

Millsaps College

How Things Work  
Spring 2006  
Stensaas and Sorci

**Tentative Course Outline:**

1. The Universe
2. Kitchen Chemistry
3. Dissecting Small Electrical Appliances
4. Sports Physics
5. Forensic Science

Classes Begin: January 9, 2006

Spring Break: March 10-19, 2006

Easter Break: April 14

Last Day of Class: April 21, 2006

**1. The Universe**

**Topic Questions:**

Will the sun last forever?

What are black holes and can you get out of one?

Are we alone in the Universe? Why is space exploration so imp?

How does satellite television work?

Who decides if weapons belong in outer space?

Activities

Planetarium field trip

Millsaps Observatory

Emission spectra lab

**2. Kitchen Chemistry**

**Topic Questions:**

Why not mix bleach and ammonia?

What's in beer or wine?

Weight loss-which diets work? (Atkins, South Beach)

Which sweetener should you use? (Splenda structure)

Activities

Kit-Do microbes make or spoil our food?

Kit-Food Chemistry (Artificial or Natural?)

Guest Lecturer on nutrition

### 3. Dissecting Small Electrical Appliances

#### **Topic Questions:**

- How does a battery work? (Galvani vs. Volta)
- How does a light bulb work?
- How do Christmas lights blink?
- How is electricity generated, transported, and transformed?
- How does a microwave work?

#### Activities

- Use fruit to make batteries
- Simple circuits with switches (investigate Christmas lights, how does blinker work)
- Investigate capacitors, resistors, chips
- Make electromagnets out of wire
- Possible Appliances (VCR, TV and remote)

### 4. Sports Physics unit (human body, medicine, game itself)

#### **Topic Questions:**

- Why can't white men jump?
- Physics of the human body, body as a spring
- Where should I hit the cue ball to make it in the corner pocket?
- Calculate hang time of football? Impact of the baseball bat on baseball-distance effect
- How do powerlifters lift so much?
- Technology (MRI and CAT scan)
- Performance Enhancing Drugs (herbal)

#### Activities

- Guest Lecturer-athletic trainer, field trip to PAC.
- Visit football field

### 5. Forensic science

#### **Topics:**

- DNA fingerprinting
- Blood typing
- Paternity testing
- The body as an ecosystem
- Molecular genetics
- Technology component

#### Activities

- Read excerpts from The Body Farm
- Kit-DNA Paternity Simulation
- Kit-Blood Typing Using Saliva

NOTE: *Components to integrate* (wherever appropriate):

- Nature and history of science, including scientific method
- Pseudoscience (CDT)

- Politics of science, including bias
- Economics, cost to benefit ratio
- Technology
- Graphing and Basic math skills
- Analysis of current topics (subscribe to Science News)