



Sunny Shelter

STEM Sims

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?