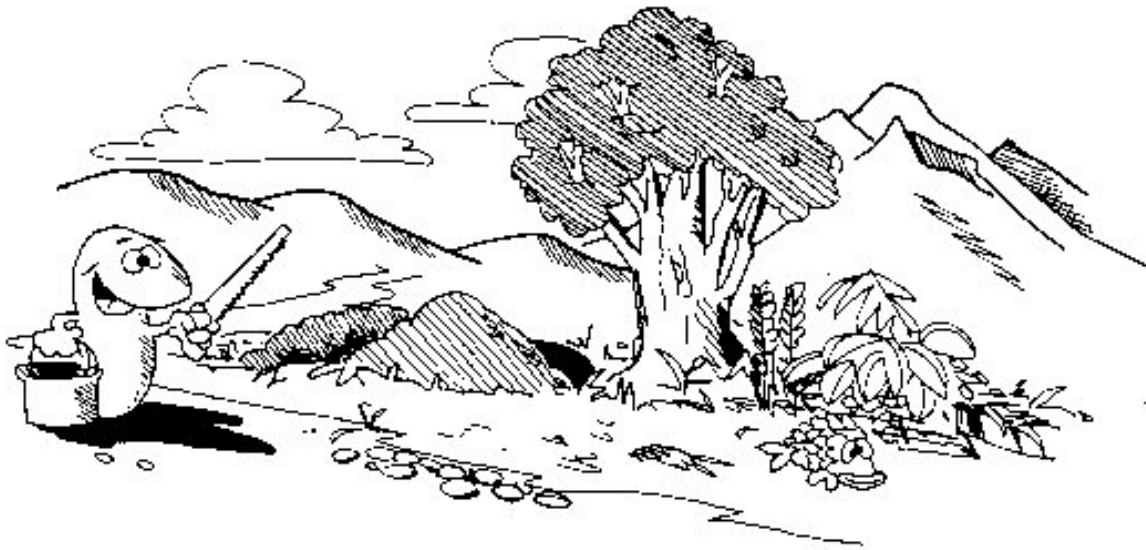


## RESOURCES - EVERYTHING COMES FROM THE EARTH



### OBJECTIVE:

Students will be able to understand the concept of natural resources.

### BACKGROUND INFORMATION:

Natural RESOURCES are naturally occurring materials that form our earth. These materials include air, water, soils, rocks, timber and plants. The earth is the foundation of all life, so taking care of the earth and its resources should be a responsibility shared by all. All resources are interconnected, so a deficiency in one area puts pressure on all others.

Our basic needs of air, water, food and shelter are supplied by these resources. The environment is fragile. If just one of these four basic needs is removed from a habitat, humans, animals and plants suffer. As earth's population increases, demand on these resources increases and thus their quantity is diminishing.

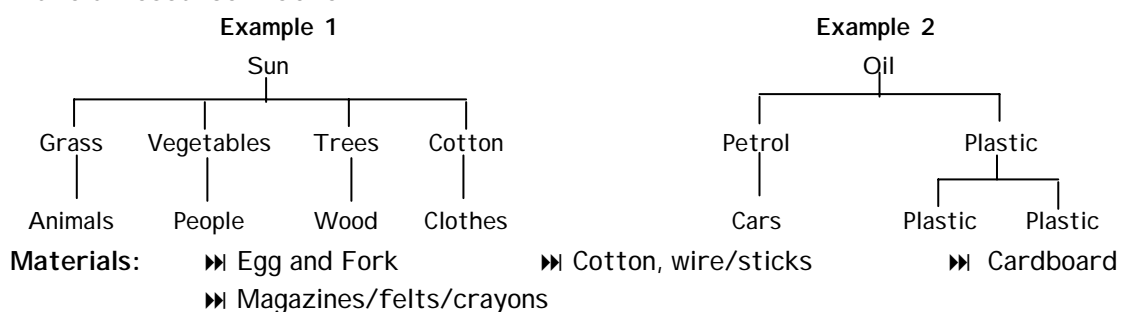
Some resources are renewable like the sun, but many such as petroleum upon which we rely heavily for energy, are non-renewable or finite. Once these finite resources are consumed, there will be no more supplies. Most of this resource use stems from people and industries in developed countries like New Zealand, Australia, the United States and Europe.

With resource uses comes waste. Excess food, packaging, products and unwanted materials end up as waste in our landfills. In order to sustain our quality of life, we must conserve our resources through waste reduction, reuse and recycling. These methods of handling waste put less pressure on resource use.

### Class Plan (Levels 1 and 2)

1. Show the children an egg and a fork.
  - ❖ Help the students trace these materials back to their source.
  - ❖ Help them recognise that an egg comes from a chicken, the chicken eats grain and grain is grown in the soil which is nourished by sunlight and water.
  - ❖ When looking at the fork they may not recognise that it comes from the earth. A lot of time and energy is spent in finding our natural resources and changing them to make them useful to us (manufacturing).
  - ❖ In producing steel to make the fork, a large amount of iron sand containing a small amount of iron must be mined first. Energy consuming machinery separates the iron from the sand, then the iron ore is purified with oxygen to make steel. The finished steel must be transported from the point of manufacture to the point of use.
  
2. Ask the students if they can think of anything that they use that is not provided by the earth. (The students will probably name some things, but on close examination, it will be seen that these things also come from the earth. Explain to students that raw materials that we take from the earth to make into other things are known as natural resources. Remind them that energy which is also a natural resource, is needed to change objects from the natural forms into the products we use.

3. Make a Resource Mobile:



### Class Plan (Levels 3 and 4)

1. Show the children an egg and a fork.
  - ❖ Help the students trace these materials back to their source.
  - ❖ Help them recognise that an egg comes from a chicken, the chicken eats grain and grain is grown in the soil which is nourished by sunlight and water.
  - ❖ When looking at the fork they may not recognise that it comes from the earth. A lot of time and energy is spent in finding our natural resources and changing them to make them useful to us (manufacturing).
  - ❖ In producing steel to make the fork, a large amount of iron sand containing a small amount of iron must be mined first. Energy consuming machinery separates the iron from the sand, then the iron ore is purified with oxygen to make steel. The finished steel must be transported from the point of manufacture to the point of use.
  
2. Ask the students if they can think of anything that they use that is not provided by the earth. (The students will probably name some things, but on close examination, it will be seen that these things also come from the earth. Explain to students that raw materials that we take from the earth to make into other things are known as natural resources. Remind them that energy which is also a natural resource, is needed to change objects from the natural forms into the products we use.
  
3. Distribute "Everything comes from the Earth" worksheets.

#### Materials:

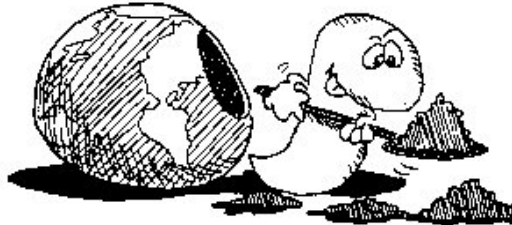
- ▶▶ Egg and Fork.
- ▶▶ Worksheets "Everything comes from the Earth".

# WORKSHEET

## "EVERYTHING COMES FROM THE EARTH"

### Soft Drink Can

Aluminium is made from a clay called bauxite, which is a non-renewable resource. Bauxite ore is mined in Australia and Brazil and shipped at great expense to its primary consumers, the United States and the Soviet Union. In the United States, aluminium is extracted from the bauxite. Thousands of kilowatt hours of electricity are expended in this extraction, and the process creates a significant amount of waste materials. For each ton of aluminium, four or five tonnes of water and rock are left over. One factory produces sheet aluminium, which is then shipped to another factory where soft drink cans are cut from the sheets.



### Cotton Jeans

Balls of cotton grow on plants throughout the southern United States, and in several other parts of the world. The cotton must be picked, cleaned, carded, made into yarn or thread, woven into our cloth, dyed the appropriate colour, cut and sewn into jeans, distributed to stores and sold. Cotton itself is a renewable resource, but a great deal of energy is expended to convert it into a pair of jeans.

### Wooden Chair

The chair is manufactured from trees that grow in the earth. Trees are a renewable resource.

### Glass Bottle

Glass is made by melting silica, a fine white sand in combination with soda (sodium bicarbonate), or small pieces of old broken glass called cullet. Either soda or cullet will help the silica melt faster; lime (calcium carbonate) is sometimes added. The silica melts in a furnace at temperatures above 1426°C. Silica is a non-renewable resource.

### Plastic Bag

Most modern plastics have petroleum, a non-renewable resource, as their primary raw material, but plastics are made from innumerable other materials as well. The earliest plastics were made from cellulose, a plant fibre, which is still the basis for film, audio and videotape. Plastic bags and playing records are derived from a mixture of petroleum and chlorine.

### Newspaper

Paper is made from wood and trees are a renewable resource.

The basic ingredient of paper is wood pulp, soft wood broken down either by chemical process or by grinding until the cellulose fibres separate. Chemically produced pulp is made into good quality writing paper; ground wood pulp is used for newsprint. The pulp is washed and screened, then mixed with water in a beater. During the beating process, coloured dyes or chemical sizing may be added. The mixture is then screened and shaken to remove the water, pressed and dried over a series of hot cylinders and wound into a roll of paper.

#### **Leather Shoes**

Real leather is made from the skin of animals that eat grasses that grow in the soil. Animals represent a renewable resource. Many modern items that appear to be made of leather are actually vinyl which is a kind of plastic.

#### **Hamburger**

The meat is beef which comes from beef cattle. The bun is made from grains that grow in the ground. Cattle feed on grass from the earth. The cattle, grains and grass are renewable resources.

#### **Steel Scissors**

Steel is the most commonly used metal in the world. It is made from three principal raw materials - iron ore, limestone and coal. The special low sulphur coals are converted into coke in ovens, and the gas released is used in processes within the works. The coke is then used in the production of iron. Iron is made in a

blast furnace. Impurities in the ore melt into the limestone to make slag (a raw material for cement). The coke reacts chemically, reducing the ore to iron. The molten iron from the blast furnace is then further refined to make steel. This is done in the basic oxygen furnace. As much as 25% of all the material which is charged into the steel making furnace is scrap metal.

#### **Bread**

A loaf of bread is made mostly of wheat grains. The grains grow in the ground. Other ingredients that come straight from the earth are water and salt.

#### **Crayon**

Crayons are made from wax which comes from bees or from chalk which is made from limestone.

#### **Flax Basket**

These are made from the fibres of flax plants, a renewable resource.

#### **Wool Jumpers**

Made from fibres of sheep or goat hair. These animals feed on grass grown in the earth.

#### **Tyre**

Most tyres are made from rubber which is extracted from the rubber plant.

#### **Clay Pot**

Made from clay, an earthy material.

#### **Butter**

Butter is made from cow's milk and salt. Cattle eat grass from the earth.

## "EVERYTHING COMES FROM THE EARTH.....BUT WHERE"

Try to trace each of the following items back to their original source, the earth. (The sun's energy, of course, is important to all of these.) For example, the egg you had for breakfast came from a chicken which ate grain which grew from the earth, SO:

*Egg - Chicken - Grains - Earth*

ALUMINIUM CAN

NEWSPAPER

PLASTIC BAG

BREAD

BUTTER

FLAX BASKET

LEATHER SHOES

WOOL JUMPER

GLASS BOTTLE

TYRE

WOODEN CHAIR

CLAY POT

COTTON JEANS

CRAYON

STEEL SCISSORS

HAMBURGER



Can you name one thing that does not come from the earth?

### ANSWER PAGE

## “EVERYTHING COMES FROM THE EARTH.....BUT WHERE”

### ALUMINIUM CAN

can → sheet → aluminium → bauxite → earth

### NEWSPAPER

paper → wood → tree → earth

### PLASTIC BAG

plastic → petroleum → earth

### BREAD

grain → earth; water → earth; salt → earth

### BUTTER

cream → milk → cow → grass → earth

### FLAX BASKET

flax fibres → flax plant → earth

### LEATHER SHOES

shoes → leather → cow/pig → grass → earth

### WOOL JUMPER

wool yarn → sheep/goat hair → grass → earth

### GLASS BOTTLE

glass → silica/sand → earth

### TYRE

rubber → rubber plant → earth

### WOODEN CHAIR

chair → timber → tree → earth

### CLAY POT

clay → earth

### COTTON JEANS

jeans → thread → cotton plant → earth

### CRAYON

wax/chalk → earth

### STEEL SCISSORS

scissors → steel → iron → ore → earth

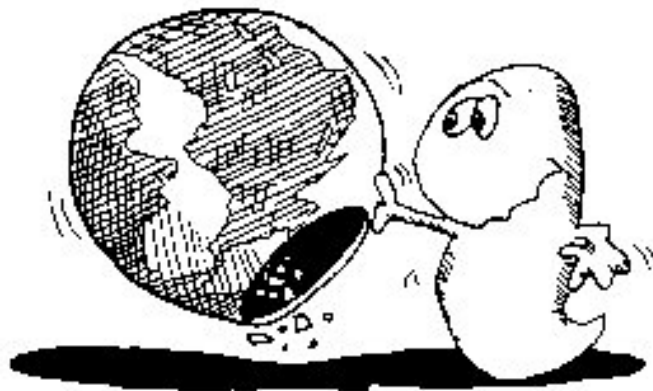
### HAMBURGER

buns → grains → earth; meat → cow → grass → earth

Can you name something that does not come from the earth?

**NO.**

## RUNNING OUT OF RESOURCES?



### OBJECTIVE:

Students learn how natural resources are used and will understand the difference between renewable and non-renewable resources.

### BACKGROUND INFORMATION:

People are putting increasing demands on the earth's resources in many ways - the need for more food puts pressure on the land and fishing resources, power, fuel and building resources are over-used, our technology demands all sorts of new raw materials, even space for living can be in short supply.

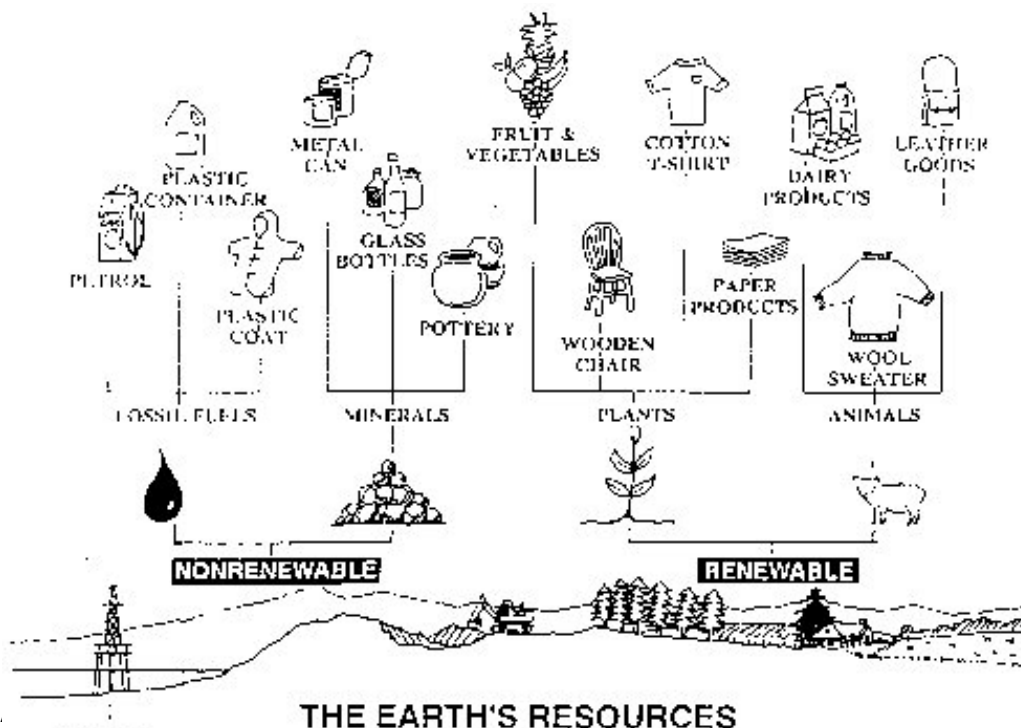
A natural resource is a valuable naturally occurring material. Renewable resources are those that can be replaced naturally, derived from an endless source, such as plants, wildlife, and sun. Non-renewable resources are those that occur in a finite amount such as fossil fuels, minerals and metals. Once used, these resources cannot be replaced.

Demand on our natural resources has grown significantly, due to the world's population increases.

### Class Plan (Levels 1 and 2)

1. Pass out clay from a container labelled "Earth's Resources", explaining that this is an example of one of the earth's resources. Make models of things using the clay.
2. Ask the children what they will do with their models now - keep them, throw them away. Discuss how we dispose of rubbish at home and at school. Get them to put in a 'throw away' or 'keep' box.
3. After we bury, burn or throw away these objects, what will happen to these things?
4. Repeat the activity several times.
5. When there is no more clay, point out that the resource container is now empty and that the resources have been used up.
6. Feel how heavy the 'throw away' box is. Point out that someone will have to take it to the disposal site where it will take up room and may contribute to pollution.
7. Ask what will happen if we keep taking materials from the earth? What will happen when we run out?
8. Point out that clay is a valuable material that can be used and reused.

If we could do this with all our waste, very little would go to the landfill and we would not take as much from the earth.



9.

**THE EARTH'S RESOURCES**

Gather a collection of various beads. The beads represent current supplies of non-renewable natural resources. Divide the class into small groups. Equally distribute beads to the group.

Children divide the resources into generations, that is some for them, some for their children and some for their grandchildren.

How many resources went into each category? Who has the most or least? How does this activity relate to the way people consume and conserve resources today for future generations to use.

**Materials:**

- ▶▶ enough clay for each member of the class to have a small amount.
- ▶▶ Two boxes labelled "Throw Away" and "Keep".
- ▶▶ Large quantity of beads.

### Class Plan (Levels 3 and 4)

1. Pass out clay from a container labelled "Earth's Resources" explaining that this is an example of one of the earth's resources. Make models of things using the clay.
2. Discuss how we dispose of rubbish at home and at school. Write the words "Bury, Burn and Throw Away" on the cardboard boxes. Students place their clay product into one of the three boxes. Discuss what would theoretically happen to each piece of clay if it is buried, burned or thrown away.
3. After we bury, burn or throw away these objects, what will happen to these things?
4. Repeat the activity several times, putting more clay items (earth's resources) into the boxes to show that as we buy and use products, we use up the supply of the earth's materials.
5. When there is no more clay, the resource container is now empty and so all the resources have been used up.
6. Discuss the concepts of finite (non renewable) Vs infinite (renewable) resources, thinking of examples of each. Some infinite resources are solar energy, timber, wind and hydroelectricity. Some finite resources are petroleum, tin, aluminium, coal and natural gas.
7. Hand out Worksheet "Running out of Resources". Are the items on the worksheet renewable or non-renewable resources? What other items do we use, where do they come from, how can we conserve them?
8. Students can survey different items in the classroom and identify what natural resources were used to make them. Are they renewable or non-renewable? Are more items made from renewable or non-renewable resources?  
  
Notice how heavy the boxes are, someone will have to take them to the landfill or school incinerator, where they will take up room and may contribute to pollution. Fortunately, the clay is still valuable material that can be used.
9. Can we ever get back the things we throw away? Which ones? What is going to happen if we keep taking materials from the earth? What will happen when we run out?

10. Instead of burying, burning or throwing the clay away, the children could reuse it. Even burning (incineration) of waste can generate heat, which can be used in creating energy, thereby saving precious fuels, such as oil and coal.
11. If we reuse the clay, we can make other items from it.

**Materials:**

- ▶▶ enough clay for each member of the class to have a small amount.
- ▶▶ Three small boxes labelled "Bury", "Burn", "Throw Away".
- ▶▶ Worksheet "Running out of Resources?"

## WORKSHEET

### "RUNNING OUT OF RESOURCES?"

Some resources come from plants and animals which grow and reproduce. These resources can slowly be replaced if we use them wisely and plan ahead for the future. If we cut down a tree to make timber, paper, or cardboard, we can plant a new tree. Since more trees can be grown, trees are called a renewable resource. Plants, animals and other things which can be replaced are all renewable.

But there are some resources which cannot be replaced. The earth has only a limited amount of them and once they are gone there will be no more. These resources are non-renewable. We can't grow or make new copper or other precious metals. And when the last oil well runs dry, there will be no more oil for heat, for cars or for use in the many plastic products which are now part of our lives. In addition to minerals and fossil fuels, water and air are also non-renewable.

#### Directions

Identify the resource which is used to make each of the items listed below. For example, cardboard boxes are made from trees. In addition, think about whether that resource can grow or be replaced so that we will have more. Mark an "R" next to those items that come from a renewable resource such as cardboard boxes. Place an "NR" next to those items which are made from sources that cannot be replaced. They are non-renewable.

Cardboard box

Steel bucket

Copper pipe

Book

Leather jacket

Wooden desk

Cotton shirt

Polyester shirt

Flour

Balloon



Aluminium pan

Drinking glass

Steak

Corn cob

Wool jumper

Tyre

Diamond

Plastic rubbish bin

Pencil

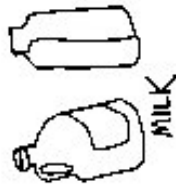
Paper towel

## ADDITIONAL MATERIAL

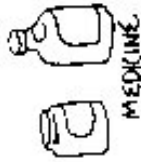
What are the things we need to live?

What are the things we would like to want? Colour in this page.

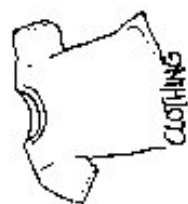
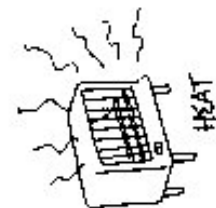
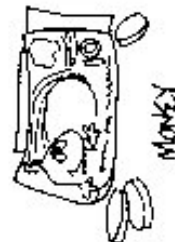
Circle the things we really NEED!



AIR

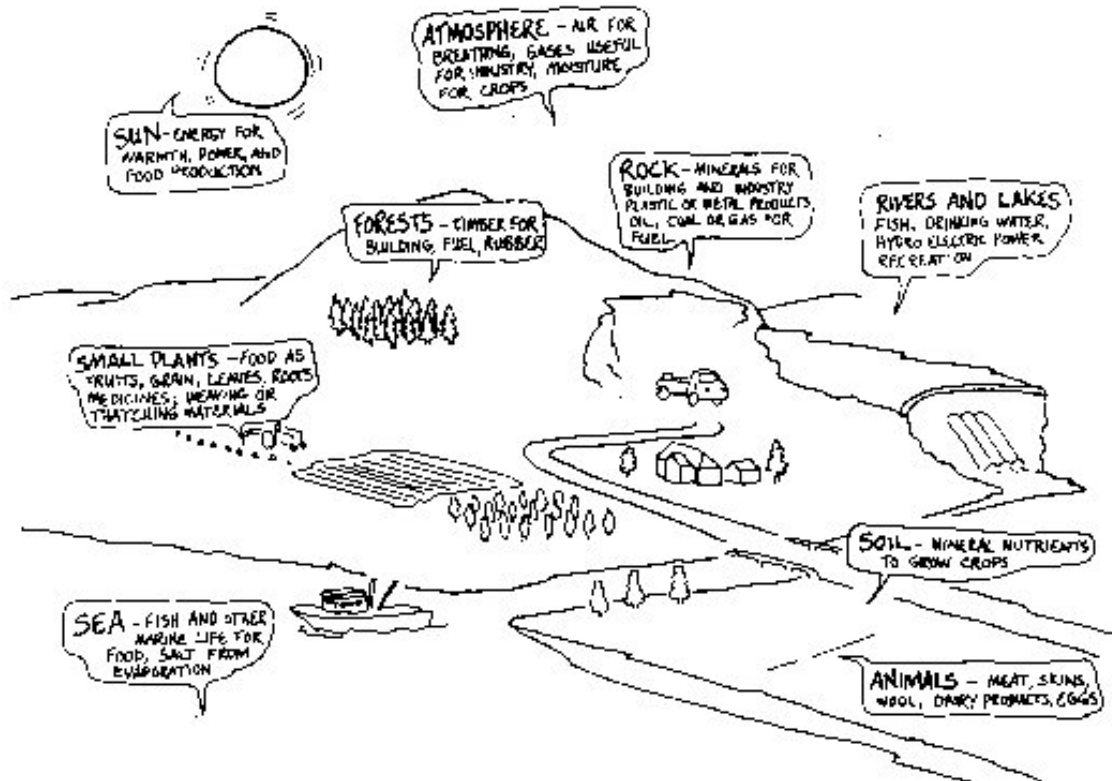


SHHH  
QUIET

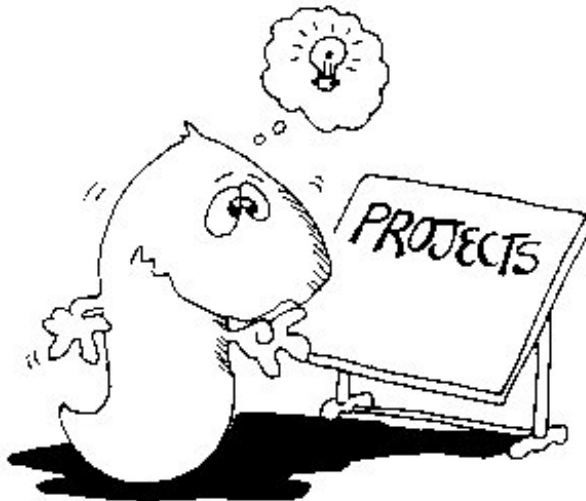


## ADDITIONAL MATERIAL

Colour this Page



## RESOURCES



- ★ Make a list of all the things you really need in your life. Do these needs use up natural resources?
- ★ Make a list of things you want. Are they necessary?
- ★ Make a list of non-renewable resources.
- ★ Make a list of renewable resources.
- ★ How can we conserve resources? (Conserve means to look after or save.)
- ★ What are some of the things you can use over and over again?

