CHAPTER 2: Energy in our Lives

Aims	The aims of this chapter are for children to become aware of a range of energy sources and to introduce the concepts of renewable and non-renewable energy sources.
Overview of Chapter	This chapter introduces the children to the concepts of renewable and non-renewable energy and focuses on sources of renewable energy. Wind energy is explored and children have the opportunity to design and make a land yacht.
Working Scientifically Skills	In this chapter the children will be applying and developing the following working scientifically and designing and making skills: • Observing • Predicting • Investigating and experimenting • Measuring • Recording and communicating • Designing and making: exploring, planning, making and evaluating
Primary Science Curriculum link	Strand unit: Heat; forces; properties and characteristics of materials; magnetism and electricity

Lesson 1 – Sources of energy

Resources

IWB 3 / PowerPoint 3: Guzzler at home

IWB 4 / PowerPoint 4: Guzzler going for a walk

IWB 5 / PowerPoint 5: Guzzler sun bathing

IWB 6 / PowerPoint 6: Guzzler doing his homework in front of coal fire

IWB 7 / PowerPoint 7: Guzzler doing his homework in front of gas fire

IWB 8 / PowerPoint 8: Guzzler doing homework in front of a radiator

Activity type: Discussion

Use **IWB activities 3 – 8** to promote discussion about different sources of energy.

If you do not have access to an IWB, use **PowerPoints 3-8** to discuss different sources of energy with your class.

Questions to promote discussion

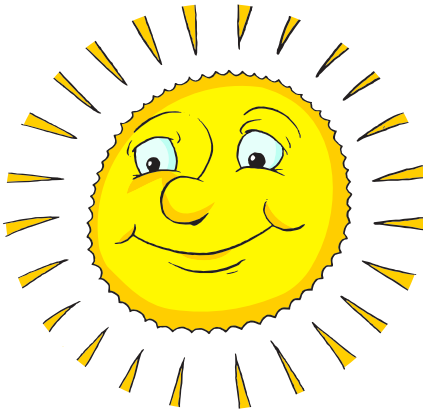
- Guzzler at home – what is happening in the picture? How do you think Guzzler feels? What should he do? why?
- Guzzler is going for a walk, it is windy – what is happening in the picture? How would he feel? Why is Guzzler cold?
- Guzzler sun bathing – what is Guzzler doing? How would he feel? Why is he hot?
- Guzzler is doing his homework in front of the fire – can you tell what is in the fire?
- Guzzler is doing his homework in front of a fire – what fuel is being used to run this fire? *(it is an enclosed gas fire)*
- Guzzler doing his homework in front of a radiator – what is making Guzzler warm?

Lesson 2 – Renewable and non-renewable energy (i)

Resources PCMs 3, 4, 5, 6: Pictures of renewable and non- renewable energy (sun, wind, coal and oil)

Teacher note: The key concept in this activity is that some sources of energy are permanent and long lasting (*renewable* - e.g. wind and solar) but other sources, such as coal and oil can only be used once and there is a limited supply of them (*non-renewable*).

Activity type: Game



This activity is a whole class musical chairs style game; you will need a space free of chairs and tables (e.g. PE hall).

1. You are provided with PCMs of pictures representing coal, oil, sun, wind. For a class of 30 children print out:
   - Sun x 5
   - Wind x 5
   - Coal x 10
   - Oil x 10
2. Scatter the PCMs around the room. Ask each child to stand on a picture and remember the picture on which they are standing. Explain that the pictures on which they are standing represent different sources of energy that we can use to produce energy for our homes.
3. Explain to the class that when you (the teacher) clap your hands, they must walk around the pictures and when you clap your hands again they must find a picture to stand on.
4. As the children walk around the room remove some of the coal and oil pictures only. When you clap your hands again, like musical chairs, the children should try and find a picture on which to stand. Repeat this step until only the sun and wind pictures remain.
5. When each child is removed from the game, ask them to sit down and give them one of the coal or oil pictures.
6. By the end of the game only children with the 5 sun and 5 wind pictures should be left standing. The class will be split in two teams: one team of non renewables (sitting down) and one team of renewables (standing).
7. Ask the class to hold up the pictures they have and conduct a whole class discussion on what the class think happened in the game.

Questions to promote discussion

1. What happened in the game?
2. What do you think is the difference between the two teams?
3. Why do you think one team is still standing and the other team sitting down?
4. Is there a difference between the different types of energy? What is it?

Lesson 3 – Renewable and non-renewable energy (ii)

Resources	IWB 9 / PowerPoint 9: Renewable and non-renewable sources of energy PCM 7: Renewable and non-renewable energy Scissors

Activity type: Discuss and sort

Use **IWB 9: Renewable and non-renewable sources of energy.**

If you do not have access to an IWB use **PowerPoint 9.** Photocopy one copy of **PCM7** per pair of children and ask them to cut out the pictures. They must group the pictures into two groups: renewable and non-renewable sources of energy.

Discuss the choices the children made. It is important to encourage the children to justify reasons for their choices (i.e. why they classified a particular energy source as either a renewable or non-renewable source).

Thinking about all three lessons: what have we learned?

Questions to promote discussion

1. In the picture where Guzzler is sun bathing - How do you think Guzzler was feeling? What was making him hot? Do you think the sun's heat would ever run out? Why?
2. How about in the other pictures where Guzzler was sitting beside sources of heat *(coal, gas, and oil used to fuel his radiator)*. Do you think the heat from the fires or the radiator could ever run out? How might they run out?
3. Do you think we could use the sun's energy and the wind to heat our houses? How could we do this?

Lesson 4 – Design and make a land yacht

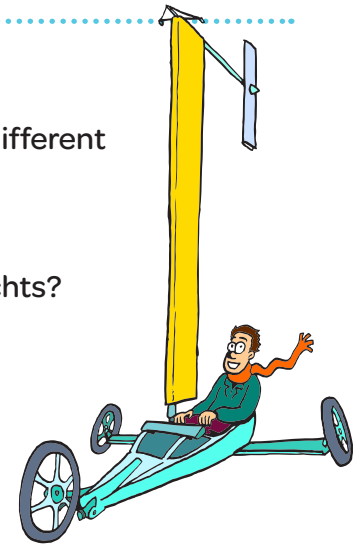
Resources

IWB 10 / PowerPoint 10: Land yachts

Some materials that could be used to make the land yachts: Straws, balloons, paper plates, tissue paper, paper, fabric, masking tape, wheels and axles, lollipop sticks, match-sticks, skewers, pipe cleaners, cellotape, glue, blu-tack, scissors, box of wheels, spools.

If your class requires additional information to build a land yacht or a balloon buggy refer to the book **The Energy File: How to make a land yacht/balloon buggy (pages 6 and 8).**

Activity type: Design and make



Using **IWB 10/ PowerPoint 10** show your class the illustrations of the different land yacht designs. Discuss the features of the land yachts.

Questions to promote discussion

1. What are the similarities and differences between these land yachts?
2. How do you think they move?
3. What materials are they made from?
4. Where do you think these land yachts get their energy to move?
5. How do you think a land yacht uses energy?

Exploring

Discuss criteria the children think would be important for making a land yacht. Record children's ideas and then select 3 or 4 criteria that all children must take into account when designing their land yachts.

For example

It must travel a set distance (30 cm)

It must have a sail

It must be able carry a certain weight e.g. €2 coin

Show the children the materials that are available to them to make the land yacht.

Planning and Making

In groups children discuss their designs and make a detailed drawing of their land yacht design. They then make their yachts.

Teacher note: Photograph the designs of each group at various stages in the design process. This can be used to make a class/ group collage.

Evaluating

Provide each group with the opportunity to present their designs and finished land yachts to the rest of the class. Encourage them to discuss their designs and whether or not their land yachts met the criteria outlined at the beginning.

Questions to promote discussion

1. Did you follow your original design?
2. Did you encounter any difficulties?
3. How did you overcome these?
4. What do you like most about your land yacht?
5. If you were to make another land yacht is there anything you would change?
6. How do you think you could make your land yacht move faster?
7. What kind of energy do land yachts use? *(wind)*
8. Is this renewable or non-renewable energy? *(renewable)*