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

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**Lesson 6: Thermal Mass**

Thermal mass is a term in building sciences that indicates how well temperature is regulated inside. The lower a building’s thermal mass is, the better the building’s ability to quickly adjust temperatures. This may be a positive or a negative.

**Doing the Science**

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

2. Make the following selections:

* House Size: Small
* Sheltering: Earth Sheltered
* Window Direction/Tint/Season: North Facing/Tinted/Summer, South Facing/Not Tinted/Winter
* Window Size: Small
* Thermal Mass: Low
* Material R-value: 10

3. Click on the Design House Now button.

4. The Energy Usage Thermometer is to the right of the image. Record the value in Table 1 below.

5. Click the Design Menu button to return to the main screen.

6. Repeat steps 2-5 but first change window tint to absent. Then repeat the choices again but change season from summer to winter until you have measured all four values. (Note: be sure that when in summer, you have the window direction set to north and the window tinted and when in winter, you have the window facing south and no tint.)

**Table 1.**

|  |  |  |
| --- | --- | --- |
| **Thermal Mass** | Low | High |
| **Summer** |  |  |
| **Winter** |  |  |

**Do You Understand?**

1. How does thermal mass affect energy efficiency in summer? In winter?
2. According to your table, which situation is optimal?