

Introductory Class

Wednesday, January 21, 2009
16:17

The instructor is the agent of change.

{ What's the problem with how Science is usually taught and why do we need to change it?

What are new perspectives on learning and teaching?

We are going to first focus on learning not teaching

- typically taught as a series of facts
- suck the life out of it to make it objective
 - most students have left
- why do I care? science is very useful in today's world?
- is everything bad? is anything salvageable
- secondary school: spit it back out w/o retention

Science/Math edu study:

comparison of 4th, 8th, 12th grades

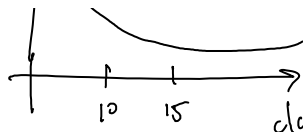
US 4th → 8th → 12th } performance

'95 → '07 no change. ~

- tendency to use a method of teaching that is effective only for a small subset of the student population.
how do you teach all students effectively?



age is important class
size is not all that



class size

important for high school,
but very important for kindergarten,
for example

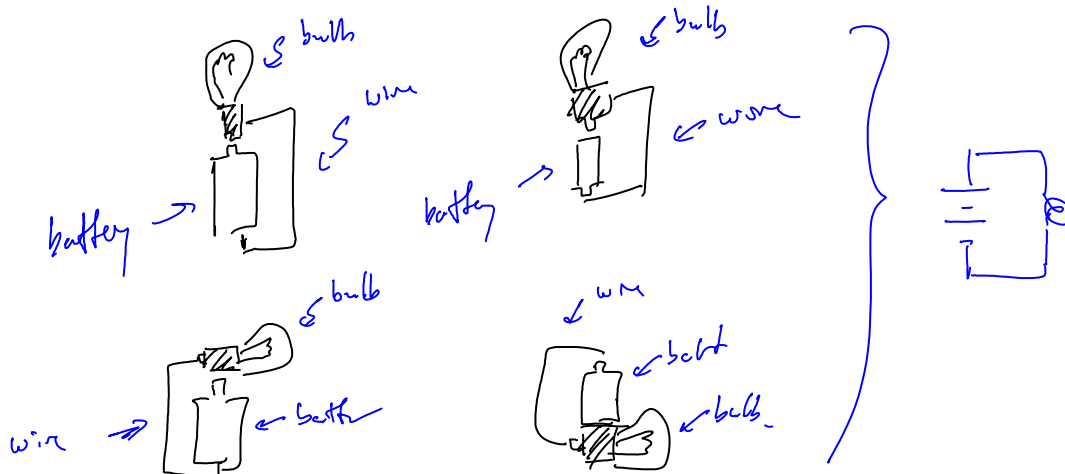
How do people learn science?

What's the best way to teach science?

- Do - learn
- examples
- build on basics
- spiral learning
- group projects / problem sets
- Cross-discipline emphasis

Using only one wire, a battery, and a bulb,
turn on the bulb

1. draw a model
2. implement the model
3. construct 3 additional models

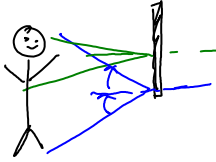


- Did your bulb turn on?
- Did you learn?

- Did you learn?
- Did you think like a scientist?
- Were you always right? or did you screw up?

Mirror activity

it's not possible to see yourself in a mirror unless the mirror is at least $\frac{1}{2}$ your body height



Reflection on Thought and Action

- What did you do? → assumptions!
- How do you know what to do?

Constructionist Theory of Learning

- you already have ideas, use them, build on them
- we don't really understand the brain, but we're trying to learn more about how people process things
- don't handhold students through easy stuff, just cover the hard stuff and introduce the easy stuff let them work things through

Start off with objective to narrow the scope and make things achievable

One goal of this course:

each student must write a "Philosophy of Teaching"

this is important for things like job apps etc