



# WAYNE STATE UNIVERSITY

## STEM Day Lesson Plan

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Title: Making Music With Electromagnetic Waves

Subject Area: Music Technology

### Learning Activity Description:

Participants will use special audio devices to listen and record electromagnetic waves emitted from everyday electronic devices, such as computers, cell phones, and televisions. The participants will have a chance to use these signals and digital audio technology to create short music. The workshop will be at a professional recording studio located in the Wayne State University's Music Department.

### Lesson Activity Objective:

Learn about electromagnetic waves and their presence in everyday life

### Lesson Activity Outcomes:

Students will learn how to analyze electronic signals of machines using affordable and easy-to-use tools. Students will also have a chance to play with professional music gears.

### Materials/Supplies Listed:

Electromagnetic pickup, guitar amps, synthesizers, drum machines, and recording studio gear (all provided by the instructors)

### Teacher Procedures:

1. Lecture and demo on the electromagnetic wave (10 min)
2. Group 1 (12 people) uses electromagnetic pickups to find sounds from machines. Group 2 (12 people) learns how to use synthesizers (10min)
3. Group 1 and 2 gather together and perform short music (5min)
4. Groups 1 and 2 changes roles and activities (10min)
5. Group 1 and 2 gather together and perform short music (5min)

Preparation Time for Learning Activity: no preparation time needed for students.

Room set-up: Recording studio & synthesizer lab

Group Strategies (example, group size, expected time for groups, etc.):

Students will pair up for each activity (finding electromagnetic waves and playing synthesizers). The pair will work together to find the optimal position to detect the electromagnetic field or to make sounds from a synthesizer in sync with other performers.

Student Products/Artifacts/work pages:

Their music performance session may be recorded and shared via web storage.

Assessment Criteria/Rubric:

The student learns to detect electromagnetic waves: 1 point

The student learns to play a synthesizer: 1 point

The student participates in the electronic music ensemble: 1 point

3 points: Most satisfactory

2 points: Satisfactory

0-1 point: Not satisfactory

Closing/Transition to the next activity: Participants will return all tools to the instructors before leaving.