



Sunny Shelter

STEM Sims

Lesson 3: Window Direction

Windows serve as great ways to view the nature outside from inside as well as let the sun shine in. How might the direction of the window affect the energy efficiency of a house?

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: North Facing
 - Window Size: Small
 - Window Tint: Absent
 - Thermal Mass: Low
 - Material R-value: 10
 - Season: Summer
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 direction to south facing. Then repeat the choices again but change season from summer to winter until you have measured all four values.

Table 1.

| Window Direction | North Facing | South Facing |
|------------------|--------------|--------------|
| Summer | | |
| Winter | | |

Do You Understand?

1. How does window direction affect energy efficiency in summer? In winter?
2. Infer the most likely reason that window direction affects energy efficiency, taking into account the seasons.