

YART – STEM Programming with Teens
Wednesday, April 8 @ 9:30
Newport Public Library, Newport, RI

Submitted by: Becky Farwick, NPL YA Librarian

Heidi Wright, 4-H Program Coordinator joined the group bringing along 16 science related project kits. Many of the projects are the result of National Youth Science Day Projects.

Each kit contains 5 youth guides and 1 facilitator guide as well as all of the materials necessary for kit projects.

Forms can be downloaded free from the NYSD website. Please leave at least one blank of each form in the kit when it leaves the library.

Please be sure to send the Group Enrollment form and the Learning Kit Evaluation to Heidi after each program.

Kits are set up to serve 4-10 teens (working in pairs) ages 9 and up. Kits are designed to teach the model for the experimental process.

We tried activities from each kit, talk about ways to expand or change them depending on teen interest and participation levels and then each librarian was issued at least one kit.

Kits are to be kept for 6-8 weeks on average and then moved to another interested library. She is donating the kits to the RI public library system.

Heidi will replace things like motors and batteries as they can be expensive, but she asked that librarians replace basic supplies like popsicle sticks, piper cleaners and the like.

Heidi also requests that the first recipients create a printed inventory there isn't one in the box already.

Activity 1 – Ecobot Challenge

Teens are given a scenario in which they must design a robot to clean up an environmental spill on a beach.

A youtube search for “bristlebots” will show the end goal

Teens:

- Design and assemble a bristle bot
- Design a beach area and set up barriers, using things like pipe cleaners or tissues to contain the bots – barriers must be true to life ie: you can't tape something to a real beach
- Have contests with bots
 - Which bot cleaned up the most spill (a.k.a rice or whatever)
 - or
 - Which bot is fastest

Potential frustrations: bot balance
 Stickiness of tape
 Be careful with the batteries – wires can be pulled out
if teens are too rough

Activity 2 – Maps and Apps

4-H has I-pads available for loan

Teens are given a scenario: someone has donated “x” acres of land to the city for a park. Design it.

Together teens should brain storm: map/blueprint elements
 Required park elements
 Elements they want in a park
 A rough sketch of where elements where go

Then they can break up into groups of two and layout park elements in detail on clear map. Groups should focus on element groups such as natural elements (trees, pond, etc.)

practical elements (bathrooms, water fountains, doggie doo bags, parking lot), recreational elements (a walking trail, playground or picnic area). Once all of the groups have finished, they come together, iron out overlaps and have a finished park.

The app “maps apps” is free from the app store. This may be a better starting point for technology driven teens.

This is a great program for Minecraft players.

Activity 3 – Rockets to the Rescue

Teens are given a scenario: you must launch food and supplies, in the form of raisins, into a disaster struck area.

In groups they will:

- brainstorm a rocket payload design
- Build the rocket and determine decoration
- Build the launch pad
- Build the payload carrier

At least a 40’ open area is then required to test the rockets. Teens must hit their target (select something to be the disaster area). They can vary things like angle of the launch pad, pressure on the “launcher” and more. When making changes, they should only change one variable at a time – scientific method – so they know which variable affected the rockets distance, trajectory, etc. (Protractors are included so they can test angles – if you only have 40’, use a 40 degree angle, no more.)

Activity 4 – Junk Drawer Robotics

www.4-h.org/resource-library/curriculum/4-h-robotics/junk-drawer-robotics

This is a general engineering box with many different activities and projects.

She recommends: notebook page 8 – think like an engineer

Bk 1 – marshmallow (or whatever) catapults – check youtube

videos: Warwick Castle Catapult, trebuchet catapults, and pumpkin chunkin’.

Bk 2, pg 16 – Slip-n-Slide

She makes the boards in advance, but teens can do it

Box of paperclips is the vehicle – wheels & motors can be added.

Try each surface multiple times for an average

angle/speed/etc. replicated) (scientific method – can it be replicated)

Bk 2, pg 38 – Can Can Robots

Bk 2 – electrical circuit information

The book set can be purchased at the 4-H Mall – Robotics curriculum - \$39.95 with DVD

Useful websites include:

Evil Mad Scientists (supplies)

Harbor Freight (batteries)

Spark Fun and Kelvin (motors, batteries)