**Atomic Connections**

*\*Works well as an extension to “Watercolor Reactions” module\**

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| Big Idea |  |
| * Creating and visualizing the atoms that make up our bodies and the essential components that connect all humans helps us connect what we are learning in science to our personal lives.
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| Essential Questions  |  |
| * Which eight atoms are most prevalent in the human body?
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| * Appx. what percentage of each of those eight atoms can be found in all humans?
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| * Is there another element that you feel is essential to your existence? What is it called and what does it look like?
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| Studio Habits of Mind | Operation in lesson |
| * Envision
 | * Using what you know about atoms, envision how to use various materials to build the one you are assigned
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| * Develop Craft
 | * Using materials you may not normally use, develop craft in thoughtfully creating your atom
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| * Understand Our Worlds
 | * Consider how you and your classmates are built from the same essential components and are thus connected scientifically in more ways than you might have assumed
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| NGSS |  |
| * MS-PS1-1: Develop models to describe the atomic composition of simple molecules and extended structures.
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| National Arts Standards |  |
| * VA:Cr.7.1: Apply methods to overcome creative blocks
* VA:Cr.7.5: Apply visual organizational strategies to design and produce a work of art, design, or media that clearly communicates information or ideas
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| **Session 1: Atomic Connections** |
| Learning Goal | Assessment |
| * I can accurately represent a given atomic element in a 3-D model
 | * Students have working plans to represent all the parts of an atom in a 3-D model.
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| Materials | Preparation |
| * Dyed cotton balls
* Various colors of beads
* Pipe cleaners of one color
* Tacky glue
* Fishing line/white string
* Scratch paper for planning designs
* Pencils
 | * Draw an atom on the board for students to help label
* Write 8 main atomic elements on board with percentages present in human body
* Pre-assign elements to students so that as a class, they can “make up” a human body. *(Ex: appx 64% are given oxygen, 18 % carbon, 10% hydrogen, etc.)*
* Set out materials
* Make or find an atom example
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| Vocabulary  |  |
| * Electrons, protons, neutrons, nucleus, electron shell
 | * Atom model
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| * Envision
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| Procedures |  |
| * Teacher assigns an atom to each student as they enter room in the amount that each element exists in the human body. *Weaver note: I found it easiest to do the math ahead of time and find out how many students were 64%, 18%, (and so on) of the class and wrote that element on (x number of) notecards, letting students choose one at random as they walked in.*
* Teacher reviews the makeup of an atom and necessary vocabulary.
* Teacher discusses assignment to create 3-D atom model with various materials.
* Students get to work.
* Five minutes before clean up, students do a gallery walk and share out of what is working and not working.
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| **Session 2: Atomic Connections** |
| Learning Goal | Assessment |
| * I can refine and complete my 3-D atom model.
 | * Students thoughtfully represent a given atom by finishing a 3-D model.
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| Materials | Preparation |
| * Same materials as yesterday
* 1 notecard (or half sheet of paper) per student
 | * Set out atoms for students to grab as they walk in
* Ensure the same information is on the board that was up last session
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| Vocabulary  |  |
| * Protons, electrons, neutrons, electron shells, nucleus
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| * Develop Craft
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| Procedures |  |
| * Teacher discusses today’s goal: finish 3-D atom models. Models must be able to hang from a string with the electron shells suspended. Adjust as necessary. Students who were given hydrogen may desire to make a second atom: they may make one of the next most prevalent atoms: sodium, chlorine, or magnesium
* Students who finish early should help peers with more difficult models to build.
* If this module is being done in extension to “Watercolor Reactions”, students may begin to carefully string atoms between 2 cardboard figures covered in watercolor paintings.
* Clean up 10 minutes before the end of class.
* Before leaving, students must complete an exit ticket: On notecard (or paper): 1) If there was another element that you are made up of that is essential to your being, what is its name? 2) What does it help you do? *(Example: “****persever****ium” helps me get out of bed in the morning even if I don’t want to. “****Art****aria” instills in me the passion to continue making artwork to fuel myself.)*
* Students turn in exit tickets to teacher on way out to compile and replace in worksheet attached below.

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| **Session 3: Atomic Connections** |
| Learning Goal | Assessment |
| * I can make a mosaic representing the basic elements in my body along with elements I associate myself with.
 | * Students neatly and completely make a mosaic.
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| Materials | Preparation |
| * Mosaic activity printout (with grid) for each student.
* Cut up paper
* Glue stick
* Markers and colored pencils
* Scissors
 | * Copies of mosaic activity printout and grid
* Cut up construction paper into appx ½” squares and organize by color (need 7 colors- see worksheet)
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| Vocabulary  |  |
| * Reflect
 | * Mosaic: a work of art made up of small pieces arranged to represent something as a whole
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| * Understand Our Worlds
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| Procedures |  |
| * Pass out activity sheet and grid to each student
* Review activity: Using cut up paper, make a mosaic that represents the percentages that the 8 most prevalent atoms in the human body exist in your body. Make a border that represents 1-2 other atoms that you associate with. See activity sheet for more thorough directions.
* Students work on mosaics.
* At the end of class, 2-3 students should share how they came up with their unique border designs.
* As time and space allows, compile the mosaics into a class “quilt” and hang in hallway.
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Period: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Elements Mosaic Activity**

 We have discussed the 8 main atomic elements that make up the human body: (oxygen, carbon, hydrogen, nitrogen, calcium, phosphorus, potassium, sulfur). Today, please represent those elements by gluing small paper onto paper, in the amount that you would find them in your body. You will need to do your best estimating. See below:

**Oxygen: Blue**: 64 % *(about 64 squares out of 100 squares)*

**Carbon: Orange**: 18 %

**Hydrogen: White**: 10 %

**Nitrogen: Purple**: 3 %

**Calcium: Green**: 2 %

**Phosphorus: Black**: 1%

**Potassium: Red**: 1 %

**Sulfur: Brown**: 0.5%

**Step 1:**

 Begin your mosaic by representing the elements above. You may arrange and glue down the paper squares however you want, as long as they aren’t stacked on top of each other. Use 10x10 of the 12x12 grid attached for this part.

**Step 2:**

 Once you have completed Step 1, you must choose **at least 2** of the “new” element options below to add a border to your mosaic. Be sure to read through all the choices before choosing. To add them to your mosaic, assign each a design (ex: *orange stripes = uniquerium or blue swirls = singium*) **Add a key** to the bottom of your mosaic so I know what your border stands for.

**Choose from the following:**

**Passionaria**: the passion for doing something that doesn’t let you quit

**Beautyerium**: makes you beautiful even if you don’t feel beautiful

**Loverium**: keeps you loving others

**Uniquerium**: makes you unique

**Attitudea**: gives you attitude

**Singium**: makes you want to sing

**Sweetoothium**: makes you want to consume all the sweet things

**Profitarium**: motivates you to make money

**Sleeparium**: makes you sleepy

**Phycarium**: gives you a tendency towards physical activity

**Musicarium**: gives you musical passion or talent

**Paintarium**: makes you express yourself through painting

**Greatium:** keeps you being yourself even if you don’t feel like yourself

**Awkwardaria**: makes you feel awkward sometimes

**Laughalearium**: makes you laugh even if you don’t feel like it

**Loudarium**: you tend to be loud

**Quietarium**: you tend to be quiet

**Smileanium**: makes you smile every day

**Doodlearium**: makes you doodle on your work

**Creatarium**: keeps creativity in your mind

**Artistium:** helps you find the artist inside yourself and use it for wonderful things

**Chillarium**: keeps you chill

**Vidarium**: makes you like videos

**Depressionarium**: a release of bodily depressions flowing into the brain area

**Funlairum**: makes you funny and fun

**Lazzarium**: makes you lazy

**Petrareian**: makes all pets love you

**Rootarium:** reminds you where you came from

**Speedium**: makes you do things super fast

**Flowerium**: reminds you of how beautiful everything and everyone is

**Kinderium:** makes you kind towards others

**Energesium**: keeps you full of energy even when you’re tired

**Positorium:** keeps you positive even when you’re down

**Talkerium**: helps you speak and start conversations

**Foodarium**: makes you hungry

**Funnyarium**: this element spreads and gives laughter to others

**Independentarium**: makes you independent

**Shamelessaria**: helps you to not be afraid of mistakes

**Careium**: The constant desire to look around and help everyone even if it hurts you

*\*If you do not finish, take this (and a plastic baggy of the paper squares you need) home to finish for homework and bring back tomorrow.*

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