UBD Unit Design Template

Time Frame: 9 Weeks	Unit Title: Matter and Chemical Reactions	Course Name: 7th Grade Science

Stage 1: Desired Results

Established Goal(s)

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

MS-PS1-3 Matter and its Interactions
Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

MS-PS1-2 Chemical Reactions
Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred

MS-PS1-6 Chemical Reactions
Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes

MS-PS1-5 Chemical Reactions
Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved

Transferable Skills

Students will be able to independently use their learning to…
Develop classification systems based on similarities among varied items.
Calculate volume
Understand and convert metric units
Synthesize informational texts to describe a historic figure
Design an experiment
Test a hypothesis
Collect data and use accurate measurement techniques
Quantitatively analysis novel data
Give constructive feedback
Justifying scientific claims with evidence
Work safely in the laboratory

Meaning

Understandings

- All matter is made of atoms and that there are to date 118 different atoms that are systematically organized on the periodic table of elements.
- Density, mass and volume of matter can be measured and calculated with arithmetic.
- The metric system is the standard unit of measurement in science and recognize at least 4 metric prefixes
- Compounds are atoms of 2 or more elements joined together through a chemical process and are recognized with a chemical formula.
- Physical changes in matter only change the shape or size of the substance and only chemical changes will change the chemical composition of the substance.
- Mass is conserved in a chemical reaction; all matter is accounted for, nothing is lost.
- Students will be able to distinguish between a chemical and physical change of matter through experimentation
- Most matter is of a crystalline structure (repeating 3-d lattice pattern)

Essential Questions

- What is matter made of?
- How is matter measured?
- How were atoms/elements discovered
- How are elements classified and organized?
- How big is an atom?
- How can atoms be manipulated to create new things?
- How do atoms join together?
    - What does that look like (crystalline structure)?
- How do we know if matter has changed into something new or just changed shape?
- What evidence do we have that can support the law of conservation of mass?

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	and the formation of crystals can be affected by external conditions. ● Nanotechnology is the manipulation of atoms to design and create new materials with unique properties.	
	Acquisition	
	Students will know… ● What matter is and is not ● Weight vs. Mass ● Volume ● Density ● What is matter made of? ● Atoms ● The History of the Atomic Theory and its contributors ● What elements are ● The Periodic Table of Elements ● Synthetic Elements ● Marie Curie - Radioactivity ● Nanotechnology ● The metric system ● Compounds ● Chemical Symbols ● Chemical Formula ● Chemical Reaction ● Chemical Change of Matter ● Physical Change in matter ● Law of conservation of Matter ● Crystalline structure of Matter	*Students will be able to…* ● Measure and calculate the density, mass and volume of an object and convert those measurements within the metric system ● Organize and classify common items based on 3 characteristics ● Understand basic chemical formulas for compounds and construct 3-D models of 2-3 element compounds ● Pick appropriate units when measuring ● Distinguish between a physical and chemical change of matter ● Design an experiment ● Collect data from an experiment ● Analyze the data collected from an experiment and produce results based on this evidence ● Use a compound microscope ● Estimate size in millimeters with a compound microscope ● Construct a scientific presentation based on their own experimentation

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Stage 2: Evidence & Assessment

Evaluative Criteria	Assessment Evidence
Various assessment tools that students will be evaluated with. Ex: Argumentative Writing rubric	**Summative Assessment(s):** Typically larger assessments that coalesce various concepts and understandings, such as large projects or papers. Ex: ● Final English portfolio ● Unit test
	Formative Assessment(s): Other types of evidence that will show if students have demonstrated achievement of the desired results. This includes quizzes, tests, homework, etc. This is also a good point to consider incorporating self-assessments and student reflections. Ex: ● Exit tickets, free writes, worksheet on slope, annotations of poems

Stage 3: Learning Overview

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A suggested abbreviated progression of learning activities/timeline of the unit.

Ex:

- Day 1: brief activity/ ageda
- Day 2: