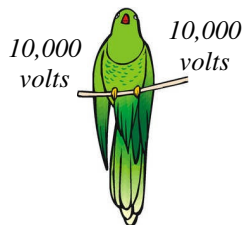
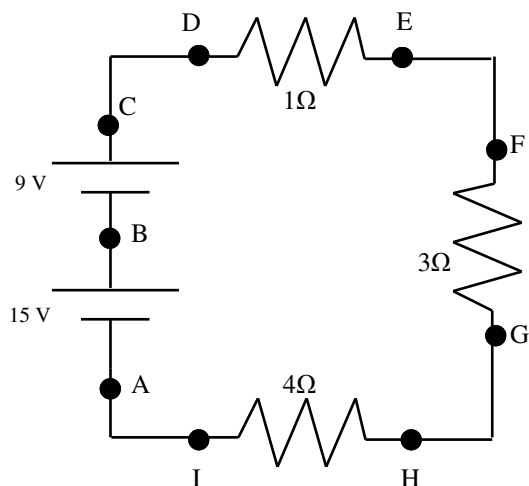


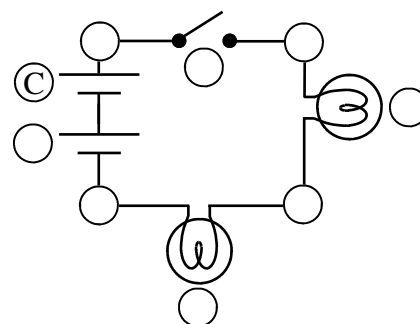
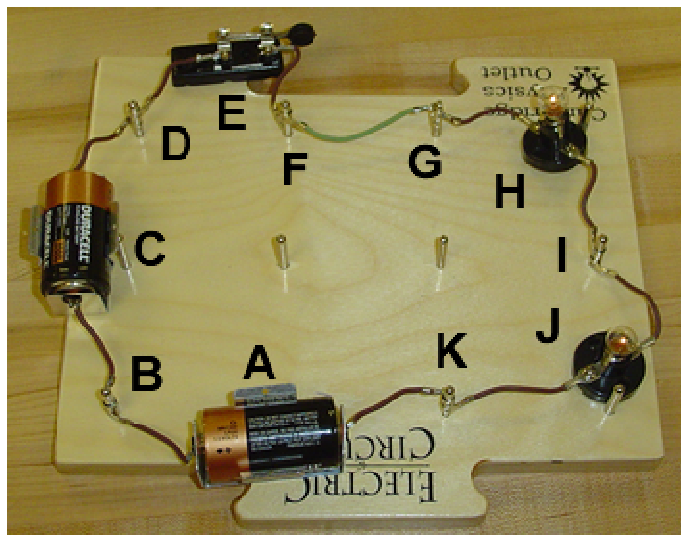
- Slim Jim is trying to move a 10 kg box. Unfortunately his dog, Bim, is trying to be "helpful".
 - How much force is actually pulling the box?
 - What is the acceleration of the box?
- C. So, it is not the force that matters, but the n_____ force.



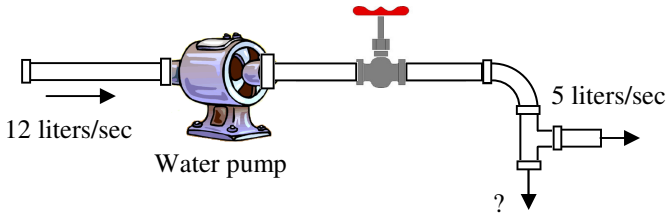
- A bird perches on a high voltage wire.
 - What is the difference of voltage between the bird's legs?
 - How big of a shock does the bird feel?
- C. What would happen if the wire sagged down until the bird's foot touched the ground?



- After working the circuit at the left, answer the following questions.
 - Just by looking, which resistor uses the least amount of voltage?
 - How much voltage does a wire use?
 - Which resistor has the greatest current?
 - What is the total voltage?
 - What is the total resistance?
 - What is the total current?
 - How many paths are there for the current to flow?
 - How much current is flowing thru the 3Ω resistor?
 - Given that $V=IR$ (always) how much voltage does the 3Ω resistor use?
 - Since resistors use up voltage, how much voltage is left at letter E?
 - Since $P=VI$, how much power is used by the 3Ω resistor?
 - Calculate the voltage used by the 12Ω resistor.
 - What is the voltage difference between point C and point E?

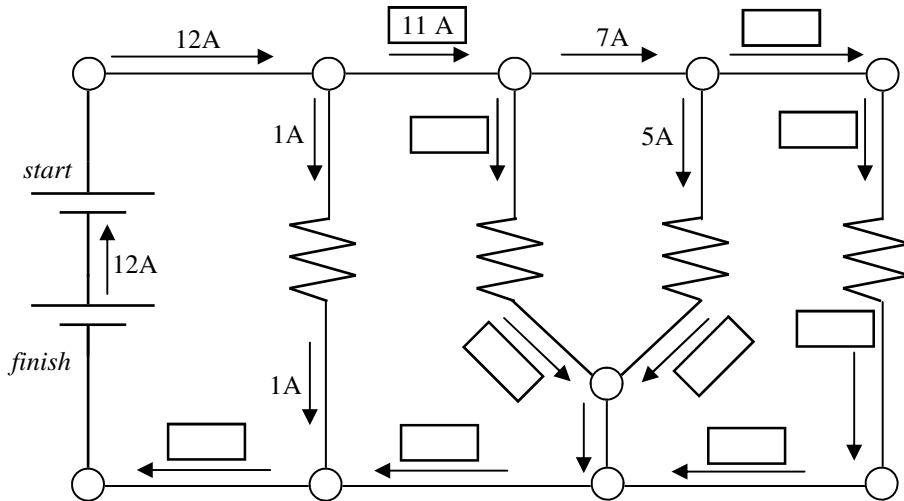


- For each of the circles on the circuit diagram above, put the corresponding letter from the picture at the left. One of them is already done for you.

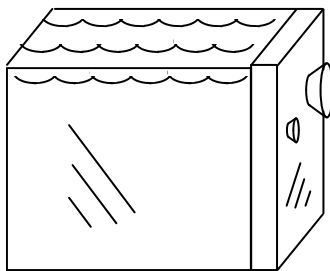


5. 12 liters/sec of water is being pumped thru pipes by a water pump. The valve is open the whole time.
 - A. The water pump is like what part of an electrical circuit?
 - B. What is the valve like?
 - C. How much water flows thru the valve?
 - D. How much water flows out of the bottom end of the pipe?

This split point is called a junction.

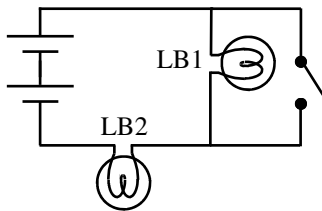


6. Think of current like water flowing thru pipes. You will start at the top of the batteries (at “start”).
 - A. In each of the circles, put one of the following:
S (split) - one wire splits into two.
J (join) - two wires combine.
T (turn) - the wire only turns.
 - B. Just like in the pipe example at the top of the page, the amount of current going into a junction (split or join) must equal the amount that flows out. In each of the boxes, fill in the current for that part of the circuit. (*Hint: this is just addition and subtraction.*)



7. Imagine a large tank of water. In one side of the tank are two holes with plugs in them: a large hole and a small hole.
 - A. When removed, which hole will have more resistance?
 - B. Which hole will have more water flowing (current) thru it?
 - C. Water, like electricity, always takes the path of:

8. From the Lab (*see the diagram at the left*) -



- A. When the switch is open (as shown), which path is less resistance: the light bulb or the switch?
- B. When the switch is closed, which path is less resistance: the light bulb or the switch?
- C. When the switch is closed, will bulb 1 get brighter or dimmer?
- D. Why?
- E. What happens if you put a wire across the terminals of a battery (between the positive and negative ends of a battery)?
- F. How could this be dangerous?

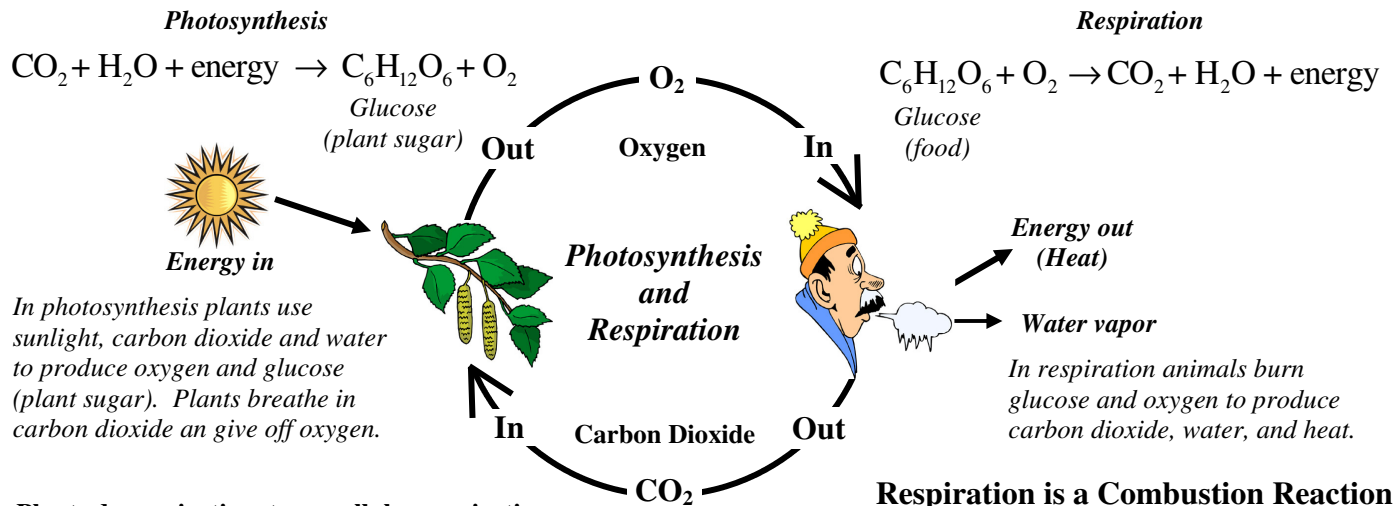
Major Cell Organelles

Organelle	Where found		Analogy	Function	Looks like
	Plants	Animals			
Nucleus	x	x	brain	holds DNA (blueprint)	The big blob in the middle
Ribosomes	x	x	factory	makes proteins from mRNA's blueprint	little dots (chocolate chips)
Mitochondria	x	x	energy plant	makes ATP (energy) for cell	hot dog with mustard
chloroplast	x		green house	performs photosynthesis	stacked M&M's in a bubble
cell membrane	x	x	skin	protects cell and allows passing of materials into cell	at the edge of the cell
cell wall	x		walls of a room	like skeleton - gives rigidity - holds up a plant cell	very edge of a plant cell
lysosomes	x	x	clean up crew	breaks down left over and worn out material	
Central vacuole	x		toilet	holds waste products; maintains water pressure in cell.	
Golgi apparatus (or complex)	x	x	post office	redistributes materials to rest of cell	Stack of pancakes
Endoplasmic reticulum	x	x	Conveyor belt for assembly line	moves materials from ribosomes to golgi	Folded fruit roll up

9. Without this organelle, the cell would be unable to repair itself or continue to grow.
10. Without this organelle, if a plant cell lost water, it would shrink.
11. Celery is hard to bend partly because of this organelle.
12. A. What color is a chloroplast?
B. Why?
13. The nucleus from Cell A is removed and replaced by the nucleus from Cell B. Afterwards, which cell's characteristics will Cell A have?
14. A cell needs certain molecules to function. These come from outside the cell.
 - A. What organelle will allow or disallow these molecules to get in?
 - B. Which organelle moves these molecules around the cell.
 - C. Which organelle will make these molecules into proteins?
 - D. Where the plans for making the proteins is stored (and comes from)?
 - E. Which organelle makes energy for these molecules to be used?
 - F. Which organelle will then moves the finished proteins around the cell?
 - G. Which organelle will break up these materials when the cell is done with them?
15. Plants actually have two organelles that make energy. Which ones?
16. If this organelle is removed, a cell loses its ability to function.

Sorry, but one more short page.

Respiration vs. Photosynthesis



Plants do respiration, too – cellular respiration, making ATP in a plant cell's mitochondria!

Respiration is a Combustion Reaction because it uses oxygen and makes water!

17. Photosynthesis or Respiration?

- | | |
|---|--|
| A. <input type="checkbox"/> Occurs in the lungs of animals. | G. <input type="checkbox"/> Produces oxygen. |
| B. <input type="checkbox"/> Occurs only in plants. | H. <input type="checkbox"/> Produces water. |
| C. <input type="checkbox"/> Carbon dioxide is a product | I. <input type="checkbox"/> Occurs in both plants and animals. |
| D. <input type="checkbox"/> Takes in sunlight. | J. <input type="checkbox"/> Makes glucose. |
| E. <input type="checkbox"/> Uses glucose as energy. | K. <input type="checkbox"/> Uses water as a reactant. |
| F. <input type="checkbox"/> Carbon dioxide is a reactant. | |

These next questions are still from the above notes. Read carefully.

18. Where is ATP created in a cell?
19. What is the proof that respiration is a combustion reaction?