

Insulation

When it is cold shut the curtains to stop precious heat escaping. Curtains and blinds will also keep heat outside when the sun is burning! How hot or cold your house gets and the amount of energy needed to keep it cool or warm enough depends on INSULATION. Insulation stops heat from passing through. Buildings can be insulated with cotton, grass, straw, sheep's wool, paper, clay bricks or straw. Build thick walls with layer of insulation in the middle.

If your roof is made of zinc think about putting layers of insulation in the loft. Include an insecticide, one that is biodegradable and safe.

Energy self-sufficiency

Most countries import their oil and gas. When producers increase the price it's difficult to pay the bill. We struggle to pay our household fuel bills and countries have the same problem, making life harder for everyone. Increasing the amount of renewable energy produced in a country reduces import bills and helps stabilise the economy. During its economic crisis Zimbabwe used locally manufactured equipment to make 50 million litres of cheap biofuel every year: without it cars would not have moved - imported fuel was too expensive.

Think about installing a biogas or solar system to power your own house, school or business. It won't create greenhouse gases like a diesel or petrol generator, is more 'climate friendly' than grid electricity, and will give you electricity with no bills.

The activities on the next few pages demonstrate how you can save fuelwood, cooking time and reduce kitchen smoke – win for you, win for the planet.

reflections

- Have you noticed climate change in your area?
- What has changed?
- Can you remember any rivers that used to always flow with water but now dry up?
- Can you still plant your crops on a certain date knowing the rains will come within a week?
- How are people adapting to climate change in your area? Do you think they need to?
- How can we help prevent negative effects of climate change?

ENERGY Activities

The activities on the next few pages demonstrate how you can save fuelwood, cooking time and reduce kitchen smoke – win for you, win for the planet.

Activity 1

Fuelwood Experiment

How does size, moisture content and type of wood affect how fuelwood burns?

What you need for the experiment:

- Two three-stone fireplaces in a safe outdoor area
- Wood (as described below)
- Matches
- Water
- Two equal-sized cooking pots



Preparation

Collect wood for three experiments as follows:

1. Wet and dry wood

Find two pieces of wood the same size. Soak one of the pieces of wood in water for one day or get one freshly cut piece of wood, and one piece of dry wood.

2. Logs and twigs

Take some dry wood from the same tree and weigh out two equal amounts — one in the form of logs and one in the form of twigs. You can use the technique shown in the picture to get two piles of wood that are the same weight. Tie a bundle of logs to one end of a pole, and then tie a bundle of twigs to the other end. Keep adding twigs until the pole is balanced when hung from a rope tied to its middle. When the pole is balanced, you will have bundles of twigs and logs of equal weight.



Experiment

1. Build two three-stone fireplaces. Use the pile of logs and the pile of twigs to make two separate fires. Compare the way the fires burn. Which pile of wood ignites and burns faster? Time how long it takes to light each fire and how long it takes to boil a pot of water with each fire.

If you have a thermometer, you can measure the temperature at ground level at a given distance from each fire. Explain your results. (Hint: Which wood has a larger surface area exposed to the air?)

2. Get the two fires to burn at the same intensity. Then add the wet piece of wood to one fire and the dry piece to the other. Compare how they burn. How long does it take to light the two pieces of wood? Which gives off more smoke? Which gives off more heat? Explain your observations.

3. Don't forget to make some tea with the water when it has boiled!

SOURCE: Outreach hands on Science: Wood it burn?
Burning Wood Efficiently

Activity 2

Compare the efficiency of different cook stoves

What you need for the experiment:

- A 3-stone fireside and three or four different types of improved wood-burning cook stove, eg. metal, clay, mud, cement.
- Firewood and matches.
- Four sets of cooking utensils: pots, knives, spoon, etc.
- Ingredients for a simple everyday meal: enough to prepare the same meal on each stove.
- A balance to weigh the wood (a butcher or grain merchant may be able to help with this).

Experiment

Each person or group prepares the same meal, each using a different stove. Each uses exactly the same quantity of ingredients.

Record the time taken from start to end of cooking.

Weigh the wood before cooking and when complete.

Record your results

Stove	Wood Consumption (kg)	Cooking Time (Hours/Minutes)
a) 3-stone		
b) Improved 3-stone		
c) Metal		
d) Clay		
e) Other		

Discuss!

SOURCE: UNAFAS, BP 307, Yaounde. www.unafas.org