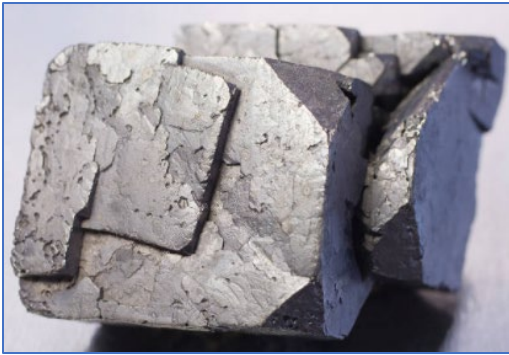




1. Galena (lead sulfide or PbS)



Galena is the most important ore mineral of lead (Pb). Notice the lead-gray color, high specific gravity (it feels heavy when you pick it up compared with a same-size piece of most other minerals), and metallic surface luster. If you rub galena on a streak plate (which is an unglazed ceramic tile), it has a gray streak.

Lead was used in making paint, for making water pipes because it is easy to shape, and as an additive to gasoline to improve engine performance. It is no longer used in these products because it can be toxic, even in small amounts. Lead pollution is documented as the cause of learning disabilities in children. It is still used in car and other types of batteries and lead crystal glass. Lead-lined aprons keep us safe from stray X-rays at the dentist's office or in the hospital.

Activities:

K-5: Galena is composed of lead and sulfur and is one of the heaviest minerals. It has a density of 7.6 g/cm^3 . That means that it is about 8 times denser than water, which has a density of 1 g/cm^3 . A typical rock is about 2.5 times denser than water. To demonstrate how density can be used to identify minerals, take two 500-mL plastic water bottles. Leave one bottle full but take the cap off the second bottle and use a graduated liquid measuring cup to pour 335 mL of water out of it, leaving 165 mL in the bottle. Put the cap back on the second bottle and put each bottle into a clean sock so that you cannot see which is the full bottle. Now, compare the weight of the two bottles. One bottle is noticeably heavier, even though both bottles are the same size. Remove the bottles from the socks to see which bottle is heavier. Circle the answer:



Full bottle

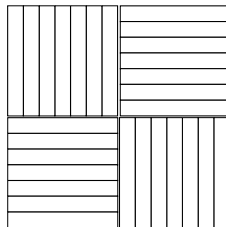


165-mL bottle



1. Galena continued

2-4: The definition of a mineral includes that it has a definite chemical composition and an ordered internal structure, which determines the shape of the mineral’s crystals. One of the ways that galena can be easily identified is by its cubic crystal structure, which means that galena crystals grow as cubes if they are forming in a roomy enough environment. Galena can also be identified by the way that it breaks along surfaces parallel to the cubic crystal faces. This is called cubic cleavage. To demonstrate this, stack some cubic dice or cubic wooden blocks together into a larger cubic block structure. Notice how the surfaces of the component dice or wooden block cubes are parallel to the outside surfaces of the larger block structure. Gently nudge the block structure with your hand to slightly separate the dice or wooden blocks. As they come apart, are the “fracture” surfaces of separation parallel to the outside faces of the larger block structure? Circle the correct answer:



Parallel



Nonparallel

All grade levels: Some metallic minerals are magnetic. If you have the Economic Rocks and Minerals set, use a magnet from your refrigerator to see if it is attracted to the galena sample. The property of magnetism can be used to identify minerals. Is galena magnetic? Circle your answer: Yes No

5+: What is the symbol for lead on the periodic table of the elements? _____
What element is in the same column, but one row higher than lead? _____

8+: What group is lead in on the table: _____. What does this position tell you about the characteristics of lead?
