Cleavage is the ability of a mineral to break into smooth, parallel surfaces (along preferred planes). A mineral may have none, one, two, or more sets of flat breaks, each set in a different direction. Each of these flat breaks represents a direction of weakness. Cleavage may be determined as none - **poor / indistinct - imperfect - good / distinct - very good - perfect.** Mica breaks along one cleavage direction. Calcite, on the other hand, has three cleavage directions. Smooth crystal faces can be mistaken for cleavage surfaces, but they differ because they appear only on the surface of crystals, while cleavage goes all the way through the crystal. This difference can be seen on broken edges of the mineral. Sometimes the crystal faces and cleavages are in the same direction, e.g. in common table salt.

Fracture is the way in which a mineral breaks where not controlled by cleavage. Certain minerals can be distinguished by their type of fracture, but also none fracture or **irregular/uneven** fracture may be observed. Quartz, for example, breaks along smoothly curving surfaces - it has **conchoidal** fracture. Pyrite and magnetite have irregular fracture. Other fractures are e. g.: **micaceous**, **fibrous** or **splintery**.

Hardness is the ability of a mineral to scratch another mineral. (Also: The relative ease or difficulty with which a smooth surface of a mineral can be scratched). It is commonly measured by Mohs' Scale of Hardness. A German mineralogist Friedrich Mohs chose a series of minerals as a scale for hardness in 1822. As you can see, talc is the softest, while diamond is the hardest mineral.

Apatite is harder than calcite, but gypsum is softer.

1 Talc [tælk]
2 Gypsum [džipsəm]
3 Calcite [kælsait]
4 Fluorite [fluərait]
5 Apatite [æpətait
6 Orthoclase feldspar [o:θəukleis]
7 Quartz [kwo:ts]
8 Topaz [təu'pæz]
9 Corundum (ruby [ru:bi] and sapphire [sæfaiə])
10 Diamond [daimənd]

Several other standards can also be used to test for hardness:
a person´s fingernail = about 2 ½
an iron nail = 5 to 5 ½

Luster is the quality and intensity of light reflected from the surface of a mineral.
Reflection like metal is called **metallic**. **Non-metallic** luster includes **glassy/ vitreous, pearly, silky, waxy**, **greasy** (=mastný), **resinous** [rezinəs] - pryskyřičný, **adamantine** [ædə'mæntain]=diamantový. If no shine is observed, the mineral is **dull**. Silver **tarnishes**, or loses its shine, if not polished. Quartz, calcite, and fluorite are likely to have a glassy luster; gypsum may look **silky** or **pearly**. Galena has a metallic luster.

Streak is the color of a pulverized substance of a mineral against a white background. This is tested by rubbing the sample on a piece of porcelain and noting the color of the powder left on the porcelain. Streak is a useful property for mineral identification. Note that if the mineral sample is harder than the porcelain (7), the powder will be not from the mineral but from the porcelain. Pyrite leaves a black streak.

Specific gravity / density of a mineral**,** given in grams per cubic centimeter, is the ratio of the mass of a substance to the mass of an equal volume of water, determined at a specified temperature. **Heft** is a rough-estimate weight test for minerals. When you pick up a mineral sample in your hand and its weight is about the same as an equal piece of quartz, the heft is average. Using this heft test, gypsum will appear light to average, orthoclase average, and galena heavy.

Diaphaneity [daiəfə'niəti] – transparent x opaque [əu'peik] x translucent

Color is likely to be the first physical property you notice about a mineral sample, but it may not help that much to identify a mineral. Many minerals can be the same color, but because of trace elements, different samples of the same mineral often have different colors. Therefore, color is actually quite irrelevant as a distinguishing physical property of many minerals.

Adapted from Věra Hranáčová