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| Unit Title: | Solar Thermal |  | Grade: | 8-12 |

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| Learning Styles: | All students have different learning styles, and we are using a mixture, based on seven recognized learning styles: Visual, Aural, Verbal, Physical, Logical, Social and Solitary. We believe this module incorporates different learning styles and that vicarious learning on the part of a student is critical for growth. Learning styles in this module include:  •Visual: Pictures and images used  •Verbal: Words to help convey meaning  •Social: Students should discuss |
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| Unit Description: | The Solar Thermal unit will examine the basic theories of heat transfer and apply these principles to Solar Thermal systems and their uses. The module will describe residential systems and how they are currently used. |
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| Instructional Objectives: | The curriculum is designed to achieve the following objectives for each Individual area.  Solar Thermal Introduction  1. Solar thermal defined  2. Insolation maps  3. Different types of solar, active and passive  Solar Thermal Basics  1. Collectors  2. Active solar  3. Types of systems  4. Open and close loop  5. Heat transfer  Passive Solar  1. Design basics  2. Sun paths  3. Control mechanisms  4. Different systems |
| Estimated Time: | 6-10 hours depending on students |
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| Teaching Strategies: | Lecture: Present materials in a structured manner.  Active Learning: Promote active learning and critical thinking in discussion. Seek from students in discussion real-life applicability for the use of renewable energy resources and the concepts provided. |
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| Assessments: | At the end of each power point have the students answer questions based on the power point. At the end of the module create an assessment combining the three power points which the student can demonstrate basic knowledge of the subject. The assessment should be based upon discussions and power points. |
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| Instructional Outcomes: | The outcomes for this unit include:  1. The student will discuss terms related to solar thermal.  2. The student will compare different collectors.  3. The student will explain heat transfer for solar thermal.  4. The student will define active systems.  5. The student will define passive systems.  6. The student will explain basic controls in active and passive.  7. The student will summarize design concepts in active and passive.  8. The student will discuss relevant terms associated with the sun.  9. The student will define solar thermal.  10. The student will compare different applications. |

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