Field Trip # 33	**Building a Low Power FM Radio Transmitter – Raspberry Pi**
Developed by:	Dr. Matt Campbell
Subject:	Basic scripting & radio wave transmission with Raspberry Pi
Short description:	Students will learn how to build their own low power FM radio transmitter using a Raspberry Pi & open source software.
Educational Level:	6th – 10th Grade
Field trip type:	Workshop
Educational Outcomes:	The Student will be able to:

The Student will be able to:
- Explain how a radio transmitter works
- Setup & boot a Raspberry Pi
- Modify source code
- Compile the source code
- Modify hardware for FM broadcast
- Evaluate transmission strength

Content:	Source: http://www.icrobotics.co.uk/wiki/index.php/Turning_the_Raspberry_Pi_Into_an_FM_Transmitter
Notes to instructor:	It is recommended that the instructor have at least one assistant in the lab to assist learners with the project. This learning object can easily be fit into a 50 minute time frame or expanded as time allows. This activity should be done in a computer lab or a classroom with one Raspberry Pi, monitor, mouse, & keyboard for each group of 2-3 students. The instructor should have a Raspberry Pi connected to an overhead projector for demonstration.

A PowerPoint instructional slide show can be provided. |

<u>LESSON PLAN for Building a Low Power FM Radio Transmitter Using Raspberry Pi</u>	Part 1 (10 minutes: 10) 　　　Explain how radio waves are produced & transmitted Part 2 (10 minutes: 20) 　　　Introduce Raspberry Pi with a brief description of hardware & capabilities 　　　Connect the Raspberry Pi to a monitor, keyboard, mouse, & antenna Part 3 (20 minutes: 40) 　　　Work with source code to make minor modifications 　　　Compile the software Part 4 (10 minutes: 50) 　　　Experiment with broadcasting radio signals through the building.
Content:	The lesson uses a custom research software called the Program Encryption Toolkit (PET) to help students visualize and create digital logic circuits and components. PET is also used to illustrate basic digital logic principles and security techniques such as obfuscation.
Notes to instructor:	