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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