Light Up Your Classroom

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SPAWAR Systems Center Pacific

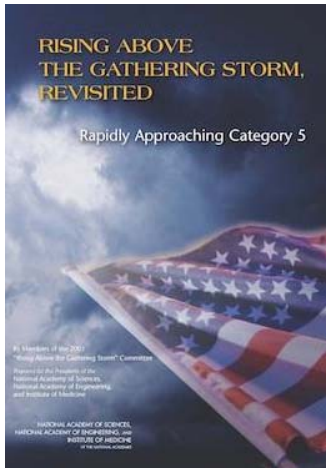
National Defense Education Program

NDEP

ONR
Revolutionary Research . . . Relevant Results

SPAWAR
Systems Center
PACIFIC

National Perspective



"The scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gathering strength"

2005 National Academy of Science

"So I want to persuade you to spend time in the classroom, talking – and showing – young people what it is that your work can mean, and what it means to you … Think about new and creative ways to engage young people in science and engineering, like science festivals, robotics competitions, and fairs that encourage young people to create, build, and invent – to be makers of things."

4/27/09 President Barack Obama to the National Academies

Naval STEM Overview

NDEP

SPAWAR Systems Center PACIFIC

Best Practices • Naval Relevance • Diversity • Metrics • Program Bridging

Engage

Educate

Inspire

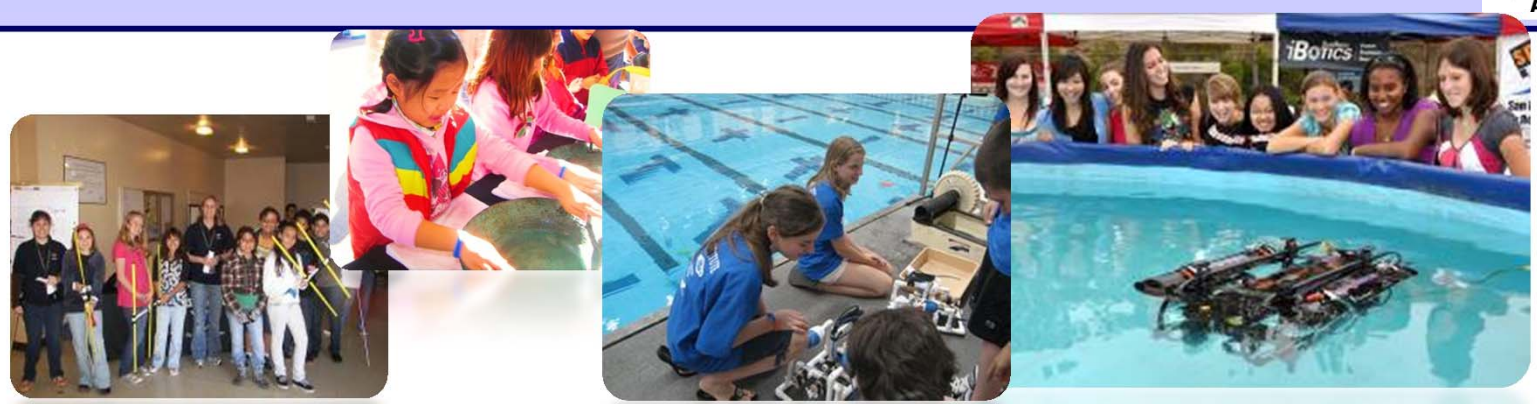
STEM2Stern

Opening Minds • Capturing the Future

Employ

Collaborate

Vision



To foster a culture that celebrates education –
particularly in the sciences, technology, engineering and mathematics through
empowering STEM professionals to bring
an added "richness" to their communities.

Important Questions

- What do you want to be when you grow up?
- Are you planning on attending college?
- What major or career path do you want?

Chris Deckard's Answers at age 12

- What do you want to be when you grow up?

  Do I have to grow up?
- Are you planning on attending college?

  Yes
- What major or career path do you want?

  NOT A CLUE!!!!!

How Chris Deckard Got Here

?

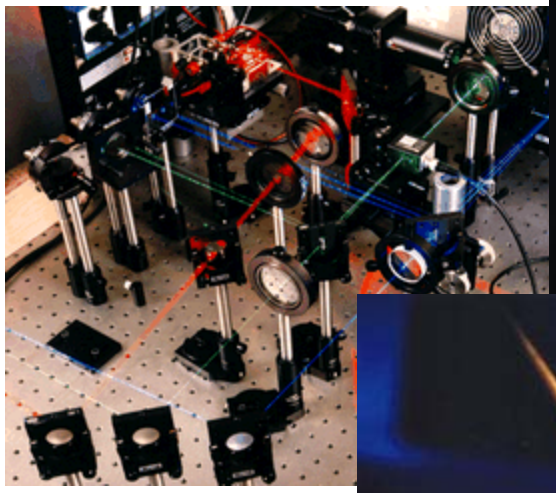
Folding a laser beam

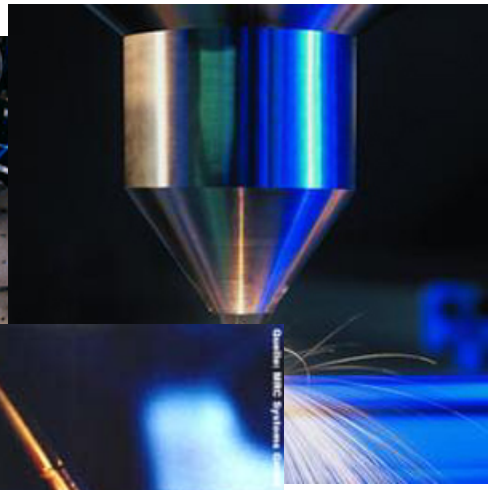
Use the mirrors, protractor and string to set up a path for a laser beam to travel and hit a target.

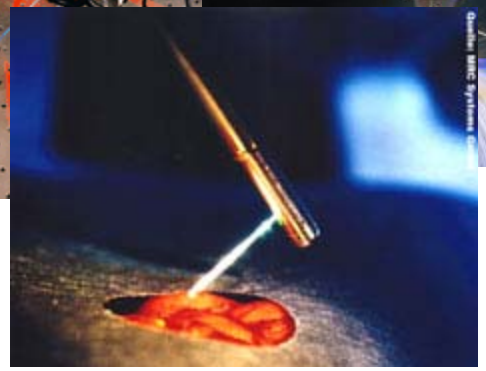
When ready, ask for laser to test.

Three tries and best score on the target board recorded

Laser Technologies





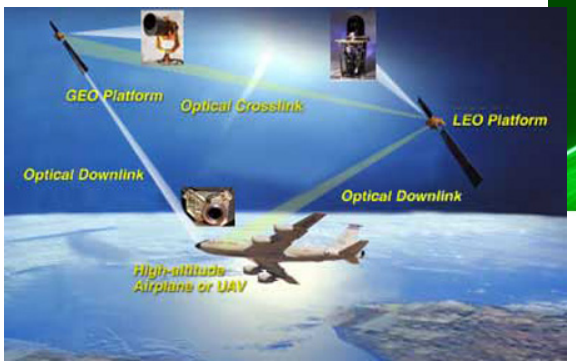


Research

Military

Medical

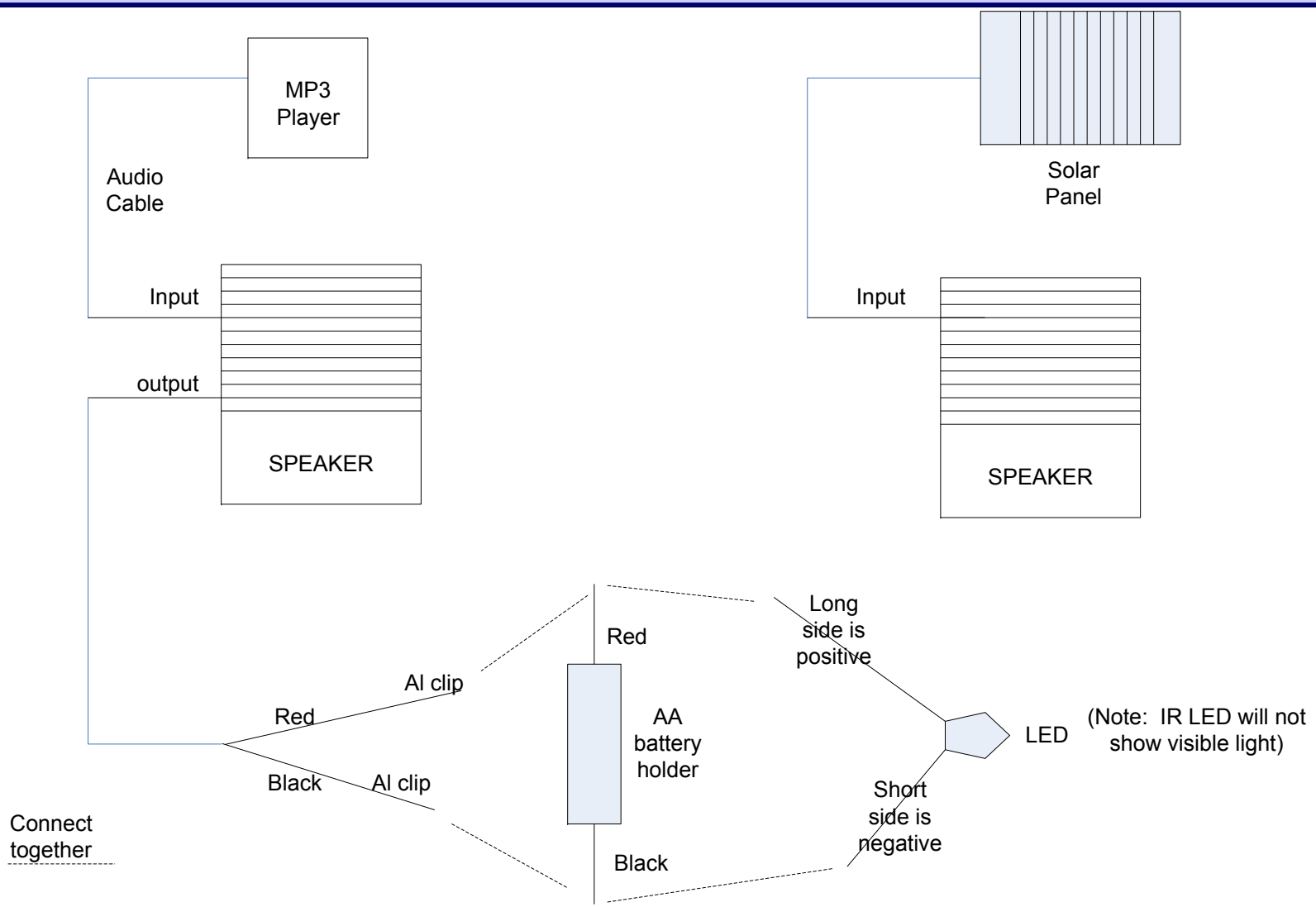
Common



Communication with Light

- Music from MP3 player converted to light and is transmitted through the Light Emitting Diode or laser pointer to a solar panel and out to the speaker.

Light Communication Setup



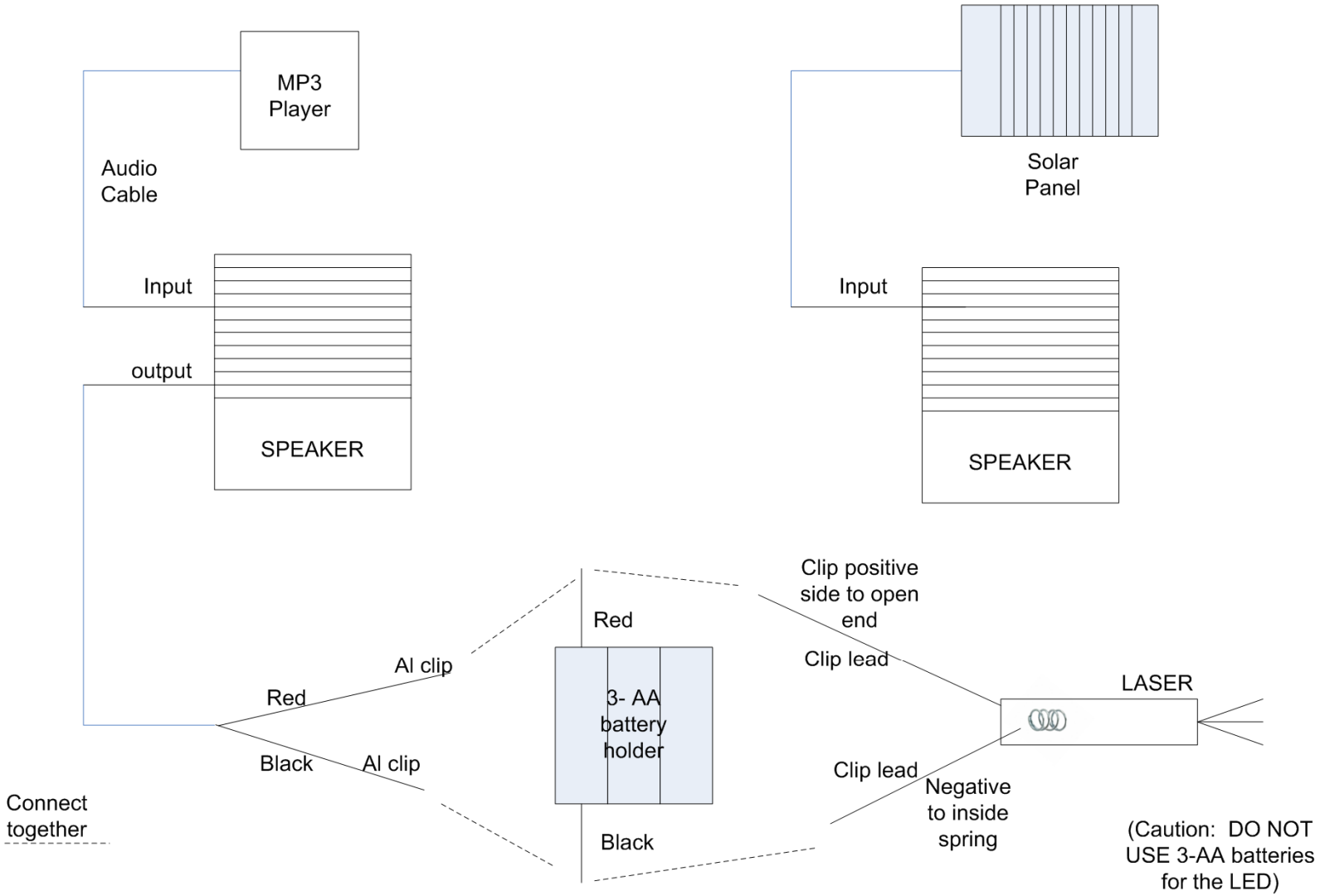
Shine LED at Solar Panel and hear the music from MP3 player. How far away can you separate the LED and solar panel? Does the LED have to be pointed directly at the solar panel?

Communication with Light

- Investigate separation distances between the two boxes and still hear the music
- Does the angle the light is pointed at the receiver matter?

- Try using the laser pointer instead of the LED box.
- Compare the separation distances.
- What are some issues with communicating this way?

Laser Communication Setup



Direct LASER at Solar Panel and hear the music from MP3 player. How far away can you separate the LASER and solar panel? Does the LASER have to be pointed directly at the solar panel?

Communication with Light

- Try using the bike lights
  - There are numerous light patterns to try
- What effects do you see or hear?
- When would you want to have interference?
- When do we not want interference?

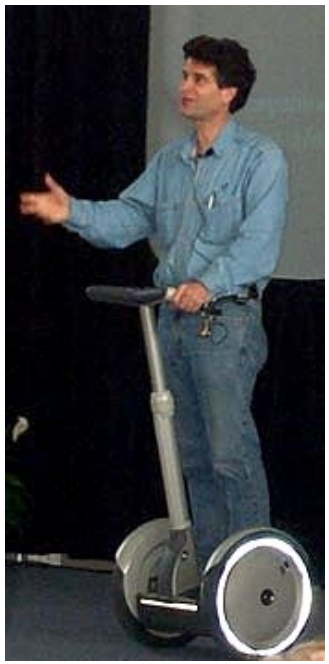
CPO Science

- Optics and light kits from CPO Science
  - ***A clear view of the properties of light.*** **New Optics with Light and Color brings greater flexibility and portability to your study of light and optics with larger, battery operated light sources. Module includes three LED lights, laser, light holders, colored filter caps, two lenses, mirror, diffraction grating glasses, laminated graph sheet, photoluminescent sheet, two polarizing filters, and a triangular prism. Requires two AA batteries per light (not included).**
  - www.cposcience.com
  - Item # 792-1650
  - Catalog Price $198.00

Some thoughts to ponder

- *"Society gets what it celebrates"*

  (Dean Kamen)



- *"Unless someone like you cares a whole awful lot, nothing is going to get better, it's not."*

  (Dr. Seuss' Lorax)

Take Aways

- Bag of Light goodies
  - Two mirror blocks
  - Light/Laser communication set
  - Infrared LED
  - Red LED
  - Laser Pointer
  - CD with cool light technology

GO FORTH AND

LIGHT UP YOUR CLASSROOM