THOMPSON RIVERS UNIVERSITY | Education & Social Work

Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM Unit Plan Template

Unit Title: Theory of Sound | Number of Lessons: 4 | Time (in weeks): 2

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Rationale

Sounds are all around us; especially in our densely populated, transit-oriented, and always- changing city. Sounds are waves that can travel through air, water, and solid objects. Sound can be used as a form of communication, learning, for safety, and as means of entertainment.

Overview:

This unit will go over what sound is, how sound is made and include the exploration of key vocabulary such as pitch and vibration through play. Through exploration of these concepts students will understand how pitch is made and how vibration makes sound, using instruments as the medium. By creating their own instruments it will also provide time to work on fine motor skills as well.

CORE COMPETENCIES

Communication	Thinking	Personal & Social
Students engage in informal and structured conversations in which they listen, contribute, develop understanding and relationships, and learn to consider diverse perspectives. This facet of communication is closely linked to the building and sustaining of relationships at home, at school, in the community, and through social media.	● Critical thinking Students think critically to develop ideas. Their ideas may lead to the designing of products or methods or the development of performances and representations in response to problems, events, issues, and needs. They work with clear purpose and consider the potential uses or audiences of their work. They explore possibilities, develop and reflect on processes, monitor progress, and adjust procedures in light of criteria and feedback. ● Creative thinking Students may generate creative ideas through free play, engagement with other's ideas, or consideration of a problem or constraint, and/or because of their interests and passions. New ideas and inspirations can spontaneously arise from the unconscious mind, but students	● Positive personal and cultural identity ● Personal awareness and responsibility ● Social responsibility

	can also develop strategies to facilitate the generation of ideas – learning a lot about something, engaging in a period of reflection, providing time for incubation, and doing relaxing or automatic activities to quiet their conscious mind. The capacity for creative thinking expands as individuals increase their range of ideas and concepts to recombine them into new ideas. The ideas available as raw material for creative thinking depend on previous experiences and learning, as well as students' cultural legacies.	

BIG IDEAS

(multiple subject areas for integrated unit)

Subject Name	Subject Name	Subject Name
Science: Light and sound can be produced and their properties can be changed.		

LEARNING STANDARDS

Curricular Competencies	Content
CC6: Safely manipulate materials to test ideas and predictions	C6: natural and artificial sources of light and sound (sources)
CC11: Compare observations with predictions through discussion	C7: properties of light and sound depend on their source and the objects with which they interact

Prerequisite Concepts and Skills:

Fine motor skills for crafts Ability to sit and listen quietly Ability to write simple sentences and draw

Teacher Preparation Required:

Lesson #	Teacher Preparation Required (See Unit Plan Sample)
Lesson 1	Bring Book "Sounds All Around"
Lesson 2	Reintroduce vocab from Lesson 1, set up materials before lesson, gather all materials at least the day before
Lesson 3	Gather all materials by the day before, have it set up in the back of class before the lesson starts
Lesson 4	Bring book We Belong to the Drum, have all materials acquired beforehand and set up in groups for ease of distribution
Lesson 5	

Cross-Curricular Connections:

Lesson 4 uses the story We Belong to the Drum as a way to explore Indigenous understanding of sound and its connection to Mother Earth but we also delve into how different communities use different sounds as comfort and as a means of displaying culture

Aboriginal Connections/ First Peoples Principles of Learning:

We Belong to the Drum is an Indigenous story about a young boy who finds comfort with the drum and how the drum represents himself. This story provides valuable insights into how Indigenous cultures see the drum as the heartbeat of Mother Earth.

FPPL: Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place): Much of this unit focuses on reflexive and experiential learning. The content is very hands on allowing students to explore at their own pace and providing many opportunities to work with their hands. As Jo Chrona states, "The experiential aspect of making meaning from learning also reinforces the need for meaningful reflection to process the experience into knowledge and understanding." The more each student gets to use their hands the more personal learning becomes which is a main focus.

Universal Design for Learning (UDL)

1. MULTIPLE MEANS OF REPRESENTATION – I provide for multiple means of representation in this unit in the following ways:
   - Students will be able to present their learning in multiple forms throughout the unit. This will include written work, drawings, or creations they have made.

2. MULTIPLE MEANS OF ACTION AND EXPRESSION – I provide multiple means of action and expression in this unit in the following ways:
   - Various forms of assessment. The implementation of art with science will allow for students to demonstrate their understanding using varied methods.
   - Triangulation of assessment to provide opportunities for all students to succeed

3. MULTIPLE MEANS OF ENGAGEMENT – I provide multiple means of engagement in this unit in the following ways:
   - Class noise will be minimized to allow for better instruction and to not upset students with IEPs.
   - For some of the lessons, students will be able to create a product that they feel connected to by colouring and drawing their favourite animals or pictures.

Differentiated Instructions (DI)

Will update when I find out what DI my students may need

Overview of Lessons:

Lesson 1

Name &Time (Minutes Allotted):	Sounds All Around (30 Minutes)
Learning Standards: Curricular Competencies	Demonstrate curiosity and a sense of wonder about the world
Learning Standards: Content	properties of sound ● examples: pitch, tone, volume ● ways of making, recording, and transmitting sound, etc. depend on their source and the objects with which they interact
Instructional Objectives	Students will be able to: state a sound and use the proper verb to describe it
Assessment:	C, Student responses/answers after the book, conversations with students during journaling time. P, Journal entries
Teaching Strategies:	Use fun, engaging voice during story time, keep class noise to a minimum during journaling time, use classroom management to gather attention, use proximity to keep students on task, use guiding questions
Materials:	the book "Sounds All Around", whiteboard/markers, journals, classroom supplies
Lesson Activities:	
Introduction/Hook:	1. Gather students on floor or in table groups and tell them it's story time. We will be reading "Sounds All Around". Read the story emphasizing key words like vibrations, pitch and how sound travels 2. On page 12 stop after reading about the vibrations produced in your larynx and have students try it out for themselves by placing 2 fingers on their neck and hum or talk.
Body:	1. After reading the book ask students to brainstorm a list of sounds in our world, maybe at school or at home, or the park etc. Write each word on the whiteboard or big lined paper. Have students also choose the verb that aligns with the word such as "dog barks, train whistles, baby cries" etc. 2. Ask students if they remember some important words from the story (vibration, sound waves, volume, pitch, echo, decibels). Tell them this will be important vocabulary as we explore the wonderful world of sounds!
Closure:	1. After students brainstorm sounds and verbs they will write in a journal about sounds they hear or their favourite or least favourite sound and the verb that goes along with it.

Lesson 2

Name &Time (Minutes Allotted):	Good Vibrations (30 minutes)
Learning Standards: Curricular Competencies	Compare observations with predictions through discussion
Learning Standards: Content	properties of sound ● examples: pitch, tone, volume ● ways of making, recording, and transmitting sound, etc. depend on their source and the objects with which they interact

Instructional Objectives	SWBAT: Describe how sounds are made and how to make different pitch
Assessment:	O, While students are exploring the guitar and drum, observe their reactions and interactions with the materials. Take note of any questions, observations, or difficulties they encounter. C, Engage students in a class discussion before and after the video. Ask open-ended questions to assess their prior knowledge and understanding of sound vibrations. P, Assess the completion and quality of the observation worksheets filled out by each student. Look for details about what they saw, heard, and felt while working with the rubber bands.
Teaching Strategies:	Keep noise to a reasonable level, use classroom management to gather attention, use active and fun voice while reading story, use proximity to keep students on task, use guiding questions
Materials:	Drum and guitar, rice/salt, mat or plastic under the drum, rubber bands and tissue paper boxes, observation sheet
Lesson Activities:	
Introduction/Hook:	1. Bring in guitar and one drum and set it up in front of the class 2. Have students come to smartboard and play "What is Sound" video on youtube (https://www.youtube.com/watch?v=3-xKZKxXuu0&ab_channel=SciShowKids) and have students listen about how vibrations make sound 3. Have empty plastic/paper cups, string and tape at each table during the video 4. Have several jugs filled up at various volumes and a spoon at the back of the class
Body:	1. After the video is finished tell students that we will be exploring how vibrations make sounds. First students will see how guitar strings vibrate and how each string makes a different sound. Explain that the vibration itself makes sound, but each string makes a different sound. Have students think about why that may be and write responses on whiteboard 2. Take out the drum and hit it a few times so students can hear what happens and see how to properly hit it. Now add salt/other small particles and have a student come and hit the drum. Note how the drum vibrates and shoots those particles in the air just like how sound vibrates particles in the air 3. Have students go back to their desks and instruct them to stretch rubber bands over the box and play around with it. Have them fill out observation worksheet (what did you see, hear and feel)
Closure:	1. Wrap up vibrations by having discussion with students, ask what they noticed about the rubber bands. Did they find anything interesting, what if the rubber bands had different thickness

Lesson 3

Name &Time (Minutes Allotted):	Pitch Perfect (30 minutes)
Learning Standards: Curricular Competencies	Communicate observations and ideas using oral or written language, drawing, or role-play

Learning Standards: Content	properties of sound ● examples: pitch, tone, volume ● ways of making, recording, and transmitting sound, etc. depend on their source and the objects with which they interact
Instructional Objectives	SWBAT examine how pitch is changed by experimenting with jugs of water
Assessment:	P, Observation/recording worksheet O, How students interact with the jugs and making connections with classmates C, Discuss questions with students and see if they can correlate the amount of water:air to different pitch
Teaching Strategies:	Have materials prepared beforehand for organization and for "hook", Keep noise levels acceptable so students will be able to hear the pitch, use classroom management to gather attention, use active and fun voice while reading story, use proximity to keep students on task, use guiding questions
Materials:	Glass jugs, water, spoons, observation worksheet
Lesson Activities:	
Introduction/Hook:	1. Play High and Low youtube song, have students sing and play along 2. Introduce to students that this is pitch, use low voice and high voice and ask if they noticed the difference 3. Have students share their high voices and low voices
Body:	1. Have student come to the back of the classroom where the jugs are. Ask students if they notice anything different about the jugs. Ask if those differences might change the sound 2. Play each jug and ask students if they notice different sounds Ask why that might be and what word are we looking for (pitch) 3. Have 5 mason jars at each table group with different amounts in each one. Have students play and make music, fill up different amounts and explore pitch 4. After several minutes explain briefly that the bottle with the least water and most air creates a lower pitch because the vibrations move slower and the bottles with more water and less air create a higher pitch
Closure:	1. Have students fill out a journal entry labelled "draw the experiment" and a writing prompt that says "What happened when the different glasses were played" 2. Ask students what they noticed and which glass they liked the best and why.

Lesson 4

Name &Time (Minutes Allotted):	Sounds as Comfort
Learning Standards: Curricular Competencies	Recognize First Peoples stories (including oral and written narratives), songs, and art, as ways to share knowledge
Learning Standards: Content	properties of sound ● examples: pitch, tone, volume ● ways of making, recording, and transmitting sound, etc. depend on their source and the objects with which they interact

Instructional Objectives	SWBAT assemble their own personal drum and connect sounds to comfort
Assessment:	C, have conversations with students about their favourite sounds or music, if students share an instrument they're connected to O, same as above but if students are sharing stories amongst each other
Teaching Strategies:	Keep noise to a reasonable level, use classroom management to gather attention, use active and fun voice while reading story, use proximity to keep students on task, use guiding questions
Materials:	We Belong to the Drum book, plastic jugs, plastic or fabric sheets, rubber bands/string, stickers and/or paint, makeshift drum sticks
Lesson Activities:	
Introduction/Hook:	1. Begin lesson by reading the story "We Belong to the Drum" by Sandra Lamouche. Have students come circle around while the story is being read 2. As the story is read ask students questions such as "do you think the pitch is high or low to reinforce the proper vocabulary.
Body:	1. After the story ask students what their favourite sounds are, or if there are any sounds that comfort them. Explain that for the MC the drum represented his community 2. Ask students where their families are from and explore different instruments that came from that place. Ask students what the pitch is, is it vibrating fast or slow, and what might the sound waves look like? Use the white board or poster paper to draw (especially the sound waves) 3. Ask students if they remembered what happened when the teachers played drum music from around the world (they all sounded different) 4. Tell students they will make their own drum out of supplies. Have students go sit back at their desks and distribute materials to each table. Give instructions on how to make the drum (stretch material super tight over the hollow top of the container and stretch a rubber band around it, decorate it after too). Allow them to experiment with different materials to make different sounds
Closure:	1. After students have completed their drums and played around with them, gather attention. Tell students that all their drums are unique in some way just like different music from different communities around the world 2. Discuss how music and sounds for many people are comforting just like how MC was always relaxed when he heard the drum 3. Talk about how certain sounds actually make us feel good and relax us. Sometimes its a good idea to listen to raindrops or fire crackling when we try to focus on something because it makes our brains feel good!

Resources:

Sounds All Around
We Belong to the Drum
https://www.youtube.com/watch?v=3-xKZKxXuu0&ab_channel=SciShowKids

Extensions to Unit:

Could transition into community for Social Studies after the final lesson
To extend the unit itself you can explore recording sound and tone

Reflections and Revisions