



# Fossil Fuels From the Forest

*Where Does Coal Come From?*

Background Info

Over half of the heat and electricity used by Americans comes from **coal** powered plants, yet most Americans don't realize that coal is actually 300 million year old fossilized plant remains! This activity addresses this issue by explaining the life cycle of coal, from **carbon** in trees to carbon in the atmosphere.

Anthracite coal is commonly burned at coal power plants in the United States. In general there are four types of coal, "ranked" according to carbon and moisture content. Carbon and moisture content of coal are the result of how long they have undergone the intense heat and pressure associated with coalification. Anthracite coal has a low moisture, high carbon content and was the first of the coal types to form and thus is the oldest. Anthracite coal is mined primarily in northeastern Pennsylvania. (The four ranks of coal, from oldest/highest carbon/lowest moisture content (also hardest to softest) are: Anthracite, Lignite, Bituminous and Sub-bituminous.)



The first part of this activity, The Life Cycle of Coal, connects our reliance on coal for **energy** with **carbon dioxide** (CO<sub>2</sub>) emissions and **climate change**. It is helpful to think of coal (and other **fossil fuels**) in the context of carbon. The ancient plants that formed coal are made almost entirely of carbon. Coal power plants burn coal (carbon), producing heat energy to turn the turbines that create electricity. In the burning process, the carbon in coal combines with oxygen in the air to create carbon dioxide, which is released into the atmosphere. CO<sub>2</sub> is an important **greenhouse gas** that helps to control surface temperatures and insulate the earth from space around it. However, since industrialization began in the 1800's and people began burning coal and other fossil fuels in unprecedented rates, we have seen an increase in the amount of greenhouse gases such as CO<sub>2</sub> and a corresponding increase in average surface temperatures. Scientists are concerned about the temperature increase, because the rate of this warming is unprecedented and is predicted to cause great changes to ecosystems and negatively effect human health.

The second part of this activity, cookie coal mining, addresses another negative side effect of relying on coal as a primary energy source. In order to access coal deposits, or all of the stored carbon in ancient plant matter, we need to mine (dig beneath) the surface of the earth. The negative implications of coal mining, both on ecosystems and human health, depend primarily on the type of coal mining. Strip mining is the most common type of coal mining in the U.S. and is therefore addressed in this activity.

## Credits

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