Lesson Title: Robot Theater – Where poetry comes to life!

Description: Create a robotic diorama complete with audio to represent a poem
Subject: Reading/Language Arts
Grade level: 6th – 8th grade
Lesson purpose: Culminating activity for a poetry analysis unit (can be a good multi-disciplinary unit)
Lesson time requirements: 6 to 8 class periods (40 minute class periods)
Developed by Sue Mellon
Provided by BirdBrain Technologies

Standards

Reading Standards:

- R6.A.1.3.1: Make inferences and/or draw conclusions based on information from text.
- R6.A.1.3.2: Cite evidence from text to support generalizations.
- R6.A.1.6.1: Identify the author's intended purpose of text.
- R6.A.1.6.2: Identify, explain, and/or describe examples of text that support the author's intended purpose. Note: narrative and poetic text

- R7.A.2.3.1: Make inferences and/or draw conclusions based on information from text.
- R7.A.2.3.2: Cite evidence from text to support generalizations.
- R7.A.2.6.1: Identify and/or describe the author's intended purpose of text.
- R7.A.2.6.2: Identify, explain, and/or analyze examples of text that support the author's intended purpose.

- R8.A.1.3.1: Make inferences and/or draw conclusions based on information from text.
- R8.A.1.3.2: Cite evidence from text to support generalizations.
- R8.A.1.6.1: Identify and/or analyze the author's intended purpose of text.
- R8.A.1.6.2: Explain, describe, and/or analyze examples of text that support the author's intended
- purpose.

Technology Standards:

- 3.4.6.C1: Recognize that requirements for a design include such factors as the desired elements and features of a product or a system or the limits placed on the design
- 3.4.7.C1: Describe how design, as a creative planning process, leads to useful products or system.
- 3.4.8.C1: Evaluate the criteria and constraints of a design
- 3.4.8.C2: Explore the design process as a collaborative endeavor in which each person I the group presents his or her ideas in an open forum.

- 3.4.8.C3: Analyze how a multi-disciplinary (STEM) approach to problem solving will yield greater results

21st Century Skills (http://www.skills21.org/)

- Collaboration
- Problem Solving
- Creativity & Innovation

Materials Required

- One computer for each student group
- One Hummingbird Kit for each student group
- One box (shoe boxes for athletic shoes work great0
- One to two glue guns with 10- 12 glue sticks for student group
- Suggested craft supplies:
- Construction Paper – assorted colors
- Markers
- Craft sticks
- Fishing Line
- White all purpose tying twine (low-stretch)
- Corrugated Cardboard scraps
- Toothpicks
- Feathers, scrap fabric, lace/trim, felt, craft foam
- Cotton balls
- Foil
- Styrofoam cups and bowls
- Pipe cleaners – assorted colors
- Small metal bells and wiggly eyes – great paired with vibration motors
- Repurposed containers that held food items

Possible Poems

- Fire and Ice by Robert Frost
- Nothing Gold Can Stay by Robert Frost
- The Pasture by Robert Frost
- Daddy Fell into the Pond by Alfred Noyes
- My Pretty Rose Tree by William Blake
- A Poison Tree by William Blake
- I held a jewel by Emily Dickinson
- "Hope" is the thing with feathers by Emily Dickinson
- A Noiseless Patient Spider by Walt Whitman

- The Bean Eaters by Gwendolyn Brooks
- Theme in Yellow by Carl Sandburg
- Grass by Carl Sandburg
- The Sun Has Long Been Set by William Wordsworth
- Bright Star by John Keats
- The Human Seasons by John Keats
- Eldorado by Edgar Allan Poe
- A Boat Beneath a Sunny Sky by Lewis Carroll
- The Crocodile by Lewis Carroll
- As I Grew Older by Langston Hughes
- Dreams by Langston Hughes
- I Know Why the Caged Bird Sings by Maya Angelou
- The Watcher by Rudyard Kipling
- Calm At Sea by Johann Wolfgang Goethe

Class Session Plans

Class Session #1

1. Explain to students that they will be placed in a group of 3 or 4 students to make a robotic diorama complete with audio of an assigned poem.

You can use the following videos to demonstrate the concept.

http://youtu.be/wRDbW-RRvOo (A Noiseless Patient Spider by Walt Whitman)

http://youtu.be/wScfmduS2cM (Bright Star by John Keats)

Here is a picture of a completed Robot Theater.

2. Using the "Hardware component Quick Reference" handout and a hummingbird with one of each component connect, quickly show the parts working.

3. By the end of the class period, the students should know their group members and the poem that they are assigned.

Class Session #2

1. Give students the Poetry Analysis Planning Document. You can either give them enough to complete their entire poem or have a set number of lines required for analysis/planning for each group. Explain that they need to do the following four steps:

- Write the lines of the poem (can be a single line or a small group of lines)
- Explain what these lines mean literally and figuratively
- Brainstorm symbolism
- Brainstorm a way that robotic components could be used for the symbolism

Example of this:

- o "Some say the world will end in fire, Some say in ice."
- o This reminds us of the age old question of whether it would be worse to die by burning or to die by freezing.
- o To represent the fire – a picture of flames with things colored red, orange, yellow
- o To represent the ice – plastic icicles from Christmas decorations, foil balls to represent
  - o snow, shredded white paper and things that are white or blue
- o To use robotics to represent the fire---red LEDs, a picture of flames moving on a motor or
  - o a servo
- o To use robotics to represent ice---blue LEDs, an open cup attached to a servo in which
  - o white shredded paper drops from

Class Session #3

1. Watch the video for connecting components to the Hummingbird Duo available at the following link:

http://www.hummingbirdkit.com/learning/tutorials/connecting-electronics

This will take 5 minutes. (If you have an original Hummingbird controller, there is a video for this on this page as well.

2. Watch the video for using Visual Programmer by using the following link:

http://www.hummingbirdkit.com/learning/using-visual-programmer

This will take approximately 12 minutes.

3. Begin checking the Poetry Analysis Planning Documents for each group. Per teacher opinion, groups who have made adequate progress in their planning may start building today. The amount of time spent using the Poetry Analysis Planning Document will depend on the following factors: length of the poem, difficulty level of the poem, student reading ability, and the group's level of collaborative communication.

Class Session #4

This class period should be devoted entirely to building. To help students manage their time encourage students to create their artwork at home for homework points.

Class Session #5

1. Give each student a copy of the Audacity Instructions handout. The handout included in this lesson gives instructions for completing this step of the project on our district's laptops. It can serve as an example for you.

2. Watch the following screen casts on how to create the audio for the poem and how to make it into an expression. This will take approximately 5 minutes

http://youtu.be/N36Krgw_6Jo (Making audio files of your poem using Audacity)

http://youtu.be/v58h-qzN7Ak (Importing your WAV file into the Visual Programmer software0

3. The remainder of the session will be for building and creating audio files.

Class Sessions # 6 and #7

Whether you need one or two more days will depend on the poems assigned (length/difficulty level) and the overall abilities of the students as well as the teacher's familiarity with all aspects of the project.

Note: For the last two school years, we have invited groups of students who have been identified as either gifted or high achieving into our school for a quick build session. The students are able to complete this work in three hours with shorter poems.

Class Session #8

1. This is "the show" day and we ask each group to make a short introduction before running their program for the class. The key points for the introduction are—

- o   Your name, the title of the poem and the author
- o   Point out an electronic component and state why you are including it and what it represents
- o   Each group member should do one electronic component
- o   Each group member should tell about something they learned through the project

2. We video the "show" and students are given digital copies of their presentation as a keepsake.

3. Robots will need to be taken apart on this day. All robotic components need to be placed back in the kit.

Poetry Analysis Planning Document   Group members: _____

Step 1 - Write the lines from the poem.

Step 2 - Explain what they mean (literally and figuratively if applicable).

Step 3 – Plan symbolism

Step 4 –Plan the use of robotic components

Audacity Instructions

The student in charge of creating the voice files should get a separate computer.

You should login to the computer as yourself.

Go to "All Program" and find "Audacity"

Open Audacity.

The red button will allow you to record.

Go to a quiet place by yourself.

Record yourself reading the first chunk of poetry. (Everyone will chunk their poem differently.)

Use the square to stop.

Use the arrow to listen to yourself.

If it is error free, then go to the "File" menu and select "Export".

Name the file something that you will remember what part of the poem it is.

Make sure that the file type is "WAV" and save the file to the desktop.

On the 2nd pop-up screen, just select "ok".

You will transfer your files to a flash drive when you are done recording.

If the bell is soon to ring and you are not done and do not have a flash drive, make sure that you place the file in

the "H drive". You will lose all files on the desktop when the machine shuts down.

The picture below shows Audacity with a recently recorded file.