

GRADE 5 – Unit 4 –Acoustics

Board Approval

June 11, 2024 (First Reading) July 9, 2024 (Second Reading)

Unit Overview

In unit 4, students will learn to:

- Students will explore the connection between science and music. This unit will begin with students working in small groups deciphering the uses of a tuning fork. They will explore how vibrations affect pitches and volume, how sound waves travel through the air and water, and how to change the pitch of stringed and wind instruments.

Year Long Pacing Guide

Unit Title	Duration	Related Standards	Learning Goals	Topics and Skills: Student Learning Objectives
Unit 1--Rhythm and Meter	16 lessons	1.3A.5.Cr1a 1.3A.5.Cr2a 1.3A.5.Cr2b 1.3A.5.Pr4b 1.3A.5.Pr4c 1.3A.5.Pr5a 1.3A.5.Pr5b	Students will learn basic to complex musical phrases in both duple and triple meters. They will be able to identify the difference between songs that are in duple or triple meter.	<ul style="list-style-type: none"> • Identify and sing using different vocal registers • Play a rhythm ostinato. • Read/ recognize rhythmic passages containing quarter note/rest and eighth notes • Read, write and recognize rhythmic passages containing sixteenth notes, sixteenth note syncopations, and dotted eighth-sixteenth note phrases.

				<ul style="list-style-type: none"> ● Identify thirty-second notes ● identify aurally presented rhythmic passages
Unit 2--Tonality	16 lessons	1.3A.5.Cr1a 1.3A.5.Cr2a 1.3A.5.Cr2b 1.3A.5.Pr4b 1.3A.5.Pr4c 1.3A.5.Pr5a 1.3A.5.Pr5b 1.3A.5.Pr6a 1.3A.5.Pr6b	Students will become more “tonally literate” while also learning about good vocal production.	<ul style="list-style-type: none"> ● Identify major, minor, and dorian tonalities within a song ● Identify the resting tone of a tonality ● Sing arpeggiated chords on tonic, dominant, and subdominant within each tonality ● Sing solfege phrases in major, minor, and dorian tonalities.
Unit 3--Musical Instruments	8 lessons	1.3A.5.Pr4a 1.3A.5.Pr4b 1.3A.5.Pr4c 1.3A.5.Pr4d 1.3A.5.Pr4e 1.3A.5.Re7b 1.3A.5.Re8a 1.3A.5.Re9a 1.3A.5.Cn10a 1.3A.5.Cn11a	Students will identify instruments and their functions within various ensembles and genres	<ul style="list-style-type: none"> ● Categorize instruments according to family ● Explore how an instrument or family of instruments affects the mood of a song ● Identify an instrument by sound ● Identify the various parts of instruments ● Know how an instrument makes its sound. ● Reading and following an orchestral score.
Unit 4--Acoustics	7 lessons	1.3A.5.Pr4b 1.3A.5.Pr5a 1.3A.5.Re7a	Students will connect science and music by experimenting with a tuning fork, manipulating string tension, and wind instruments.	<ul style="list-style-type: none"> ● Group work ● Students are given a tuning fork and are required to answer

		<p>1.3A.5.Re7b 1.3A.5.Cn11</p>	<p>Students will view videos of sound waves and shock waves, and get a hearing test to hear the highest pitch they can hear.</p>	<p>questions about it.</p> <ul style="list-style-type: none"> ● Students will be given the correct answers after exploring ● 5 more questions and facts about the tuning fork <ul style="list-style-type: none"> ○ SloMo Guys ○ Dip into water ● A deeper dive into Sound Waves <ul style="list-style-type: none"> ○ Mythbusters ○ Space Shuttle ○ Shattering Glass With Voice (Video) ● Slinky experiment ● Tuning a string ● Tuning a wind instrument.
Unit 5–BandLab	17 lessons	<p>1.3A.5.Cr1a 1.3A.5.Cr2a 1.3A.5.Cr2b 1.3A.5.Cr3a 1.3A.5.Cr3b 1.3A.5.Pr4a 1.3A.5.Pr4b 1.3A.5.Pr4c 1.3A.5.Pr4d 1.3A.5.Pr4e 1.3A.5.Pr5a 1.3A.5.Pr5b 1.3A.5.Pr6a 1.3A.5.Pr6b 1.3A.5.Re7a 1.3A.5.Re7b 1.3A.5.Re8a</p>	<p>Students will learn to use a free online program to write music. BandLab has over 10,000 prewritten loops designed by musical artists in from Blues to Hip Hop to Electric Dance Music. These loops can be dragged into as many as 16 separate tracks to create music. These tracks can be manipulated by tempo, key and structure. Effects can be applied such as pan effects and echo. The available loops span most instruments as well as manufactured sounds. Students can also have the opportunity to record their own voices and play</p>	<ul style="list-style-type: none"> ● Create a BandLab account ● Browse loops and drag them to tracks. ● Combine tracks to form an 8 bar song. ● Create a layered 32 bar song. ● Submit assignments. ● Extend loops ● Create new tracks. ● Change tempo ● Change keys ● Change time display ● Use the metronome ● Modify Loops ● Cut/Copy/Slice

		1.3A.5.Re9a 1.3A.5.Cn10a 1.3A.5.Cn11a	from MIDI keyboards to enter music.	<ul style="list-style-type: none"> ● Arrange a song with effects ● Pan a track from left to right ● Solo and mute tracks. ● Create a song using ABA form. ● Create a drum track to accompany a song. ● Create a 64 bar song using layering, modified loops, original drum track, pan and volume effects with the following form: Intro, ABA, Outro.
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Grade 5– Unit 4–Acoustics–7 Total Lessons

Unit Vocabulary

Sound Waves	Sound Barrier			
Frequency	Vibrations			
Shockwave	Hertz			
Mach				

Preparation for College, Careers, and Beyond

Career Ready Practices	Personal Financial Literacy (9.1) and Career Awareness, Exploration, and Preparation (9.2)
CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills.	9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

<p>CRP3. Attend to personal health and financial well-being.</p> <p>CRP4. Communicate clearly and effectively and with reason.</p> <p>CRP5. Consider the environmental, social and economic impacts of decisions.</p> <p>CRP6. Demonstrate creativity and innovation.</p> <p>CRP7. Employ valid and reliable research strategies.</p> <p>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</p> <p>CRP9. Model integrity, ethical leadership and effective management.</p> <p>CRP10. Plan education and career paths aligned to personal goals.</p> <p>CRP11. Use technology to enhance productivity.</p> <p>CRP12. Work productively in teams while using cultural global competence.</p>	<p>9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.</p> <p>9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.</p> <p>9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.</p>
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Cross-Curricular Connections						
Interdisciplinary Connections	Technology Integration and Literacy	Climate Change	Amistad Law	Holocaust Law	LGBT & Disabilities Law	Asian Pacific Islander
<ul style="list-style-type: none"> • Science • Mathematics 	<p><i>Online links and possible resources for the integration of technology into lessons are embedded within the "Possible Resources and Activities" column for each Topic area.</i></p>	•	•	•	•	•

Possible Assessment and Instructional Modifications			
Special Education	At-Risk	Gifted	English Language Learners
<p><i>*All teachers of students with special needs must review each student's IEP. Teachers must then select the appropriate modifications and/or accommodations necessary to enable the student to appropriately progress in the general curriculum.</i></p> <p>Possible Modifications/Accommodations</p> <ul style="list-style-type: none"> • Extra time on assessments • Use of a graphic organizer • Use of concrete materials and objects (manipulatives) 	<p>The possible list of modifications/accommodations identified for Special Education students can be utilized for At-Risk students. Teachers should utilize ongoing methods to provide instruction, assess student needs, and utilize modifications specific to the needs of individual students. In</p>	<ul style="list-style-type: none"> • Enrichment projects • Higher-level cooperative learning activities • Provide higher-order questioning and discussion opportunities • Tiered centers • Tiered assignments • Alternate assignments/ enrichment assignments 	<ul style="list-style-type: none"> • Continue practicing vocabulary • Choice of test format (multiple-choice, essay, true-false) • Vary test formats • Read directions to student • Provide study guides prior to tests • Clarify test directions, read test questions • Read test passages aloud (for

<ul style="list-style-type: none"> ● Opportunities for cooperative partner work ● Assign fewer problems at one time (e.g., assign only odds or evens) ● Differentiated center-based small group instruction ● If a manipulative is used during instruction, allow its use on a test ● Provide reteach pages if necessary ● Provide several ways to solve a problem if possible ● Provide visual aids and anchor charts ● Tiered lessons and assignments ● Highlight key directions ● Test in alternative site ● Use of word processor ● Allow for redos/retakes 	<p>addition the following may be considered:</p> <ul style="list-style-type: none"> ● Additional time for assignments ● Review of directions ● Review sessions ● Use of mnemonics ● Have student restate information ● Provision of notes or outlines ● Concrete examples ● Support auditory presentations with visuals ● Use of a study carrel ● Assistance in maintaining uncluttered space ● Peer or scribe note taking ● Space for movement or breaks ● Extra visual and verbal cues and prompts ● Books on tape ● Graphic organizers ● Preferential seating ● Reduction of distractions ● Answers to be dictated ● Follow a routine/schedule ● Teach time management skills ● Agenda book and checklists ● Adjusted assignment timelines ● Varied reinforcement procedures ● Work in progress check ● Personalized examples ● No penalty for spelling errors or sloppy handwriting 	<ul style="list-style-type: none"> ● Provide texts at higher reading level ● Extension activities ● Pairing direct instruction w/coaching to promote self directed learning 	<p>comprehension assessment)</p>
Individualized Learning Opportunities			
<ul style="list-style-type: none"> ● Possible independent study and online learning opportunities are embedded within the “Possible Resources and Activities” column for each Topic area. 			

Possible Assessments

Formative Assessments	Summative Assessments	Performance Assessments	Major Activities/Assignments
<ul style="list-style-type: none"> • Anecdotal notes during the whole group, small group and individual. • Small group answers about tuning fork. • Review at the beginning of each class. 	<ul style="list-style-type: none"> • Quiz on tuning fork 	<ul style="list-style-type: none"> • Tuning a guitar string using a tuning fork 	<ul style="list-style-type: none"> • Quiz

Grade 5– Unit 4–Acoustics–7 Total Lessons			
Topic & # Days	NJ Visual and Performing Arts Standards	Critical Knowledge & Skills	Possible Resources & Activities
Introduction 2 lessons	<ul style="list-style-type: none"> • 1.3A.5.Pr4b–Demonstrate an understanding of the structure and expanded music concepts in music selected for performance. • 1.3A.5.Pr5a–Apply teacher-provided and established criteria and feedback to evaluate the accuracy and expressiveness of ensemble and performance. • 1.3A.5.Re7a–Demonstrate and explain, citing evidence, how selected music connects to and is influenced by specific interests, experiences, purposes, or contexts. • 1.3A.5.Re7b–Demonstrate and explain, citing evidence, how 	<p>Obj. We are learning to:</p> <ul style="list-style-type: none"> • Manipulate a tuning fork. • Describe the functions of a tuning fork. • Describe the uses of a tuning fork. <p>Anchor Standards:</p> <ul style="list-style-type: none"> • Anchor Standard #4–Selecting, analyzing, and interpreting work. • Anchor Standard #5–Developing and refining techniques and models or steps needed to create products. • Anchor Standard #7–Perceiving and analyzing products. • Anchor Standard #11–Relating artistic ideas and works within societal, cultural, and historical contexts to deepen understanding. <p>Artistic Process</p> <ul style="list-style-type: none"> • Analyze • Interpret • Evaluate • Connect <p>Enduring Understandings:</p> <ul style="list-style-type: none"> • Performers’ interest in and knowledge of musical works, understanding of their own technical skill, and 	<ul style="list-style-type: none"> • Group work • Students given a tuning fork and are required to answer questions about it. • Students will be given the answers

	<p>responses to music are informed by the structure, the use of elements in music, and context.</p> <ul style="list-style-type: none"> 1.3A.5.Cn11–Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life. 	<p>the context for a performance influence the selection of repertoire.</p> <ul style="list-style-type: none"> To express their musical ideas, musicians analyze, evaluate, and refine their performance over time through openness to new ideas, persistence, and the application of appropriate criteria. Individuals’ selection of musical works is influenced by their interests, experience, understandings, and purposes. Response to music is informed by analyzing context and how creators or performers manipulate the elements of music. Musicians connect their personal interests, experiences, ideas, and knowledge to creating, performing, and responding. <p>Essential Questions:</p> <ul style="list-style-type: none"> What is this object [tuning fork] called? What is it used for? How is it used in music? <p>Practices:</p> <ul style="list-style-type: none"> Analyze Evaluate Interpret <p>Suggested Formative Assessment(s):</p> <ul style="list-style-type: none"> Anecdotal notes during whole group, small group and individual. Small group answers about tuning fork. Review at the beginning of each class. 	
<p>Discovery 3 lessons</p>	<ul style="list-style-type: none"> 1.3A.5.Pr4b–Demonstrate an understanding of the structure and expanded music concepts in music selected for performance. 1.3A.5.Pr5a–Apply teacher-provided and established criteria and feedback to evaluate the 	<p>Obj. We are learning to:</p> <ul style="list-style-type: none"> Use a tuning fork properly How the size of the tuning for effects it’s pitch See how sound waves travel through different substances. <p>Anchor Standards:</p> <ul style="list-style-type: none"> Anchor Standard #4–Selecting, analyzing, and interpreting work. Anchor Standard #5–Developing and refining techniques and models or steps needed to create products. Anchor Standard #7–Perceiving and analyzing 	<ul style="list-style-type: none"> 5 more questions and facts about the tuning fork <ul style="list-style-type: none"> SloMo Guys Dip into water A deeper dive into Sound Waves <ul style="list-style-type: none"> Mythbusters Space Shuttle Shattering Glass With Voice (Video) Slinky experiment Tuning a string Tuning a wind instrument.

	<p>accuracy and expressiveness of ensemble and performance.</p> <ul style="list-style-type: none"> ● 1.3A.5.Re7a—Demonstrate and explain, citing evidence, how selected music connects to and is influenced by specific interests, experiences, purposes, or contexts. ● 1.3A.5.Re7b—Demonstrate and explain, citing evidence, how responses to music are informed by the structure, the use of elements in music, and context. ● 1.3A.5.Cn11—Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life. 	<p>products.</p> <ul style="list-style-type: none"> ● Anchor Standard #11—Relating artistic ideas and works within societal, cultural, and historical contexts to deepen understanding. <p>Artistic Process</p> <ul style="list-style-type: none"> ● Analyze ● Interpret ● Evaluate ● Connect <p>Enduring Understandings:</p> <ul style="list-style-type: none"> ● Performers’ interest in and knowledge of musical works, understanding of their own technical skill, and the context for a performance influence the selection of repertoire. ● To express their musical ideas, musicians analyze, evaluate, and refine their performance over time through openness to new ideas, persistence, and the application of appropriate criteria. ● Individuals’ selection of musical works is influenced by their interests, experience, understandings, and purposes. Response to music is informed by analyzing context and how creators or performers manipulate the elements of music. ● Musicians connect their personal interests, experiences, ideas, and knowledge to creating, performing, and responding. <p>Essential Questions:</p> <ul style="list-style-type: none"> ● What comes away from the tuning fork when it vibrates? ● How can you hear the sound? ● What does frequency mean? ● When the frequency goes up, what happens to the pitch? <p>Practices:</p> <ul style="list-style-type: none"> ● Analyze ● Evaluate ● Interpret <p>Suggested Formative Assessment(s):</p> <ul style="list-style-type: none"> ● Anecdotal notes during whole group, small group and 	
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		<p>individual.</p> <ul style="list-style-type: none"> ● Review at the beginning of each class. ● Tuning a string using a tuning fork. 	
<p>Wrap up 2 lessons</p>	<ul style="list-style-type: none"> ● 1.3A.5.Pr4b—Demonstrate an understanding of the structure and expanded music concepts in music selected for performance. ● 1.3A.5.Pr5a—Apply teacher-provided and established criteria and feedback to evaluate the accuracy and expressiveness of ensemble and performance. ● 1.3A.5.Re7a—Demonstrate and explain, citing evidence, how selected music connects to and is influenced by specific interests, experiences, purposes, or contexts. ● 1.3A.5.Re7b—Demonstrate and explain, citing evidence, how responses to music are informed by the structure, the use of elements in music, and context. ● 1.3A.5.Cn11—Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life. 	<p>Obj. We are learning to:</p> <ul style="list-style-type: none"> ● How do you tune a string? ● How does the tension of a string affect the vibration and pitch? ● What is the highest frequency that humans can (generally) hear? <p>Anchor Standards:</p> <ul style="list-style-type: none"> ● Anchor Standard #4—Selecting, analyzing, and interpreting work. ● Anchor Standard #5—Developing and refining techniques and models or steps needed to create products. ● Anchor Standard #7—Perceiving and analyzing products. ● Anchor Standard #11—Relating artistic ideas and works within societal, cultural, and historical contexts to deepen understanding. <p>Artistic Process</p> <ul style="list-style-type: none"> ● Analyze ● Interpret ● Evaluate ● Connect <p>Enduring Understandings:</p> <ul style="list-style-type: none"> ● Performers’ interest in and knowledge of musical works, understanding of their own technical skill, and the context for a performance influence the selection of repertoire. ● To express their musical ideas, musicians analyze, evaluate, and refine their performance over time through openness to new ideas, persistence, and the application of appropriate criteria. ● Individuals’ selection of musical works is influenced by their interests, experience, understandings, and purposes. Response to music is informed by analyzing context and how creators or performers manipulate the elements of music. 	<ul style="list-style-type: none"> ● Tuning a guitar ● Hearing test ● Quiz on the tuning fork.

		<ul style="list-style-type: none"> ● Musicians connect their personal interests, experiences, ideas, and knowledge to creating, performing, and responding. <p>Essential Questions:</p> <ul style="list-style-type: none"> ● What comes away from the tuning fork when it vibrates? ● How can you hear the sound? ● What does frequency mean? ● When the frequency goes up, what happens to the pitch? ● How do you tune a string? <p>Practices:</p> <ul style="list-style-type: none"> ● Analyze ● Evaluate ● Interpret <p>Suggested Formative Assessment(s):</p> <ul style="list-style-type: none"> ● Anecdotal notes during the whole group, small group and individual. ● Review at the beginning of each class. ● Tuning a string using a digital tuner? 	
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