

## Enhancement Activities/Strategies for Gifted/High Ability Learners: Sample SCIENCE Learning Plan

### Big Idea/ Topic

Atomic structure, chemical and physical properties and changes, periodic table

### Standard Alignment

**S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.**

- a. Develop and use a model to compare and contrast pure substances and mixtures.
- b. Develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed.
- d. Construct an argument based on observational evidence to support the claim that when a change in a substance occurs, it can be classified as either chemical or physical.
- e. Develop models by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms and simple molecules.

**S8P2. Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system.**

- d. Plan and carry out investigations on the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction), through space (radiation) or in currents in a liquid or a gas (convection).

Connections to other contents:

**ELAGSE8SL1, 1a, SL4**

### Advanced Research

**Solar Oven S'mores:**

If **Radiation** is the emission (sending out) of energy from any source, then Ultraviolet (UV) is a form of electromagnetic **radiation** that comes from the **sun**.

This task will require you to investigate, test and document the effects of the heat transferred from the sun's rays by building your own Solar Oven to cook s'mores or any other food that you desire. Take a close look at

the picture below as a *sample/example* of what you will be asked to use and build:



### Communication

Examine the items carefully and consider the questions below to help develop a plan for your Solar Oven:

- What type of box is used in the example? Does the size or type matter?
- Why is aluminum foil included? Does the type matter?
- Why is plastic wrap used? What would be another similar material to use?
- Why is a skewer included? What is its purpose?
- Is a plate necessary?
- What other supplies would be necessary?

Use a jot board or post-its to record your answers.

### Critical Thinking and Critical Problem-Solving Skills

- Does the type of plate matter? Why?
- Does the time of day affect the process of creating S'mores? Why?
- Does the location affect the process of creating S'mores? Why?
- Would you add all ingredients to the Oven at once or in stages? Why?
- What other tools might be needed to track/measure the efficiency of your Solar Oven?
- What scientific processes are occurring in the graham cracker? The marshmallow? The chocolate?

Use a jot board or post-its to record your answers.

**Creative Thinking and Creative Problem-Solving Skills**

Now that you have considered the critical points, it's time to plan, build and test out your Solar Oven. Any good scientist knows that an experiment has to be tested out more than once so...After you build your oven, you will need to test out *3 different locations* (suggestions provided but feel free to get creative). You will need to compare/contrast their effect of the S'mores in each location. Be sure to document your findings below and TAKE PICTURES to provide proof/evidence:

	<b>Location 1: Any outside location</b>	<b>Location 2: In front dash of vehicle</b>	<b>Location 3: your choice</b>
Start time			
Outside temp			
Observations/times:			
End time			
Conclusion statement:			

**Awareness of Self—Student's Well-being**

Did your Solar Oven perform as you expected? What could change/adapt to make it a better Version 2.0? If available, how can you share your knowledge/experience with other gifted learners? Compare your discoveries and collaborate safely to create a blueprint of a SUPER oven that could be used for a different item (non-S'mores or whatever you prepared).

### Use an organizer to research radiation and ultraviolet rays

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  - Why is aluminum foil included? Does the type matter?
  - Why is plastic wrap used? What would be another similar material to use?
  - Why is a skewer included? What is its purpose?
  - Is a plate necessary?
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Did your Solar Oven perform as you expected? What could change/adapt to make it a better Version 2.0? If available, how can you share your knowledge/experience with other gifted learners? Compare your discoveries and collaborate safely to create a blueprint of a SUPER oven that could be used for a different item (non-S'mores).