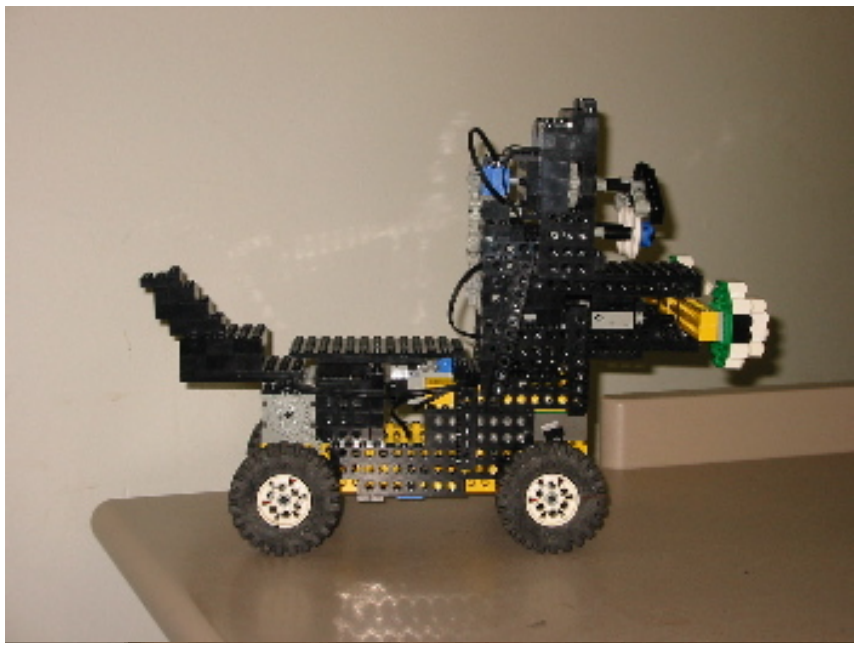
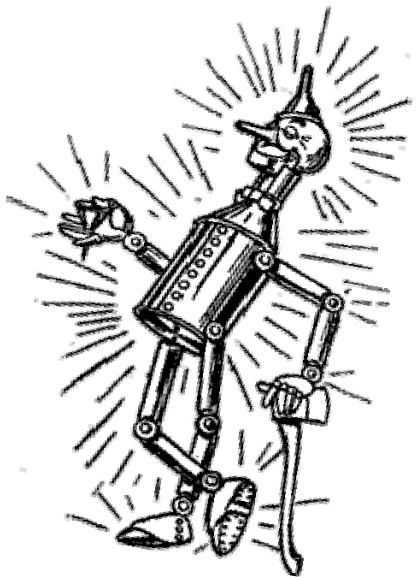
Lego Mindstorms and brickOS



What is a robot? (again)

You can think of a robot as having 5 essential parts

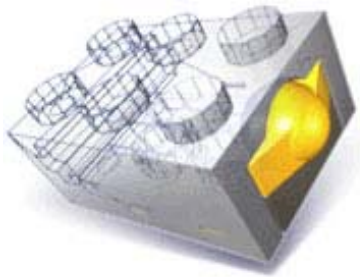


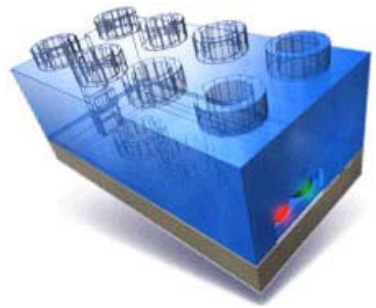
- *A brain* : something which controls the robot
- *A body* : the physical aspect of your robot
- *Actuators* : things which allow the robot to move
- *Sensors* : things to give robots information about their environment
- *A power source* : the "juice" needed to run everything

Programmable Legos!?

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

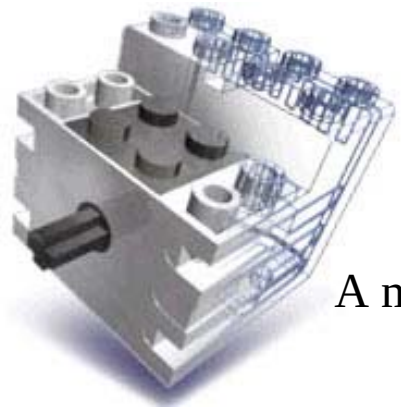
A "brick". You can download programs and attach sensors and motors to this.





Different kinds of sensors

Batteries are used to power the brick.



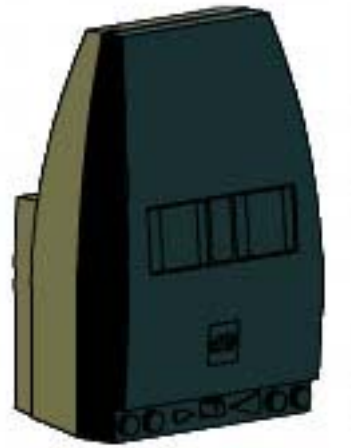
A motor

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!

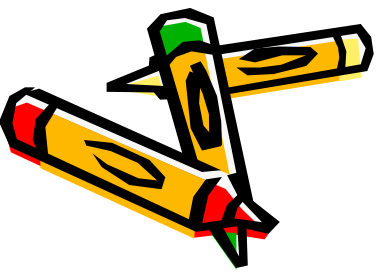
Let's say we have our program already, and we save it in the folder:

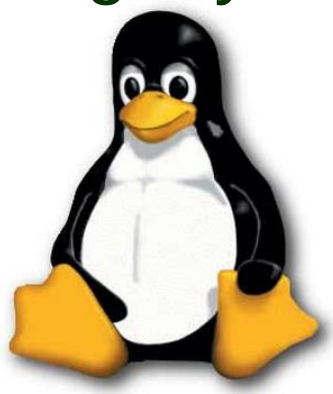
`Y:/pro/artemis/2006/Curriculum/Robots/Students/<Group name>`

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

Introducing our friendly neighborhood Operating System...

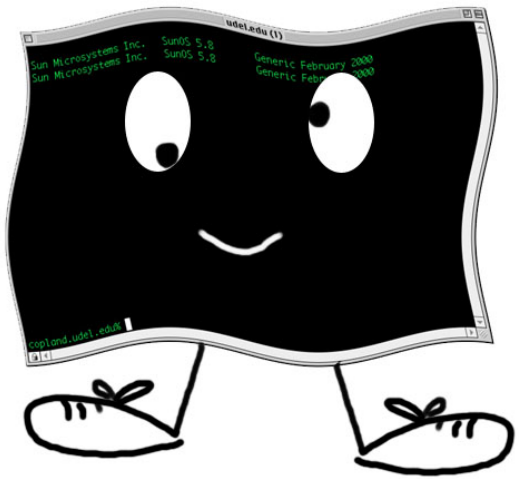
Linux!





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.
The shell you use in Linux is called an 'xterm shell'
and this is how you communicate with the computer!



I'm an xterm shell, what are you?

It's all about the typing, baby!

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…

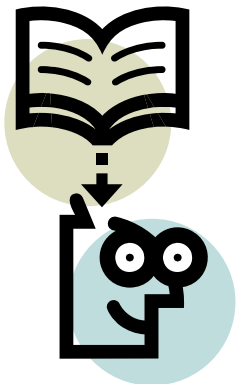
… but we only care about two (maybe three) commands

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

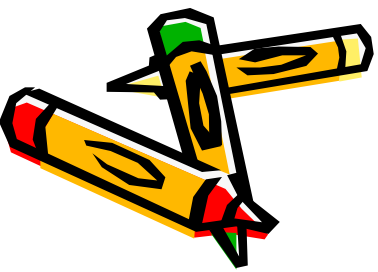
`cd Y:/pro/artemis/2006/Curriculum/Robots/Students/<Group name>`

when you are in the Linux xterm shell, it 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 both a Linux rundown and a "Notes and Howto" handout, which covers the technical aspects of these slides and lists a few extra points.