Components of Energy Literacy

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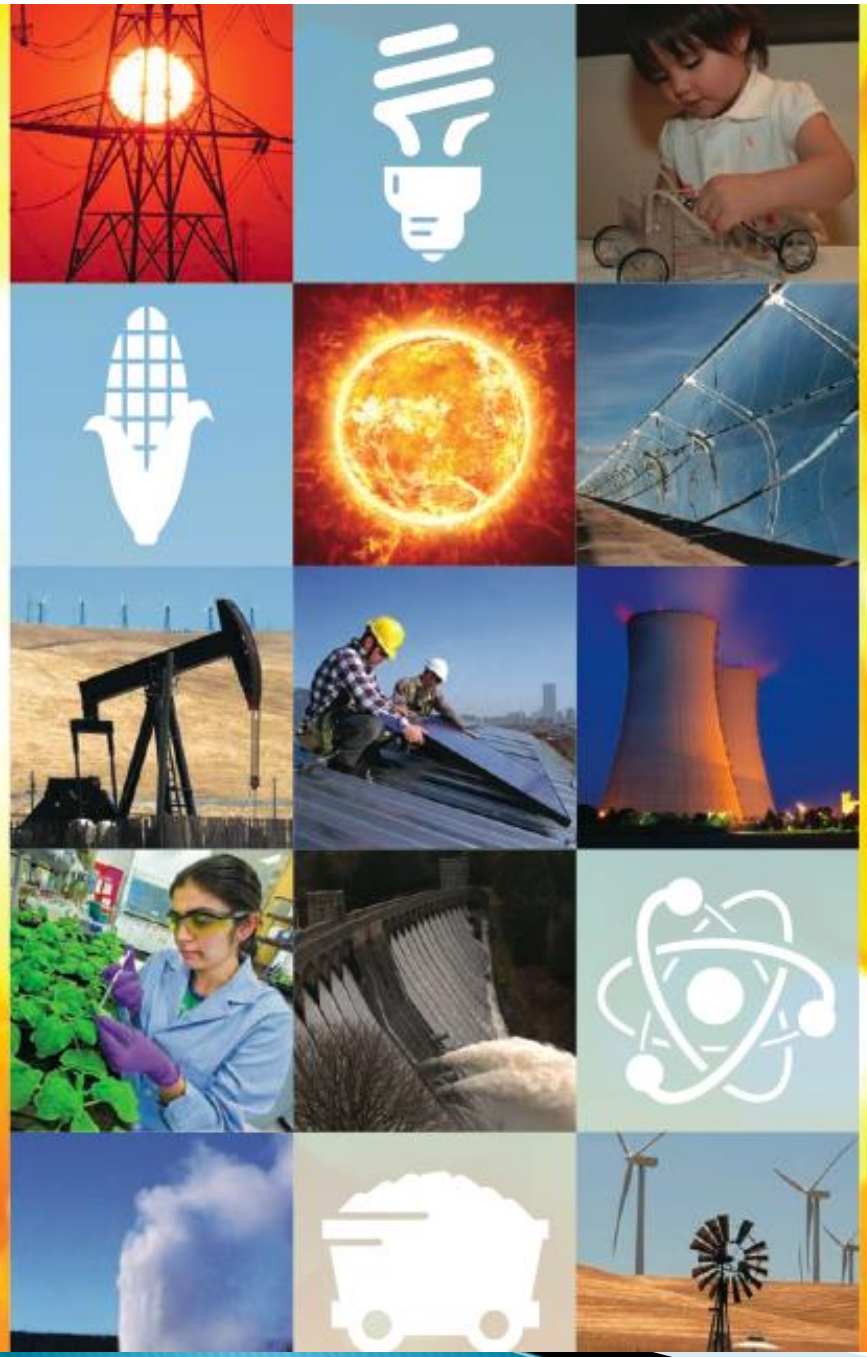
-Based on-

Department of Energy (2017). Energy Literacy: Essential Principles and Fundamental Concepts for Energy Education



Energy Literacy

Essential Principles and Fundamental Concepts for Energy Education

What is energy literacy?

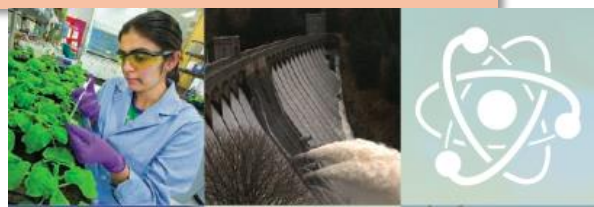
- An understanding of the nature and role of energy in the universe and in our lives.
- The ability to apply this understanding to answer questions and solve problems.

An energy-literate person:

- Can trace energy flows and think in terms of energy systems
- Knows how much energy he or she uses, for what, and where the energy comes from
- Can assess the credibility of information about energy
- Can communicate about energy and energy use in meaningful ways
- Is able to make informed energy and energy use decisions based on an understanding of impacts and consequences
- Continues to learn about energy throughout his or her life

Energy Literacy is a Part of Social and Natural Science Literacy

- A comprehensive study of energy must be interdisciplinary.
  - Energy issues cannot be understood and problems cannot be solved by using only a natural science or engineering approach.
  - Energy issues often require an understanding of civics, history, economics, sociology, psychology, and politics in addition to science, math, and technology.
  - Just as both social and natural science are a part of energy literacy, energy literacy is an essential part of being literate in the social and natural sciences.
- References to energy can be found in National Education Standards in nearly all academic disciplines.



Why Does Energy Literacy Matter?

A better understanding of energy can:

- Lead to more informed decisions
- Improve the security of a nation
- Promote economic development
- Lead to sustainable energy use
- Reduce environmental risks and negative impacts
- Help individuals and organizations save money

Principles of Energy Literacy

1. Energy is a physical quantity that follows precise natural laws.

2. Physical processes on Earth are the result of energy flow through the Earth system.

3. Biological processes depend on energy flow through the Earth system.

4. Various sources of energy can be used to power human activities, and often this energy must be transferred from source to destination.

5. Energy decisions are influenced by economic, political, environmental, and social factors.

6. The amount of energy used by human society depends on many factors.

7. The quality of life of individuals and societies is affected by energy choices.

Energy is a physical quantity that follows precise natural laws.

Some Attributes:

- Can be transferred from system to system.
- The energy of a system or object that results in its temperature is called thermal energy.
- Can neither be created nor destroyed.
- Energy available to do useful work decreases as it is transferred from system to system.
- Comes in different forms and can be divided into categories.

Physical processes on Earth result from energy flow.

Some attributes:

- Sunlight, gravitational potential, decay of radioactive isotopes, and rotation of the Earth drive physical processes on Earth.
- Earth's weather and climate are driven by energy from the Sun.
- Water plays a major role in the storage and transfer of energy.
- Greenhouse gases affect energy flow.

Biological processes depend on energy flow through the Earth system.

Some attributes:

- The Sun is the major source of energy for organisms and the ecosystems of which they are a part.
- Energy available to do useful work decreases as it is transferred from organism to organism.
- Energy flows through food webs in one direction, from producers to consumers and decomposers.
- Humans are part of Earth's ecosystems and influence energy flow through these systems.

Various sources of energy are used to power human activities. Often must be transferred from source to destination.

Some attributes:

- Humans transfer and transform energy from the environment into useful forms.
- Fossil and biofuels are organic matter that contain energy captured from sunlight.
- Humans transport energy from place to place.
- Humans generate electricity in multiple ways.
- Energy sources, storage, and transport forms each have different benefits and drawbacks.

Energy decisions are influenced by multiple factors

- Decisions concerning the use of energy resources are made at many levels.
- Energy infrastructure has inertia.
- Energy decisions can be made using a systems-based approach.
- Energy decisions are influenced by
  - Economic factors
  - Political factors
  - Environmental factors
  - Social factors

Many factors influence the amount of energy we use.

Examples:

- Human demand for energy is increasing.
- Earth has limited energy resources.
- The amount of energy used is affected by:
  - Social and technological innovation
  - Behavior and design
- Products and services carry with them embedded energy.
  - Life cycle analyses important.
- Amount of energy used can be calculated and monitored.

Energy choices affect the quality of life of individuals and societies.

- Impacts include
  - Economic security
  - National security
  - Environmental quality
  - Health
  - Socioeconomic status
  - Global partnerships
- Supply and demand for fossil fuels especially important.
- Some populations more vulnerable to impacts of energy choices than others.

To learn more

- Contact:

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  Washington, DC 20585
  202-586-5000

  https://www.energy.gov/energysaver/energy-literacy-essential-principles-energy-education