

Iron Ore FRQ

Iron ores are rocks from which metallic iron can be extracted for steel production. This process involves several steps. Iron ore is first mined and then turned into pig iron in a blast furnace, and some rock waste such as silicon dioxide is separated out. In the final step, the pig iron is refined into steel using a process that includes reacting the molten pig iron with oxygen to remove impurities.

- a. The data table below highlights some of the global iron and steel data:

Global Iron and Steel Data
1.6 billion tons of iron ore are used yearly to make pig iron.
1.2 billion tons of pig iron are produced each year.
Iron ore reserves are estimated to be 800 billion tons.
95% of iron ore that is mined is used in steel production

- Calculate the weight (in tons) of rock waste produced globally each year when iron ore is converted to pig iron.
- Calculate the weight (in tons) of pig iron that could be produced if all of the estimated global iron ore reserves were used for pig iron production.
- Calculate the weight (in tons) of the current global iron ore reserves that would be used to make steel if the current trends continue.

Both iron ore and coal are mined for use in the manufacture of steel. It is estimated that for every ton of steel recycled, 1.25 fewer tons of iron ore and 0.7 fewer tons of coal must be mined. About 80 million tons of steel are recycled each year in North America.

- b. Calculate the weight (in tons) of coal that is conserved each year in North America by recycling steel.

Before 1900, most mining companies abandoned surface and subsurface coal mine sites.

- Describe TWO environmental problems associated with abandoned coal mine sites.
- Describe one method a company can use to mitigate one of the problems you identified in the previous question.
- Discuss one reason why surface coal mining is generally less expensive than subsurface mining.

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