Hello!

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Clue...?
WELL WELL.....

WHAT DO WE HAVE HERE?
What is Chrome Music Lab?

Chrome Music Lab is a web-based tool that makes learning music more accessible through fun, hands-on experiments. Many teachers have been using Chrome Music Lab as a tool in their classrooms to explore music and its connections to science, math, art, and more. Because it is web-based, this tool can be used on computers, tablets, or phones.
Cross-Curricular Connections

This presentation explores the cross curricular connections that can be made using Chrome Music Lab between music and the subjects tested by NSCAS, including English Language Arts, Math, and Science.
The Experiments
Song Maker

- This tool lets you create your own song by clicking on the grid to add notes and percussion.
- You can change instruments and adjust the tempo. When finished, you can play your song back, and then share it as a link, download it, or embed it on a website.
How can this be used in core classrooms?

**English Language Arts**
- Reading from left to right
- Create a song to go along with a story; reflect on its effectiveness
- Present a song that you create; describe its portrayal and message

**Math**
- Students describe relative position (above, below, beside, etc.)
- Use this template as a coordinate plane; have students identify quadrants, plot points, name points
Song Maker
Coordinate Plane
Rhythm

◎ This tool lets you create rhythms by clicking on the grid to add beats for several different percussion instruments.
◎ There are four options: 3 beats, 4 beats, 5 beats, and 6 beats. (The beats are represented by the dark grey lines, and the off-beats are in between them.)
How can this be used in core classrooms?

**English Language Arts**

◎ Use media to communicate information and ideas
◎ Write out a rhythm and have students recreate the rhythm using this tool
◎ Presentation skills: create a rhythm, present it to the class, describe choices made, apply it to text and explain how it adds to the text
◎ Listening skills: listen to others present, evaluate presentations, describe the rhythm, evaluate its effectiveness when applied to text
Spectrogram

This experiment allows you to see a visual representation of a sound with a spectrogram, which shows the frequencies that make up the sound, from low to high, and how they change over time. You can choose between and compare a variety of instruments, other sounds from everyday life, and even your own voice.
How can this be used in core classrooms?

**English Language Arts**
- Visually see the way their voice changes when using inflection, expression, and character.

**Math**
- Describe relative positions - compare the different sound examples and where they are on the spectrogram

**Science**
- Gather, analyze, and communicate evidence of light and sound waves.
- Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
Chords

◎ This tool is a 2-octave range keyboard that allows you to explore and learn about chords. Click on any key displayed on the piano, and a three-note chord will be played.

◎ This is great to showcase how chords are built, as well as the difference between major and minor chords.
How can this be used in core classrooms?

**English Language Arts**

- Digital Citizenship!
- Students can practice the norms of appropriate and responsible technology use.

**DID YOU KNOW?**

All of the Google Chrome Music Lab experiments fulfill the digital citizenship standard in English Language Arts for all grade levels?
Sound Waves

◎ With this experiment you can see how sound waves travel as vibrating air molecules. A grid of blue dots represent the air molecules, and when you click on the on-screen piano the dots will vibrate to show how the sound waves move.

◎ You can also click on the magnifying glass to track a single molecule for a more detailed visualization of different sounds waves for each note.
How can this be used in core classrooms?

**Science**

◎ Gather, analyze, and communicate evidence of light and sound waves.
◎ Use as a model to describe patterns in terms of amplitude and wavelength.
◎ Observe how the amplitude of a wave is related to the energy in a wave.
Arpeggios

◎ This experiment lets you see the circle of 5ths and play arpeggios, chords played one note at a time. You can click on the wheel to choose different arpeggios played and on the arrows to hear different arpeggio patterns.

◎ You can also click the controls at the bottom to change the instrument and tempo.
This experiment combines art and music. It was inspired by Wassily Kandinsky, an artist who compared painting to making music.

Simply draw on the screen, and anything you draw (lines, circles, triangles, or scribbles) will be turned into sound. Use the controls at the bottom to switch to different instruments and sounds.
How can this be used in core classrooms?

**English Language Arts**
- Generate representations of ideas (e.g., pictures)
- Use media to communicate information and ideas
- Presentation skills: create a picture, present it to the class, describe choices made, apply it to text and explain how it adds to the text
- Listening skills: listen to others present, evaluate presentations, describe the rhythm, evaluate its effectiveness when applied to text

**Math**
- Identify and create shapes
- Describe geometric characteristics and create two and three-dimensional shapes.
Melody Maker

◎ This tool allows you to use colored blocks to create an 8 note melody. This is a great tool for composition.
◎ You can also click the button to the right of the play button to add an automatically created harmony. This is great to show the difference between one melody and harmony. There is a tempo control as well.
How can this be used in core classrooms?

**English Language Arts**
- Reading from left to right
- Create a song to go along with a story; reflect on its effectiveness
- Present a song that you create; describe its portrayalal and message

**Math**
- Students describe relative position (above, below, beside, etc.)
- Use this template as a coordinate plane; have students identify quadrants, plot points, name points.
  Translation can also be introduced
Voice Spinner

◎ This experiment allows you to explore how frequency affects pitch. First you can use the recording provided, or you can use your mic to record yourself.

◎ Using the controls at the bottom, or by clicking and rotating the sound waves, you can play the sound fast or slow, forward or backwards.
How can this be used in core classrooms?

**English Language Arts**

◎ **Phonological Awareness:** Students can demonstrate phonological awareness through oral activities.

◎ **Blend and segment phonemes in spoken words** (e.g., initial, medial vowel, and final sounds [phonemes]; recognize same sounds in different words).

◎ **Identify and produce oral rhymes.**

◎ **Blend and segment spoken onsets and rimes to form simple words** (e.g., v-an, gr-ab).
Harmonics

◎ This tool lets you explore harmonics both visually and aurally.
◎ You can play notes in a harmonic series, which is a set of frequencies with a simple relationship, such as twice as fast, three times as fast, four times, and so on.
How can this be used in core classrooms?

**English Language Arts**
- Digital Citizenship
- Students can practice the norms of appropriate and responsible technology use.

**Math**
- Divide into two, three, or four equal parts.
- Describe the parts using the language of halves, thirds, fourths, half of, a third of, a fourth of.
- Identify and use tools to solve real-world problems involving length.

**Science**
- Plan and conduct investigations to provide evidence that vibrating materials can make sound.
- Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
Piano Roll

◎ This tool is a simulation of an old-time piano roll. You can play the music and see the notes scroll by. There are different songs to choose from and instruments to play.
◎ You can also press the microphone button to record a short example, and that sound is used as the basis for all the notes.
How can this be used in core classrooms?

**English Language Arts**
- Reading from left to right
- Listen to the songs and describe what you hear, what you like, what you don’t like (experiment with the different instruments as well!)

**Math**
- Students describe relative position (above, below, beside, etc.)
- Compare length of notes and describe the difference in sound
- Order objects by comparing their lengths
Oscillators

◎ This tool lets you explore how the shape of a wave can change the sound it makes. You can choose from four different waveforms including square, sawtooth, triangle, and sine.
◎ When you click and hold from the top to the bottom of the screen, the wave will play from high to low. You can also see how the wave speed changes depending on the frequency.
How can this be used in core classrooms?

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<th>English Language Arts</th>
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Strings

- This experiment lets you explore the natural mathematical relationship between a string’s length and its pitch.
- 5 of the 6 strings have been divided into 2 sections of different lengths. This is a great way to visually show how the size of a string relates to pitch. It is also a good opportunity to discuss one way music relates to fractions.
How can this be used in core classrooms?

**Math**
- Divide into two, three, or four equal parts.
- Measure objects by using a shorter object end-to-end and know that the length of the object is the amount of same-size objects that span it lined up end-to-end.
- Describe the parts using the language of halves, thirds, fourths, half of, a third of, a fourth of.
- Identify and use tools to solve real-world problems involving length.

**Science**
- Plan and conduct investigations to provide evidence that vibrating materials can make sound.
- Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
“Music... is an effective cross-curricular teaching tool, as it not only aids in the neuroprocessing that makes for stronger language skills, but the mode of delivery appeals to the creative and auditory-preferred learners.”

Thanks!

Resources can be found here:

http://bit.ly/2uw7yjG

Any questions?

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