



**Half a Million Hands  
On the Road with the Little Shop of Physics**



**Who We Are**



**What We Do**







Blowing your way  
December 11th!!

<http://littleshop.physics.colostate.edu/>

*Every Day*  
**Science**  
**WIND**



**A Bit of History...**

## Enhancing Teaching and Learning

Little Shop of Physics  
2006-2007 Tour

### *It's Up in the Air*

- Presentations to over 20,000 students
- Diverse range of schools, students
- Experiments with atmospheric focus



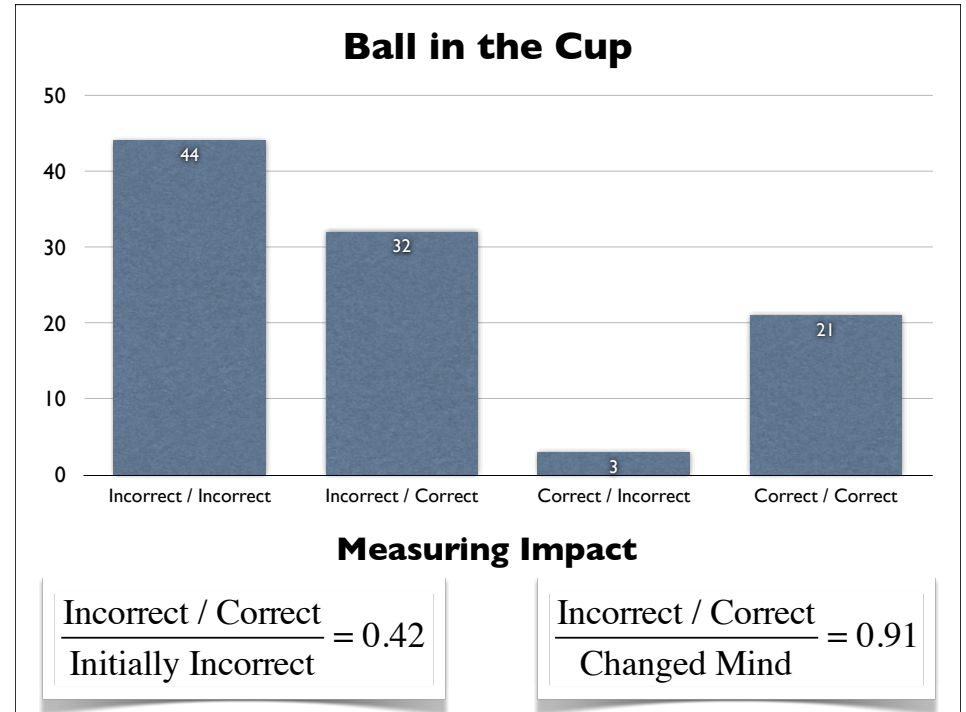
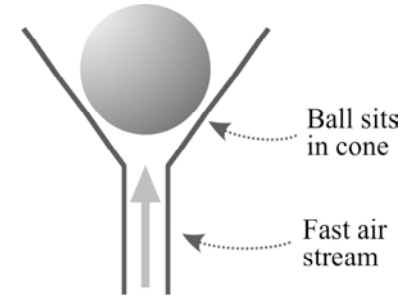




### The Ball in the Cup

The picture at right shows a particular experiment in the Little Shop of Physics. When the air stream is turned on,

- A. The ball flies out of the cup.
- B. The ball is pulled in to the cup.



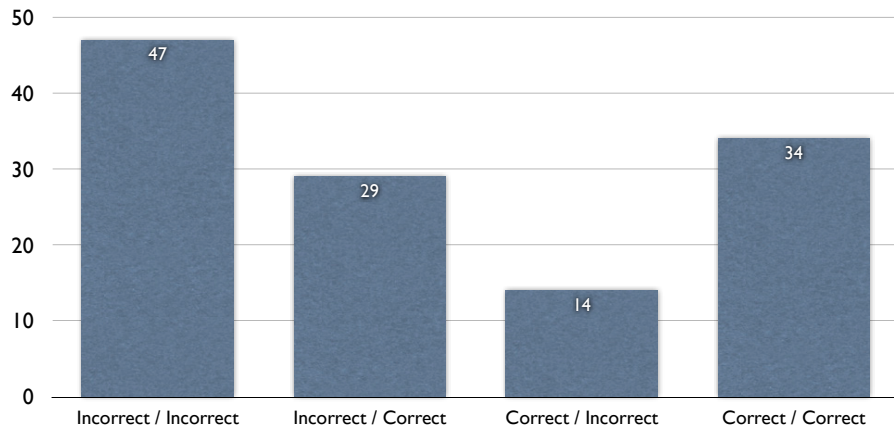
## Red Light, Blue Light

Light is composed of bundles of energy we call *photons*. Which type of light has photons of higher energy?

- A. Red light
- B. Blue light



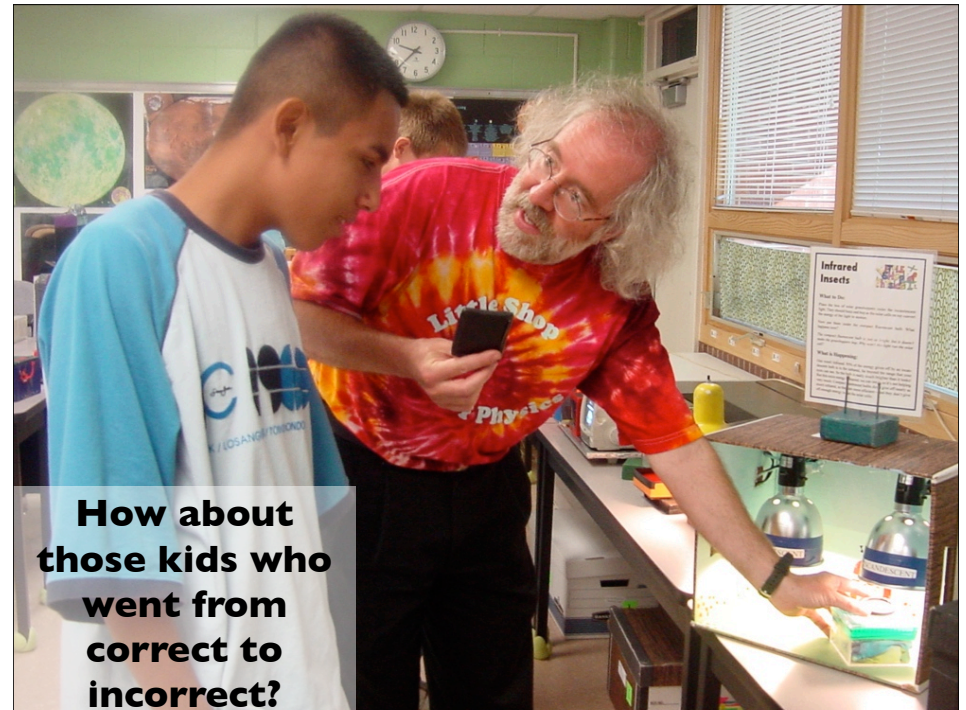
## Red Light / Blue Light



### Measuring Impact

$$\frac{\text{Incorrect / Correct}}{\text{Initially Incorrect}} = 0.38$$

$$\frac{\text{Incorrect / Correct}}{\text{Changed Mind}} = 0.67$$

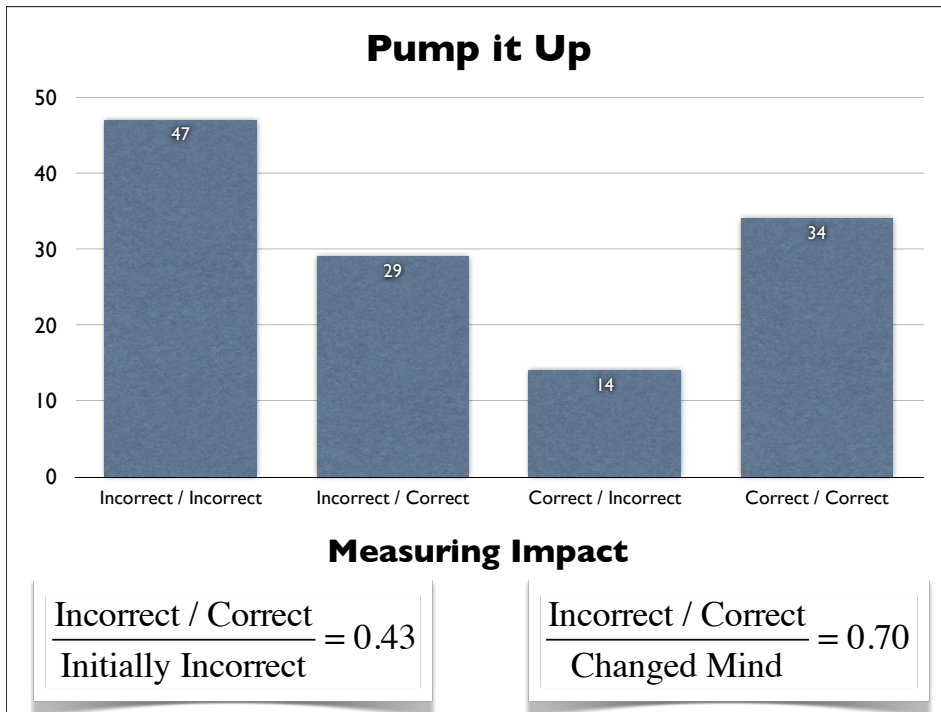




## Pump It Up

A bike pump is used to pump air into a bottle. As the pressure goes up, what happens to the temperature of the air?

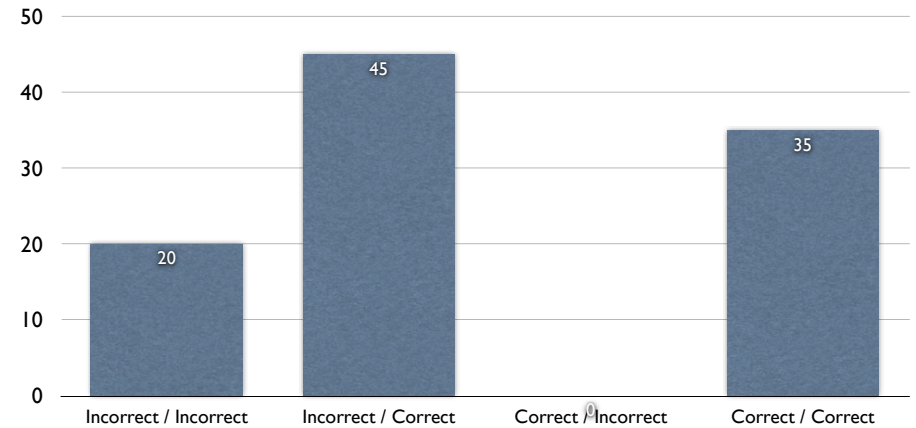
- A. The air warms up
- B. The air stays the same temperature
- C. The air cools down



Different types of LED flashlights require different voltages to operate. Which color flashlight will require the highest voltage?

- A. Red
- B. Green
- C. Blue

## Solar Cells and Light



### Measuring Impact

$$\frac{\text{Incorrect / Correct}}{\text{Initially Incorrect}} = 0.69$$

$$\frac{\text{Incorrect / Correct}}{\text{Changed Mind}} = 1.00$$

## Weather and Climate for Teachers

The class uses a mix of lecture and interactive engagement throughout. Lessons follow the “5 E” format:

- Engage
- Explore
- Explain
- Extend
- Evaluate



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[www.cmmmap.org](http://www.cmmmap.org)



## “We Don’t Have Time to Play with Toys”

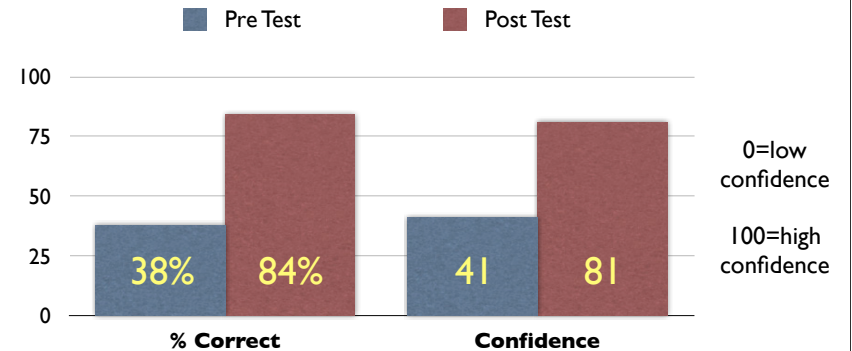


### Activity Plus Discussion

On a cool night, dew condenses on the roof of your car.

As the water vapor condenses to make the droplets of liquid water that you see as dew,

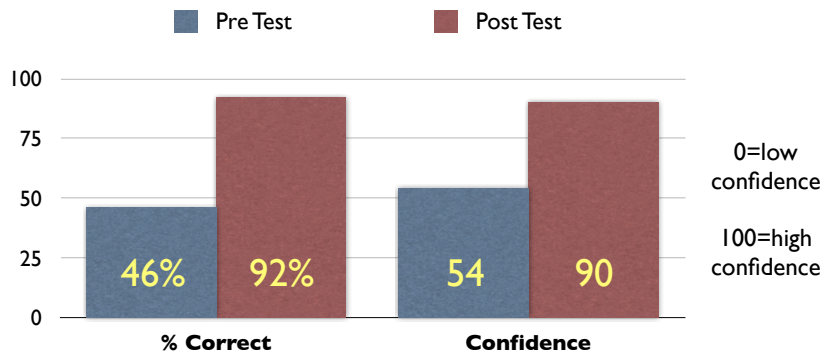
- A. Heat energy is transferred to the roof of your car, warming it.
- B. Heat energy is transferred from the roof of your car, cooling it.



### Activity Plus Discussion

On a clear night, the temperature drops more than on a cloudy night. How do clouds “insulate” the earth?

- A. They trap warm air near the surface of the earth.
- B. The condensation of water vapor keeps the clouds warm.
- C. They block the transmission of infrared radiation to space.



### Lecture Only

Why is increasing carbon dioxide likely to cause an increase in the earth’s surface temperature?

- A. Carbon dioxide absorbs radiant energy from the earth, keeping heat in.
- B. Carbon dioxide absorbs radiant energy from the sun, warming the air.
- C. Adding carbon dioxide to the atmosphere increases the density of the atmosphere, making it a more effective insulator.

