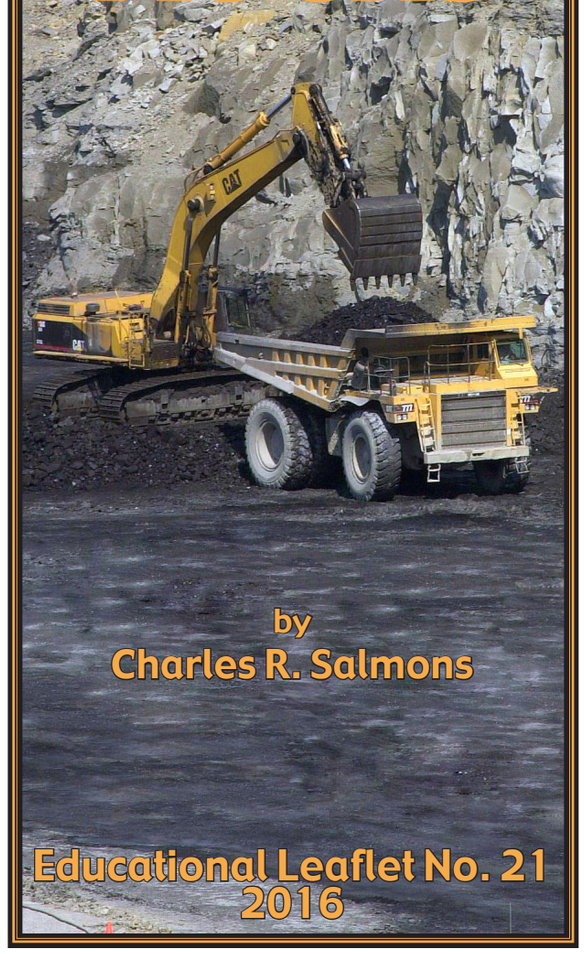
Your House Rocks



by
Charles R. Salmons

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Where Raw Materials Come From

The geology of Ohio does not provide us with all of the raw materials we need to build a house, but many of these materials are found throughout our state. The rocks we use for building and manufacturing are called *industrial minerals*, and they include clay, coal, salt, limestone, sandstone, sand, and gravel.

Industrial minerals are extracted from the land in various ways. Some materials come from mines, quarries, and pits at the land surface. Here, the rocks are blasted loose with explosives and hauled away by large pieces of equipment, such as excavators and dump trucks.

Excavator loading a dump truck with coal at a strip mine.

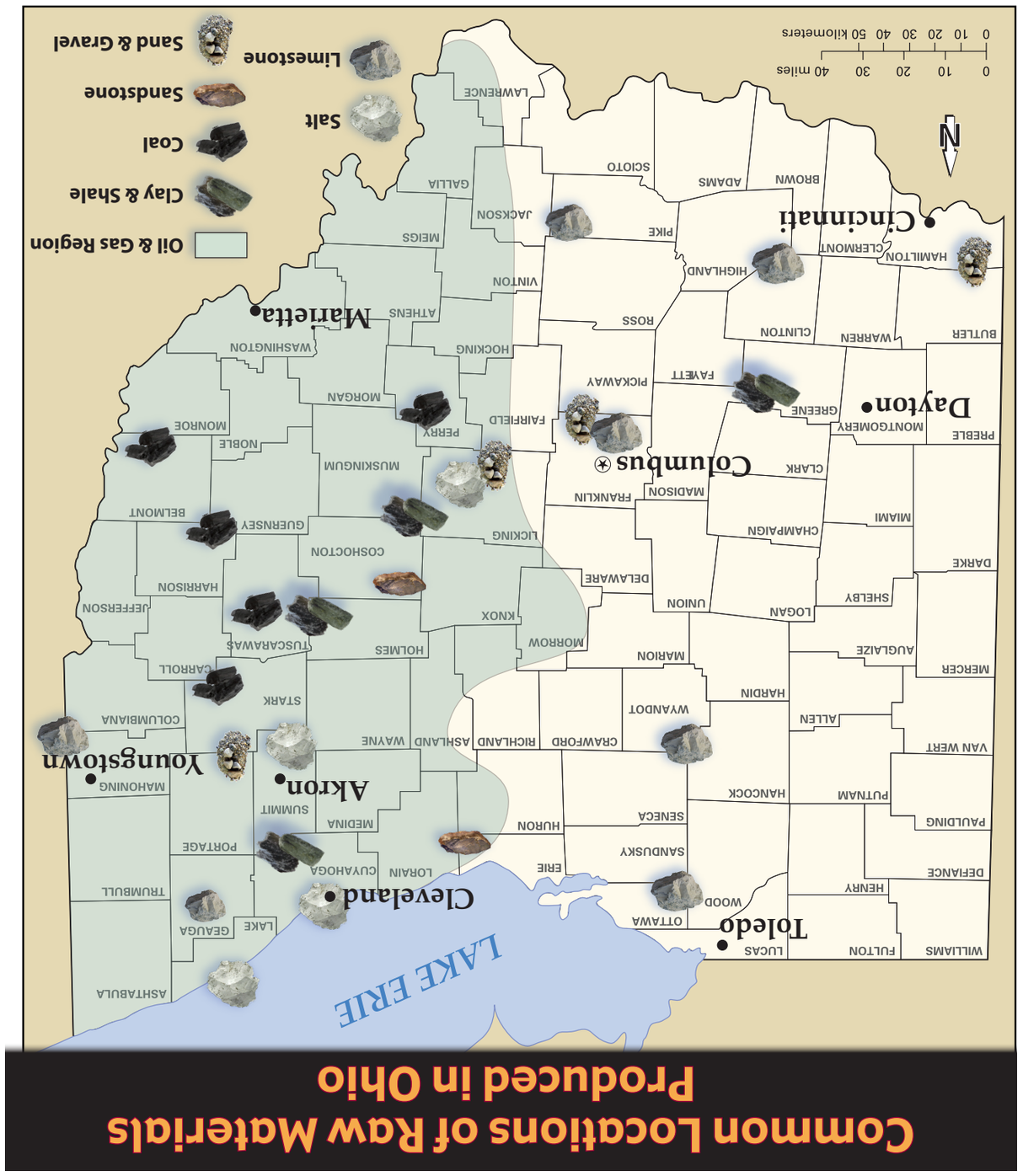
Whether you know it or not, geology plays an important role in your life every day. From the house that you live in, to products that help you get ready for school, to equipment you use for sports and other activities, geology makes life easier in many ways.

Many of the products we use are made from various rocks and minerals, metals, or petroleum. These are called *raw materials*, and we get them through mining or drilling.

Geologists have a saying: "If it can't be grown, it has to be mined." While plants provide us with various things we need to survive, such as food and clothing, many everyday products would not exist without geologic raw materials.

Quarry blast.

Common Locations of Raw Materials Produced in Ohio



Concrete being poured into a form.

Your home is built using a large number of geologic raw materials, but it is also built using other products that are made using some raw materials. For example, the lumber used to build the roof, walls, and floors are fastened together with nails and screws, which are made from iron and zinc.

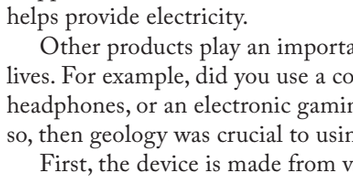
Concrete is another product that is necessary to build your home. Concrete is made from a mixture of crushed stone (called *aggregates*), water, and cement (a blend of limestone, clay/shale, and gypsum).

Raw Materials in Your Home

Industrial minerals also come from underground mines, where miners use special machines to remove the rocks.

Other raw materials we use every day are petroleum-based products. These products are made from oil and natural gas, which are extracted from deep inside the earth by large drills. Petroleum is used to make plastics, but it also is used to supply energy for automobiles and for heating our homes.

Western Ohio has many quarries that provide stone aggregates composed of limestone and dolomite. The geology in eastern Ohio provides clay, shale, coal, sandstone, oil, and gas. Salt, another important raw material, is mined deep in the earth below Lake Erie. Sand and gravel comes from many areas of Ohio but especially where glaciers advanced across the land during the Ice Age.



Salt mine under Lake Erie.

Plastic products also are used to make buildings. Items in your house that may be made from plastic include countertops in your kitchen or bathroom, siding on the exterior walls, and various fasteners.

Finally, various metals are used to build your house. For example, many of the items in your house are made from steel. Steel is produced using iron, nickel, and other metals. And copper is used to make pipe for plumbing materials, which carry water to your house. Copper also is used to make the electrical wire, which helps provide electricity.

Other products play an important role in our daily lives. For example, did you use a computer, television, headphones, or an electronic gaming system today? If so, then geology was crucial to using that device.

First, the device is made from various geologic materials, including minerals such as silica, metals such as gold, copper, and platinum, and petroleum products (plastics).

Second, you need electricity to power the device. When you plug the device into an outlet in your house, electricity flows into the device giving it the energy it needs to work properly. Most of the energy we use comes from power plants, which burn coal and natural gas to generate electricity.

Technology needs geologic raw materials to create and run devices such as tablet computers.

See how many of the following items you used today and the raw materials used to make them.

Can you name other items you use every day that are made from geologic raw materials?

- Toothpaste (limestone)
- Hand lotion (oil, clay)
- Drinking glass (sand)
- Make-up/cosmetics (clay, shale, other minerals)
- Baked goods (gypsum)
- Plastic comb/brush (oil)
- Paper (clay, limestone)
- Dandruff shampoo (coal)
- Peanut butter (salt)

Further Reading

Explore the websites below for activities that will help you learn more about rocks and minerals and other geology topics.

education.usgs.gov/primary.html
U.S. Geological Survey – Contains educational resources useful to educators and K-6 students. Materials cover a range of topics, including biology, geology, and geography.

mineralogy4kids.org
Mineralogical Society of America – Features educational materials and activities for kids and parents, on topics such as the rock cycle, mineral properties, crystals, home products, and an interactive mineral ID tool.

mineralseducationcoalition.org
Minerals Education Coalition – Offers fact-based K-12 lessons and activities to inform and educate the public about the importance of mineals and mining in their everyday lives.

OHIO Rocks!™

Established in 2012, *Ohio Rocks!* provides grants to Earth Science students at Ohio colleges and universities for research on the geology of Ohio and funds outreach to Ohio's K-12 schools.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL SURVEY
Thomas J. Serenko, Chief

2045 Morse Road, Bldg. C-1
Columbus, Ohio 43229-6693
(614) 265-6576

OhioGeology.com

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Explore this house to find geologic materials used to build it.

1. Foundation & sidewalks – concrete (**limestone, clay & shale, sand,** aggregates, & water)
2. Waterproofing & sealing – asphaltic materials (**petroleum**)
3. Exterior walls – concrete blocks, **limestone**, **aluminum** siding, bricks (**clay & shale**), or stucco (**sand** and Portland cement)
4. Windows – glass (**sand**, **silica**, & other minerals), frames (**aluminium**, **petroleum,** wood)
5. Interior walls – wallboard/drywall (**gypsum**)
6. Furnace – steel (**iron** & other metals)
7. Attic and wall insulation – glass wool (**sand** & other minerals) or **vermiculite**
8. Toilets, sinks, & bathtubs – porcelain (**clay & shale**)
9. Countertops – **granite**, **marble**, steel, or even concrete
10. Floor coverings – porcelain or ceramic tiles (**clay & shale**) or carpet (**petroleum & limestone**)
11. Door knobs, hinges, locks, hardware, & plumbing fixtures – metals including brass (**copper & zinc**) and stainless steel (**iron**, **nickel**, chrome, & **zinc**)
12. Paints – minerals and pigments
13. Rain gutters & downspouts – **aluminum**, steel, **copper**, or plastic (**petroleum**)
14. Driveway – concrete, gravel aggregates, or asphalt (**petroleum**, aggregates, **sand & gravel**)
15. Roof – asphalt shingles (**petroleum**), **clay** tiles, corrugated **iron**, or **slate**
16. Yard & landscaping – soils (**gypsum**, minerals)
17. Systems & maintenance – water softening, de-icing (**salt**)

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Clay & Shale
1 8 10 15

Coal
2 14 15

Salt
17

Sandstone
1 3 16

Gypsum
1 5 16

Limestone
1 3 9 10

Sand & Gravel
1 2 4 7 9 10 14

Petroleum
2 10 13 14 15