Proposed freshers design project spec

Cost:

* The total cost of components should be less than £7.50 per team/individual
* The cost of PCBs should be less than £5 per design (this means we will use a master design/ allow teams to use their designs)

Outcome:

At the end of the design there should be a small maze which the robots should try to navigate using determinism, bump sensors (following the right hand wall for example), light based line following, or ultrasound sensors (these should largely need the same PCB design, but be programmed and populated differently)

Things to be learned from it:

* Electronics design
* C programming (on an embedded platform)
* Game strategy
* How to use sensors
* Soldering
* How to version control a project

What the PCB needs to do (if a master is used):

* Be powered by 3 AA batteries (4V5)
* Must have an on/off switch
* Have a programmable ATTiny or Arduino (must have an accessible programming header)
* Have 2 H-bridges, each with a motor (cheap DC?) and places for wheels (proper tyres or just laser cut acrylic to cut down on cost)
* Have GPIO broken out for sensors (may be better to have IR circuitry straight on the board, as it will need to be attached to the bottom)
* Be less than 100mm x 100mm

What the PCB needs to do (if a master isn’t used):

* Be powered by 3 AA batteries (4V5)
* Must have an on/off switch
* Have a programmable ATTiny or Arduino (must have an accessible programming header)
* Have 2 H-bridges, each with a motor (cheap DC?) and places for wheels (proper tyres or just laser cut acrylic to cut down on cost)
* Have chosen sensors in sensible positions (the options are bump, IR, ultrasound, None for deterministic approach)
* Be less than 100mm x 100mm