

ECO

**World
Savers**

G4003

WORLD

ENERGY ISSUES

Activities To Build Awareness & Understanding



Liz Foxwell and Les Ray

Acknowledgements

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WORLD ENERGY ISSUES

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Teacher's Guide & Planning**The Key Issues**

- Energy is found everywhere, from the sun's rays, a bolt of lightning or sound.
- Energy can be stored (potential) or moving (kinetic). Sometimes energy moves from one state to the other.
- There are various forms of energy; these include heat, light, radio waves, sound, electricity and mechanical energies.

Additional Activities**Language**

- Describe what it would be like to live in a house without electricity.
- Feel the warmth of the weather today, e.g., a summer's day. Describe it and then describe the opposite i.e., a winter's day.

Maths and Science

- Experiment to find out what makes a good conductor of electricity.
- Record the outside temperature for seven days. Graph this. What is the best form of recording?
- Measure your pulse before and after exercise. What happens and why?
- Experiment with plants. What happens if you deprive a plant of heat or light energy? Why?

Art and Humanities

- Find out about how the light bulb has changed over the years.
- Create a 'mood board' about light. How do you feel in different kinds of light?
- Use a rainbow to describe feelings. Say how you feel about each colour.

Research

- Research what happens to particles as substances get hotter.
- Research five different vehicles and their energy sources.
- Find out in what units energy is measured.
- Research all the different ways to heat a house.

More Information

Answers:

Stored (potential) energy	Moving (kinetic) energy
plants, barrel of oil, sun, streetlight, battery.	Rollercoaster car downhill, windmill, water wheel, a man running, an apple falling from a tree.

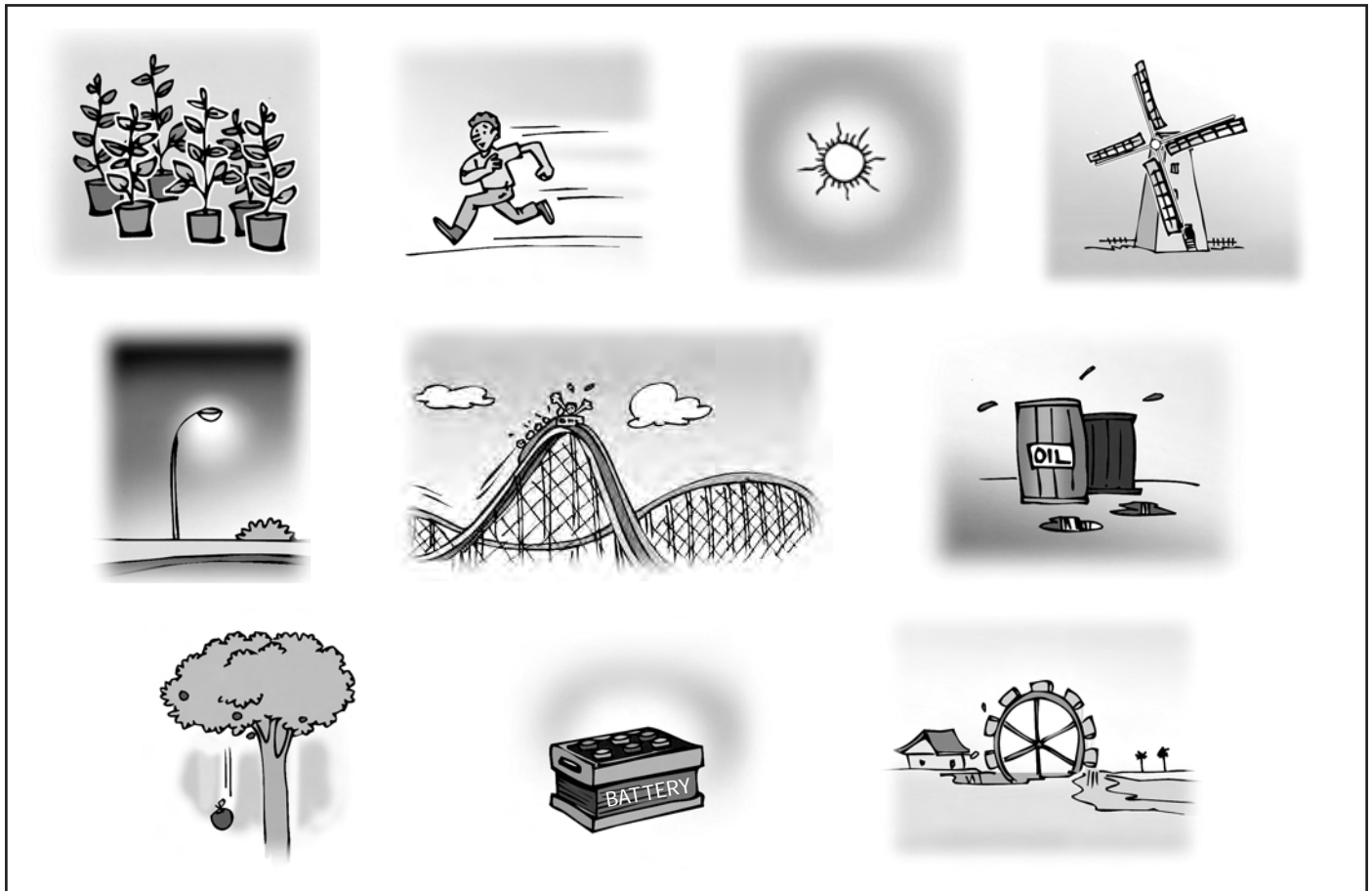
WORLD ENERGY ISSUES

What Is Energy?

We use energy for everything we do. We use energy to do work.

1. **Stored energy is called potential energy.**
2. **Moving energy is called kinetic energy.**

• Look at the pictures. What kind of energy do they use? Put them in the correct box.



Stored (potential) energy	Moving (kinetic) energy

WORLD ENERGY ISSUES

Why We Need Energy

Teacher's Guide & Planning

The Key Issues

- All living things need energy for warmth, growth, repair, reproduction and movement.
- Energy for use by humans has been developed in many ways.

Additional Activities

Language

- Create an energy ABC.
- Write a letter to someone in another country telling them how you use energy.
- Write a list of all the different ways you use energy in a week.

Maths and Science

- Make a bar chart of the different ways that you and some friends use energy in one day.
- Find out where oil comes from and how it is distilled.
- Calculate how many joules you use up in one day.

Art and Humanities

- Survey the item that most people would miss if they did not have electricity.
- Make a story board showing someone using energy. Describe the processes involved.

Research

- Research the different uses of electricity in your area.
- Find out what a joule is and how much you need in a day.
- Research an area in the world that has little or no electricity. How do people create heat and light to live?

More Information

Humans use energy everyday by walking, running, swimming, eating, and keeping themselves warm. Plants make their food out of the sunlight and they also make oxygen, which we need to breathe (photosynthesis). They also use carbon dioxide and so help prevent global warming. The sun is also responsible for the weather – influencing the wind and rain. We all need energy, but we also have to learn how to save it, or we will be using too many of the earth's resources and also spoiling our environment.

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Why We Need Energy

Energy can be found in a number of different forms in the home.



- Look at the pictures. What kind of energy do they produce?

- Look around you at all the things that use heat energy to power them. Write about which two you would not want to lose and say why.

- Scientists talk about six different kinds of energy. These are:

Chemical energy
Electrical energy
Heat (thermal energy)
Light (radiant energy)
Mechanical energy
Nuclear energy

- Find an example of each for the chart.

Teacher's Guide & Planning

The Key Issues

- Energy can change from one form to another, but it is never used up.
- Using energy efficiently is a responsible use of the energy source.
- There are different types of energies including chemical, electrical, radiant and mechanical.

Additional Activities

Language

- Write notes for a speech. Explain what energy efficiency means in the fewest words.
- Write a diary of all the times you move or use mechanical energy in a week.
- What kinds of movement use more energy?

Maths and Science

- Discuss what is meant by 'healthy food'. Analyse what a child eats during the day. Decide what is healthy or not and why.
- Count and list the items you notice that use chemical and mechanical energy.
- Find out and give an example of what radiant energy is.

Art and Humanities

- Make a display to show the food cycle and how energy gets recycled.
- Create a diagram to show what time the sun rises and sets in your area. Would this be the same if you chose another country from a map? Why?
- Consider what happens in countries in the far north where for some times of the year they have more darkness than sunlight. What would it be like to live there?

Research

- Find pictures in magazines to illustrate the six different types of energies.
- Find out how people collect the sun's radiant energy effectively. How does this save energy for us?

More Information

Energy efficiency means changing or moving the most matter with the least amount of energy.

- Electrical energy is the flow of charged particles called electrons or ions.
- Chemical energy is that which is stored in molecular bonds.
- Radiant energy involves light.
- Kinetic energy is when something is moving.
- Mechanical energy is the way we describe gears or engines.
- Thermal energy is what we describe when heat is involved.
- Potential energy is like energy-waiting-to-happen.

WORLD ENERGY ISSUES

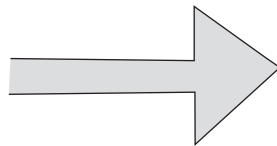
Energy Can Change From One Form To Another

Energy can be changed from one form to another, for example solar energy into electricity, but it can never be used up.

- Explain what happens to energy in the pictures below.



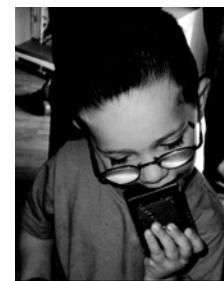
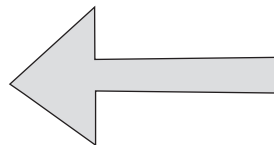
Radiant energy from the sun



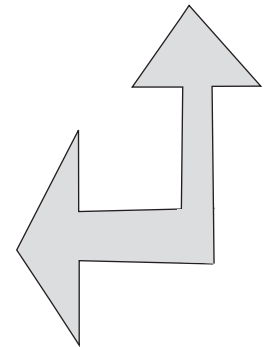
Chemical energy
Plants use solar energy to make vitamins



Mechanical energy
Healthy food gives you energy



Chemical energy
The energy in food is passed to you



- How have you used energy today? Where could you use it more efficiently?

WORLD ENERGY ISSUES

Making Use Of Energy

Teacher's Guide & Planning

The Key Issues

- The sun is the main source of energy.
- Solar energy is also called radiant energy. It is a good example of renewable energy.
- There are advantages and disadvantages of using solar energy.

Additional Activities

Language

- Describe how it feels when the sun shines on you.
- Imagine a land without the sun to heat it up. What would it look like? How would it feel? Invent a name for the place and then write a story about life in it.

Maths and Science

- Make temperature charts from places in each continent. What are the differences? Which would be the best places to make use of solar power? Why? Which would be the worst places? Why?
- Find out how a solar panel works and draw and label it.
- What is the difference between UV and infrared rays? Why can the sun's rays be dangerous to the human skin? What can you do to stop this?

Art and Humanities

- Which is the sunniest country in the world? How does your country compare?
- Find out about how solar power might be produced. Write a description of the process from catching the sun's rays to the production of power.
- What other forms of renewable energy are there? Why is it important to use them?

Research

- What is a photovoltaic cell? Find as many ways of converting the sun's energy as you can.
- What is a 'greenhouse gas'? How does using renewable energy help to prevent this?

More Information

The sun gives off a huge amount of energy every day and we should be making use of this source of renewable energy. Solar energy results when we collect the radiant energy from the sun. This energy can then be converted into heat or electricity after being collected via a solar collector. If the solar collector is a plant we call these solar thermal plants. If it is collected into a solar panel we call this a photovoltaic cell. Energy is measured in joules.