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| **Lesson Title : Sorting Trash** | **Unit #:**  **1** | **Lesson #:**  **1** | **Activity #:**  **2** |
| **Activity Title: Physical and Chemical Webquest** |

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| **Estimated Lesson Duration:** | **2- 45 minutes Periods** |
| **Estimated Activity Duration:** | **75 minutes** |

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| **Setting:** | **Classroom** |

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| **Activity Objectives:**  **Students will be able to:**  **Summarize Chemical properties, physical properties, chemical changes, physical changes, density, volume, and mass**  **Apply knowledge of physical and chemical properties to real world examples** |

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| **Activity Guiding Questions:**  **What is a physical property?**  **What is a chemical property?**  **What is a physical change?**  **What is a chemical change?**  **What is the difference between volume, mass, and density?** |

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| **Next Generation Science Standards (NGSS)** | |
| **Science and Engineering Practices (Check all that apply)** | **Crosscutting Concepts (Check all that apply)** |
| X☐ Asking questions (for science) and defining problems (for engineering) | ☐ Patterns |
| ☐ Developing and using models | ☐ Cause and effect |
| X☐ Planning and carrying out investigations | ☐ Scale, proportion, and quantity |
| ☐ Analyzing and interpreting data | X☐ Systems and system models |
| ☐ Using mathematics and computational thinking | ☐ Energy and matter: Flows, cycles, and conservation |
| X☐ Constructing explanations (for science) and designing solutions (for engineering) | ☐ Structure and function. |
| X☐ Engaging in argument from evidence | ☐ Stability and change. |
| ☐ Obtaining, evaluating, and communicating information |  |

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| **Ohio’s New Learning Standards for Science (ONLS)** |
| **Expectations for Learning - Cognitive Demands (Check all that apply)** |
| ☐ Designing Technological/Engineering Solutions Using Science concepts **(T)** |
| X☐ Demonstrating Science Knowledge **(D)** |
| ☐ Interpreting and Communicating Science Concepts **(C)** |
| X☐ Recalling Accurate Science **(R)** |

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| **Common Core State Standards -- Mathematics (CCSS)** | |
| **Standards for Mathematical Practice (Check all that apply)** | |
| ☐ Make sense of problems and persevere in solving them | ☐ Useappropriate tools strategically |
| ☐ Reason abstractly and quantitatively | ☐ Attendto precision |
| ☐ Construct viable arguments and critique the reasoning of others | ☐ Look for and make use of structure |
| ☐ Model with mathematics | ☐ Look for and express regularity in repeated reasoning |

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| **Unit Academic Standards (NGSS, ONLS and/or CCSS):**  School Standards   * 1.A.2 - Distinguish between chemical and physical properties and between chemical and physical changes. * 1.A.3 - Classify specific examples as either chemical or physical properties. Classify specific examples as either chemical or physical changes. * 1.A.6 - Classify selected elements as metals, nonmetals, or metalloids based on observations of chemical and physical properties. |

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| **Materials**: (Link Handouts, Power Points, Resources, Websites, Supplies) |

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| **Teacher Advance Preparation: Teacher should have the Webquest printed out or available to students online. Teacher should have food waste and compost sitting out for students to view.** |

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| **Activity Procedures:**  **Teacher will have the compost sitting out and will ask students if they have ever seen one before.**  **Teacher will tell students it is a compost used for breaking down food to turn it into usable soil. Teacher will ask students what a compost has to do with Biochemistry?**  **Teacher will deposit food into the compost and tell students they will revisit it in a week to see what has happened to the waste.**  **Students will complete the first half of the webquest.**  **At the end of the lesson the teacher will review with students the ideas of physical changes, chemical changes, chemical properties, density, mass, volume, and physical properties. Teacher will have a powerpoint of various chemical and physical changes and properties and will go over them as a class.** |

**Formative Assessments:** Link the items in the Activities that will be used as formative assessments.

The students will have formative assessments in two ways. First, the students will have answers on their actual web quest. Secondly, the students will have to answer in class questions about what constitutes as a chemical and physical property.

**Summative Assessments:** These are optional; there may be summative assessments at the end of a set of Activities or only at the end of the entire Unit.

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| **Differentiation:** This activity had to be modified in a few ways for different learners, First of all ELL students needed the teacher to sit down with them and go through the web quest with them. Some learners had extra time to finish the assignment as stated in their IEP. Others were still confused after we reviewed the basic terms and needed for the teacher to go over each of the terms with them. |

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| **Reflection:** The lesson was generally successful. The students were not very interested in the composter so I probably will not include that next time I do this unit. Luckily the composter ties into food waste which is something we talk about in 4th quarter. In the future I will probably do a quick powerpoint explaining the terms and them allow the students to do the webquest. Although most students would not need to talk about the terms as a class, It would be very beneficial to some students. It was beneficial to go over the concepts half way through the webquest to give students a break and also to make sure that they were understanding the content and that no misconceptions were being developed. |