Colorado CTE

Energy Efficiency & Environmental Technology (2015): Grades 9, 10, 11, 12, Higher Education

Adopted 2015

Understand and analyze the environmental impact of energy production and use and the effect of efficiency on energy demands. EEET.01

01. **Understand energy resources and the effects of these resources and systems on the environment.** EEET.01.01
    a. Classify various conventional energy resources by depletable, nondepletable, renewable, and nonrenewable type. EEET.01.01.A
    b. Research the new and emerging energy resources. EEET.01.01.B
    c. Differentiate the advantages and disadvantages of energy resources in terms of their effects on the environment. EEET.01.01.C

02. **Understand the environmental implications of energy conversion processes and energy transmission systems.** EEET.01.02
    a. Map energy conversion processes and energy transmission systems as they relate to activities across the environment. EEET.01.02.A
    b. Explore the basic terms, characteristics, and concepts of physical and chemical processes related to components and systems operations and maintenance in energy conversion and transmission systems. EEET.01.02.B
    c. Identify the basic gas, electrical, and electronic terms, units, definitions, and concepts in energy conversion and transmission systems. EEET.01.02.C
    d. Compare the influences of three different energy conversion processes and energy transmission systems. EEET.01.02.D
    e. Identify the basic principles of energy systems: chemical, hydraulic, pneumatic, electrical, nuclear, solar, wind, and geothermal. EEET.01.02.E
    f. Identify basic energy production systems and components, including the main components and system flow-paths in energy conversion and transmission systems. EEET.01.02.F

03. **Understand the applications and environmental effects of energy extraction processes, energy conservation systems, and energy storing systems.** EEET.01.03

- a. Know the common energy extraction processes, energy conservation systems, and energy storage systems. EEET.01.03.A
- b. Understand the environmental implications of energy conservation principles related to energy extraction processes, conservation systems, and storage systems. EEET.01.03.B
- c. Understand the pragmatic applications of energy extraction processes, energy conservation systems, and energy storing methods. EEET.01.03.C
- d. Apply the structure of the atmosphere to Earth's weather and climate. EEET.01.03.D
- e. Evaluate the causes and effects of climate change. EEET.01.03.E
- f. Describe the types and effects of water, air, and soil pollution and how their quality affects biodiversity. EEET.01.03.F
- g. Describe ecological responses to environmental change. EEET.01.03.G
- h. Discuss environmental laws, ethics, and policies. EEET.01.03.H
- i. Relate environmental issues to population and economic growth. EEET.01.03.I

04. **Understand the physics of energy movement.** EEET.01.04

- a. Define Temperature, sensible vs. latent heat, heat loss and gain. EEET.01.04.A
- b. Explain conduction, convection and combined conduction-convection. EEET.01.04.B
- c. Discuss forced convection versus natural convection. EEET.01.04.C
- d. Define radiation heat transfer. EEET.01.04.D
- e. Explain the operation of heat exchangers. EEET.01.04.E
- f. Discuss heat transfer as it applies to heating, ventilation, air conditioning and refrigeration (HVACR). EEET.01.04.F
- g. Relate physics of heat to structural heat loss and infiltration principles. EEET.01.04.G

05. Analysis and application of energy saving techniques. EEET.01.05

a. Apply knowledge of energy use and efficiency to real life situations. EEET.01.05.A

b. Compare different building materials and techniques to achieve the most efficient structure. EEET.01.05.B

c. Analyze the impact of structural energy saving features such as windows, doors, and insulation on the overall energy use. EEET.01.05.C

d. Identify alternative energy applications that apply to real life situations. EEET.01.05.D

e. Critique the effectiveness of Energy-saving and water-saving appliances. EEET.01.05.E

f. Analyze Heating and cooling (HVAC) equipment and systems on energy efficiency. EEET.01.05.F

g. Apply knowledge of energy use, conservation and efficiency to real life situations. EEET.01.05.G