

Adaptation of JiTT in CPSC 121

Steve Wolfman

Why JiTT?

We wish to move lecture's focus from this:

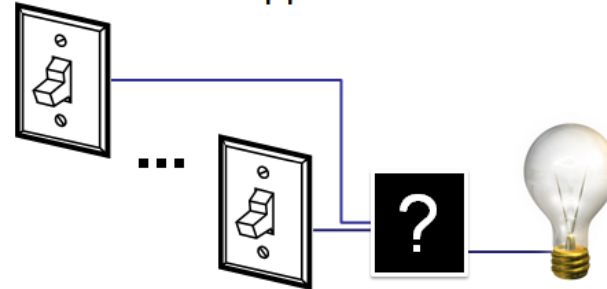
Truth Tables

What should \wedge (conjunction) mean?

i	s	$i \wedge s$

To this:

Problem: Describe an algorithm for designing a circuit to control a light so that the light changes state any time any of its n switches is flipped.



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...b/c we believe reading the text is as effective as lecture for students to learn the former, while an interactive-engagement lecture is a better way to learn the latter.

What's JiTT? (Just-in-Time Teaching)

Pre-class, students answer a few open-ended Qs that exercise key LGs online.

Instructor reads and aggregates responses.

Class opens with brief review based on responses.

Class focuses “above” the basic knowledge level with discussion building from the quiz question.

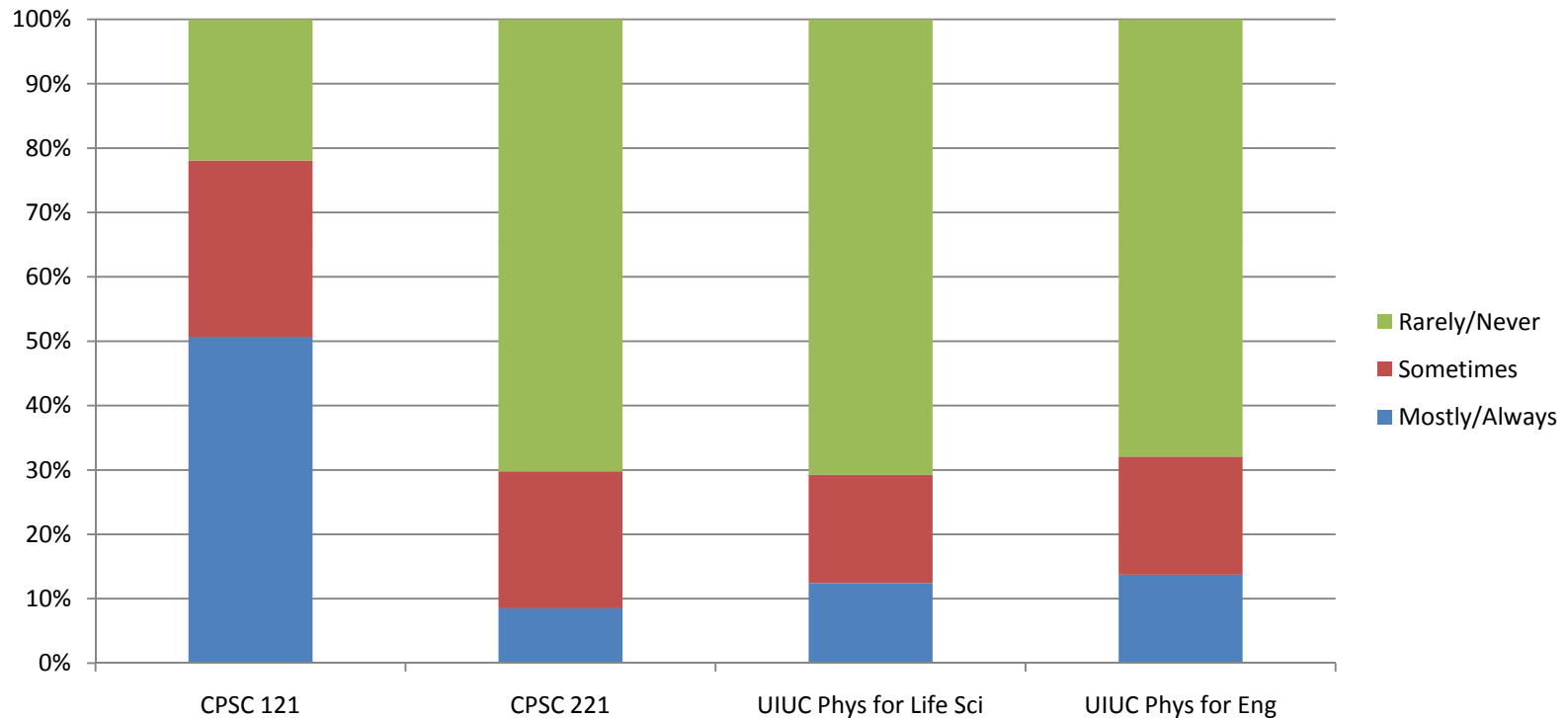


Does water conduct electricity? Please explain.

Chemical Reactivity example,
from Bob Blake's CHEM C105,
IUPUI JiTT Sampler Archive.

Why Care About *our* JiTT?

Student Self-Reports of Textbook Use



CPSC 121/221 data from end-of-term surveys.

UIUC data from three years of JiTT Physics.

UCSD CS1/1.5 with Peer Instruction reports "20-38% read most or all of the time".

CPSC 121 Adaptation: Timeline & Examples

Current unit pre-class/in-class learning goals, readings, and rec'd problems posted in prev. unit slides.

Pre-class quiz posted; students can open, work, and submit until deadline.

Previous unit lecture closes with brief discussion of next unit's LGs.

Pre-class quiz due. (Night before.)

Discussion of current unit LGs and quiz results. Mini-lecture/follow-up clicker Qs as needed.



Current unit lecture focuses on *in-class* LGs and open-ended pre-class quiz question using clicker questions w/discussion/revoting and lecture. (Units average ~2.15 lecture hours in length.)

Pre-class LGs/readings

By the start of class, you should be able to... **convert positive numbers from decimal to binary and back.**

Pre-class quiz

What is the decimal representation of the unsigned binary number 101110?

Read Section 1.5 **and** the supplement.
Solve problems like 1.5, #1-16, 27-36, and 41-46.

Review: The supplement was review in 2008W2 on signed number conversion.

To convert a signed binary int to a decimal number, use the following algorithm. We illustrate the algorithm on two four-bit examples: **1110** and **0101**.

1. If the leftmost bit is a 1, the number is negative. Do the following... (**1110 starts with a 1. It's negative.**)
 - a. Flip all the bits in the number. (**1110 becomes 0001.**)
 - b. Add 1 to the number. (**0001 + 1 = 0010.**)
 - c. Convert the result to base 10 and report its negation. (**0010₂ is 2₁₀. The answer is -2.**)
2. If the leftmost bit is a 0, the number is positive or zero. Convert the number from base 2 to base 10 and report the result. (**0101 starts with a 0. 0101₂ is 5₁₀. The answer is 5.**)

In-class LG and problem (both of which are also given pre-class).

Critique ... a digital representation scheme—including describing its strengths, weaknesses, and flaws...—for a given type of data and purpose...

UBC Computer Science

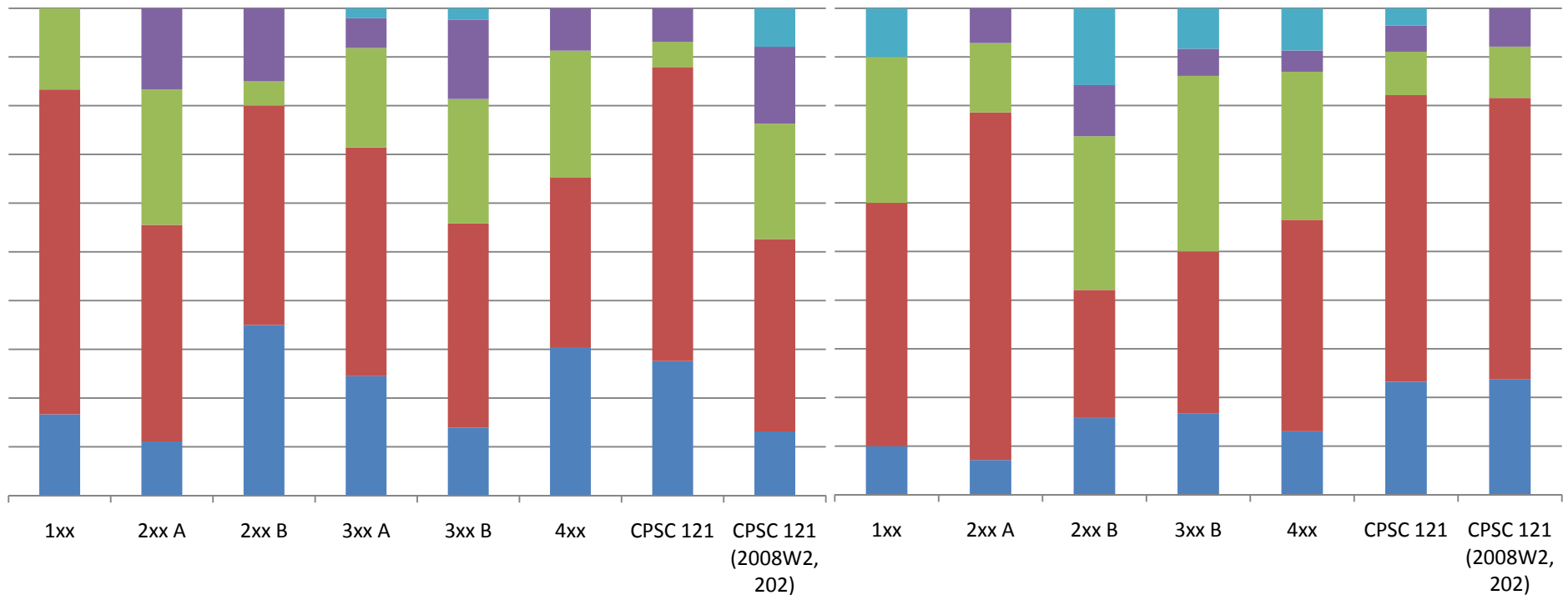
Problem: Can you be 1/3 Scottish?



2009W1 Midterm Evaluation Results (all available CPSC courses)

Lectures contributed to understanding?

Reading the text contributed to understanding?



(%age responses with strongly disagree at top, down to strongly agree)

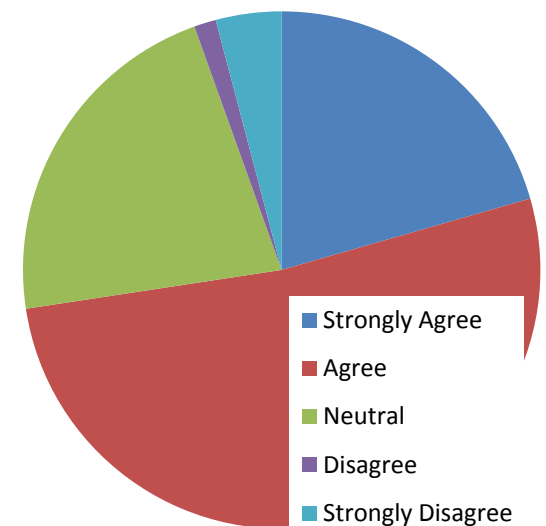
CPSC 121 textbook is seen as useful. Changes to lecture from 2008W2 maintained value of text while addressing lecture concerns.

Success of Textbook Reading?

Workload: Median of 2 hours per week reported on pre-class readings and quiz. (end-of-term survey)

Effectiveness: Median learning gain of 59% on “pre-class” pre-test/post-test items, vs 45% on entire pre-test/post-test.

Actual final exam had **no** clearly “pre-class” questions. 😞



Pre-class readings are valuable to learning.