lithium on page 2 in pairs or small groups to insure the students understand how to analyze the periodic table to find the information for the chart. If students are grasping the concept, they can complete Zirconium and Iron by themselves.
5. Show StudyJams video about Atoms to review today’s important information:  
<http://studyjams.scholastic.com/studyjams/jams/science/matter/atoms.htm>

### **Day 2:**

#### **Before Class:**

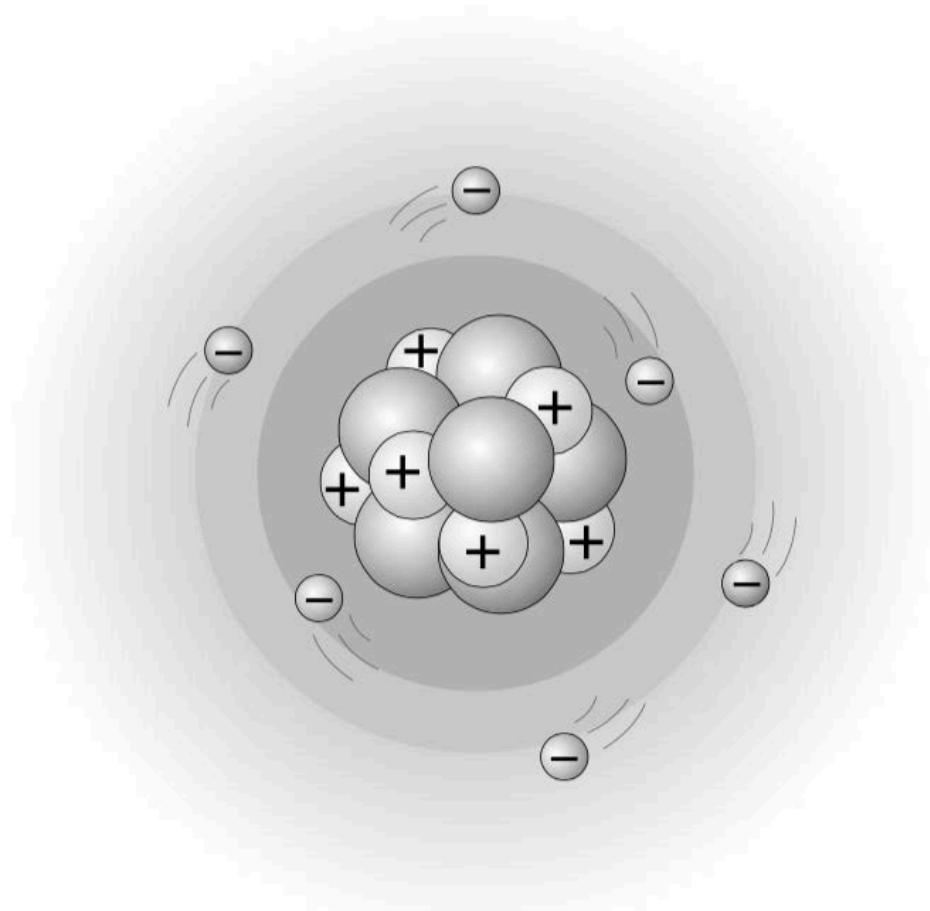
\*Print off challenge cards, atom model rubric, review station worksheets, and get computer(s) set up for stations.

\*Create 5 groups for station work today.

**Hook:** Have the website <http://education.jlab.org/elementmath/> up on the Active/SmartBoard. To refresh the students on how to figure out the subatomic particles of a particular type of element go through the “Element Math” game with them together on the board.

**Procedure:**

1. Explain the stations set up around the room. The stations should be set up with the following:
  - \*Refer to the Review Stations worksheet for specific instructions for each station.
    - #1 – Set out the book titled: The Elements : A Visual Exploration of Every Known Atom in the Universe with the attached model assignment rubric.
    - #2, #3, & #4 – Set out The Photographic Card Deck of The Periodic Table with printed sheets of the attached challenge cards – one challenge at each deck.
    - #5 – Have computers set up with the website: <http://education.jlab.org/indexpages/elementgames.html>
2. Hand out and explain the worksheet below titled, “Atoms & Elements Review Stations”. Explain that all their work for the stations will be recorded on there.
3. Monitor students as they work at the different stations. Rotate them through each station with enough time to complete each one (except the 3D Model assignment will be finished as homework). This may take more than one class period depending on how much time you have to spend on it.
4. Have students turn in their worksheet to show what they have accomplished for the day.



## Model of an Atom

Name: \_\_\_\_\_ **Atoms & Elements**

All atoms are made up of a nucleus (protons and neutrons) and electrons, which orbit the nucleus.

Atoms have NO electrical charge.

Atoms that have the same number of protons but different numbers of neutrons are called isotopes.

Elements are substances that contain one kind of atom.

Things to Remember:

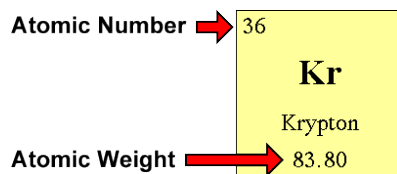
Number of Protons = Atomic Number

Number of Electrons = Number of Protons = Atomic Number

Atomic Mass = Number of Protons + Number of Neutrons

Number of Neutrons = Atomic Mass – Atomic Number

Example: Krypton



1. Round the Atomic Mass to the nearest whole number. \_\_\_\_\_
2. How many protons are in Krypton? \_\_\_\_\_
3. How many electrons are in Krypton? \_\_\_\_\_
4. Fill in the equations below to see the two ways you can find the number of neutrons in Krypton.

$$\frac{\quad}{\text{Number of Neutrons}} = \frac{\quad}{\text{Atomic Mass}} - \frac{\quad}{\text{Atomic Number}}$$

OR

$$\frac{\quad}{\text{Atomic Mass}} = \frac{\quad}{\text{Number of Protons}} + \frac{\quad}{\text{Number of Neutrons}}$$

### Practice

Directions: Fill in the chart using the element listed to the left.

3

**Li**

**Lithium**

**6.941**

Atomic Number	# of Protons	# of Electrons	Atomic Mass	# of Neutrons

40

**Zr**

**Zirconium**

**91.224**

Atomic Number	# of Protons	# of Electrons	Atomic Mass	# of Neutrons

26
Fe
Iron
55.845

Atomic Number	# of Protons	# of Electrons	Atomic Mass	# of Neutrons

### 3D Atom Model Rubric

**Assignment:** Create a model of a specific atom by choosing an element from the periodic table book and figuring out the number of protons, neutrons, and electrons.

	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
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\*You may use any

of the materials from your teacher left on the table with the periodic table book or you may use items from home. No food allowed.

Atomic Number	# of Protons	# of Electrons	Atomic Mass	# of Neutrons

**My  
3D  
Ato**

**m is the element:** \_\_\_\_\_

<b>Accurate Information</b>	3D Model has the correct number of protons, neutrons, and electrons.	3D Model has the correct number of nucleus subatomic particles but the electrons are wrong.	3D Model has only the correct number of electrons.	3D Model has protons, neutrons, and electrons but they are not correct.
<b>Neatness &amp; Construction</b>	3D Model is made to be durable and is very neat – no glue chunks, random jagged pieces, etc.	3D Model is durable and neat but has a few messy spots.	3D Model is neat but not durable. It falls apart easily.	3D Model is not durable or neatly made. Looks as if it was thrown together.
<b>Labels &amp; Color Coding</b>	3D Model has all of the subatomic particles color-coded and labeled with a key.	3D Model has labels but no color coding.	3D Model has color coding with no key.	3D Model isn't color coded or labeled.

**Scoring Rubric:**

## The Photographic Card Deck of the Periodic Table Challenge Cards

### Challenge Task #1

#### Play Element Go Fish

**You can discard a group of cards if they are from the same periodic table column.**

**\*Make sure to keep your hand completely hidden because the name is on both sides of the cards!**

## **Challenge Task #2**

### **Spot the Similarities**

**Pick all of the cards from a given column (group) or row and see what similar factors you can find in their physical properties: Are they all similar, or do they trend in one direction or another?**

## **Challenge Task #3**

### **Spelling Fun**

**See if you can spell words using the symbols from the different elements. For example "Oliver" can be spelled as O-Li-V-Er (Oxygen, Lithium, Vanadium, & Erbium). Lay the cards out overlapping so jus the abbreviations are visible in the right order.**





## **Atoms & Elements Review Stations**

**Station 1: The Elements: A Visual Exploration of Every Known Atom in the Universe**

1. Take the first few minutes to explore the book of elements. While looking, choose one element you would like to create a 3D model of.
2. Take a copy of the 3D Atom Rubric. Read the Rubric over with your station group. By yourself, fill in the rubric with your element's atomic information.
3. Begin creating your sketch of your model on the back of the rubric. Make sure to include a list of materials you need to complete it. This will make your actual construction go much easier.

**\*Attach your rubric by stapling it to this worksheet for credit for your work today.**

### **Station 2: The Photographic Card Deck of The Periodic Table**

Complete Challenge Task #1 with this card deck.

**Who won Go Fish in your group?** \_\_\_\_\_

### **Station 3: The Photographic Card Deck of The Periodic Table**

Complete Challenge Task #2 with this card deck.

**What groups of elements did you examine for similarities? What similarities did you find?**

### **Station 4: The Photographic Card Deck of The Periodic Table**

Complete Challenge Task #3 with this card deck.

**List all of the words you were able to create in the space below:**

**Station 5: Element Games Online**

Choose an element game to complete on the following website:

<http://education.jlab.org/indexpages/elementgames.html>