Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Lesson 2: Getting Down to the Hard Facts**

Substances differ in their hardness. Some materials, like diamonds, are extremely hard, while others, such as mica, are fairly soft. The Mohs Hardness Scale is a way to compare the relative hardness of materials. Are you ready to do some scratching?

**Doing the Science**

1. Start the Buckyball Simulation by clicking on the “Sim” tab.

2. Click on the fullerene (C60) container and drag a chunk to the Mohs Hardness Tester.

3. Note and record in Table 1 the hardness of the fullerene.

4. Click the “Reset” button at the bottom of the screen.

5. Click on the fullerene (C60) container and drag a chunk to the blue Hydraulic Press located on the right side of the screen.

6. Click the “On” button to start the press.

7. Note and record in Table 1 the amount of volume compression experienced by the fullerene sample.

**Table 1. Fullerene Hardness and Compression Data**

|  |  |  |
| --- | --- | --- |
| **Sample** | **Mohs Hardness Value** | **Volume Compression Value (%)** |
| Fullerene |  |  |

**Do You Understand?**

1. Use available resources to look up a table of Mohs Hardness Values for common substances. Which substance has a similar hardness to fullerene?

2. Is fullerene harder or softer than quartz? Please explain your response.

3. Use Table 2 below to rank fullerene’s ability to have its volume reduced when compressed.

|  |  |
| --- | --- |
| **Substance** | **Volume After Compression by Press (% of Initial Volume Remaining)** |
| Nylon | 40 |
| Bone | 85 |
| Lead | 90 |
| Bronze | 95 |
| Gold | 98 |
| Steel | 99 |