

Trophic Tower

STEM Sims

Lesson 2: Modeling Energy Dissipation in an Ecosystem

Sunlight is captured by photovoltaic cells of a solar panel and converted into electrical energy. A circuit travels up to the top of the electrical tower powering light bulbs along the way, but the brightness at each level is different. Can you find the current through each bulb?

Doing the Science

1. Start the Trophic Towers Simulation by clicking on the “Sim” tab.
2. Click on “Electrical Tower” and read the instructions provided.
3. Drag the ammeter to the “Primary” wire located on the right side of the tower.
4. Record the number of amps in “Current Strength” in Table 1.
5. Move the ammeter to each level and record the current strength.
6. Calculate the “Percent in Current” by dividing the “Current Strength” at each level with the “Current Strength” at the “Primary” level, then multiply by 100.
7. Reset the simulation and repeat steps 3-6 for Trial 2.

Table 1.

Level	Trial 1		Trial 2	
	Current Strength	Percent in Current	Current Strength	Percent in Current
Primary				
Consumers 1				
Consumers 2				
Consumers 3				
Consumers 4				

Do You Understand?

1. How did the size of the current at the Consumers 4 level compared to that of the Primary level? What was the cause of the change in current?
2. At each level in the tower, a device called a resistor (the gray coil of wire) dissipated some of the electrical energy into heat before the energy reached the light bulb. This energy conversion resulted in each light bulb being progressively dimmer. Relating back to the producers and consumers food chain part of this simulation, discuss what “thing” is the energy dissipater in a food chain.