4th Grade Mystery Science Strand 4.3 Wave Patterns
Salt Lake City School District 2020-2021

Mystery Science Lesson Rationale:
Mystery Science Lessons seek to promote engagement and inspire excellence in students' mastery of science and engineering. The lessons support our vision and mission of equity and access in elementary science. The sequence of Mystery Science Full Lessons supports fourth grade students' sense making with respect to Wave Patterns
using three- dimensional instruction. The sequenced Mystery Science Lessons support fourth grade teachers in implementing the new Utah SEEd Standards about Wave Patterns identified specifically in the Prioritized SEEd Pacing Guide. Lessons include a video focused on a phenomenon, a hands-on activity, and an assessment. The lessons are designed to take students approximately 60 minutes to complete. Most lessons use minimal materials, such as printouts and pencils. Additionally, most paper printouts can be downloaded individually from the Mystery Science Lessons website in the form of an editable document that can be assigned through Canvas. Some lessons suggest markers, group work, or demonstrations. Teachers can make easy modifications to these lessons based on students 'and teachers' resources.

Note: Use a Science Notebook or print the Mystery Science PDF Booklet for students to complete the lesson series below.
You can also print individual lesson materials by following the links in the ***Materials per student and Assessments***.

Strand 4.3 Wave Patterns (***March 15- April 9)***
Waves are regular patterns of motion that transfer energy and have properties such as amplitude (height of the wave) and wavelength (spacing between wave peaks). Waves in water can be directly observed. Light waves cause objects to be seen when light reflected from objects enters the eye. Humans use waves and other patterns to transfer information.

Standard 4.3.2 Light Waves
Develop and use a model to describe how visible light waves reflected from objects enter the eye causing objects to be seen. Emphasize the reflection and movement of light. The structure and function of organs and organ systems and the relationship between color and wavelength will be taught in Grades 6 through 8.

RISE Benchmark 4.3.2 as SLCSD Interim April 12-16

Mystery Science Lesson	Suggested Date and SEEd Alignment	Materials and Assessments	Remote Learning Modifications
Anchor Phenomenon Lesson: **Seeing Sound** The anchoring phenomenon for this unit is a music video by composer Nigel Stanford, that showcases a	**March 15** Before starting this lesson, review the Teacher Guide for a unit overview of the Anchor Layer. **Teachers note:** Make sure to turn on the Mystery Science anchoring phenomenon in the Waves of Sound Unit	**Materials per student:** **See-Think-Wonder** chart **Seeing Sound** worksheets	**Ready to Teach** Make sure ALL students have copies of the handouts

series of devices that make sound waves visible. Students generate observations and questions about the phenomenon and create an initial conceptual model to explain what is happening.	**Mystery Science Handouts Pdf** SLCSD 20/21 Prioritized Pacing Guide only teaches standard 4.3.2 Use Lessons 1, 2, & 3 for that standard.		
Lesson 1: How far can a whisper Travel? In this lesson, students learn about the connection between sounds and vibration. In the activity, Paper Cup Telephone, students make telephones using cups and string. Students then modify the design of their telephones using different types of supplies to see if they can improve the sound quality.	**March 15** SEEd Standard 4.3.1 **Disciplinary Core Ideas**: 4.PS4.A, 4.PS4.C Sound, Vibrations, & Engineering **Science and Engineering Practice:** Constructing explanations and designing solutions **Crosscutting Concept:** Patterns	**Materials per Student:** **Paper Cup Telephone** worksheet Engineering materials such as paper clips, construction paper, different sized cups, yarn, ribbon, or dental floss. Pencil Coated paper clips Paper cups (8oz) String 180 ft. **Paper Cup Telephone Answer Key** teacher-only resource **Paper Cup Telephone Teacher Tips** worksheet **Newsela Articles:** How far can a whisper Travel? **Assessment:** Mystery 1 Assessment Answer Key	**Ready to Teach** ***Teaching in the classroom*** Students can do the first part of the activity solo (Steps 1 - 8). Partner steps can be completed at a distance if the teacher is able to help tie the two phone strings together (Step 10). ***Teaching Online*** Each student needs: 1 paper cup, 1 paper clip and 6 feet of string. Students can do the first part of the activity solo (Steps 1 - 8). They will need a partner and extra supplies for the remaining steps.
Anchor Phenomenon Lesson 1		**Materials per student:** **See-Think-Wonder** chart **Seeing Sound** worksheets	
Lesson 2: What would happen if you screamed in outer space?	**March 22** SEEd Standard 4.3.2	**Materials per Student:** **Sound Blobs** printout Scotch tape Balloons Small Binder Clips (3/4")	**Adjust Supplies** ***Teaching in the classroom*** ●For the first activity, you may want to have some balloons filled with air ready to go and demonstrate the activity using a

In this lesson, students explore the role that air plays in enabling a sound vibration to travel. In the activity, Act Out a Sound, students do two short activities that explore sound vibrations. Students experiment with sound to understand how it moves through the air and then consider what would happen in an environment like space where there is no air.	**Disciplinary Core Ideas**: 4.PS4.B Sound & Vibrations **Science and Engineering Practice:** Planning and carrying out an investigation & construct an explanation & Develop a model **Crosscutting Concept:** Cause and effect	**Newsela Articles:** What would happen if you screamed in outer space? **Assessment:** Mystery 2 assessment Answer Key	large speaker instead of blowing onto the balloon. ●For the second activity, watch Steps 4 - 6 of the step-by-step instructions. ***Teaching Online*** ● Each student will need 1 balloon and 1 binder clip for the first activity. ●**Note:** Students working solo will need to hold their own balloon while they make sounds. ●For the second activity, watch Steps 4 - 6 of the step-by-step instructions.
Anchor Phenomenon Lesson 2		**Materials per student:** **See-Think-Wonder** chart **Seeing Sound** worksheets	
Lesson 3: Why are some sounds high and some sounds low? In this lesson, students discover that sound is a wave. In the activity, Making Waves, students draw the waves that different sounds make using a virtual oscilloscope, a machine that shows images of sound waves. Then they vibrate a rope to make waves that look like the ones made by the oscilloscope.	**April 5** SEEd Standard 4.3.2 **Disciplinary Core Ideas**: 4.PS4.B Sound Waves & Wavelength **Science and Engineering Practice:** Analyze and interpret data, Engage in argument from evidence, Models **Crosscutting Concept:** Patterns	**Materials per student:** **Be The Vibration** worksheet **Sound Vibrations** worksheet Clotheslines (Rope) **Be The Vibration Answer Key** teacher-only resource **Sound Vibrations Answer Key** teacher-only resource **Newsela Articles:** Why are some sounds high and some sounds low? **Assessment:** Mystery 3 assessment Answer Key	**Alternative activity** ***Teaching in the classroom & Teaching Online*** ●An oscilloscope draws a picture of a sound. Students can explore **this online oscilloscope** and follow instructions for the 3 experiments. Challenge students to make a sound that makes skinny waves and one that makes wide waves. Ask them to describe what is different about the sounds that make different waves.
Anchor Phenomenon Lesson 3		**Materials per student:** **See-Think-Wonder** chart **Seeing Sound** worksheet	
Performance Task: How can you make	**April 12** SEEd Standard 4.3.3	**Materials per student:** One **My Sound Wave Watcher** worksheet (Part 1 and 2).	**Ready to Teach** Make sure ALL students have copies of the handouts and materials to design and build a

sound waves visible? In the Performance Task, students will design and build a device that uses the vibrations of sound to make visible patterns.	**Disciplinary Core Ideas**: 4.PS4.C Sound & Vibrations **Science and Engineering Practice:** Constructing explanations and designing solutions **Crosscutting Concept:** Patterns	One **My Sound Wave Watcher Rubric** **Assessment:** **Unit Assessment** **Answer key** **RISE Benchmark** 4.3.2 as SLCSD Interim April 12-16	device that uses the vibrations of sound to make visible patterns.