

Natural resources form by themselves.  
Name the three places they come from.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Why is recycling metals better than mining and extracting new metals?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

How can metals be recycled?

\_\_\_\_\_

\_\_\_\_\_



What are the '3 Rs' connected with recycling?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Why is this easy to do with glass?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Life Cycle Assessments**

This looks at every stage of a product's life and checks the effect on the environment. Add three points under each heading explaining what it means.

1. Getting the Raw Material

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Manufacturing and Packaging

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Using the Product

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. Product Disposal

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What are the problems with Life Cycle Assessments?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

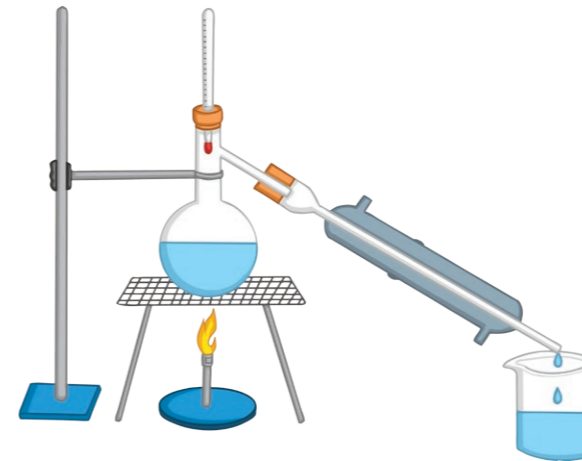
Compare the life cycle of a plastic bag vs a paper bag.

Compare them for the following factors:  
raw material, manufacturing, packaging, using the product, product disposal.

Plastic Bag	Paper Bag

**Desalination**

Describe this process.



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Renewable Resources vs Finite (Non-Renewable)**

Complete the table with the following keywords: nuclear fuels, timber, fossil fuels, minerals, metals, fresh water, food.

Renewable	Finite

Potable water is water you can drink.

For water to be safe to drink, it must...

1. not have high levels of \_\_\_\_\_  
\_\_\_\_\_;
2. a pH between \_\_\_\_\_ and \_\_\_\_\_;
3. not have any \_\_\_\_\_.

**a**

Where does surface water collect?

\_\_\_\_\_

\_\_\_\_\_

Where does ground water collect?

\_\_\_\_\_

\_\_\_\_\_

**c**

Sewage treatment occurs in several stages (as shown below).

Number the statements in the correct order.

- Anaerobic digestion of sewage sludge.
- Screening and grit removal.
- Aerobic biological treatment of effluent.
- Sedimentation to produce sewage sludge and effluent.

**f**

What are the two processes involved in water treatment?

Name them and describe the process.

1. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**i**

Choose the correct answer to complete the sentence below:

Phytomining is the use of \_\_\_\_\_ to extract copper.

1. bacteria
2. plants
3. animals
4. fungi

Explain how this process occurs.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**b**

Where does waste water come from? Give four examples.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

**d**

Why is it important to use sustainable resources?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

**g**

List the positives of extracting resources.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

**e**

Evaluate the pros and cons of using coal compared to a renewable energy.

	Pros	Cons
coal		
renewable energy		

**h**

List the negatives of extracting resources.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

**j**

Biobleaching is the use of \_\_\_\_\_ to obtain copper.

Explain how this process occurs.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

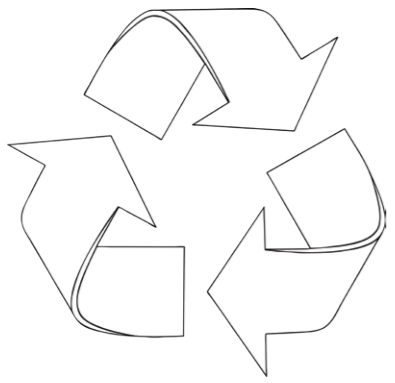
\_\_\_\_\_

Natural resources form by themselves.  
Name the three places they come from.

1. earth
2. sea
3. air

Why is recycling metals better than mining and extracting new metals?  
Mining and extraction of metals uses a lot of energy. Recycling uses a lot less energy and it saves the earth's metals.  
It also cuts down on landfill waste.

How can metals be recycled?  
Metals can be recycled by melting them down and then re-shaping them.



What are the '3 Rs' connected with recycling?

1. reduce
2. reuse
3. recycle

Why is this easy to do with glass?  
Glass can be reused without reshaping. Some has to be recycled - it is crushed, melted and re-shaped.

**Life Cycle Assessments**  
This looks at every stage of a product's life and checks the effect on the environment.

Add three points under each heading explaining what it means.

1. Getting the Raw Material  
Extraction damages the environment and uses a lot of energy. Results in pollution and some things need processing to turn them into useful materials.
2. Manufacturing and Packaging  
Making packaging can cause pollution. Chemical reactions are sometimes used and they make waste products that have to be disposed of.
3. Using the Product  
Using the product can damage the environment. For example, fossil fuels produce greenhouse gases and fertilisers can get into streams and rivers.
4. Product Disposal  
Products thrown away in landfill sites take up space and pollute the earth. Energy is also needed to take the product to the landfill. They may also be incinerated which will cause air pollution.

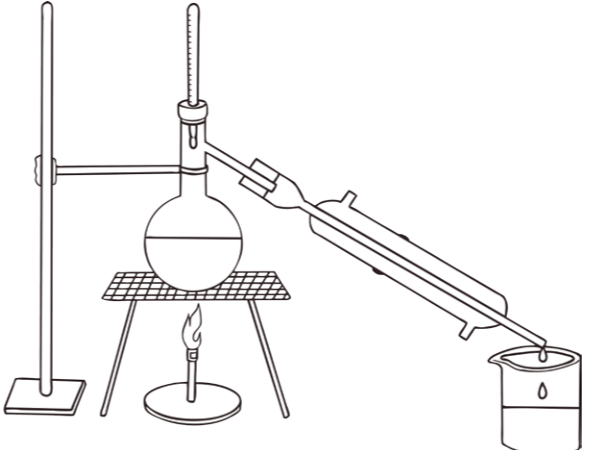
What are the problems with Life Cycle Assessments?

1. Sometimes it is hard to give a numerical value.
2. They can be biased (depends on the person carrying them out).
3. They can be selective to provide a company with positive advertising.

Compare the life cycle of a plastic bag vs a paper bag.  
Compare them for the following factors:  
raw material, manufacturing, packaging, using the product, product disposal.

Plastic Bag	Paper Bag
from crude oil	from wood
Manufactured by fractional distillation, cracking, and polymerisation.	Made from pulped wood – lots of energy is needed.
Reused, most are non-biodegradable, take up space in landfill.	Usually only used once, recycled, biodegradable.

**Desalination**  
Describe this process.



Neutralise the water first by adding either acid or alkali depending on the pH.

Salt water is heated and the water reaches boiling point. When it does, it is evaporated. The vapour goes into the condenser and cools down, forming pure water. Salt crystals are left behind in the flask.

**Renewable Resources vs Finite (Non-Renewable)**  
Complete the table with the following keywords: nuclear fuels, timber, fossil fuels, minerals, metals, fresh water, food.

Renewable	Finite
timber	nuclear
fresh water	fossil fuel
food	minerals
	metals

Potable water is water you can drink.  
For water to be safe to drink, it must...

1. not have high levels of dissolved salts ;
2. a pH between 6.5 and 8.5 ;
3. not have any bacteria.

Where does surface water collect?  
**lakes, rivers and reservoirs**

Where does ground water collect?  
**Collects in rocks trapped underground.**

Sewage treatment occurs in several stages (as shown below).

Number the statements in the correct order.

- Screening and grit removal.**
- Sedimentation to produce sewage sludge and effluent.**
- Anaerobic digestion of sewage sludge.**
- Aerobic biological treatment of effluent.**

What are the two processes involved in water treatment?

Name them and describe the process.

- Filtration**  
 Water is passed through a wire mesh and filter beds to filter out any solid parts.
- Sterilisation**  
 Water is sterilised to kill bacteria or microbes by bubbling chlorine gas through it and using UV or ozone gas.

Choose the correct answer to complete the sentence below:

Phytomining is the use of **plants** to extract copper.

- bacteria
- plants**
- animals
- fungi

Explain how this process occurs.

**The copper builds up in the leaves of the plants. The leaves are picked, burnt and the ash is collected. The ash contains the copper.**

Where does waste water come from? Give four examples.

- bath/toilet/shower**
- washing-up**
- farming**
- industrial processes**

Why is it important to use sustainable resources?

- To preserve the environment.**
- Resources are needed for future generations.**
- To allow ourselves to live comfortably.**

List the positives of extracting resources.

- Useful products made/collected.**
- Jobs for the local area.**
- Brings money to the area.**

Evaluate the pros and cons of using coal compared to a renewable energy.

	Pros	Cons
coal	cheaper	Non-renewable and takes a long time to form/ pollutes the environment/ produces many greenhouse gases/ leads to global warming and climate change.
renewable energy	less of an impact on the environment/ can be re-used	Can be dependent on factors such as the weather or the environment.

List the negatives of extracting resources.

- Bad for the environment.**
- Uses lots of energy.**
- Produces waste.**
- Destroys habitats.**

Bioleaching is the use of **bacteria** to obtain copper.

Explain how this process occurs.

**Bacteria convert copper compounds found in the ore into soluble copper. The solution produced by the process can be extracted by electrolysis.**