

# What Science One Did to My Brain

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# Poll

- How many are scared you'll fail Science One?

# Poll

- How many are scared bad grades in Science One will cause you to fail in life?

My message is simple

You'll have fun, you'll learn lots, you'll do fine.

# Science One & Beyond

- Science One 2006/2007
- UBC iGEM 2009
- BSc, UBC Integrated Science 2010
- Married 2014
- PhD, MIT Biological Engineering, expected 2017

# Science One 2006/2007



Figure 1: Our Bamfield group: Cindy, Charles, myself Joey.

# Science One 2006/2007



Figure 2: 3/4 of our Bamfield group.

# Science One 2006/2007



Figure 3: Charles behaving like a whale.

# Science One 2006/2007



Figure 4: BMSC, 2006.

# Science One 2006/2007



Figure 5: Greg Bole leads us observing water sample.

# Science One 2006/2007



Figure 6: Water sampling boat.

# Science One 2006/2007



Figure 7: View from the dock.

# Where are we now?



Figure 8: Si Rim, Joey: medical doctor

# Where are we now?



Figure 9: Laz: medical doctor

# Where are we now?



Figure 10: Phil: medical doctor, entrepreneurship

# Where are we now?

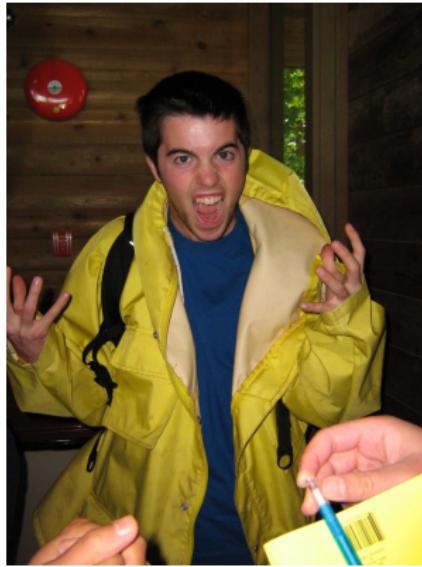


Figure 11: Paul: grad school

# Where are we now?



Figure 12: Katie: adventuring

# Where are we now?



Figure 13: Myles: grad school

# Where are we now?



Figure 14: Charles: pharmacy

# Where are we now?

- Charles Z.: U Toronto, PhD Physics
- Tiffany T.: Global Development & Entrepreneurship, Tanzania (?)
- Jacob B.: Twice my schoolmate: UBC & MIT, spoke last year @ SciOne
- Cindy Y.: U Toronto, grad school
- Mo C.: UC Berkeley, PhD EECS

*You'll do just fine. :-)*

Let's have a taste of the coming year.

## Question

*“According to Einstein’s mass-energy equivalence, if a piece of chalk were to be completely converted to energy, how many days of power would that piece of chalk provide to Vancouver?”*

- Pair or triple up.
- Don’t Google the question.
- Feel free to check online for whatever data you need to assume.
- When you’ve got an answer, write it on the whiteboard, expressed in “number of days”.
- Spend 10 minutes on this. You can AMA.
- One or two groups tell us their answer.

# Lesson

*Order of magnitude is more than accurate enough.*

- Think in scales, thinking at scale.
- Approximations that answer the right question are better than precisely answering the wrong question.

# A lesson in approximation to a journey in computation

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- How much exactly does flu shuffle its genome in the world? Is it important for switching viral hosts?
- Answered in Ma et. al., 2016 (PNAS).

## How would you solve these problems?

*I just flipped that starfish over... How long do starfishes take to flip back over?*

*Are there outlier Pokemons? Do their height/weight combinations actually make sense?*

- Pair or triple up.
- Take 10 minutes to outline a strategy for answering one of these questions. Specifically answer the question: what are you going to measure?
- Share at the end.

# Pokemon heights and weights

- Go to the following URL: <http://goo.gl/94i0rq>
- Enter as many height/weight combinations as you have/can.

# Science as measurement of the world

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- T1 Bamfield: Starfish flipping.

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- T1 Bamfield: Starfish flipping.
- T2 Measurement: Antimicrobial properties of traditional Chinese herb extracts.

# Science as measurement of the world

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- Modelling error in measurement and propagating through phenotype predictions.
- Thinking at Scale: How much viral drug resistance is out there?

# Final Words

- Participate.
- Teach one another, learn from one another.
- You'll do fine. :-)

# Where are these slides?

On GitHub: <https://github.com/ericmjl/what-science-one-did-to-my-brain>

Short URL: <http://goo.gl/pkzv2t>