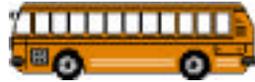




ABOUT MINERAL RESOURCES

DID YOU KNOW?



Paint is manufactured with mineral fillers (clay and limestone) and pigments (from various minerals).

Doorknobs, locks and hinges are made of brass or steel (copper, zinc and iron ore).

In pre-Columbian times, indigenous people in North America mined turquoise, jet, asbestos, salt, sodium sulfate, and other minerals. Turquoise, jet, opal, copper and silver were mined mostly for decorative use. Coal was mined for fuel. Obsidian and other igneous rocks were mined to make arrowheads, mortars and pestles, grinding stones and stone axes. Clay and asbestos were mined to make pottery. Salt was used as a preservative and for flavoring.

Diatoms (microscopic single-celled plants that live in fresh or seawater), have extremely intricate shells made of silica. When large numbers of these shells are deposited, diatomite is formed. When diatomite is cleaned and packed to form a filter, the intricate geometry of the shells can remove impurities as small

as 0.1 micron from the water. Clear juices (such as apple juice) and wines may be filtered through these skeletons. Diatomite can also be used as a non-chemical insecticide; the sharp silica shells cut and shred the insects.

One ounce of gold can be stretched into a wire more than 40 miles long. Gold can be worked into a layer measuring 1 millionth of an inch. All the gold discovered thus far would fit in a cube 22 meters on a side.

In the average 3,000-pound car, there are 139 pounds of aluminum, 28 pounds of copper, and 20 pounds of zinc.

Roads and highways are made from gravel, asphalt and cement—all produced from minerals.

Glass is made from silica sand and limestone, both of which have to be mined.

Clays are used in hazardous waste disposal to solidify organic waste and salt solutions, and to create impermeable barriers to encase the waste.

Limestone removes phosphorus and nitrogen, controls odor, kills bacteria, and aids in the clarification of waste water. Limestone also neutralizes acid rain drainage.

Lithium is used in high-energy batteries for use in computers and electric car propulsion.

Silver is used to kill bacteria in water purification systems.

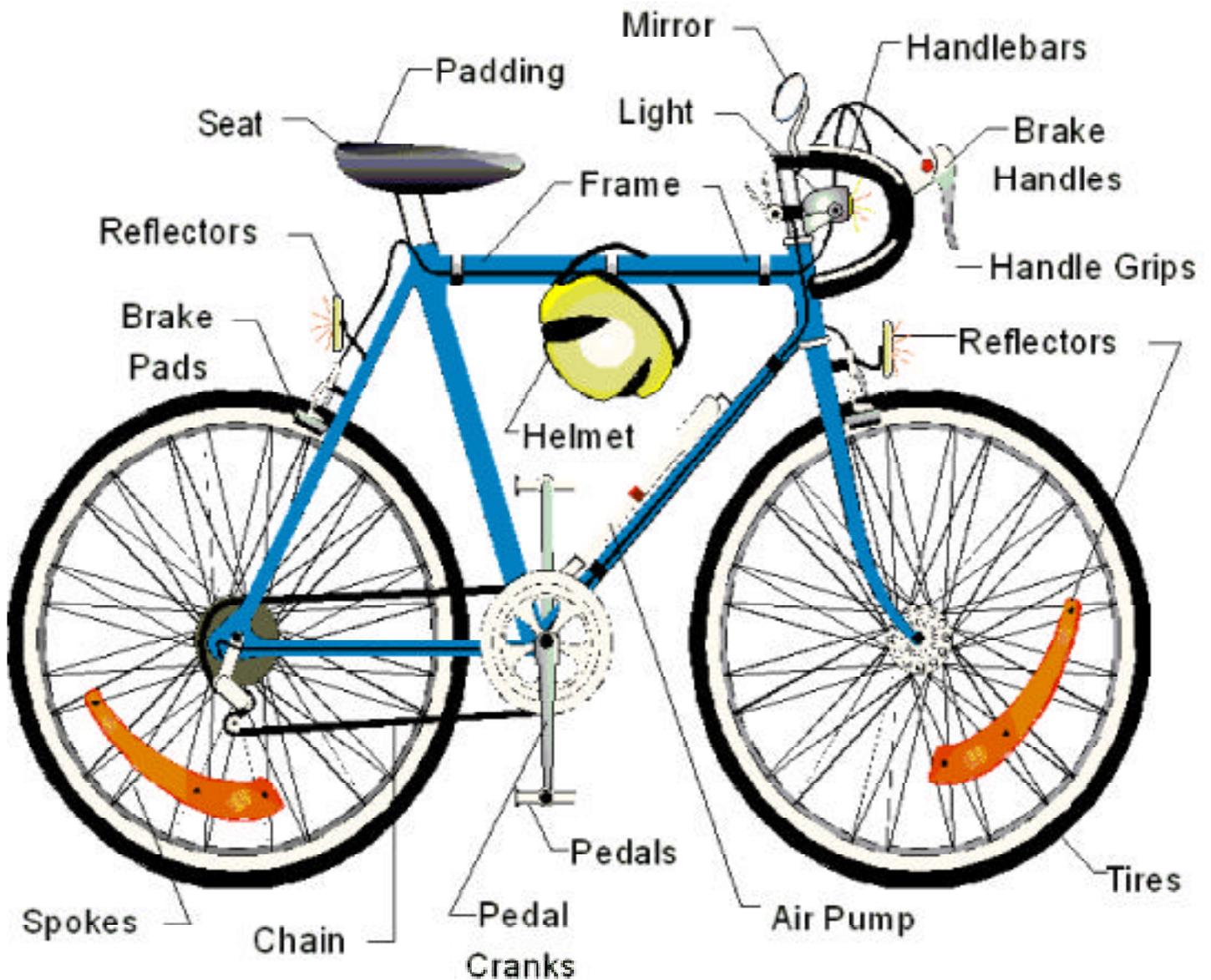
Approximately 90% of the phosphate mined in the world today goes into fertilizer for production of food.

Mineral elements provide the color in fireworks. Barium produces bright greens; strontium yields deep reds; copper produces blues; sodium yields yellow. Other colors can be made by mixing elements: strontium and sodium produce brilliant orange; titanium, zirconium and magnesium alloys make silvery white; copper and strontium make lavender. Gold sparks are produced by iron filings and small pieces of charcoal. Bright flashes and loud bangs come from aluminum powder.

Gold plays an important role in keeping pilots safe. Gold is used in microelectronic circuitry in escape mechanisms, parachutes and air-survival radios. Gold is the best metal

to use in these applications because it doesn't corrode, crumble or tarnish. It is unaffected by moisture, oxygen or ordinary acids, and is virtually indestructible.

What minerals, rocks or elements are used to make this bike?



Bicycle: concept and information from C.L. Pridmore, Associate Engineering Geologist, DMG; graphics by Debbie Maldonado, DMG.

Answers on next page.

More than 30 million cars are equipped with air bag systems that have gold-plated electrical contacts, ensuring that the system will work flawlessly for the life of the car.

Gold's ability to reflect infrared radiation helps shield astronauts, sensitive electronic equipment and circuitry. It also protects the tether that secures astronauts on spacewalks.

Magnetite is an iron oxide mineral that is magnetic.

Galvanizing is the process of dipping steel into molten zinc to prevent rust.

Aluminum metal is made from the aluminum ore, bauxite.

Modern pewter is 93% tin, 6% antimony and 1% copper. Other metals that have been used in pewter include lead, bismuth and zinc.

Electrical wiring is made of copper or aluminum.

Sources: U.S. Geological Survey and Minerals Information Institute

Answers!



The following lists the elements that contribute to the different parts of the bike. Those denoted with* are minerals, and ** are rocks. A mineral is a naturally occurring element or chemical compound that is crystalline. A rock is generally considered to be an aggregate of minerals.

Metal parts of bike: Pedals, frame, pedal cranks, chain, etc.

Titanium
Iron
Chromium
Tungsten
Manganese
Molybdenum
Aluminum
Zinc
Nickel
Magnesium
Sulfur
Fluorite *
Marble **
Limestone**

Rubber and plastic parts: seat, tires, brake pads, helmet, etc.

Petroleum products (derived from crude oil)
Marble**
Mica*
Talc*
Clay (either a mineral group or rock type)
Barite*
Wollastonite*
Titanium
Halite*
Sulfur

Glass parts: mirror, reflectors

Silica or Quartz sand
Sodium carbonate minerals
Borate minerals
Silver
Dolomite*
Barite*
Magnesite

Batteries

Zinc
Manganese
Lead

Paint

Titanium dioxide*
Iron oxide*
Mica*
Talc*
Clay (mineral group and/or rock type)
Wollastonite*
Molybdenum
Silica*
Sulfur
Barite*

Significant amounts of the following elements and minerals are also obtained through recycling: Aluminum, Chromium (as stainless steel), Iron and Iron steel, Lead, Magnesium, Nickel (as stainless steel), Silver, Titanium, Tungsten, Zinc and Silica (from glass containers).

The U.S. Geological Survey publishes mineral commodity reports. This and other information is also accessed from the webpage <http://minerals.usgs.gov/minerals>