

Name: _____ Teacher: _____

7.PS1.5 How Many Atoms?

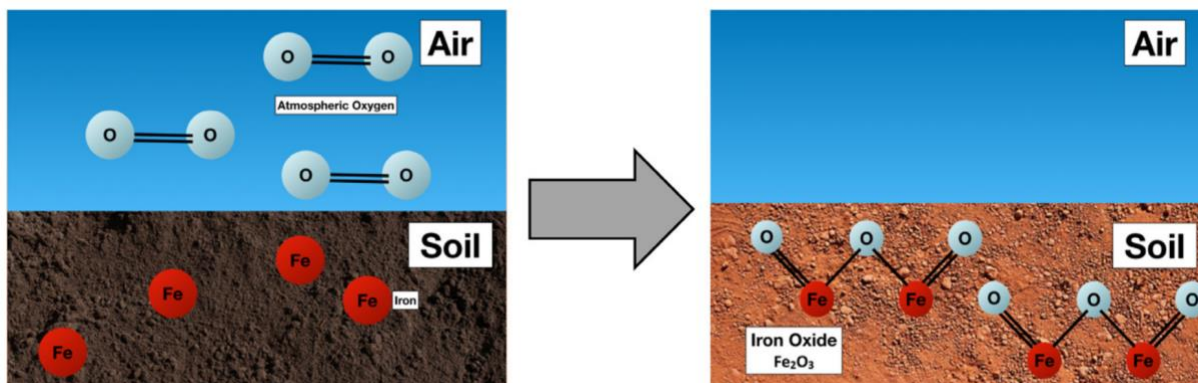
Formative Assessment Task: Chemical Reactions



Oklahoma is known for its “red dirt.” But what is it that causes the dirt to be red? The simple answer is the presence of iron. How and why the iron gets in the soil is interesting. Soil or dirt forms when the rocks below the surface are broken down. The color of the soil is affected by the type of rock from which it forms and the physical and chemical interactions that break it down. Oklahoma’s “red dirt” is due to a chemical interaction known as oxidation. Oxidation of iron occurs when oxygen (O₂) from the air, water, or bacteria in the soil interacts with matter, like iron (Fe), causing it to change into a different kind of matter called iron oxide (Fe₂O₃), commonly known as rust. It may surprise you to learn that Oklahoma is not the only place that has red soil. Tropical forest soils made from volcanic rock, like those found in the Amazon, are also rich in rust formed from iron and aluminum (iron oxide and aluminum oxide). Below is a simplified model of the system in which oxidation occurs in soil as described above.

Task 1

1. Use the model of rust (iron oxide) formation, and the information above as evidence to answer the following questions.



A. What parts shown make up the model system shown above?

B. What are the important parts of the model that could help explain why we have “red dirt”?

C. According to the model, how do oxygen and iron interact?

Task 2

Three claims could be made about the mass (weight) of the soil/“red dirt” component of the system.

- A. The iron-rich soil in Oklahoma has more mass (weighs more) before it oxidizes and changes into “red dirt”.
- B. The oxidized “red dirt” in Oklahoma has more mass (weighs more) than the original iron-rich soil from which it formed.
- C. The iron-rich soil and oxidized “red dirt” both have the same mass (weigh the same).

With which claim do you most agree? _____

Explain why you think this claim is the most correct. Use evidence from the information and model on the previous page to support this claim.
