D-Lab Development
2009.10.16

Water Quality Testing

You can’t see bacteria
Make it visible, in a way you can acknowledge its presence, or count how many are there
Give it a food, metabolizes and turns certain color
Different waste products produce different colors
Don’t want to set off every bacteria
Grow them at 98.7 (human temp)

Food. Environment. Temp

Method 1
Choliform turns yellow

Method 2
Sulfur reducing bacteria, will turn black (rotten eggs)
Test tubes aren’t reusable
Wasteful
Expensive for resource strapped community
To reuse, have to sterilize tube

Presence absence test
YES or No are they there?

Quantify
2 Methods
Petri Film
Measure 1ml of water
Place on dried gelatin
Red and blue colonies
Red = choliforms
blue = fecal choliforms
You will be able to count them
Problem, small sample size
Normally quantified by 1 per 1000 parts (?)

Method 2
Take larger water sample
Pull sample through filter paper
All bacteria in sample are deposited on paper
Save filter paper, place on petri dish, grow to see what is there
Then you can count how many bacteria

It is all about growing and changing color

Method 2 device costs a lot of money, $850 - $1000
So D-Lab made a cheap device,
with a baby bottle
Sterile inserts adapted to baby bottle, for about $20

D-Lab, what we think is how we can make everything cheaper
Easy to replace parts
Incubate them at warm temp.
   Field incubators cost $1200 and need electricity
   Most places don't have electricity
   Have to do test in 6hrs of timing
   D-Lab wanted to make a kit that could be tested in field

Phase Incubator, based on phase change material to maintain temp
   of 37 for 24hrs
   Recent news from Peru that the phase change incubator
   is comparable to an electric incubator, go Amy's invention

Have students do a bunch of water quality testing
Important, to test bacteria in water, not on hands or in mouth
   Simple sterilization techniques
      Alcohol + Flame
      The only thing you will use to touch things that come in
      contact with water, forceps
      "Edward Forcepts Hands"

Sterilization order
   Ring, Filter Paper, Mesh,

Running blanks to make sure that your test are not
   contaminated
   Once every 20 tests maybe
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