

# Teaching Pack



[www.MyFriendBoo.com](http://www.MyFriendBoo.com)

The Energy Strand of My Friend Boo was produced by the YES project with the support of the Intelligent Energy Europe Program.



Business Solutions Europa



# Index

A fun and stimulating way to teach children aged 5-8 years old about the importance of energy	4
Common Words and Phrases	6-7
Lesson 1 - Energy Conservation 'Switch it Off'	8-18
Lesson 2 - Renewable Energy 'The Three Alternatives'	19-26
Lesson 3 - Transport 'On Your Bike'	27-35
References and Further Information	36

# Acknowledgments

We would like to thank a number of people for their collaboration in producing this teaching pack.

Many thanks to the following Children's Museums for their support and translation of this material:

- **Explora, the Children Museums of Rome - Italy**
- **Technopolis®, The Children's Science Centre, Mechelen - Belgium**
- **Artland in Sofia - Bulgaria**
- **ParkMiniatur, Łódź - Poland**
- **Imaginosity Dublin Children's Museum - Ireland**

We are particularly grateful to the teachers and children of the participating schools who have been fantastic in taking time to review the episodes of the energy strand, test the teaching pack, and help with providing with their feedback along the project:

- **166° circolo didattico 'Antonio Gramsci', Rome - Italy**
- **Sint Jozefsschool Eizer, Overijse - Belgium**
- **St. Patrick's Girls National School, Dublin - Ireland**
- **Primary School 152 'Elizy Orzeszkowej' , Łódź - Poland**
- **Primary School 120 'Georgi Stoikov Rakovski' , Sofia - Bulgaria**

Many thanks to all the partners of the project YES and all those who have provided with their support and ideas to realise this exciting project.

The YES project coordinator

# A fun and stimulating way to teach children aged 5-8 years old about the importance of energy

Energy provides us with so many of the things we depend upon in life; it underpins all of our economic activities as well as our leisure pursuits. By the year 2050, world-wide energy demand is projected to be at least twice today's level. This is why to meet this demand energy supply must be sustainable, and diverse, and the energy we have should be used more efficiently.

My Friend Boo is a fun-filled, animated series supported by the European Commission. The aim of the series is to help young viewers aged 5-8 years old to understand some of today's most important world issues like **energy**, the environment and conservation and health. These are some of Europe's most pressing issues but they are often too complicated and just too gigantic for young people to identify with, or to understand.

The My Friend Boo Energy strand takes young viewers on three amazing journeys to learn about some of the fundamental issues surrounding energy resources and consumption. The strand has been produced by the Young Energy Savers (YES) project with the support of the European Commission's Intelligent Energy Europe Programme. The episodes have been produced by a team of independent conservation, pedagogic, communication and animation experts who have worked with focus groups of over 500 children from Belgium, Bulgaria, Ireland, Italy and Poland to produce the three energy-themed adventures:

- **'Switch It Off'** - helps children understand the importance of saving energy
- **'The Three Alternatives'** - shows children that there are a number of different and clean sources of energy
- **'On your Bike'** - shows children that a car is certainly not the only way to travel

The series does not preach. The goal is to use imagination, comedy, adventure and magic to educate and empower children, giving them the knowledge they need to understand energy issues and practical information to inspire them into action and to become more energy intelligent.

We hope Boo, his friends and his inspirational stories reach and motivate millions of European children. The series will be broadcast on TV networks and channels across Europe in several languages and will also be available for educators to download via [www.myfriendboo.com](http://www.myfriendboo.com). This complementary teaching pack has also been developed to accompany the energy strand episodes of the My Friend Boo series. This pack is intended for educators to use alongside the three episodes and can be used both in classrooms and in non-formal educational settings with or without audiovisual support (storyboards are provided for educators who may not have access to audiovisual material).

It provides background information about the issue of energy for educators and provides tasks and exercises to set the issues tackled in the episodes into context for our young viewers.

We hope that this new and fun resource, in some small way, encourages educators and pupils to think about how they can, even with everyday gestures, make a difference to their worlds and the wider world around them. And we hope in turn that their families and friends can too!

Enjoy!

# About energy

In general, 5-8 year old children don't yet understand what energy actually is. Many do not know where the heating or lighting in their homes really comes from, most are not familiar with the consequences of using too much energy even if they may have heard those around them talking about the importance of saving energy. For children, these issues need to be explained and put into a context that they understand...

The following general information provides educators with some helpful background for use when introducing the issue of energy awareness and conservation to children and introducing the *My Friend Boo* series in the classroom. It is important to set the scene and introduce some basic concepts before watching the episodes even if many of these issues are explained in the episodes and clarified in the subsequent activities.

The information can either be introduced directly by the educator, used in a Q&A session or you may choose to use the information in a more creative way. Either way, we hope you find it useful.

## *What is energy?*

As humans we obtain our energy from the food we eat. Bread, meat, fruit or drink milk or juice- all food contains energy. Our bodies convert food into energy that we use when we walk, run, play or sleep. Even when we aren't doing anything we use energy. We can't do anything without it.

You and I need food energy in order to function and stay alive. Lots of machines use fuel or electricity to run and to work properly. The fridge, the TV set, lights, heating, the cooker, the oven, cars, games consoles, computers, and lots of other appliances all fuel or electricity for their energy.

Using energy to power machines seems simple. All it takes is the flick of a switch to turn on your light night or switch on your TV, DVD player, console or mp3 player. At home, your parent or guardian just needs to twist the knob on the oven to make you your meal.

But the energy we use needs to come from somewhere....

## *Where does energy come from?*

Energy comes from lots of different places. Machines, appliances and lights at home use electricity, and this can be produced in lots of different ways including using the light from the sun, the wind or by burning coal or gas. It is also possible to heat a house using some of the heat that comes from the sun, natural gas, or even wood.

## *Where can you buy energy?*

We get our food energy from the supermarket or the market and buy different types of food, or we can even grow our own fruit and vegetables in the garden. When we need electricity or gas we can buy energy in its different forms from companies that specialise in producing and selling energy (*energy providers*) They will then deliver it straight to your house through cables and pipes in the air or under the ground, in the form of electricity (for example to power the TV) or gas (to heat the house or power the oven). Each month a bill arrives which tells you how much you need to pay. Cars and buses need energy to work too, so their drivers need to go to a petrol station to buy petrol or diesel which will power their engines. These days you can even choose which kind of energy you want and where it comes from. More about this later...

# Common Words and Phrases

*In the episodes, characters may use words that children might not always understand. Please find below definitions of the more complicated words and concepts, this might help you explain them to children. For each word, it is indicated in which episodes it is used:*

**Energy** (*all episodes*) is the power to do any kind of activity; it is essential for life. Energy is not only necessary for humans, but also for plants and animals.

Lots of things we use in our daily lives also need energy to function; the lights at school, the oven for warming up your meals, the bus or car for getting to school or work.

**Renewable Energy** (*The Three Alternatives*) is all energy that is produced from everlasting sources like the sun, the wind, or the oceans; as the sun or the wind will always be available, renewable energy will never run out. In addition, renewable energy is clean and neither its production nor its use pollutes the environment.

**Solar Energy** (*The Three Alternatives*) is the light and heat that come from the sun. The light and heat from the sun not only make the plants grow, but can also be used by humans to produce electricity or to warm up the water in your house.

**Wind Power** (*The Three Alternatives*) is the energy produced by the movement of the air. When the wind blows it generates movement that is captured by wind turbines and turned into electricity.

**Sea Power** (*The Three Alternatives*) - The seas and the oceans are also a source of energy. The movement of the waves in the sea or the tide can be captured and used as well to produce electricity.

**Wind Turbine** (*The Three Alternatives*) is a huge tower with blades; when the wind makes the blades turn, this movement produces electricity.

**Solar Panel** (*The Three Alternatives*) is a board generally placed on the roof of a house or in any other place that is exposed to sunlight that soaks up the sunlight that is then converted to use it to produce electricity. Solar panels can also be used to capture that heat from the sun and warm the water we need for our homes.

**Electricity** (*The Three Alternatives*) is what powers the light in your house or runs everyday appliances, such as the fridge or the TV. It is produced through solar energy, wind energy or by burning fossil fuels.

**Fossil fuels** (*The Three Alternatives and On Your Bike*) are materials, such as coal or oil. They were formed millions of years ago with the organic remains of animals and plants. They are nowadays used to produce energy; however, when the existing reserve has been used up fossil fuels will be gone forever.

**Coal** (*The Three Alternatives*) is a black or brown rock and is very dirty. Coal is burned in huge power plants and turned into electricity. Burning coal is however extremely bad for the environment because when it burns gases such as carbon dioxide are released into the environment.

**Oil** (*The Three Alternatives*) is a black liquid that you normally find under the ground or under the sea. Oil is processed to make many products such as fuel for cars or even chemicals, paints and plastics. It is very polluting and bad for the environment. When oil is burned it gives off gasses such as carbon dioxide, which is released into the environment.

**Bike lane** (*On Your Bike*) is a part of the road that is reserved for bicycles only. You can generally easily recognise a bike lane because it is separated from the main road by a line on the ground and often the symbol of a bicycle is painted on the lane. Bike lanes ensure that cyclists can pedal safely and are not bothered by cars.

**Pollution** (*On Your Bike*) is when the environment and nature are damaged by a substance or an activity. For example, the air is polluted when a lot of dirty smoke is released; the water is polluted when dangerous substances are thrown into rivers or the sea causing the death of fishes and plants.

**Fuel** (*On Your Bike*) is any type of material or substance that is burned to produce heat or power  
OR

It is what you need to fill up your car with in order to make it move.

**Save Energy** (*Switch it Off*) means to use less energy and particularly to avoid using energy when it is not really necessary. For instance, everybody can save energy by turning off their computers or games consoles when nobody is using them.

**Waste energy** (*Switch it Off*) means to throw away energy. Even if you do not see wasted energy in the rubbish bin, leaving a light on when nobody is in the room, or the TV turned on when nobody is watching means consuming a lot of energy without any specific purpose.

**Electrical devices** (*Switch it Off*) are all the machines that use electricity to work. In all our home there are many types of electrical devices, such as the fridge, the washing machine, the TV, the radio, the mp3 player, the DVD, the hair-dryer, the PC.

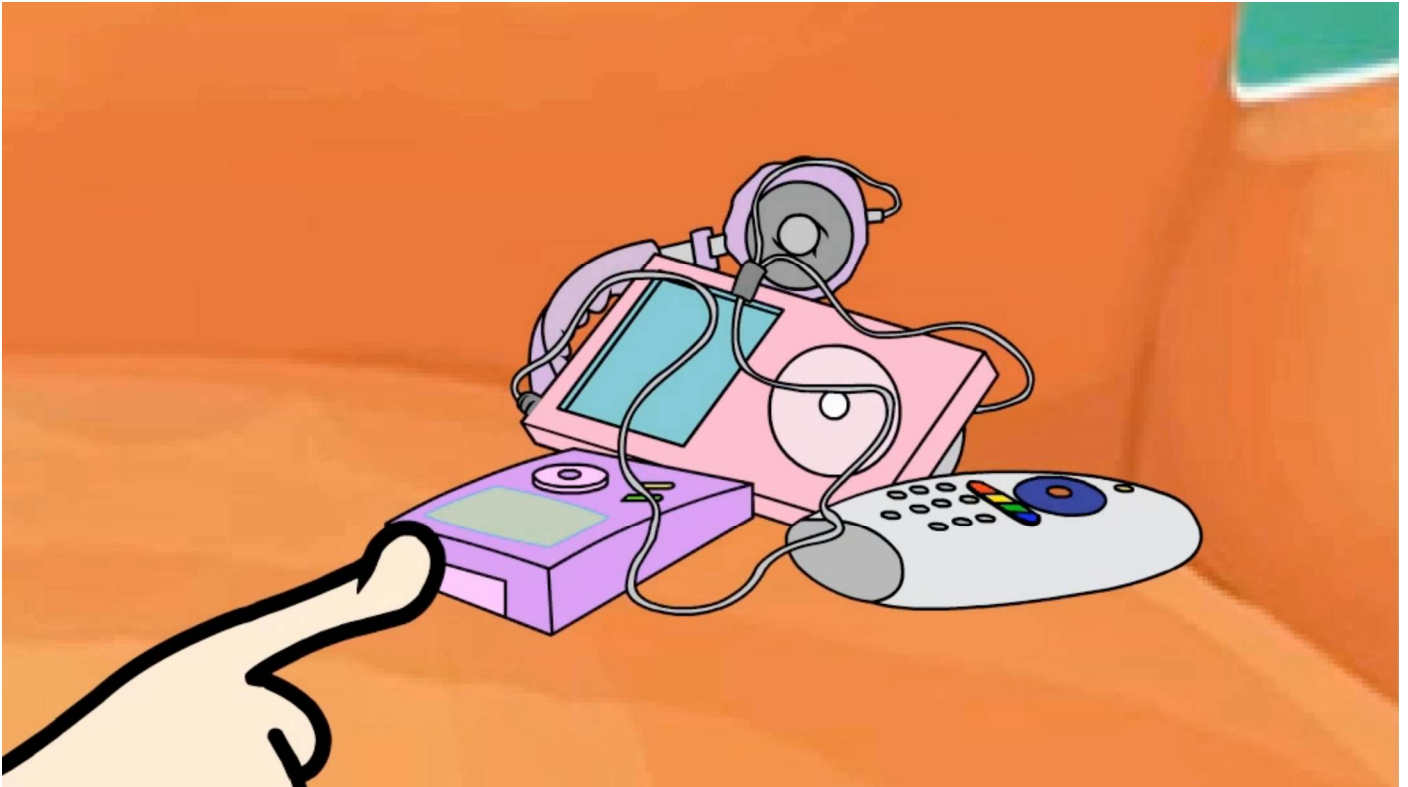
*You may also need to know the meaning of the following expression:*

**Non-renewable energy: finite sources** — It is a type of energy that will run out soon or later. For instance, fossil fuels are non-renewable energy as they were formed millions of years ago and once they will be exhausted it will not be possible to recreate them again.



# Lesson 1 - Energy Conservation

'Switch it Off'





# Lesson 1 - Energy Conservation

## 'Switch it Off'

*Read this section before starting your lesson in order to familiarize yourself with the issues of this lesson plan.*

We use energy at almost every moment of our lives: energy for running our bodies (food, drink, sleep) and energy for running our equipment around us. Machines like the television, DVD player, refrigerator, heating systems, air conditioning systems, computers, phones, cars and light bulbs are all consuming energy.

### Where does energy come from?

Today most energy is produced in **power plants** with the help of fuels such as coal, oil or gas. These fuels are known as fossil fuels. When fossil fuels are burned to produce energy, they also produce gasses which can be very polluting. These gasses are not only damaging for the environment, but also for animals and humans. The full scope of the consequences will only be understood in the future, but their impact is already being felt. For example, burning these fuels result in an increase in air pollution and water pollution. In addition, gasses released from the burning of fossil fuels are upsetting the delicate balance of nature. The outcome of this is that many species of plants and animals are losing their habitats or dying out because they are unable to live under these new climactic conditions. Plants and animals that have evolved and survived over millions of years could be wiped out in the next future, and a careless consumption of energy has unfortunately a huge role to play in it!

### Which are the effects of producing energy?

The more energy we use from power stations that burn fossil fuels, the more pollution is released into the atmosphere and the less fossil fuel there is left.

If we consume too much fossil fuel energy, we dangerously impact on the environment. We pollute the air, the water, the soil and many plants and animals are endangered.

On top of these consequences the quantity of the resources we use for energy, namely coal, oil and gas, is limited – we can simply run out of them!

### How can we make a difference?

There is a very easy way for all of us to make a difference –

- we have to use energy carefully
- by using energy carefully we use less of it, and
- using less of it means less pollution is realised into the atmosphere
- using less of it also means fossil fuels will be used up more slowly
- we can consider which machines and equipment needs to stay switch on and the rest we can switch off. It is not enough to use the remote control and leave them on stand-by like we often do with the TV or DVD player – we have to switch them off on at the source, otherwise they still consume energy...

With simple solutions we can do two things at the same time: save money and the environment!

# Introduction

*Before watching the animation, you can ask pupils what they know about Energy Conservation. You should explain the principle in a friendly and participative way, encouraging pupils to take part in the discussion. You can ask them: "Let's try to find all the words we associate with energy. Which kind of images does the word energy suggest you? When do you use energy?"*

*Collect all the different answers and write them on the blackboard. You will discuss them again after watching the animation.*

**IMPORTANT:**

- *Collect the answers without making any judgment in order to fuel the children's involvement;*
- *Facilitate the youngest children's answers by using images and examples from their everyday life.*

## Viewing the animation

Watch the episode with your group or, if it is not possible, distribute Worksheet 1 & 2 (available at the end of the lesson). The worksheet outlines the storyline of the episode and provides images and stills from the episode. Children can either read the storylines themselves (depending on their age) or follow the story read out by the teacher.

## Activity 1 – Brainstorming: what is Energy Conservation?

*Learning Objective: Involve all the children in order to create awareness about energy conservation and its environmental benefits and to develop the individual sense of responsibility towards our planet.*

After watching the animation or reading the story, you can check with the children their "energy keywords", written previously on the blackboard and see how they match with the story of My Friend Boo. Then you can ask the children some questions to stimulate the discussion:

- Which part of the episode do you like most?
- Which character do you prefer in this episode?
- How and when do Ben, Lucy and Jaq use energy in this episode? What about you?
- What happened to Klexus' alien world?
- When do Lucy and Klexus waste energy in this episode? What about you?
- How could the animation characters save energy?
- How could we save energy?
- According to Jaq, Ben and Lucy, who and how can make the difference in saving energy?

... and all the other questions that you want to ask your pupils!

## Activity 2 – Drawing: why should energy be saved?

*Learning objective: Understand why energy should be saved and the potential consequences of wasting energy.*

**Material: Drawing material, 2 big poster sheets**

Questions to fuel the activity:

- Look at Klexus' planet: what happens if we use energy without thinking about our planet?
- What happens if you use up your planet's resources and pollute the atmosphere?
- What if you save energy?

Divide the class in two groups: one group has to produce a poster depicting what our planet will look like if we use all resources and pollute the atmosphere, the other group what the planet will look like if everybody saves energy and uses it carefully.

After drawing, compare the two posters and discuss.

## Activity 3 – How can energy be saved? – The Big Boo Racing Game

*Learning objective: Explain to children how they can contribute to saving energy in their daily lives and encourage them to change their habits whenever possible.*

**Material: Worksheet 3 (4 copies), 4 pencils, 4 paper clips**

In the episode, Lucy learned that you can really make a difference. You don't need stuff turned on all the time! Just switch electrical equipment on when you want to use it, and switch it off when you're finished. Don't leave televisions and games consoles on stand-by all night!

Divide the group in 4 teams and assign to each team a place holder (Boo, Ben, Lucy and Jaq).

Copy (or hang) on the blackboard the race course that you find on Worksheet 3.

Make each team build their wheel following the instructions on the Worksheet.

When the 4 teams are ready, you can start the race. Each team will take it in turns to spin the wheel and advance according to the instructions that are on the wheel.

The team that reaches the end of the race first is the winner!

## Activity 4 – Switch it off and go and have fun!

*Learning objective: Make children aware of the fact that they can have fun also without switching on electrical appliances.*

Divide children into two groups. Ask them about games that they can play without having to switch on an electrical appliance and write them on the blackboard. The group that comes up with the most suggestions wins.

After the game, discuss the positive effects of this on the planet and also on health.

*NOTE FOR TEACHERS: Please keep in mind that using energy is not bad – but there are also a lot of fun activities to do without electrical equipment. The main message should anyway remain, "Switch off electrical equipment if you are not using it"*

## Activity 5 – The Energy Sheriff

*Learning objective: Translate the learning from the lesson into everyday life.*

**Material: Worksheet 4 (1 energy sheriff pin for each child + 1 poster with messages to hang on the classroom wall)**

All the children who participated in the activities are now ready to be Energy Sheriffs. They will get a badge and they will be encouraged to spread the messages learnt in the lessons – that are easily summarized on the poster – among their families and friends, as well as with other educators, coaches and role models.

Discuss the results of the activity in class a week later.

## Activity 6 – Wordsearch

*Learning objective: To remember the words and concepts explained in the episode*

In the letters grid, find the words listed below:

**ELECTRICAL**  
**BOO**  
**WASTE ENERGY**

**DEVICES**  
**LUCY**  
**PLANET**

**SAVE ENERGY**  
**BEN**  
**LIGHT**

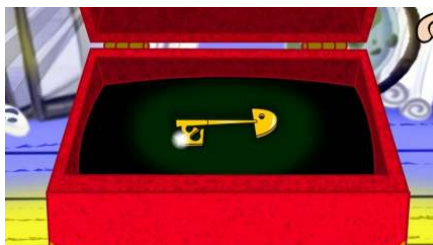
**RESOURCES**  
**JAQ**  
**SWITCH OFF**

C	S	A	V	E	E	N	E	R	G	Y
S	B	I	F	G	R	T	L	R	T	O
W	A	S	T	E	E	N	E	R	G	Y
I	Q	P	D	E	V	I	C	E	S	S
T	S	L	I	G	H	T	T	G	B	D
C	D	A	R	J	U	X	R	C	E	T
H	V	N	F	B	L	A	I	U	N	N
O	R	E	S	O	U	R	C	E	S	T
F	B	T	C	O	B	J	A	Q	R	E
F	S	T	V	G	T	Y	L	U	C	Y
L	X	R	P	L	S	W	R	T	Y	H

# Worksheet 1

## Introduction to the Series

One day Ben, his little sister Lucy and Jaq his best friend, are playing in their attic which is full of old junk when they find a very scruffy and old looking toy dog and a broken fairground carousel.



Suddenly, something very unusual and magical happens - the little toy dog comes alive and starts to talk and walk around and the broken fairground carousel starts to twirl around and around it goes!



The toy dog introduces himself as Boo and using the magic carousel Boo takes the children on lots of adventures to weird and wonderful places where they will learn lessons about the importance of water, whilst having a lot of fun!

### Character Biographies



**BEN** is eight years old and is very active, good at sport and loves to skateboard. He's practical and considerate and is the leader of our little group. He's great at getting everyone to rally together to get things done and to think of himself as a bit of a 'cool dude' but he's easily embarrassed by his Little Sister, Lucy who follows him and his friend Jaq around.

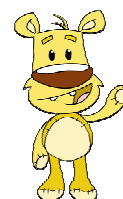


**JAQ** is Ben's best friend and is also eight years old. She's kind hearted and is very knowledgeable about all kinds of issues. She likes to listen to music, ride her bike and loves food!



**LUCY** is Ben's little sister, she's five years old and quite precocious. She likes to hang around with her big brother and his friend, she thinks of herself as being 'very grown up' and certainly doesn't like being told what to do. She's enthusiastic about practically everything, very inquisitive, has no fear and just doesn't know when to shut up. She has a great knack for accidentally stirring up/ causing trouble and embarrassing her Big Brother.

**BOO** is a toy dog. He's bit tatty and worn BUT when he becomes a 'real' character he's transformed. Boo is fast-talking and a little bit out there but lots of fun. He has something of the circus ringmaster or a vaudevillian comedian about him (as per his Victorian origins).





# Worksheet 2

## 'Switch it Off' – Storyline and Stills

Lucy is an energy waster, she just can't see how one little girl can make a difference. She quickly learns her lesson when Boo takes her, Ben and Jaq to a barren and dark alien planet where the inhabitants are sad and weary; they have no energy!



The aliens have tried conserving power to save their world before it's too late, but one alien won't comply. KLEXUS a little alien girl (not dissimilar to Lucy) has sucked up all the planet's energy by playing galactic computer games and watching her multiple TV screens in her flashing neon castle!



Lucy realizes that Klexus is just like her and with the help of Boo and a cosmic dance-off the kids manage to show Klexus the consequences of her actions and she promises to cut down on all her wastefulness. In turn, she also realizes that she's enjoyed playing with someone else and so ventures outside the castle to play with the other aliens.

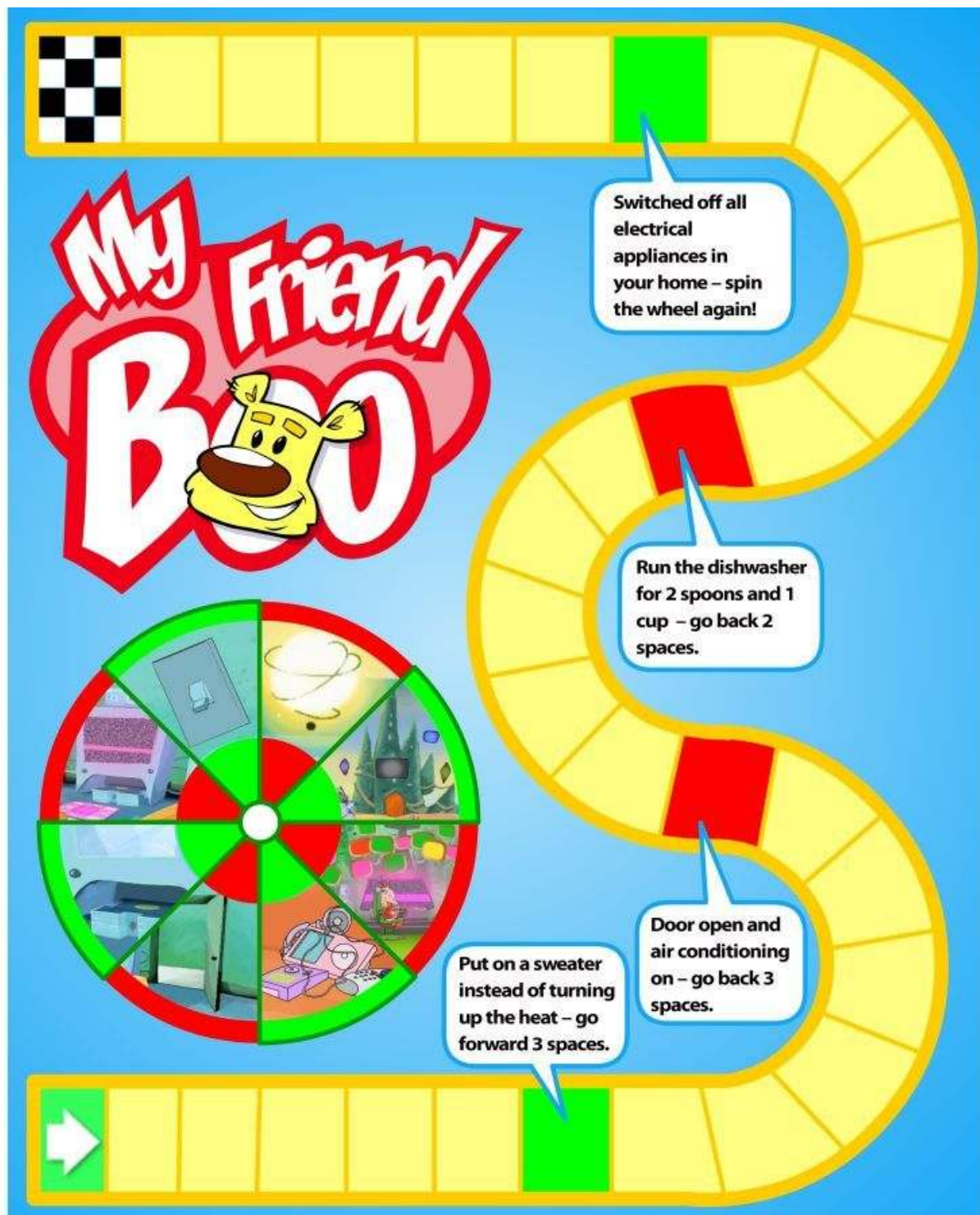


The children climb aboard the carousel and head home. Lucy zips around the house and turns off her unused TVs and consoles.... One person can make a difference!



# Worksheet 3

## Lesson 1—Activity 3



Place a paper clip on the point of a pencil and place the point of the pencil in the middle of the spinner. Spin the paper clip around the pencil. If the paper clip dial lands on green, move forward two spaces. If the paper clip dial lands on red, move back one space.

# Worksheet 4

## Lesson 1—Activity 5

### ENERGY SHERIFF POSTER



Switch electrical devices off when you're not using them!

Don't leave television, computer and games consoles on stand-by all night!



Switch off the light when you leave a room!

Close the door when you leave a room!



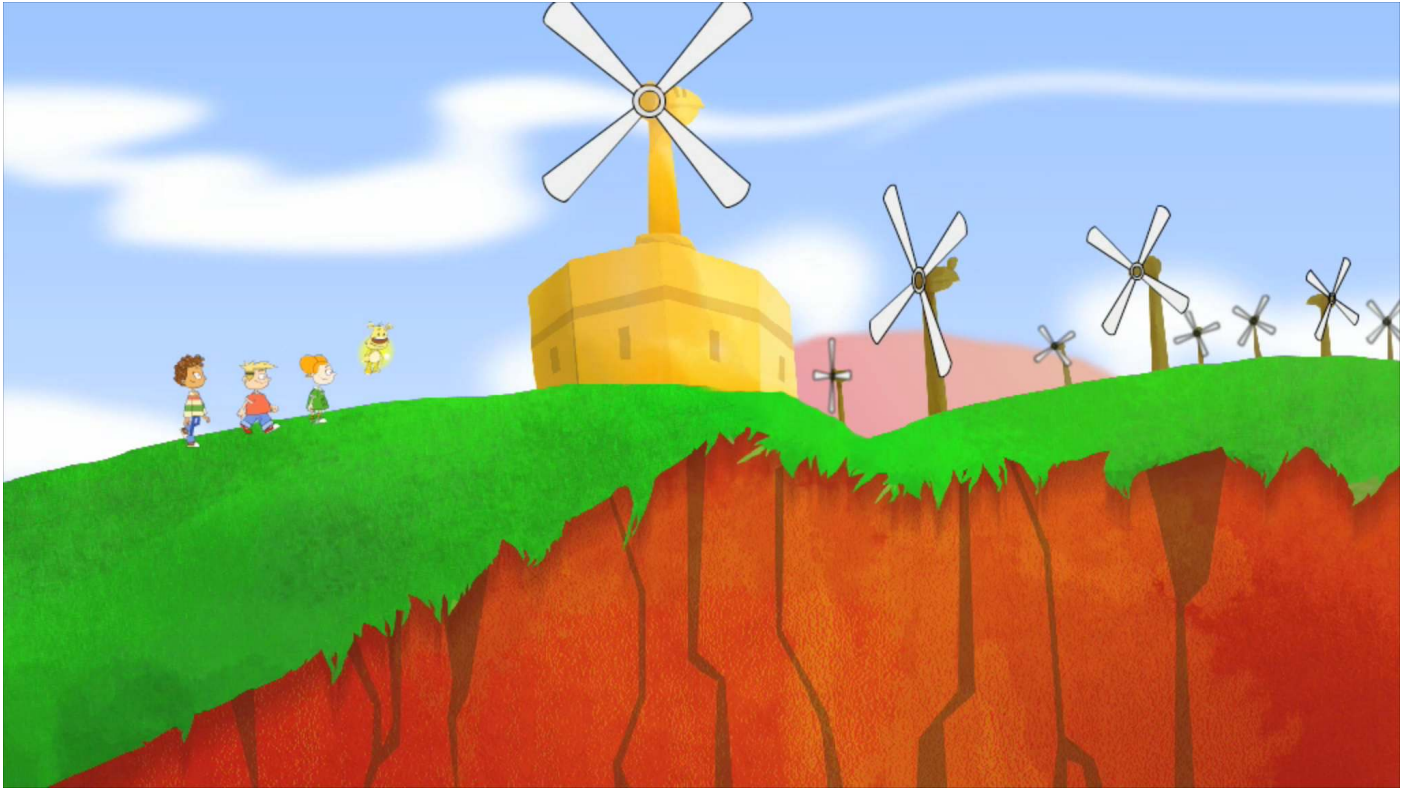


# Energy Sheriff Badges



# Lesson 2 - Renewable Energy

## 'The Three Alternatives'



# Lesson 2 - Renewable Energy

## 'The Three Alternatives'

*Read this part before starting your lesson in order to familiarize yourself with the issues of this lesson plan.*

There are two types of energy sources: non-renewable energy sources (fossil fuels) and renewable energy sources.

**Non-renewable energy sources** like gas, coal and oil (fossil fuels) are limited and will sooner or later run out. Fossil fuels are the result of the decay of organic matter from an animal or a plant that lived millions of years ago. These organisms have decayed over a long time (millions of years) under high temperatures and high pressure in the Earth's Crust, the chemical reaction in the decaying process results in different materials; coal, oil and gas. When humans have burned all the available fossil fuels, this type of energy will be gone forever because we burn much, much faster than it naturally occurs. In addition, when fossil fuels are burned, smoke and gases that pollute and warm the environment are emitted.

**Renewable energy sources** (like sunlight, wind or oceans) are never-ending or *renewable* because sun, wind or oceans will never run out. The sun rises every morning, the wind always blows somewhere and there will always be waves moving in the ocean and they can be constantly used. Moreover, renewable energy sources are clean because they do not give off gasses so do not pollute the environment.

At night time there is no sun, and at certain times of day the waves are smaller than at other times of day. In certain seasons the wind doesn't blow much. Improvements in the technology used to store energy obtained from renewable sources is making it easier to store renewable energy so that we can gather it, for example when the sun shines, or the wind blows and then use it even when the sun isn't shining or when the wind is still. However, we can also combine energy sources if possible. For example, use solar energy when it is available and then switch to fossil fuels when absolutely necessary. It is possible to use solar panels to heat the water we need for our homes but then still to use electricity from fossil fuel-powered power stations for the rest of our energy needs. Combining energy like this uses renewable and non-renewable energy.

Of course, the first step should always be to **save energy** and use as little energy as possible; when the use of energy cannot be avoided, then it is important to choose renewable energy because it is clean and does not pollute the environment.



## Introduction

*Before watching the animation, you can ask pupils what they know about Renewable Energy. You should explain the principle in a friendly and participative way, encouraging pupils to take part in the discussion. If you want, you can ask pupils "What is renewable energy? What does renewable mean?". Collect all the different answers and write them on the blackboard. You will discuss them again after watching the animation.*

**IMPORTANT:**

- *in order to fuel the children's involvement try to collect the answers without indicating any judgement;*
- *Facilitate the youngest children's answers by using images and examples from their everyday life.*

## Viewing the animation

Watch the episode with your group or, if it is not possible, distribute Worksheet 1 & 5 (available at the end of the lesson). The worksheet outlines the storyline of the episode and provides images and stills from the episode. Children can either read the storylines themselves (depending on their age) or follow the story read out by the teacher.

## Activity 1 – Brainstorming: what is renewable energy?

*Learning objective: Involve all the children in order to create awareness about renewable energy*

After watching the animation or reading the story, you can check back with the children on their "renewable energy keywords", written previously on the blackboard and see how they match with the story of My Friend Boo. Then you can ask the children some questions to stimulate the discussion:

- Which part of the episode do you like most?
- Which character do you prefer in this episode?
- Which renewable energies are shown in the animation?
- Which energy resource group did you like best? Why?
- Why were people in the future pushed to investigate alternative energy forms?

... and all the other questions that you want to ask to your pupils.

## Activity 2 – Drawing: why should renewable energy be used?

*Learning objective: Understand why renewable energy should be used and the positive impact that renewable energy has on the planet.*

### **Material: Drawing material**

Ben, Lucy and Jaq visit the Earth in the future. Humans have replaced fossil fuels with renewable energies, and as a result they have all the energy they want, but no air pollution, toxic waste products or other negative effects associated with fossil fuels.

Ask each pupil to draw their world: how would it look like if renewable energies were used more often?

## Activity 3 – How can renewable energy be produced?

*Learning objective: Explain to children how renewable energy is produced.*

Ask children which renewable would work best in the place where they live. Is it often sunny? Is it very windy? Is it close to the sea or big rivers?

Discuss with children the possibilities – existing or potential

## Activity 4 – Build your own Windmill

*Learning objective: Help demonstrate to children how wind energy is captured.*

**Material: Worksheet 6, drawing material, pins (paper fasteners), straws, scissors, glue**

Photocopy worksheet 6 and distribute to the children for them to colour and cut out. Follow the instructions on the worksheet to fold the paper in order to obtain a windmill-like pin wheel.

Stick a pin (or a paper fastener) firmly through the center of the paper, making sure it pokes through all four folded corners, as well as the back of the paper.

Stick the pin with the pinwheel attached through a straw. Encourage the children to put their windmills in a windy place. The following day at school talk about what they observed.

## Activity 5 – Create your own solar panel

*Learning objective: Demonstrate to children how energy from sunlight can be captured.*

**Material: For each group: 3 empty CD cases, black paper and white paper**

Divide the children into groups. Each group is going to create its own solar panel. Ask them to cut out two pieces of black paper and one piece of white paper to fit inside the front of each of the three CD cases. Ask the children to close one black CD case and the white one. Leave the other black one open. Leave the three CD cases in a sunny place for one hour. A windowsill is a good place. If it is not a sunny day, you can leave them under a reading lamp instead.

After one hour, feel the paper in each CD case. Which is the warmest? This experiment shows how heat from sunshine (i.e. energy) can be captured. Discuss the result of the experiment with the group. This is how some solar panels work!

*NOTE: this activity could also be done as home activity, with involvement of the parents/carers*

# Activity 6 – Wordsearch

Learning objective: To remember the words and concepts explained in the episode

In the letters grid, find the words listed below:

- RENEWABLE

BOO

FOSSIL FUELS
- SOLAR PANELS

LUCY

ELECTRICITY
- WIND TURBINE

BEN
- SEA

JAQ

S	O	L	A	R	P	A	N	E	L	S	H
Z	L	M	L	M	T	Z	V	L	T	R	K
F	O	S	S	I	L	F	U	E	L	S	M
R	T	A	P	S	G	E	B	C	R	R	B
G	H	S	E	A	M	D	S	T	F	E	G
S	F	P	A	I	S	T	Q	R	C	N	F
W	I	N	D	T	U	R	B	I	N	E	R
L	K	Q	I	H	R	L	U	C	Y	W	T
M	N	J	U	G	W	R	W	I	U	A	Y
V	B	A	P	B	O	O	X	T	I	B	U
C	X	Q	L	E	M	F	C	Y	K	L	I
E	R	T	R	D	V	V	D	S	B	E	N

# Worksheet 5

## 'The Three Alternatives' – Storyline and Stills

There are major ructions in the house as Lucy, Ben and Jaq argue over what they are going to do this afternoon. Ben wants to go skateboarding, Jaq wants to fly her kite, and Lucy just wants to listen to the music mp3s she has stored on her phone. Having reached a stalemate they all visit Boo to ask him what they should do. Boo considers their dilemma and decides to take them somewhere which can help them make a decision.



They climb aboard the carousel and head off...to the Planet Earth of the far future. The place appears to be very clean and fresh, future humans having prevented the destruction of the planet from over-reliance on fossil fuels by finding other ways to create energy. The children think this is fantastic!



The humans have split up into three groups. The first group uses solar energy and has fantastic electric go-karts powered by the sun. They encourage the kids to race in the cars.

Our heroes go to play with the second group which gets all its power from huge wind turbines. They ask the children to come in for dinner. You bet – after all that playing, the kids are really hungry...

Boo takes the children to visit the third group, which gets its power from the ocean. The kids get to try out some very special electrical gadgets...

Boo tells the kids that each group is using sustainable energy and by using all three together they can have plenty of energy to do loads of fun things.

If they all use sun, wind and ocean then there will always be a power source.

Boo takes the kids home and the argument over what game to play continues where it left off. Boo asks Lucy for a solution and she replies they should combine the three games, just like the future humans combined energy sources.



# Worksheet 6

## Lesson 2—Activity 4

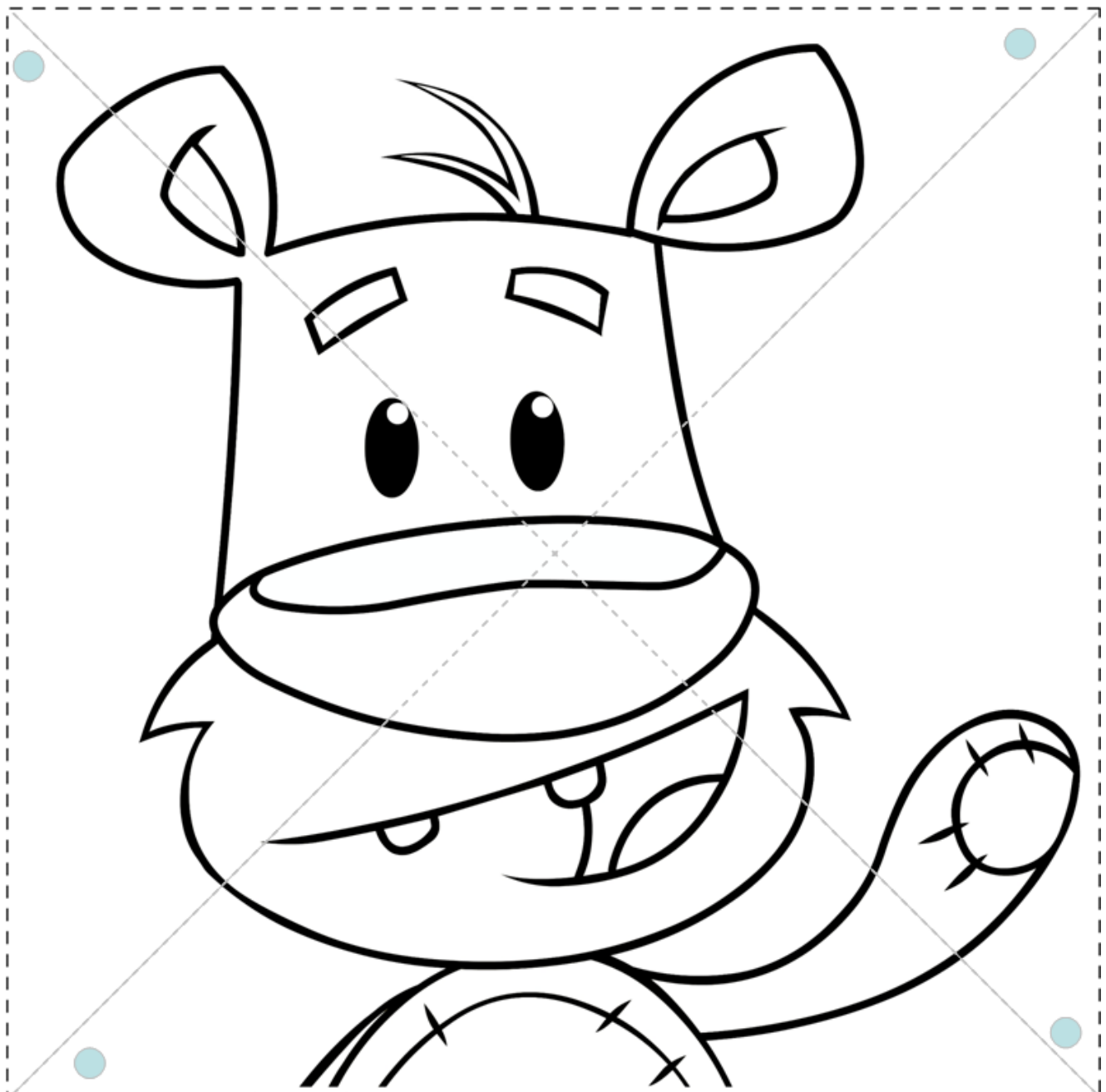
### Instructions

Cut out the square of paper and fold diagonally. Press along the crease and unfold. Now fold it again across the other diagonal, press along the crease and unfold.

The point where the creases meet is the center of your paper. From there, measure 4 cm along each diagonal and mark with a pencil. Cut from the corner of the square along each diagonal until the pencil mark. With the help of your pencil, make a small hole in the center of the square, and 4 holes as illustrated in the picture. Fold each of the corners so that the holes line up with the hole in the center. Push the paper fastener through all the holes.

Measure 2 cm from the top of your straw and make a small hole from side to side. Push the paper fastener with the wheel attached through the straw and fold the ends back to hold it.

Your windmill is ready.





# Lesson 3 - Transport

## 'On Your Bike'



# Lesson 3 - Transport

## 'On Your Bike'

*Read this part before starting your lesson in order to familiarize yourself with the issues of this 3<sup>rd</sup> lesson plan.*

People need to move to go to work, to school, to the cinema, or to go on holiday. It is important to choose the right means of transport according to the distance and duration of the journey, the cost, and the impacts on the environment and on your health.

Cycling and walking are the best solutions for a short journey: no need to spend time and money in refuelling (the only fuel you need is the food you need to walk or pedal); no negative impact on the environment (a bike does not emit dirty smoke). In addition, cycling and walking are good physical exercise to keep you healthy.

Using the car for short journeys is not an ideal solution: cars run on fossil fuels that pollute the environment with dirty smoke. The petrol and diesel used to fuel the car is not only very polluting, but it is also very expensive. In addition, travelling by car is not always the fastest solution because of frequent traffic jams and time needed to find a place to park.

An alternative to the car, if walking or cycling is not possible, is to take public transport such as the bus, the tram, the metro or the train. If there is no other available solution to the car, a good idea is to share a car ride with your neighbours or other people (car pool), for example instead of having four cars going to the same place with only one passenger, it makes more sense to use only one car with four passengers. In this way, pollution, traffic jams and even travel costs can be reduced.

## Introduction

*Before watching the animation, ask pupils what they know about Transport. You should explain the principle in a friendly and participative way, encouraging pupils to take part to the discussion. If you want, you can ask pupils "what methods of transport can you list?". Collect all the different answers and write them on the blackboard. You will discuss them again after watching the animation.*

**IMPORTANT:**

- *Collect the answers without making any judgment in order to fuel the children's involvement*
- *Facilitate the youngest children's answers by using images and examples from their everyday life.*

## Viewing the animation

Watch the episode with your group or, if it is not possible, distribute Worksheet 1 & 7 (available at the end of the lesson). The worksheet outlines the storyline of the episode and provides images and stills from the episode. Children can either read the storylines themselves (depending on their age) or follow the story read out by the teacher.

## Activity 1 – Brainstorming: forms of transport and their consequences

*Learning objective: Involve all the children in order to create awareness about transport's impact on the environment.*

After watching the animation or reading the story, you can check back with the children on their "transport keywords", written previously on the blackboard and see how they match with the story of My Friend Boo. Then you can ask the children some questions to stimulate the discussion:

- Which part of the episode do you like most?
- Which character do you prefer in this episode?
- Which means of transport are shown in the animation?
- Do you use any of them?
- Which other means of transport exist on the top of the ones showed in the animation?
- Do you use any of them? When?
- Which are you favourite means of transport?
- Do you use public transport?

... and all the other questions that you want to ask your pupils!

## Activity 2 – Drawing: why should we think of the consequences of our form of transport?

*Learning objective: Understand why we should change from car to other means of transport and increase awareness on the environmental impact of each means of transport.*

### **Material: Drawing material**

In this episode Lucy encounters plenty of problems by driving a car: traffic jams, travel sickness, pollution, cost of fuel, etc. while Jaq and Ben are very happy with their bicycles.

Ask each pupil to draw their world: what would it look like if less polluting forms of transport were used more often? Would it be more fun to go to school all walking together? To ride a bike instead of waiting hours in traffic jams?

After drawing, compare all drawings and discuss.

## Activity 3 – How can we reduce the impact of transportation on the environment?

*Learning objective: Explore alternative forms of transport and understand the different impacts different means of transport have on the environment.*

### **Material: drawing material, 2 (or more) big paper sheets**

Ask children to name all the unusual forms of transport they can think of (from skateboard to sailing ship, to horses etc) List them all on the blackboard and briefly discuss pros and cons of each.

Divide the children in two (or more) groups and ask them to imagine a futuristic non-polluting form of transport and to draw it.

After drawing, kids should explain to others how their transportation vehicle works and which are its pros and cons.

## Activity 4 – Roll the Dice

*Learning objective: Raise awareness on the impact of transport on the environment.*

**Material: Worksheet 8, scissors, glue**

Photocopy worksheet 8 and distribute to the children for them to colour and cut out. Follow the instructions on the worksheet to fold and glue the paper in order to obtain BOO's DICE.

Explain to the children that they can challenge each other with their dice: whoever gets the higher number wins.

## Activity 5 – Home Activity - SURVEY

*Learning objective: Raise awareness among children about potential obstacles to use of non-polluting transport means and encourage them in finding solutions.*

**MATERIAL: Worksheet 9**

Ask each child to carry out a survey on their parents/carers using the questionnaire provided in worksheet 9.

The following day discuss the results in class and analyse the main obstacles that children's families encounter in using less-polluting means of transportation. Try and discuss possible solutions.

**NOTE FOR TEACHERS:** be careful: children should not feel guilty if their parents use the car. We are just talking about making a choice, when it is possible!

## Activity 6 – Wordsearch

Suitable for children from 6 to 8 years old

*Learning objective: To remember the words and concepts explained in the episode*

In the letters grid, find the words listed below:

**ENERGY**  
**BOO**

**FUEL**  
**LUCY**

**BIKE'S LANE**  
**BEN**

**POLLUTION**  
**JAQ**

C	V	B	O	O	C	W	L	T
D	B	I	I	N	B	I	U	R
E	F	K	J	M	E	U	C	N
F	U	E	L	Y	N	I	Y	T
R	T	S	D	S	F	G	R	I
P	O	L	L	U	T	I	O	N
S	E	A	T	R	B	J	A	Q
Z	E	N	E	R	G	Y	V	A
S	F	E	G	T	N	C	X	S



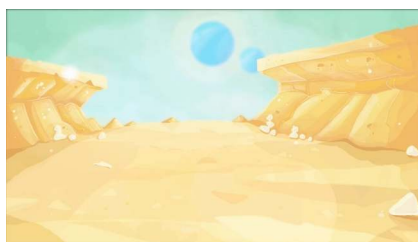
# Worksheet 7

## 'On Your Bike' – Storyline and Stills

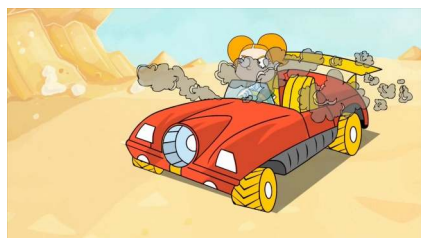


Lucy is disappointed. 'Alien Racers II', the new computer game that she has been waiting for comes out today and Mum and Dad's car is in the garage being repaired. She hasn't got a lift to the computer game shop. Ben and Jaq try to cheer Lucy up and tell her that they'll go with her – they can all ride to the game shop on their bikes. Lucy isn't keen – she thinks it'll take ages and be really tiring. Going by car is much better. Ben tells her that she's wrong about this – a visit to Boo will make her see sense....

Boo takes them all aboard the carousel...and they find themselves inside Lucy's computer game.



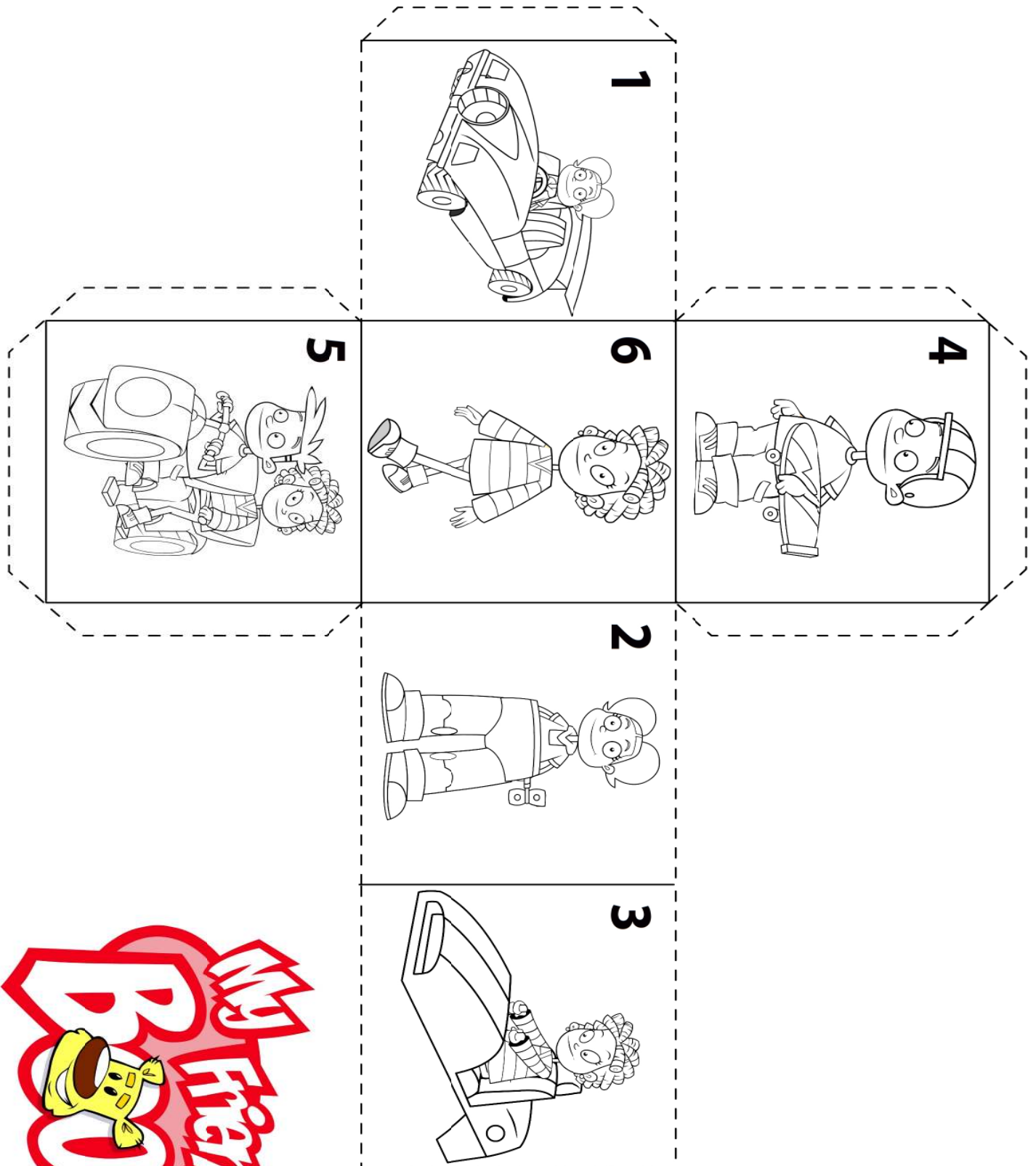
Boo proposes a race across the digital city, Lucy in a computer game racing car, Jaq and Ben on ordinary push bikes. Lucy thinks she can't lose! The game starts and Lucy whizzes into the lead, but immediately faces problems... Jaq and Ben take a scenic view and stop to watch digital fish leaping from a silicon pond. Their way isn't causing pollution and their fuel is a tasty banana to keep them going! Ben and Jaq cycle along the cycle path and pass the finish line first.



Lucy eventually finishes the race but finds she feels cramped and a little achy after being sat in the car all that time. The others feel great after all that fresh air and exercise. To make matters worse, Lucy can't find anywhere to park her computer game car! Lucy has to admit that maybe Ben and Jaq have a point. They climb aboard the carousel and return to the attic, Lucy agreeing to go to the game shop on her bike!

# Worksheet 8

## Lesson 3—Activity 4



# Worksheet 9

## Lesson 3—Activity 5

### Survey

#### MY FRIEND BOO SURVEY

1) Which means of transport do you use more often?

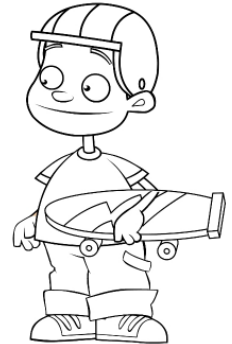
2) Why do you choose it?

3) How long do you spend every day:

- A) in your car
- B) on the bus
- C) on the train
- D) walking

4) Would you like to use non polluting transport means transport more often?

5) If yes, why aren't you doing it already?



# References and Further Information

Try these websites for more general information and useful resources for teachers and pupils:

REC GREEN PACK - <http://greenpack.rec.org/ru/en/energy/index.shtml>

MANAGENERGY: KIDSCORNER - <http://managenergy.net/kidscorner/>

EUROPEAN COMMISSION: ENERGY - [ec.europa.eu/energy/index\\_en.htm](http://ec.europa.eu/energy/index_en.htm)

INTELLIGENT ENERGY EUROPE - [ec.europa.eu/energy/intelligent/](http://ec.europa.eu/energy/intelligent/)

KIDS4FUTURE - [www.kids4future.eu/regnmakersidene/](http://www.kids4future.eu/regnmakersidene/)

FLICK THE SWITCH project - <http://www.flicktheswitch.eu>

KYOTO IN HOME - <http://www.kyotoinhome.info>

WWF European Policy Office - [http://www.panda.org/what\\_we\\_do/how\\_we\\_work/policy/wwf\\_europe\\_environment/initiatives/energy/](http://www.panda.org/what_we_do/how_we_work/policy/wwf_europe_environment/initiatives/energy/)

## Share your thoughts!

Write us an email to [yes@bs-europa.eu](mailto:yes@bs-europa.eu)

Or send us a fax (0032 2 894 96 28)

Or go on our Facebook page

**And check on our websites: [www.myfriendboo.com](http://www.myfriendboo.com)**

**[www.animate-eu.com](http://www.animate-eu.com)**