>> Sally: Hey Dude, look who's here.

It's my friend Izzy the iGEMer.

She just stopped by for a visit.

>> Dude: Whoa!

I've never met a real iGEMer before!

>> Izzy: Hey Dude, great to meet you.

>> Sally: I need to split some cells in the tissue culture room, but I thought that you and Izzy could chat.

Maybe she could tell you a bit about her project?

>> Dude: Awesome!

>> Dude: So what was your iGEM project?

>> Izzy: Well we tried to engineer a bacterial arsenic detector.

>> Dude: A what?

>> Izzy: A bacterial cell that could tell us when arsenic is present in water.

>> Izzy: See arsenic contamination in drinking water is a big problem for people living in Bangladesh and West Bengal.

And since there's no easy way to know if arsenic is in the water, people there have been drinking contaminated water and getting sick .

So we wanted to engineer a biological system that people can use to test their water for arsenic.

>> Dude: I had no idea this was such a problem!

What a great project to work on.

How does your system work?

>> Izzy: Well our goal or the system specification as engineers call it was to have people mix a little of their drinking water, with a culture of bacteria and know that there's arsenic contamination if the liquid changes color.

>> Dude: Awesome!.

But how did you get a bacteria to do that?

I'm still trying to figure how to make my bacterial balloon work!

>> Izzy: Well like all engineers, we used abstraction to help us.

Let's take a look.

>> Izzy: We knew we needed to build a system that could take as input arsenic and produce as output a change in the color.

>> Izzy: So first, we compiled our system into devices.

We needed one device that could detect arsenic and produce a signal.

We called this our arsenic sensor and gave it a part number, BBA J33201.

And we needed a second device that could produce a color when it got the signal from our arsenic sensor that there's arsenic around.

We called this color reporter BBA J33202.

>> Dude: I don't get it.

Why are you using two devices?

Wouldn't it be way easier to make just one: arsenic in and color out?

>> Izzy: Well you could do it that way.

But then the only thing that the device could be used for is to report on arsenic contamination with color.

By splitting the system into two devices, a sensor and a reporter, we hope future iGEM teams can use one or the other for new projects.

>> Dude: How?

>> Sally: Well a team could connect the arsenic sensor device to a different reporter device that say, produces light instead of color.

Or a team could build a new system that detects say, mercury contamination, and then produces a color as a response.

>> Izzy: Yep, we designed our system so that people can more easily reuse and build on our work!

>> Dude: Oh I get it!

Maybe I could connect your arsenic sensor device to my balloon-making device!

>> Izzy: Exactly!

>> Dude: But shouldn't I know a little more about how the arsenic sensor works before I just hook it up to by balloon making device?

Sally got kinda upset last time I didn't' stop the balloons from growing and growing...

>> Izzy: That's why we entered both devices into the Registry of Standard Biological Parts.

We also documented our project online at the iGEM wiki to make it easier for others to build upon our work.

>> Sally: The goal is that eventually, for each device in the Registry, there will be a datasheet available that summarizes all the relevant information about that device so that you know how to use it in a higher level system like the arsenic detector.

>> Dude: You mean just like this old datasheet I found for this a 7404 hex inverter chip?

>> Sally: Yep.

But I'm afraid there's still a lot of work to do before all the parts and devices in the Registry have datasheets.

>> Dude: Great!

Lots of work to do.

Let's get started!