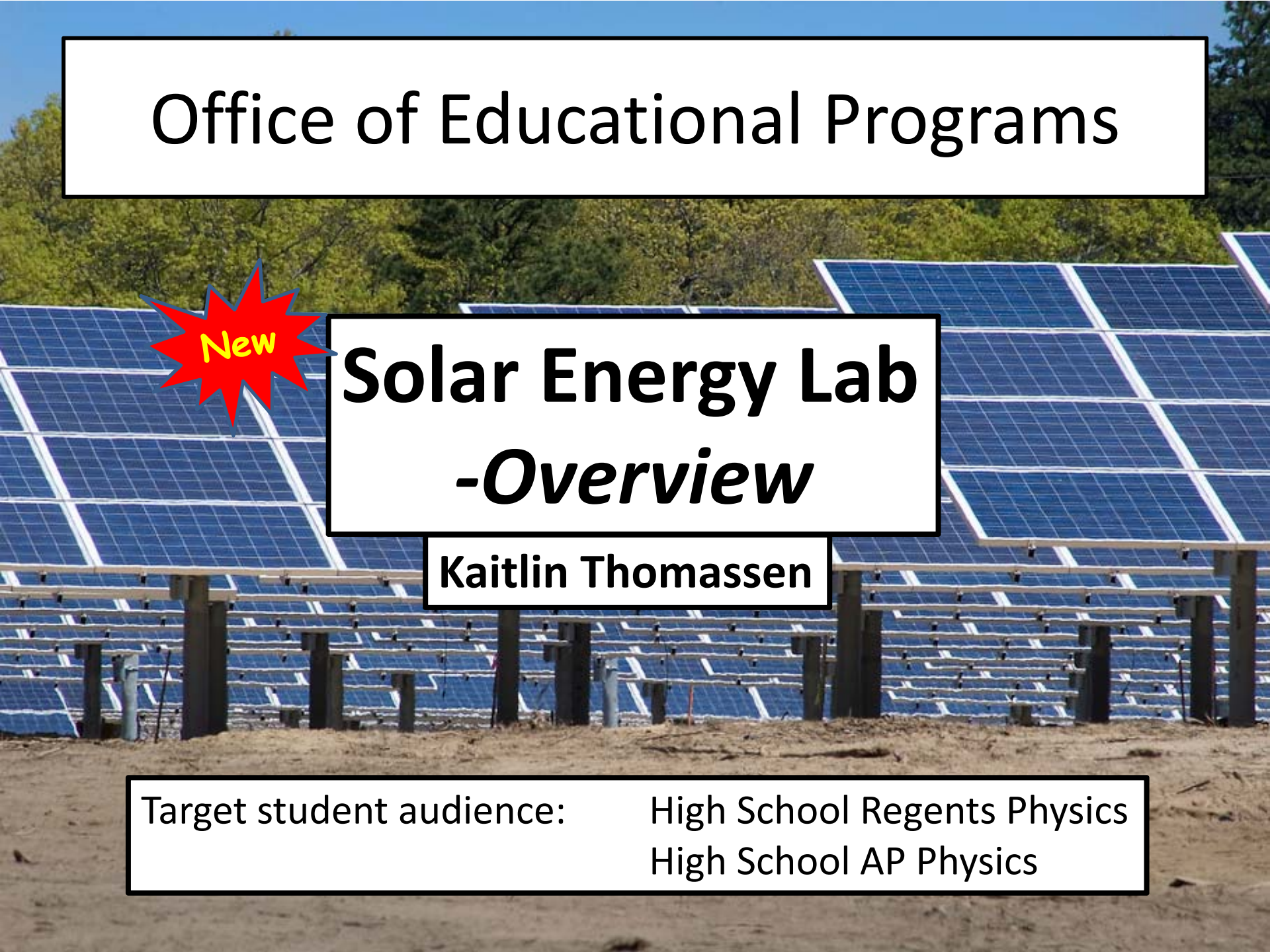

Office of Educational Programs
New
Solar Energy Lab
-Overview
Kaitlin Thomassen
Target student audience:
High School Regents Physics
High School AP Physics

Solar Energy Lab: Goals

Highlight research conducted at BNL

Introduce students to a new and exciting form of renewable energy

Challenge students to apply their science and math knowledge in an enriching hands-on lab

Areas of Research Highlighted (1 of 3)

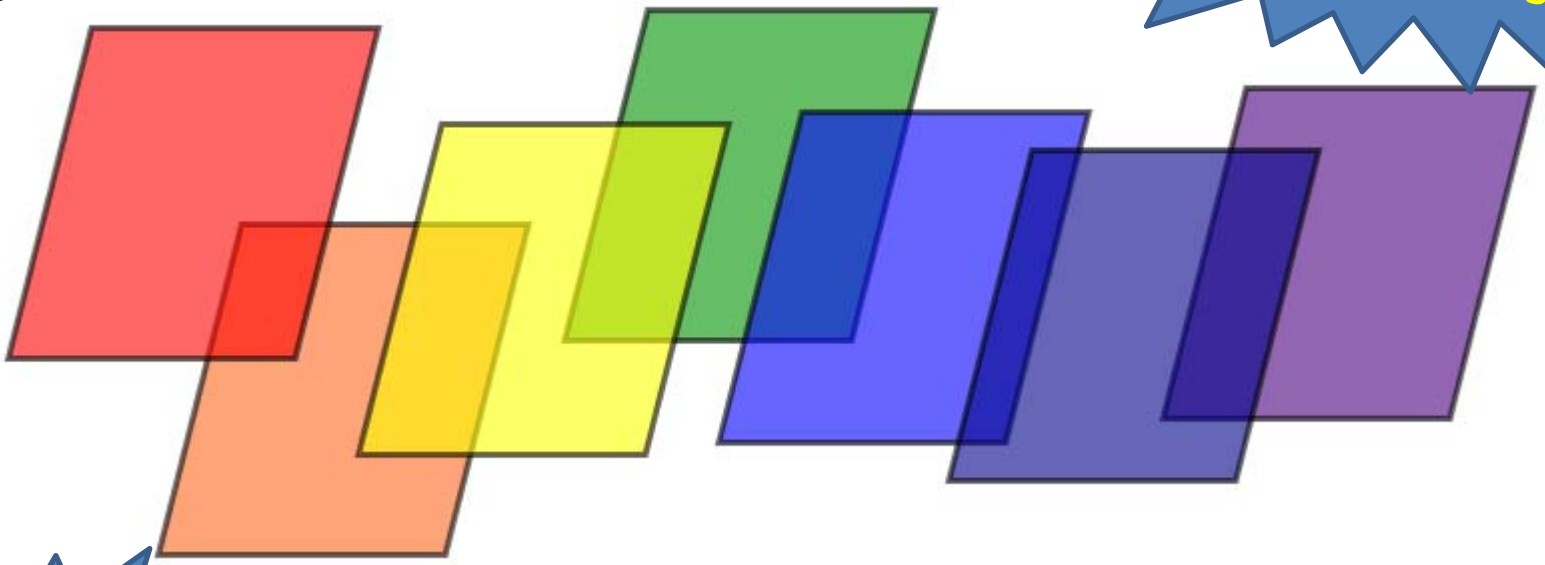
<u>Center for Functional Nanomaterials</u>

Scientists and engineers research methods to make solar panels more efficient.

Solar Panel Efficiency

Different wavelengths of light have different amounts of energy!

Students use color filters over the solar panels to isolate different wavelengths of light.



E=hv

The students discover whether the energy in varying wavelengths effects the amount of electricity produced by the panels.

Areas of Research Highlighted (2 of 3)

Long Island Solar Farm & Northeast Solar Energy Research Center (NSERC)

Scientists and engineers will research actual versus theoretical power output of solar panels, as well as optimum grid integration techniques.

Solar Panel Output

Students are challenged to power this car!

Criteria:

1) **Students can only use solar panels.**

2) **The solar panels must produce the same amount of electricity as the batteries that originally came with the car.**

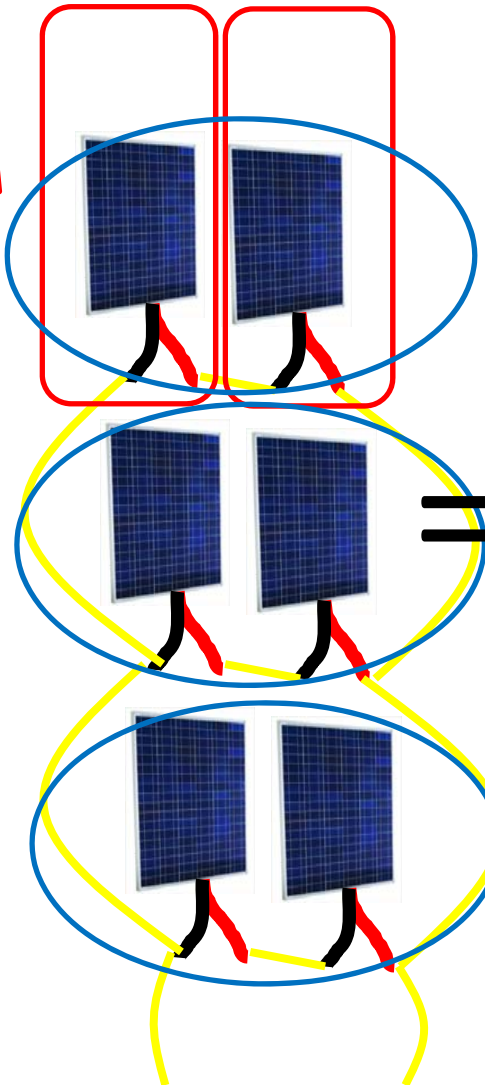
Learning outcomes:

1) Students learn the voltage and current outputs for both series and parallel circuits.
2) Students discover how to connect panels together into a “grid.”
3) Students appreciate the decrease in grid power when there is limited light.

Answer... (in case you were curious)

2 batteries in series
Each battery = 1.5V

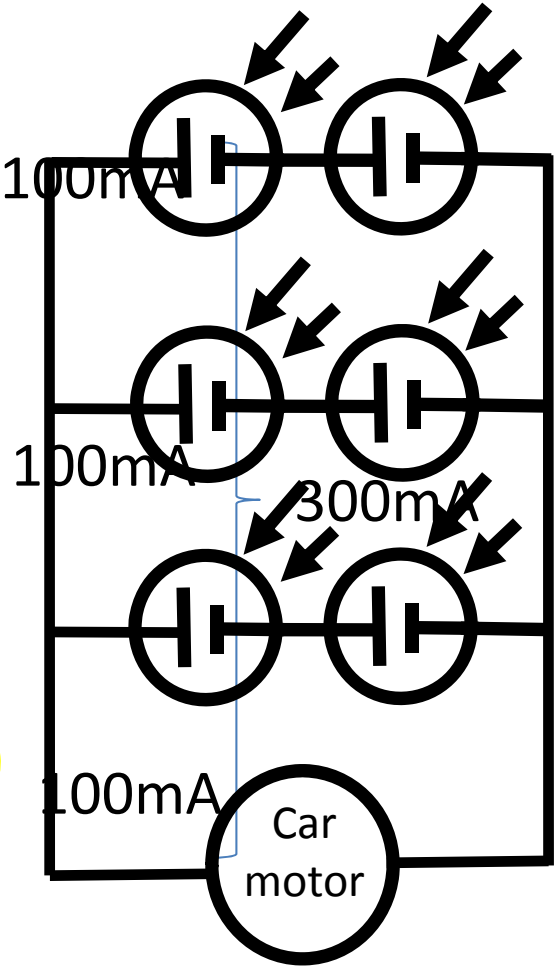
=



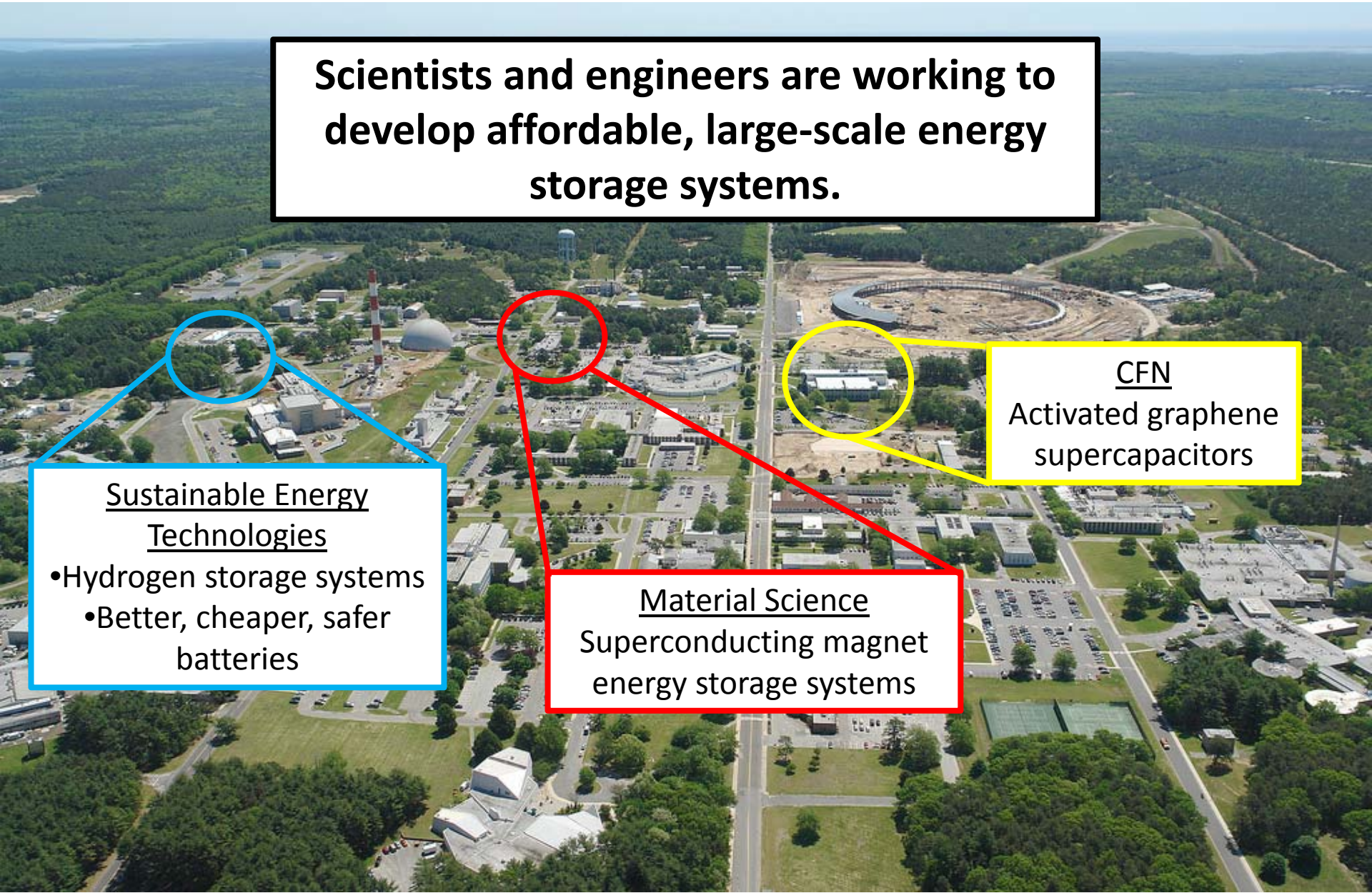
1.5V + 1.5V =**3V**

Total voltage 1.5V + 1.5V =**3V**
Total Current = **300 mA**

=



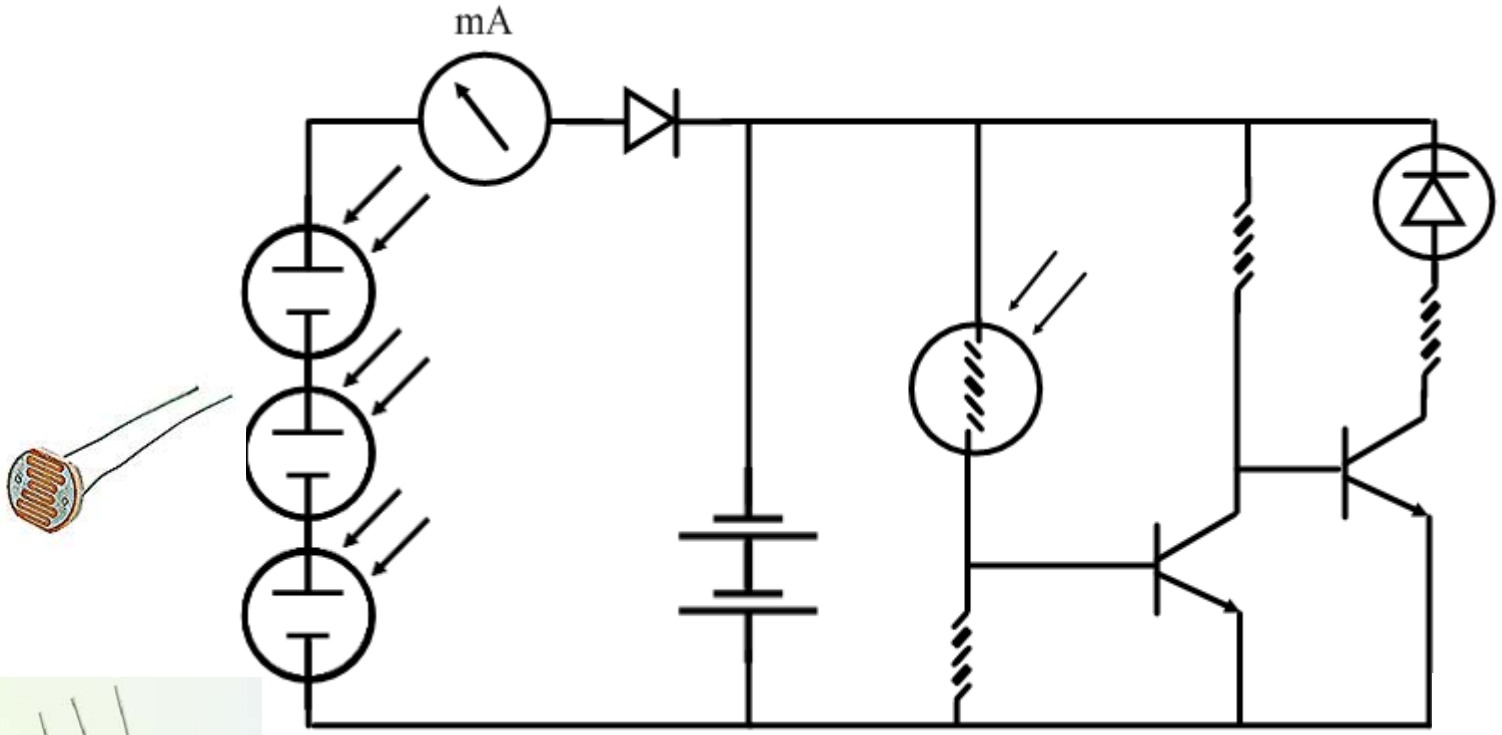
Areas of Research Highlighted (3 of 3)



Energy Storage

How can we use solar power to run headlights?

Solar Powered Headlights Circuit



Thank you!

- My Contact Information

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- If you know a teacher who would like to book a program…

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