

Uses of Rocks and Minerals – Answer Page

Directions: *Is this material composed of rocks & minerals? For each material write yes or no.*

<i>Material</i>	<i>Hypothesis</i>	<i>Actual</i>	<i>Components</i>
Diamond engagement ring		YES	Diamonds, gold/platinum/silver
Camera		YES	Film has silver in it, flash has magnesium alloy wires, glass, plastic, metals
Soda water		YES	Water, salts, carbon dioxide
Hammer and nail		YES	Steel
Eye glasses		YES	Glass, nickel and silver reinforced frames, plastic frames, metal hinges
Toilet bowl		YES	Porcelain, steel, plastic
Cosmetics		YES	Talc, iron oxides, chrome oxides, manganese violet, lapis lazuli, kaolin, soda ash, and charcoal for colors; mica for luster
Light bulbs		YES	Glass, aluminum, tungsten
Soap		YES	Potash, salts

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Asbestos	Asbestos is used in fireproof fabrics, yarn, cloth, paper, paint filler, gaskets, roofing composition, as a reinforcing agent in rubber and plastics, brake linings, tiles, electrical and heat insulation, cement, and chemical filters.
Bauxite	The main source of aluminum. Aluminum is used in the United States in packaging, transportation, and building.
Stibnite	Antimony metal is extracted from stibnite and other minerals. Antimony is used as a hardening alloy for lead, especially storage batteries and cable sheaths, also used in bearing metal, type metal, solder, collapsible tubes and foil, sheet and pipes, and semiconductor technology. Stibnite is used for metal fireworks. Antimony salts are used in the rubber and textile industries, in medicine, and glassmaking.
Barium	Used as a heavy additive in oil-well-drilling mud, in the paper and rubber industries, as a filler or extender in cloth, ink, and plastics products, in radiography, as alloys in vacuum tubes, deoxidizer for copper, lubricant in X-ray tubes, spark-plug alloys. Also used to make an expensive white pigment.
Beryllium	Beryllium alloys are used mostly in applications in aerospace, automobiles, computers, oil and gas drilling equipment, and telecommunications. Beryllium salts are used in fluorescent lamps, in X-ray tubes, and as a deoxidizer in bronze metallurgy. Beryl is the source of the gemstones emerald and aquamarine.
Coal	One of the world's major sources of energy. More than half of all the electrical energy that is generated and used in the United States comes from coal.
Cobalt	Used in super alloys for jet engines, chemical paint driers, pigments, rechargeable batteries, magnets, and cemented carbides for cutting tools.
Copper	Used in electric cables and wires, switches, plumbing, heating, roofing and building construction, chemical and pharmaceutical machinery, electroplated protective coatings and cooking utensils.
Feldspar	A rock-forming mineral, industrially important in glass and ceramic industries, pottery and enamelware, soaps, abrasives, bond for abrasive wheels, cements and concretes, insulating compositions, fertilizer, poultry grit, tarred roofing materials, and in textiles and paper production.
Fluorite	Used in production of hydrofluoric acid, which is used in the electroplating, stainless steel, refrigerant, and plastics industries, in production of aluminum fluoride, which is used in aluminum smelting, as a flux in ceramics and glass, in steel furnaces, and in emery wheels, optics, and welding rods. Used in drinking water and toothpaste.
Gold	Used in dentistry and medicine, in jewelry and arts, in medallions and coins, in ingots as a store of value, for scientific and electronic instruments, as an electrolyte in the electro-plating industry.

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Gypsum	Processed and used as prefabricated wallboard or as industrial or building plaster, used in cement manufacture, and agriculture.
Halite (Salt)	Used in human and animal diet, food seasoning and food preservation, used to prepare sodium hydroxide, soda ash, caustic soda, hydrochloric acid, chlorine, metallic sodium, used in ceramic glazes, metallurgy, curing of hides, mineral waters, soap manufacture, home water softeners, highway de-icing, photography, herbicide, fire extinguishing, nuclear reactors, mouthwash, medicine, in scientific equipment for optical parts. Single crystals used for spectroscopy, ultraviolet and infrared transmission.
Lead	Used in lead batteries, gasoline tanks and solders, seals or bearings, used in electrical and electronic applications, TV tubes, TV glass, construction, communications, protective coatings, in ballast or weights, ceramics or crystal glass, tubes or containers, type metal, foil or wire, X-ray and gamma radiation shielding, soundproofing material in the construction industry, and ammunition.
Limestone	Limestone is used in the construction industry and is the main ingredient from which aggregate, cement, lime, and building stone are made. As a source for lime, it is used to make paper, plastics, glass, paint, steel, cement, and carpets. Used in water treatment and purification plants, and in the processing of various foods and household items (including medicines).
Lithium	Lithium compounds are used in ceramics and glass, in primary aluminum production, in the manufacture of lubricants and greases, rocket propellants, vitamin A synthesis, silver solders, underwater buoyancy devices, and batteries.
Mica	Mica is used in electronic insulators, ground in paint, as joint cement, as a dusting agent, in well-drilling muds, and in plastics, roofing, rubber, and welding rods.
Platinum	Platinum is used principally as a catalyst for the control of automobile and industrial plant emissions, and as a catalyst to produce acids, organic chemicals, and pharmaceuticals. Also used in bushings for making glass fibers used in fiber-reinforced plastic and other advanced materials, in electrical contacts, in capacitors, in conductive and resistive films used in electronic circuits, in dental alloys used for making crowns and bridges, and in jewelry.
Potash	Used as a fertilizer, in medicine, in the chemical industry, and to produce decorative color effects on brass, bronze, and nickel. Is an essential mineral for vegetable and animal life.
Quartz	As a crystal, quartz is used as a semiprecious gemstone (agate, jasper, onyx, amethyst, citrine, rose quartz, smoky quartz, etc.) Because of its properties quartz is used for pressure gauges, oscillators, resonators, and wave stabilizers; heat-ray lamps; and in prism and spectrographic lenses. Used in the manufacture of glass, paints, abrasives, refractories, and precision instruments.

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Silver	Used in photography, jewelry, and electronics. Used as currency, in lining vats and other equipment for chemical reaction vessels, water distillation, mirrors, electric conductors, batteries, silver plating, table cutlery, dental, medical, and scientific equipment, electrical contacts, and bearing metal.
Sodium carbonate	Used in glass container manufacture, in fiberglass and specialty glass. Also used in production of flat glass, in powdered detergents, in medicine, as a food additive, photography, cleaning and boiler compounds, and for pH control of water.
Sulfur	Used in the manufacture of sulfuric acid, fertilizers, chemicals, explosives, dyestuffs, petroleum refining, vulcanization of rubber, fungicides.
Tantalum	Used mostly in the production of electronic components. Alloyed with other metals, it is also used in making carbide tools for metalworking equipment, and in the production of super alloys for jet engine components.
Titanium	Titanium is a strong, lightweight metal often used in airplanes, and as a brilliant white pigment used in paint, paper, and plastics.
Tungsten	Used in metalworking, construction and electrical machinery and equipment, in transportation equipment, as filament in light bulbs, as a carbide in drilling equipment, in heat and radiation shielding, textile dyes, enamels, paints, and for coloring glass.
Zeolites	Used in aquaculture (fish hatcheries for removing ammonia from the water), water softener, in catalysts, cat litter, odor control, and for removing radioactive ions from nuclear plant waste.
Zinc	Used as a protective coating on steel, with copper to make brass, and as chemical compounds in rubber and paints, used as a sheet zinc and for galvanizing iron, electroplating, metal spraying, automotive parts, electrical fuses, anodes, dry cell batteries, fungicides, nutrition (essential growth element), chemicals, roof gutter, engravers' plates, cable wrappings, organ pipes, in pennies, primers, paints, to protect ship hulls, in lubricating oils and greases. Zinc oxide is used in medicine, paints, as an electrostatic and photoconductive agent in photocopying.
Clay	Used to coat the pages of newspaper, magazines, stationery, brochures, and boxes so that the ink used in printing on them will be bright and will not run. Also used as a brightener and abrasive in toothpaste, and in medicines to provide a smooth coating for the stomach.
Chromite	Used in making steel, "chromed" parts for automobiles and appliances and in the manufacture of chromic acid which is used to tan much of the leather used in making shoes, belts, purses, jackets, gloves, etc.

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Hematite	Hematite is processed to produce iron, which is used to make steel. Steel, in turn, is used in everything from automobiles to flatware to the machinery used in most manufacturing. Steel is used in the manufacture of such things as kitchen appliances, furniture, tools, bridges, buildings, construction equipment, highway construction, shipbuilding, and trains and railroads. Powdered iron is used in magnets, high-frequency cores, auto parts, and as a catalyst. Radioactive iron is used in medicine and as a tracer element in biochemical and metallurgical research. Iron blue is used in paints, printing inks, plastics, cosmetics, and paper dyeing. Black iron oxide is used as a pigment and in polishing compounds, medicines, and magnetic inks.
Gilsonite	Gilsonite is used in the manufacture of wire insulation, paints and varnishes, construction materials, asphalt, printing ink, oil well drilling, and in foundry casting.
Kaolinite	Kaolinite is a very fine white clay used as a filler in many products, for coating pages in magazines and newspapers to prevent ink from running, and as a whitener and abrasive in toothpaste.
Magnetite	Magnetite is processed to produce iron which is used in making steel. Steel is used to make nails, kitchen appliances, furniture, tools, bridges, buildings, automobiles, construction equipment, manufacturing machinery, and in highway construction, shipbuilding, trains, and railroads. Powdered iron is used in magnets, high-frequency cores, auto parts, and as a catalyst. Radioactive iron is used in medicine and as a tracer element in biochemical and metallurgical research. Iron blue is used in paints, printing inks, plastics, cosmetics, and paper dyeing. Black iron oxide is used as a pigment and in polishing compounds, medicines, and magnetic inks.

Rock / Mineral Careers Resource Pages

Textile machine operator	You are responsible for running machines that make textile products from fibers. Products made from fibers include towels, socks, tires, roofing materials, and just about all clothing. You learned this skill in a vocational training program after high school.
Tile installer	You are responsible for applying hard tile (such as ceramic and marble) to floors, walls, ceilings, and roof decks. You learned this skill on the job during summers while going to high school, working as a helper to a more experienced tilesetter.
Insulation worker	You are responsible for properly insulating buildings to reduce energy tanks, vessels, boilers, and pipes. You learned this skill just after high school with on-the-job training.
Packer	You are responsible for manually packaging a variety of materials. You also inspect items for defects, label cartons, stamp information on products, keep records of items packed, and stack your packages on a loading dock. You learned this skill at the age of 18 with on-the-job training.
Metallurgical engineer	You are responsible for removing metals from ores and making them suitable for industrial processes by refining and alloying. You learned this skill in a four-year program at college.
Metalworking machine operator	You are responsible for producing products made of metal. Metalworking industries produce most of the consumer products on which we rely daily. You learned this skill on the job after high school.
Transportation inspector	You are responsible for inspecting equipment in connection with the safe transportation of cargo or people. You have inspected trucks, airplanes, and automobiles. You learned this skill working in a related occupation after high school.
Logistics manager	You are responsible for planning, directing, and coordinating transportation, storage, and distribution of goods for a paper manufacturer. You must follow governmental policies and regulation. You learned this skill working in a related occupation after high school.
Solderer	You are responsible for using molten metal to join two pieces of metal together (similar to welding). You commonly join electrical, electronic, and other small metal parts together. You learned this skill during high school in a vocation-training program.
Painter	You are responsible for communicating ideas, thoughts, or feelings through art. You use shading, perspective, and color to produce realistic scenes or abstractions. You learned this skill while earning a masters degree in fine art at a college.
Electrician	You are responsible for installing, connecting, testing, and maintaining electrical systems. You learned this skill by completing an apprenticeship program lasting 3-5 years.

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Driller	You are responsible for operating rotary, churn, and pneumatic drills to tap subsurface water and salt deposits. You have also drilled to remove core samples during mineral exploration or soil testing. On occasion you have had to drill in order to use explosives for mining or construction. You learned this skill after a moderate amount of on-the-job training after high school.
Printing machine operator	You are responsible for preparing, operating, and maintaining the printing presses in a pressroom. You ink the presses, load the paper, adjust the pressure and flow of ink, feed the paper through the press cylinder, and adjust the feed and tension cords. You learned this skill through a formal apprenticeship after high school.
Mine cutter	You are responsible for operating machinery to allow access to coal deposits, stone quarries, or other mining areas. You also facilitate blasting, separating, or removing minerals or materials from mines. You learned this skill after a moderate amount of on-the-job training after high school.
Dental hygienist	You are responsible for helping patients develop and maintain good oral health. You clean teeth, examine patients for oral diseases, and teach your patients about good oral health. You learned this skill in college and had to be licensed by the state.
Chemist	You are responsible for searching for and using new knowledge about chemicals. This knowledge leads to the discovery and development of new fibers, paints, adhesives, drugs, cosmetics, electronics, lubricants, and thousands of other products. You learned this skill in a masters program at college.
Dietician	You are responsible for managing food service systems for institutions, promoting sound eating habits through education, and conducting research. You learned this skill in a four-year program at college, and then received a license from the state.
Concrete finisher	You are responsible for placing and finishing the concrete used in building. Concrete is a mixture of cement, sand, gravel, and water. You can create walls, sidewalks, beams, columns, and panels. You learned this skill with on-the-job training after high school.
Jeweler	You are responsible for designing and manufacturing new pieces of jewelry. You cut, set, and polish gemstones, and repair or adjust jewelry. You learned this skill at a technical school after high school.
Desktop publisher	You are responsible for using computer software to format and combine text, numerical data, photographs, charts, and other visual graphic elements to produce publication-ready materials as brochures, advertisements, and newsletters. You learned this skill by completing a certificate program after high school.
Glazier	You are responsible for selecting, cutting, installing, replacing, and removing all types of glass. You learned this skill after high school with on-the-job training.

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<p>Agricultural scientist</p>	<p>You are responsible for studying farm crops and animals, and developing ways to improve the quantity and quality of food. To do this you must control labor costs, pests, and weeds. You also work to conserve soil and water. You earned a doctoral degree in order to do research in this area.</p>
<p>Plasterer</p>	<p>You are responsible for applying and repairing plaster to interior walls and ceilings. You specialize in plastering over concrete. To do this you apply a gypsum plaster layer onto a supportive steel wire mesh. You follow this with a finished lime plaster layer. You learned this skill through a 2-3 year apprenticeship.</p>
<p>Agricultural manager</p>	<p>You are responsible for managing the day-to-day activities of one or more farms, ranches, nurseries, timber tracts, greenhouses, and other agricultural businesses. Some of your duties include marketing, supervision of animals and workers, determine crop transportation and storage requirements. You learned this skill by earning a four-year degree in business at college.</p>
<p>Water resource engineer</p>	<p>You are responsible for designing and supervising the construction of dams, bridges, water supply systems, and sewage systems. You learned this skill in a four-year degree program and became an expert in this area after earning a doctorate degree.</p>
<p>Fish hatchery manager</p>	<p>You are responsible for raising fish and shellfish in marine, brackish, or fresh water. You can do this in ponds, floating nets pens, raceways, or re-circulating systems. You learned this skill in a four-year program at college.</p>
<p>Home appliance repairer</p>	<p>You are responsible for keeping home appliances working and helping prevent unwanted breakdowns. You can work on refrigerators, dishwashers, water softeners, washers, and dryers. You learned this skill at a trade school after you finished high school.</p>
<p>Automotive repairer</p>	<p>You are responsible for straightening bent auto bodies, removing dents, and replacing parts that cannot be fixed. You can repair all different kinds of cars, trucks, and buses. You learned this skill in formal training programs given by vehicle manufactures as well as on-the-job training.</p>
<p>A & P mechanic</p>	<p>You are responsible for keeping aircraft in peak operating condition by performing scheduled maintenance, making repairs, and completing inspections required by the FAA. You learned this skill with 30 months or more of on-the-job training in both engines and airframes to earn a certificate from the FAA.</p>
<p>Accounting clerk</p>	<p>You are responsible for organizing an organization's financial record-keepers. You update and maintain the accounting records for your organization. You often use computers to store information. You learned this skill in college.</p>

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Photographic process worker	You are responsible for retouching photographic negatives and prints to emphasize or correct specific features. You learned this skill with on-the-job training.
Animal breeder	You are responsible for breeding animals according to their genealogy, characteristics, and offspring. You need to keep your animals healthy and clean. You use your computer to keep excellent records. You learned this skill from on-the-job training.
Aquatic biologist	You are responsible for the study of micro-organisms, plants, and animals living in water. You learned this skill by earning a PhD.
Construction laborer	You are responsible for performing many physically demanding tasks including cleaning and preparing construction sites, digging trenches, mixing concrete, and setting braces. You also do a lot of loading and unloading of materials. You learned this skill on the job during high school.

Teacher reference page – Minerals listed by career**NOTE: Additional correlations apply. Four are listed here as a reference.**

Career	Rock / Mineral
Textile machine operator	Asbestos Feldspar Tungsten Stibnite
Tile installer	Asbestos Halite Feldspar Lithium
Insulation worker	Asbestos Copper Stibnite Feldspar
Packer	Clay Barium Tungsten Kaolinite
Metallurgical engineer	Bauxite Stibnite Lead Lithium
Metalworking machine operator	Bauxite Copper Zinc Magnetite
Transportation inspector	Bauxite Magnetite Lead Platinum
Logistics manager	Bauxite Asbestos Limestone Clay
Solderer	Stibnite Copper Gold Lead
Painter	Barium Hematite Magnetite Limestone
Driller	Barium Coal Gold Silver

Career	Rock / Mineral
Printing machine operator	Barium Cobalt Feldspar Clay
Mine cutter	Coal Gold Silver Cobalt
Electrician	Coal Copper Lead Silver
Dental hygienist	Kaolinite Clay Halite Platinum
Chemist	Fluorite Halite Lithium Tungsten
Dietitian	Halite Limestone Lithium Zinc
Concrete finisher	Limestone Tungsten Zinc Magnetite
Jeweler	Silver Copper Beryllium Gold
Desktop publisher	Clay Kaolinite Beryllium Barium
Plasterer	Gypsum Limestone Tungsten Chromite
Agricultural Scientist	Potash Gypsum Halite Limestone

Career	Rock / Mineral
Glazier	Quartz Sodium carbonate Lead Lithium
Water resource engineer	Zeolites Hematite Silver Sodium carbonate
Fish hatchery manager	Zeolites Sodium carbonate Halite Limestone
Home appliance repairer	Zeolites Chromite Tungsten Halite
Automotive mechanic	Chromite Magnetite Platinum Lead
Accounting clerk	Clay Beryllium Silver Lead
Photographic process worker	Halite Silver Sodium carbonate Gilsonite
Animal breeder	Potash Halite Beryllium Sodium carbonate
Aquatic biologist	Potash Halite Lithium Limestone
Construction laborer	Limestone Tungsten Magnetite Hematite
A & P mechanic	Lead Lithium Cobalt Titanium

Teacher reference page – Careers listed by mineral**NOTE: Additional correlations apply. Four are listed here as a reference.**

Rock / Mineral	Career
Asbestos	Textile machine operator Tile installer Logistics manager Insulation worker
Barium	Packer Painter Driller Printing machine operator
Bauxite	Metallurgical Engineer Metalworking machine operator Transportation inspector Logistics manager
Beryllium	Jeweler Desktop publisher Transportation inspector Animal breeder
Chromite	Transportation inspector Plasterer Home appliance repairer Automotive repairer
Clay	Packer Logistics manager Printing machine operator Desktop publisher
Coal	Insulation worker Driller Mine cutter Electrician
Cobalt	Tile installers Transportation inspector Printing machine operator Mine cutter
Copper	Insulation worker Metalworking machine operator Solderer Electrician
Feldspar	Textile machine operator Tile installer Insulation worker Printing machine operator
Fluorite	Solderer Chemist Tile installer Dental hygienist

Rock / Mineral	Career
Gold	Solderer Driller Mine cutter Jeweler
Gypsum	Concrete finisher Plasterer Agricultural scientist Agricultural manager
Halite	Tile installer Dental hygienist Chemist Dietician
Lead	Metallurgical engineer Transportation inspector Solderer Electrician
Limestone	Logistics manager Painter Dietician Concrete finisher
Lithium	Metallurgical engineer Chemist Tile installer Dietician
Mica	Insulation worker Painter Concrete finisher Driller
Platinum	Textile machine operator Transportation inspector Solderer Dental hygienist
Potash	Dietician Chemist Agricultural scientist Agricultural manager
Quartz	Jeweler Painter Glazier Chemist
Silver	Driller Mine cutter Electrician Jeweler

Rock/ Mineral	Career
Sodium carbonate	Textile machine operator Dietician Glazier Agricultural scientist
Stibnite	Textile machine operator Insulation worker Metallurgical engineer Solderer
Sulfur	Chemist Driller Agricultural scientist Agricultural manager
Tantalum	Electrician Metalworking machine operator Transportation inspector Metallurgical engineer
Titanium	Metalworking machine operator Transportation inspector Desktop publisher Printing machine operator
Tungsten	Textile machine operator Packer Chemist Concrete finisher
Zeolites	Chemist Water resource engineer Fish hatchery manager Home appliance repairer
Zinc	Metalworking machine operator Dental hygienist Dietician Concrete finisher