

What is it made of?

Relate each mineral or rock to the everyday object containing it.

This activity was developed as a competition between two teams, but it can be carried out without competition.

Place the minerals and rocks listed in the Resources section below on a table in the centre of the laboratory or classroom. Nearby, place the manufactured objects from the Resources list (see photos below).

Method 1 – one connection

Each team takes one side of the table and chooses a spokesperson. In turn, each team identifies a mineral or rock and matches it to the object that contains it. This connection must be justified by the team. If the relationship indeed exists, the team gets a point and both the mineral and the object are removed from the table. Otherwise, they remain on the table and the turn

passes to the other team. When all the connections have been made, the points awarded to each team are counted up and a winner is declared.

Method 2 – multi connections

Although the activity was devised with the object-mineral relations that are shown in the first table below, any other valid relationships may also be used. For example, pupils are expected to relate the computer to gold (which is found in computer boards) but they may also relate it to oil (for the plastic case) or quartz (for the chips). As long as the relationship is correct, the team will obtain one point. Using this method, the objects are left on the table until all the connections are made (as shown in Table 2 below).



Earth materials - minerals, a rock and an energy source on the table.



Manufactured objects to be matched with their source materials.

The back up

Title: What is it made of?

Subtitle: Relate each mineral or rock to the everyday object containing it.

Topic: The presence of geological resources in many of the things used in our daily lives.

Age range of pupils: 11-18 years.

Time needed to complete activity: 20 minutes.

Pupil learning outcomes:

Pupils can:

- relate different common objects with some of the minerals or rocks that are needed for their manufacture;
- understand the importance of minerals and rocks in our everyday lives.

Context:

This activity may have different objectives. As presented here, the activity would follow earlier lessons where students have experienced the identification of minerals and rocks, and have also been introduced to their uses.

However, it could also become an introductory activity, highlighting the close links between mineralogy and society. In this case, the activity would lose its competitive character, since the students would not yet know how to identify the minerals and so it would be the teacher who would lead the activity.

Resource list:

N.B. the materials detailed below are just suggestions. If others are easier to obtain, they can also be used.

Table 1: Suggested Earth materials and objects manufactured from them.

Minerals, Rocks, etc.	Objects
Clay	Pottery
Sulphur	Firecracker
Bauxite	Can of soda
Calcite	Blue scourer
Chalcopyrite	Copper wire
Cinnabar	Thermometer
Quartz	Test tube
Fluorite	Toothpaste
Galena	Fishing sinker
Graphite	Pencil
Halite	Cooking salt
Haematite	Champagne caps
Magnetite	Magnet
Mica	Glitter make-up ¹
Gold	Laptop
Petroleum	Technical shirt
Silver	X-ray photograph
Sylvite	Fertiliser
Talc	Talcum powder
Gypsum	Plaster cast

Following up the activity:

The activity can be extended by introducing new minerals and objects or simply by making each mineral on the table relate to more than one object (Method 2, above) . The second table shows some additional uses. In some cases, images can be used in place of specimens and objects.

Students may also be asked to state which samples are rocks and which are minerals, once all the minerals and rocks are correctly related to the objects (in the example above, clay and bauxite are normally classed as rocks; petroleum is an energy resource; all other items are minerals).

Thinking skill development:

- The identification of minerals contributes to the construction of scientific knowledge and helps to link these minerals with their uses.
- Bridging is carried out by having to relate the objects to the samples.
- The discussion among the members of the team about the identification of the samples and the relationships between them implies metacognition and causes cognitive conflict. The same happens if the activity is extended and several objects are discussed that can be related to the same sample.

Table 2: Some additional uses of the Earth materials used in the activity

Minerals, Rocks, etc.	Objects
Clay	Make-up, cat litter, bricks
Sulphur	Insecticide, fungicide
Bauxite	Foil, power lines
Calcite	Toothpaste, bulk fillers
Chalcopyrite	Laptop, water pipes
Cinnabar	Fluorescent lighting, antique mirror
Quartz	Quartz watch, any glass object, sand paper, silicon oxide bags for moisture
Fluorite	Teflon
Galena	Flashings for roofs; car batteries
Graphite	Image of a nuclear power plant
Halite	Bleach
Haematite	Make-up ² , screw, hanger
Magnetite	The same as haematite (as iron ore), in making of steel objects
Mica	Some types of wallpaper or paint
Gold	Mobile phone, jewellery
Petroleum	Exfoliating gel, any object made of plastic
Silver	Mirror, jewellery
Sylvite	Potassium in medicines
Talc	Make-up, paint
Gypsum	Bread, plasterboard

¹ In the ingredients list, look for the code C170019.

² In the ingredients list, look for Iron Oxides or the codes C177491, C177492, C177499.

Note that some traditional sources of materials are being phased out, e.g. mercury in thermometers, mirrors or low energy light bulbs.

Useful links:

- <https://es.scribd.com/document/252505905/Los-Minerales-Industriales-en-La-Vida-Cotidiana-M-Regueiro>
- <https://organics-magazine.com/pigmentos-toxicos/>
- <https://rebeautys.com/2014/06/04/mica/>
- http://www.earthlearningidea.com/PDF/170_Minerals_3.pdf

Source:

Written by Ana Guarinos, inspired by an activity carried out by professors of the University of Salamanca in the Spanish Geology Olympiad of 2017.

Photos: Ana Guarinos

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