

A WORLD OF RESOURCES

Objective: To discover that worldwide cooperation is necessary to make most products.

A Few Facts

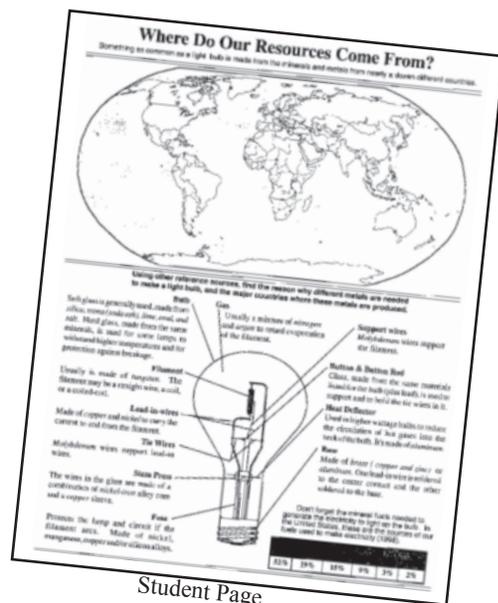
In today's world, no country is truly self-sufficient; not one can produce all of the different minerals needed to maintain its own economy and society. Larger countries (because of their size) come close to self-sufficiency, but none have achieved it yet.

The economics of entire nations can depend on mineral resources. Half of the world's known gold reserves are in South Africa; petroleum is in Arab nations, copper in Chile and other minerals and metals in Canada, Siberia and Peru.

The U.S. has to import:

- 100% of the bauxite needed to make aluminum
- 39% of the chromium needed to make stainless steel
- 63% of its tungsten (used in light bulbs and special steels)
- 100% of its graphite, manganese, strontium, and vanadium
- 80% of its tin (for cans and containers); 76% of its zinc (for food and medicine); 73% of its potash (a necessary fertilizer to grow food)
- 57% of its petroleum (to provide the energy we all use)

(sources: USGS and DOE)



Classroom Experience

Who comes closest to self-sufficiency?

Group students into six teams for the six main continents. Let each team explore and determine who controls the majority of the world's resources.

Is there a concentration of minerals in one major area of a continent?

In just one country?

On which countries does the U.S. most depend for minerals?

Assign different metals to the class to find out:

Why is more lead, gold and platinum recycled than aluminum?

Why doesn't the U.S. mine bauxite?

Dig A Little Deeper

- What effect, if any, does the availability of natural resources have on your life-style? Has the need for resources ever caused war?
- What causes famine in some countries? Is it lack of food or politics?
- Can a country maintain its independence and quality of life without a dependable supply of natural resources? If yes, for how long? If no, what can that country do to continue its existence?

Read More About It!

Check out this book for your class:

- *In Coal Country* by Judith Headershot; Knopf



Note: Check any current event involving conflict. Does the scarcity of resources play a role? Remember, resources include the Earth's natural resources and man-made resources.

Integrating the Curriculum

1. Explore how important it is to speak the language of those countries from which one wishes to buy natural resources.
2. What effect did the gold rush have on the settlement of the western frontier? On the United States? Some children might explore the origin of the word "sourdough" and then make sourdough bread.
3. What are the difficulties of extracting minerals from the Earth? Is it different in Alaska than it is in South Africa?
4. There is a feeling of brotherhood among people involved in producing resources. Suggest students discuss, role play or research why this might be so. (Note: farmers feel brotherhood, so do loggers and cowboys.)
5. Learn songs dealing with each of the resources. *Oklahoma!* (where the corn grows...), *Home on the Range*, etc.

Where Do Our Resources Come From?

Something as common as a light bulb is made from the minerals and metals from nearly a dozen different countries.



Using other reference sources, find the reason why different metals are needed to make a light bulb, and the major countries where these metals are produced.

Bulb
Soft glass is generally used, made from *silica, trona (soda ash), lime, coal, and salt*. Hard glass, made from the same minerals, is used for some lamps to withstand higher temperatures and for protection against breakage.

Gas
Usually a mixture of *nitrogen* and *argon* to retard evaporation of the filament.

Support wires
Molybdenum wires support the filament.

Button & Button Rod
Glass, made from the same materials listed for the bulb (plus *lead*), is used to support and to hold the tie wires in it.

Heat Deflector
Used in higher wattage bulbs to reduce the circulation of hot gases into the neck of the bulb. It's made of *aluminum*.

Base
Made of *brass (copper and zinc)* or *aluminum*. One lead-in wire is soldered to the center contact and the other soldered to the base.

Fuse
Protects the lamp and circuit if the filament arcs. Made of *nickel, manganese, copper* and/or *silicon* alloys.

Stem Press
The wires in the glass are made of a combination of *nickel-iron* alloy core and a *copper* sleeve.

Tie Wires
Molybdenum wires support lead-in wires.

Lead-in-wires
Made of *copper* and *nickel* to carry the current to and from the filament.

Filament
Usually is made of *tungsten*. The filament may be a straight wire, a coil, or a coiled-coil.

Don't forget the mineral fuels needed to generate the electricity to light up the bulb. In the United States, these are the sources of our fuels used to generate electricity.

Coal	Nuclear	Hydro	Natural Gas	Oil	Other
45%	20%	7%	23%	2%	3%

Source: Energy Information Administration