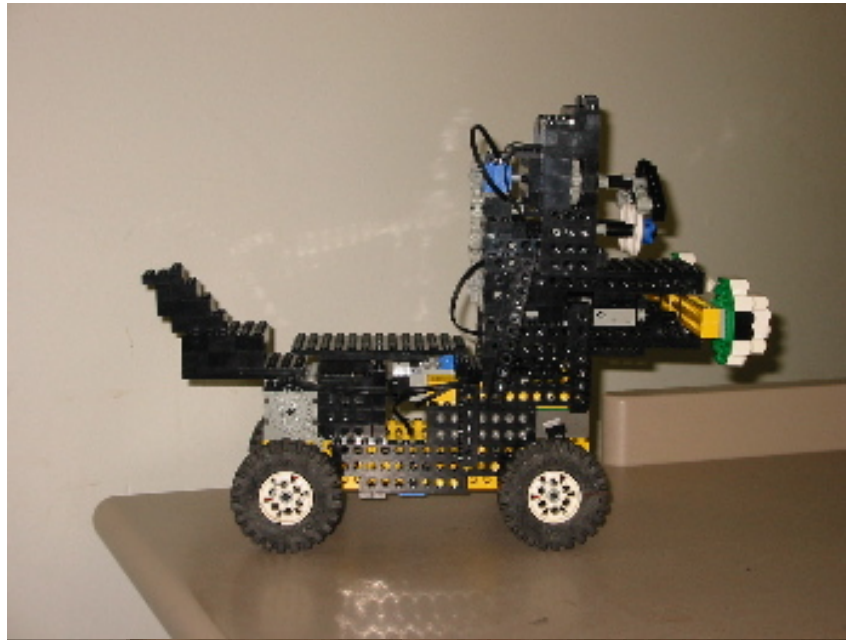
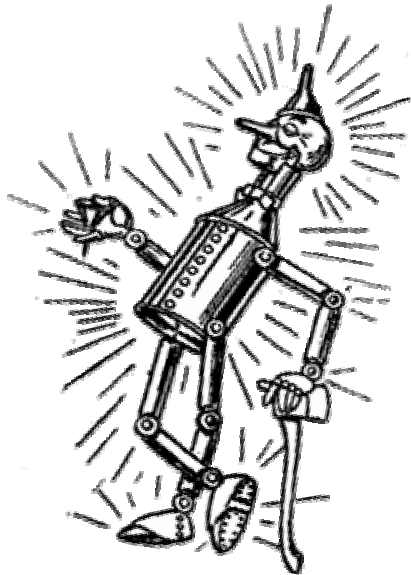


Lego Mindstorms and brickOS



What is a robot? (again)

You can think of a robot as having 5 essential parts



- *A brain*: something which controls the robot
- *A body*: the physical aspect of your robot
- *Actuators*: things which allow the robot to move
- *Sensors*: things to give robots information about their environment
- *A power source*: the "juice" needed to run everything

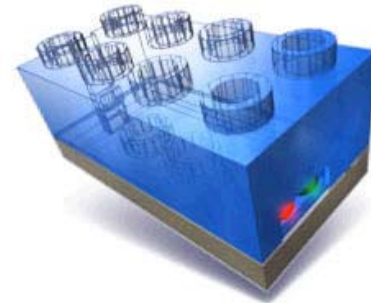
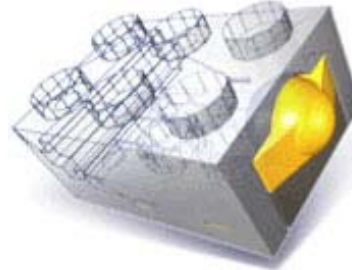


Programmable Legos!?

Lego Mindstorms is a set of Lego products which help you to create your first robot! Here are some Lego Mindstorms items.



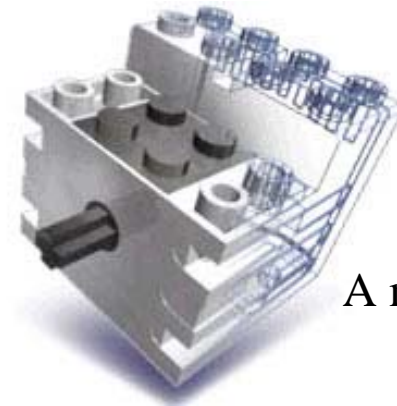
A “brick”. You can download programs and attach sensors and motors to this.



Different kinds of sensors



Batteries are used to power the brick.



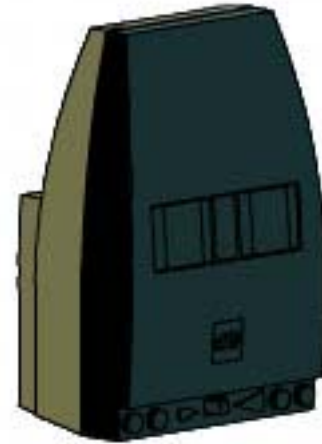
A motor

To build our robot, we also need PLENTY of Lego pieces!



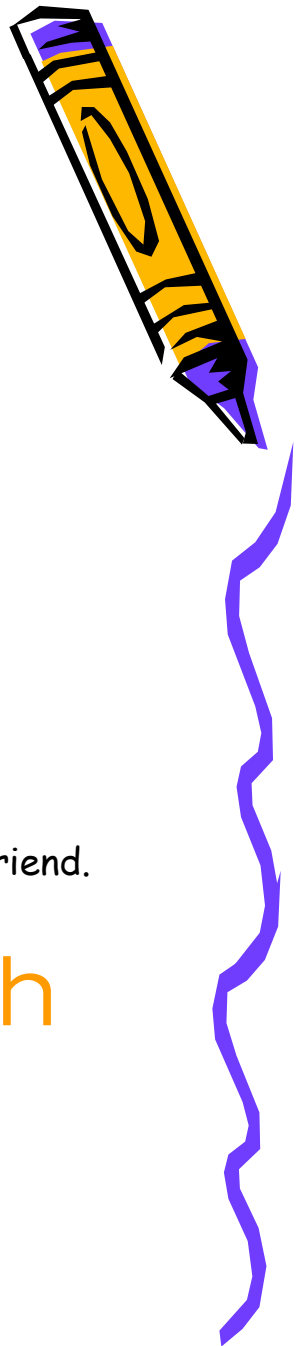
brickOS - a few notes

- brickOS is the interface* on the brick which allows you to install programs on.
- Transfer of data is done via the IR port. →
- Programs are written in C (a type of programming language).



*don't worry if you don't understand this word, just know that brickOS is our friend.

Ready to start playing with
some Lego Mindstorms?



Wait, not so fast!!!



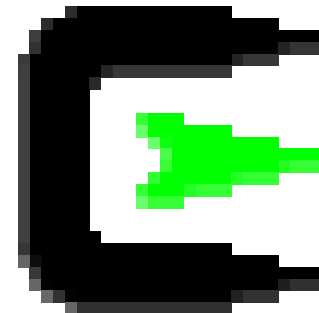
We still have NO IDEA what we're doing!

Let's say we have our program already, and we save it in the folder `R:/krista/` (or `Z:/robots/krista ... same thing`)

How do we get it from our folder into the yellow brick?

Introducing our friendly neighborhood shell...

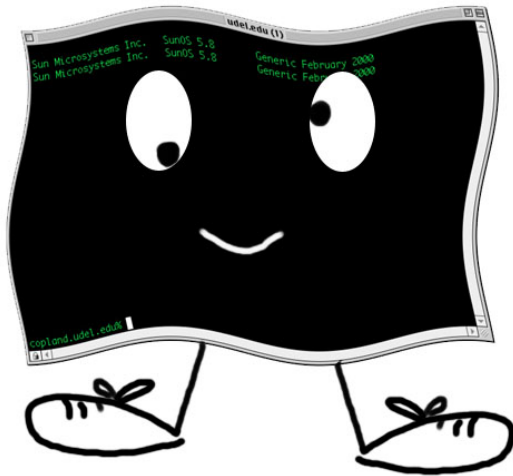
Cygwin!



What's a shell?

A shell is a different way of looking at a computer.
Main difference: You can't use a mouse in a shell.

It's all about the typing, baby!



I'm a shell, what are you?

When I use a shell, I have to type **commands** to do what I want to do.

What's a command?

It's an order!

It's something you tell someone else to do. (And then they do it)

In shells, there are commands for everything: making a new folder, opening a file, creating a new document...



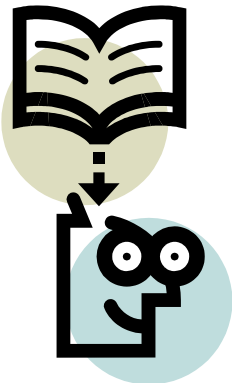
... but we only care about two (maybe three) commands



cd

This means “change directory (aka folder)”

It is our way of navigating around the computer using a shell
You use cd by typing “cd” and then the location of the folder you’re trying to get to



e.g. Typing `cd R:/krista/` when you open Cygwin will take you to my folder in the robot folder

The slashes indicates that one folder **contains** another

make install

Going into one of your robot project folders and typing this command will download your program onto the yellow brick.

Make sure you have an IR port connected, and your brick is turned on when you do this command.

ls

This means “list”. It will display what is in the folder you are currently looking at.





Too much information?



The best way to learn these concepts is by actually doing them.

So... it's time for YOU to try things out!

To help you out, we have provided a "Notes and Howto" handout, which covers the technical aspects of these slides and lists a few extra points.

