

Thought Lab 2.2: Carbon, Sulfur and Iron Answer Key

Answers to Analysis Questions

- Pyrite breaks down when exposed to oxygen, converting sulfide to sulfuric acid. If pyrite was exposed during the mining process, the lower pH caused by the formation of sulfuric acid may have killed the plants.
- Coal mining can expose previously buried sulfur compounds, which cause acidification of the soil and run-off, harming vegetation. Large, open pit mines can also create unstable slag heaps (waste left after coal is processed) and water and air pollution (coal dust). Aesthetic damage can also be an issue.
 - Give a well-defended answer.
- Depending on the amount of sulfur in the coal, the mine may have no effect on the sulfur cycle, or it may increase the amount of sulfuric acid in the cycle (rapid cycling) and decrease the amount of sulfide bound to iron in pyrite (slow cycling) as pyrite breaks down upon exposure to air.
 - Mining removes carbon from the ground (slow cycling) and increases coal dust in the atmosphere (rapid cycling). Coal, when it is burned, releases carbon dioxide into the atmosphere as well (rapid cycling).
- Coal mining may expose previously buried pyrite. Upon exposure to oxygen, the Fe^{2+} in the pyrite will be converted to Fe^{3+} by bacteria, increasing the overall amount of Fe^{3+} in the iron cycle.