The Predator-Prey Theory in an Ecosystem

Presented

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Purpose of the Predator-Prey

- **Initial Goal: To demonstrate the concept of energy flow in an ecosystem**
- **Ultimate Goal: To help students understand that Biology is not only a theory but rather a daily interaction between species in the environment**

How does Energy travel in the Environment?

- **Key Concepts**: The ultimate source of Energy in the environment is the Sun.
- **Green Plants** known as **Producers** use the sun's energy into a process known as Photosynthesis to produce food.
- The group of animals eating directly from the plants called **herbivores** use the plants as their source of energy
- **Carnivores** (*meat eaters*) and omnivores (*eat both meat and plants*) Get their energy from the herbivores or smaller carnivores

Purpose of the Predator-Prey model

- **Goal # 1: To illustrate, using visual interaction, that a hierarchy order exist in the environment**
- **Goal #2: Advance the Predator-Prey model to perform more functions related to classroom activities useful to scientists.**

Building the Predator-Prey Model

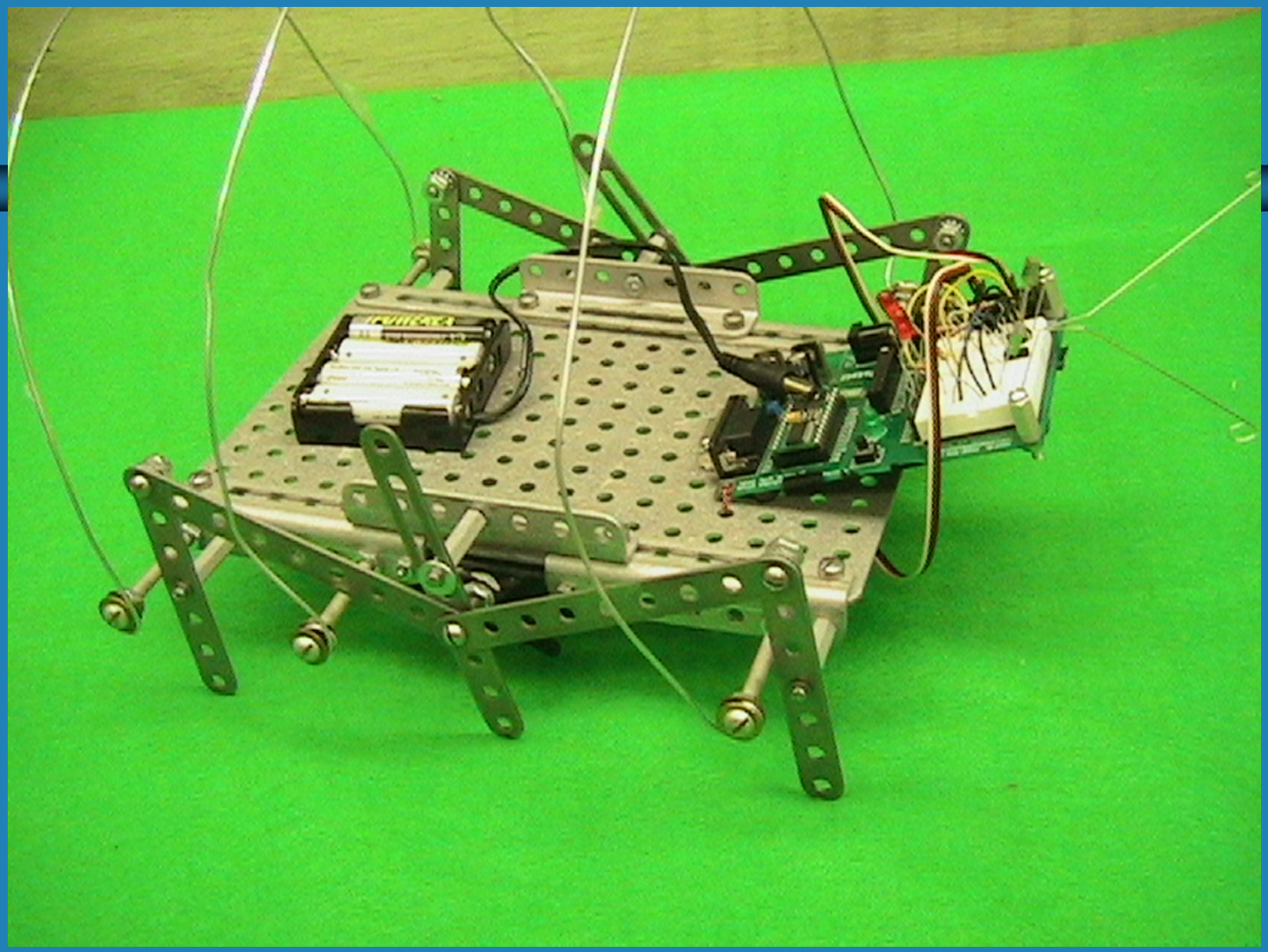
- We built a table and a border wall using plywood, Plexiglas and green felt to simulate grass.
- We used a silk flower mounted on a servo-motor to simulate growth by photosynthesis
- The prey was made using a Boe-Bot kit
- The predator was built using mechanical hardware
- All components, except the table, were built using various circuitry.

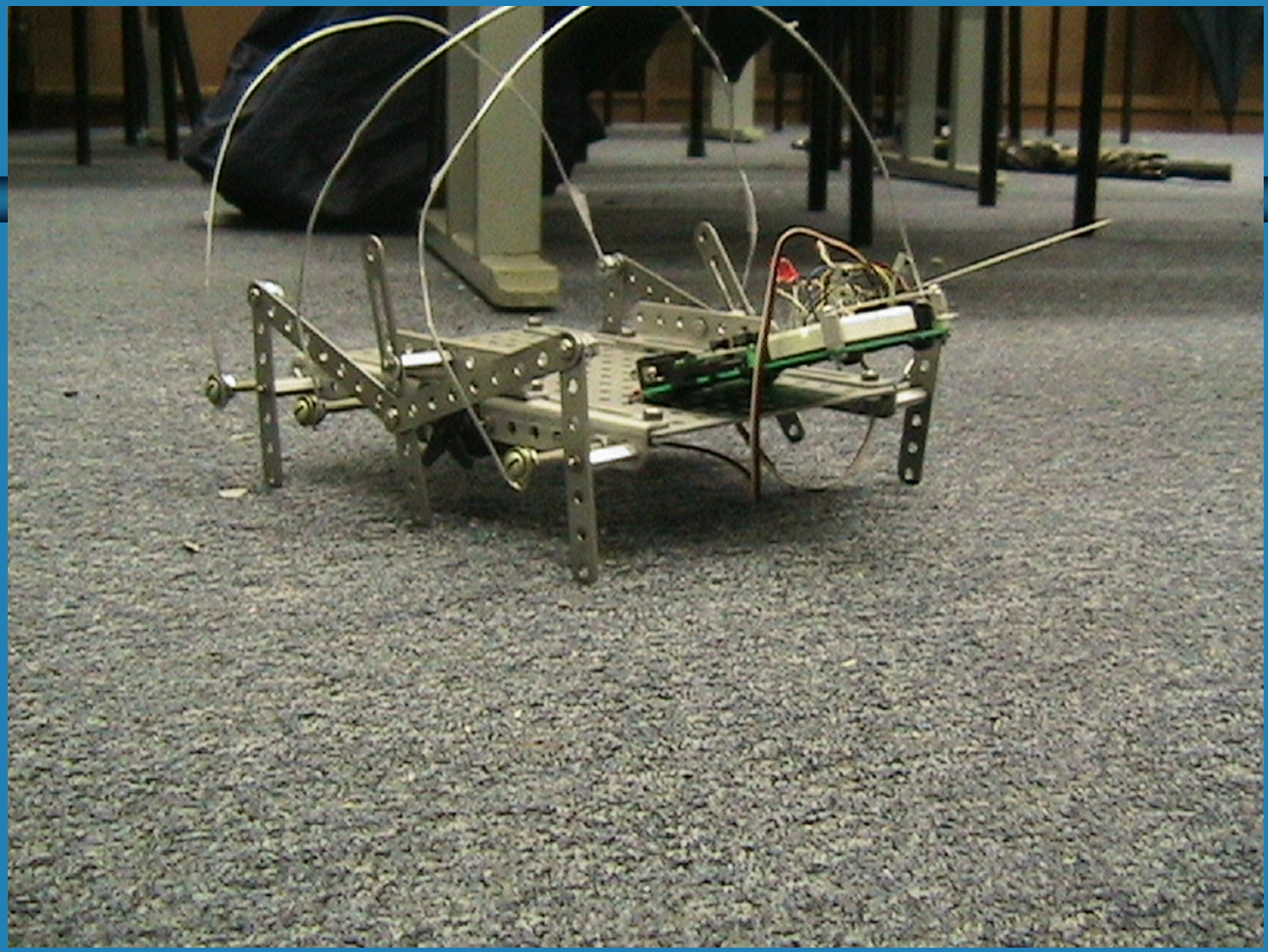
Programming the Predator-Prey Model

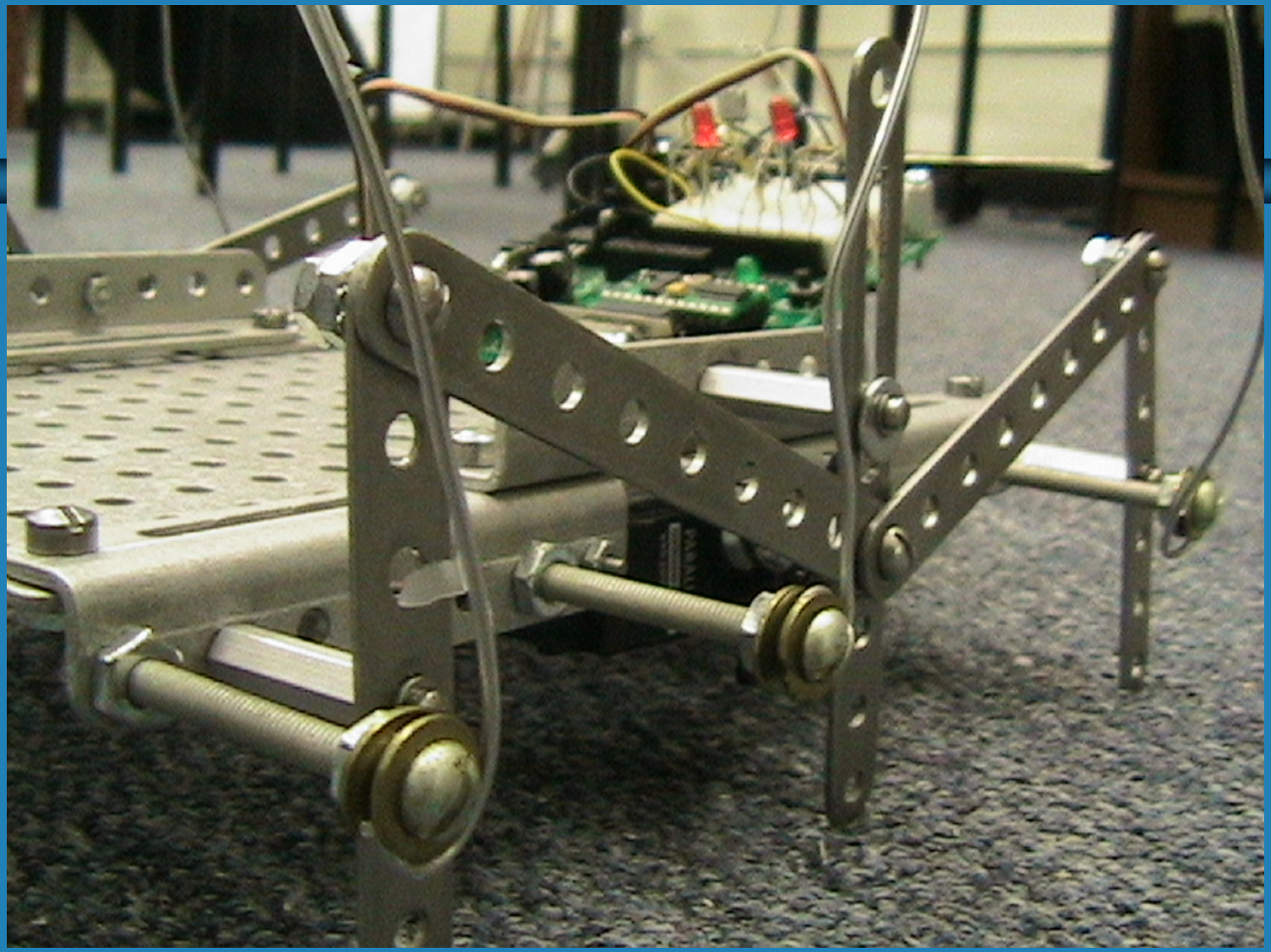
- The flower: We use a photo-resistor to sense light which activates the motor mechanism causing the flower to grow and also in the absence of light, it causes the crickets to chirp.
- Prey: Using Infrared detectors, the prey is able to hone in on the flower containing the infrared emitter.
- Predator: Similar to the prey, is able to hone in to the prey using its infrared sensor

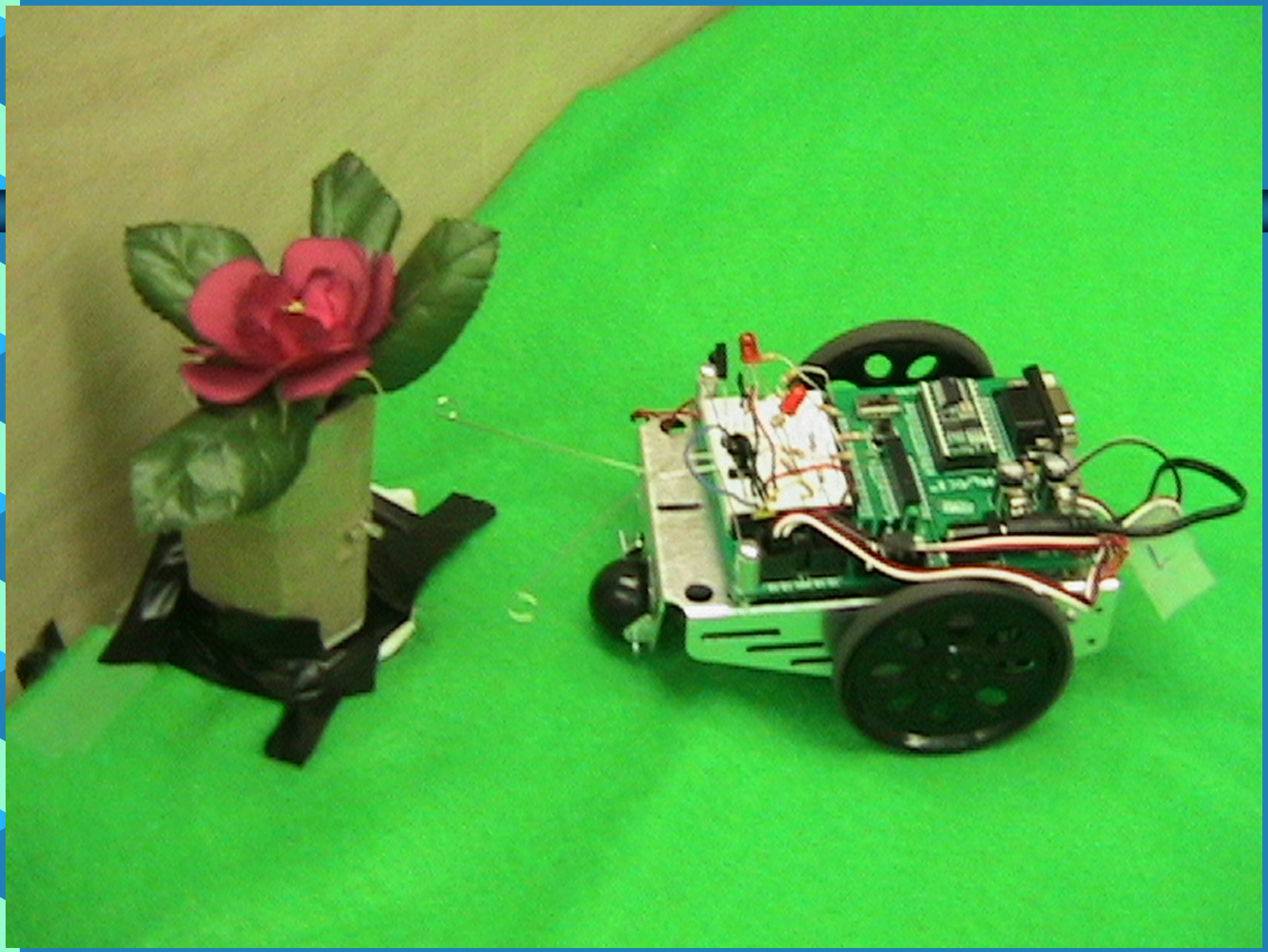
Conclusion

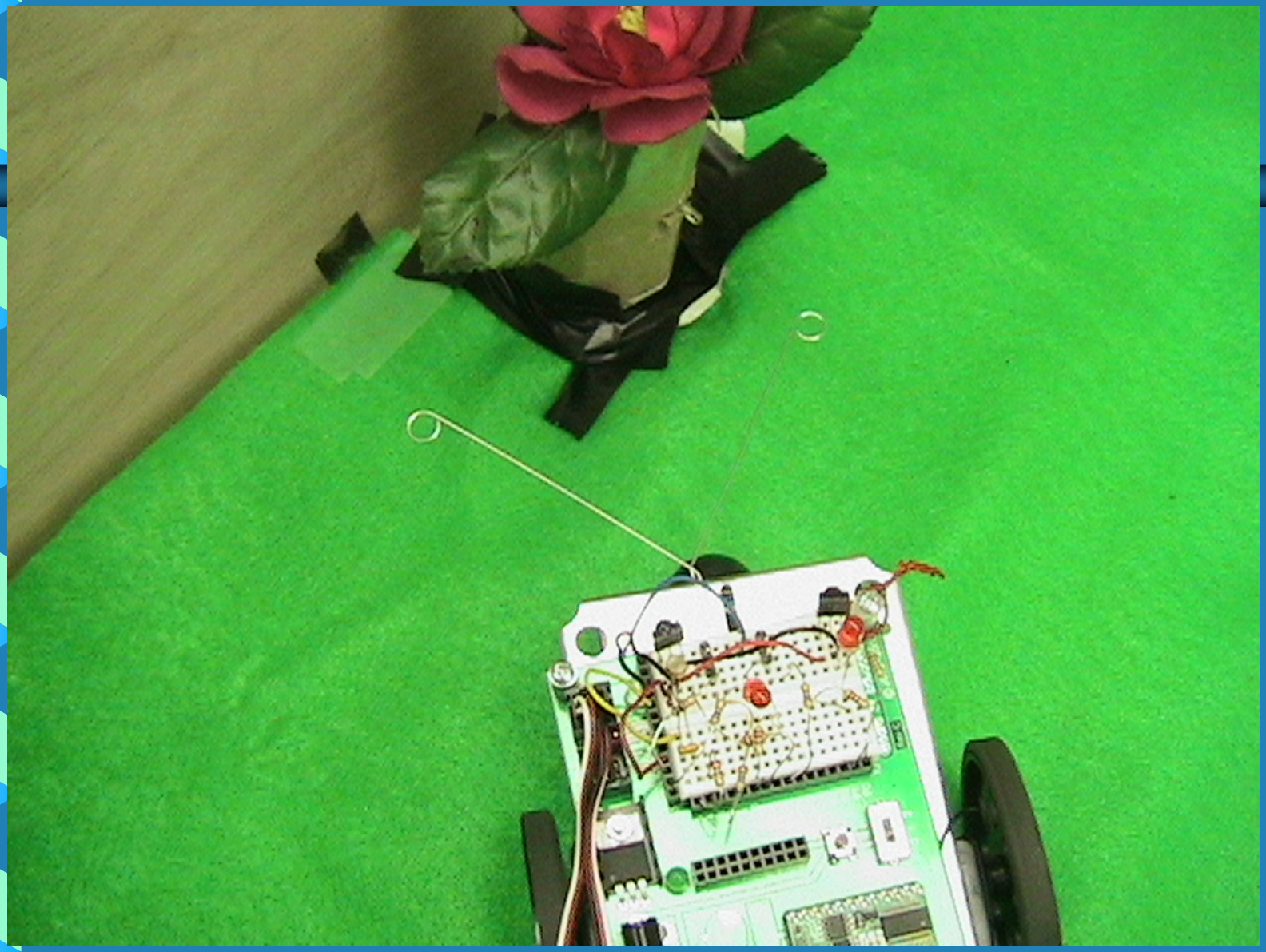
- The predator-prey model is a useful tool that all living environment teachers are encouraged to use in order to help students understand with a visual the way energy travels in an ecosystem.
- Such a vivid image will help students realize that biology is an applied concept not pure theory.











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