



'Junkbots' – A Public Engagement Case Study by the University of Northampton

Summary:

Junkbots is a project where students (previously, pupils in secondary schools) got an opportunity to investigate turning household waste (such as drinks cans) and simple electric items (e.g. electric motors and batteries) into moving 'bots'. The original project involved the junkbot building - programming of Lego™ robots and a set of waste management exercises (see <http://junkbots.blogspot.co.uk/2010/01/introduction.html> for further details).



Building on the success of the University of Northampton's Junkbots project within the School of Science and Technology, the work has been re-purposed for primary schools, focussing on the junkbot building.

Figure 1: Drawing bot

Background:

In the School of Science and Technology we are in the fortunate position of having computing, engineering, material science and environment science within the school, as well as having staff with the expertise and the enthusiasm to communicate science and technology.

The material that has been produced as a result of engagement with the adopter project has been trialled in Northamptonshire primary schools.

Project Highlights:

1. Developed activities suitable for primary school children informed by the practices drawn from the "[Enhancing Effective STEM Public Engagement](#)" project
2. Created a new 'junkbot' based around the students producing a drawing bot (see figure 1)
3. Created activities that are easily adaptable for different age groups, interests or length of session:
 - Drawing junkbots - a fairly easy introduction, good for younger student and for sessions less than 1 hour
 - Junkbot that moves in a straight line - more challenging and takes a longer time due to the experimentation time needed
 - Junkbots to collect small waste items - more challenging and needs a greater amount of time. Suited to older primary students
4. The project is sustainable:
 - Resources needed are low cost or often already available within the school (junk, electric motors and batteries)
 - The cost of delivering a small number of sessions is in-line with spend on similar outreach activities
 - Now the activities have been developed, they can be delivered by others

Outcomes:

- Wider range of potential places for the workshops
 - In-class (for example, a half-day session):
<http://junkbots.blogspot.co.uk/2012/03/junkbots-goes-to-roade.html>
 - One and half hour workshop as part of National Science and Engineering week:
<http://junkbots.blogspot.co.uk/2012/03/junkbots-goes-south.html>
 - An activity for a STEM club:
<http://junkbots.blogspot.co.uk/2012/05/wootton-primary-school.html> see figure 2
- Comment from teachers
 - "... the junkbots project went to Wootton Primary's STEM club. The task was challenging to design and to build junkbots that can draw in less than 45 minutes...and they did. Great work and some engineers / technologists for the

future.” STEM Club

- “The students at Brooke Weston had a fantastic time ... They learnt a lot about team working and developing ideas over an extended project. Very worthwhile and our gifted & talented year 8 students had a brilliant time.” Junkbots with other children.
- Teachers have used these activities as topics in other areas namely, in year 1 ‘writing’. This also provides evidence that the students found these activities engaging.



Figure 2. STEM Club

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This activity was undertaken as a part of the National HE STEM Programme, via the South West Spoke. For more information on South West Spoke projects, please see www.hestem-sw.org.uk. For more information on the overall national programme, please see www.hestem.ac.uk.