



Negative Cement

STEM Sims

Lesson 1: Making Things Concrete

Concrete is used in many modern building applications. Its ability to be formed, yet still create a strong permanent structure, makes it an ideal material for construction uses. Cement is used to make most types of concrete. However, the making of cement usually releases large amounts of carbon dioxide into the atmosphere. Can you make cement that does not have the carbon dioxide emission problem?

Doing the Science

1. Start the Negative Cement Simulation by clicking on the “Sim” tab.
2. Click on the “Sample 1” button. Note and record the makeup of this cement sample in Table 1.
3. Click the gray “Make Cement” button. Note and record in Table 1 the Temperature required to make the cement sample and the amount of carbon dioxide released into the environment (CO₂ level).
4. Click the gray “Test Cement” button. In this test, carbon dioxide will be released into the atmosphere above the cement sample and some of the CO₂ will be reabsorbed by the cement. To do this, click the “Release” button.
5. Note and record in Table 1 the amount of carbon dioxide reabsorbed by the cement. To find this relative value, subtract the final CO₂ Level from the initial CO₂ Level (2.0) that was released into the environment.
6. Click the “New Sample” button, then click on the “Sample 2” button and repeat steps 2-6.
7. Repeat the process described above, until you test all three cement samples. Make sure to record your data in Table 1.

Table 1. Cement Samples

Sample	Description	Temperature	Production CO ₂ Level	Initial CO ₂ Level	Final CO ₂ Level	Reabsorbed CO ₂
1				2.0		
2				2.0		
3				2.0		

Do You Understand?

1. Which type of cement released the smallest amount of carbon dioxide during its production?
2. Which type of cement reabsorbed the greatest amount of carbon dioxide? Did this make the cement carbon dioxide neutral or even better? That is, did the cement reabsorb as much or more CO₂ than it released? If so, provide and discuss a reason for this happening.