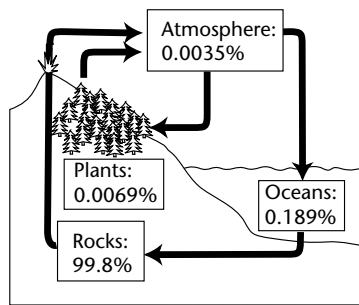


The Solar System ▪ *Enrich***Atmospheres of Earth and Venus**

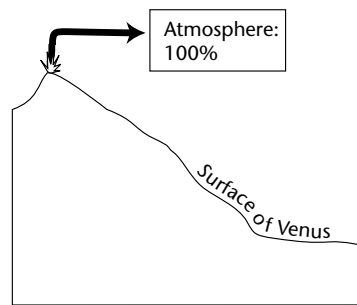
Earth and Venus are about the same size. Still, it is hard to imagine how the conditions on the surfaces of Earth and Venus could be more different. Earth's surface is cool, while that of Venus is 460°C. You have learned that this is because Venus is closer to the sun than Earth and because of the greenhouse effect caused by the carbon dioxide gas in Venus's atmosphere. Earth has a smaller greenhouse effect because there is much less carbon dioxide in its atmosphere. Why is this so, if the two planets are so similar in other ways?

Both Earth and Venus get much of their carbon dioxide from the same source: erupting volcanoes. Unlike on Venus, Earth's carbon dioxide is constantly removed from the atmosphere by two things that Venus lacks: liquid water and green plants. Carbon dioxide dissolves easily in water. Once it is there, it joins with other chemicals to form solid substances that become part of sea-floor rocks. This carbon dioxide is trapped unless the rock melts. As a result, much of Earth's carbon dioxide is "locked up" in these rocks. Plants also absorb carbon dioxide and lock up some of the gas. On Venus, carbon dioxide simply builds up in the atmosphere.



Location and pathway of carbon dioxide at or near Earth's surface

Figure 1



Location and pathway of carbon dioxide at or near the surface of Venus

Figure 2

Use the diagrams to answer the questions below on a separate sheet of paper.

1. Figure 1 shows, in very simple terms, the pathways taken by carbon dioxide on Earth. According to the diagram, where does carbon dioxide go when it leaves Earth's atmosphere?
2. On Earth, where is most of the carbon dioxide located at any one time? On Venus, where is most of the carbon dioxide located at any one time?
3. On Earth, how does carbon dioxide move from the atmosphere into rocks? Why does this movement not occur on Venus?
4. If the temperature of Earth's surface were to increase by 100°C, what would happen to the amount of carbon dioxide in the atmosphere? Why?
5. If all carbon dioxide coming out of volcanoes were to remain in the atmosphere, what further effect would this have on Earth's temperature?