8. Hematite (iron oxide or Fe_2O_3)

Hematite is one of the common ore minerals of iron. Hematite is found in large sedimentary beds of Precambrian age, where it is mined by open pit methods. It also occurs in other environments, but not usually in quantities large enough for commercial mining. It can be reddish and earthy in appearance or have silver-like reflective flaky crystals (called specular or micaceous hematite), but all varieties give a reddish-brown streak on an unglazed ceramic tile streak plate. Hematite has a hardness that is close to that of glass and has a density that is twice as high as granite or sandstone.

As one of the primary ores of iron, hematite is used in the manufacture of wrought iron and the alloy steel. Steel is used in our economy for many essential tasks, from structural supports in buildings to ships and automobiles, furniture, and household tools. Hematite is also used to make red pigments for paint and cosmetics.

The other common ore mineral of iron is magnetite. They can be readily distinguished because hematite is nonmagnetic whereas magnetite is magnetic and has a black streak.

Hematite is a truly out-of-this-world mineral: NASA discovered that hematite is one of the most abundant minerals on the surface of Mars. This is what gives the planet a reddish brown color in the night sky, earning it the nickname “red planet.”

Activities:

K-3: Find a steel nail and put it in a cup of water for a few days. Did a reddish-brownish coating form on the nail. Circle your answer: Yes No

The coating is rust, which is caused by the iron in the nail combining with oxygen to form an iron oxide like hematite. However, many nails are coated with zinc to prevent rusting. This is called “galvanizing” and it typically like a bumpy, silvery gray–colored coating. If your nail didn’t rust, it must be galvanized.

K-5: Try to scratch the surface of a copper penny with a steel nail. Then try to scratch the nail with the penny. This is done to determine the relative hardness of one material to another. If the nail cannot scratch the penny, then the penny is harder. If the nail can scratch the penny, then the nail is harder. Circle which is harder (next page):

8. Hematite continued

Penny

Steel nail

5: Research the Mohs hardness scale for minerals. Would the steel nail scratch hematite? Yes No

5-8: If you have a strong magnet and the hematite sample from the HGMS rock set, check if the hematite is magnetic. Circle your answer: Magnetic Nonmagnetic

Does a weaker refrigerator magnet attract the sample? Circle your answer: Yes No. What does the weaker magnet's behavior tell you about how strongly magnetic the hematite is? _____

_____.

9+: Research whether Mars is visible in the night sky tonight. If it is, look to see if it deserves the nickname "red planet" compared with the other planets and stars. If Mars is not visible tonight, find an online image of it and check the planet's color. Is Mars red in the night sky: Yes No