

In the Zone, Creating a Personal
Cardio Playlist

Regina Flores-Dunda

High School

Music + Physical Education

CONCEPT-BASED LESSON PLANNING PROCESS GUIDE

Note: The shaded areas indicate the shifts from more traditional lesson planning to a concept-based instructional design and asks teachers to metacognitively reflect on their planning. The red cells and shading indicate the primary focus of our work at the Institute. **The process guide is to help make visible “the invisible thinking” in which teachers engage as they plan lessons.** The guide is not intended to suggest that templates in use by teachers or in districts should be replaced; in fact, the process guide may be a valuable tool when used “side-by-side” with other lesson planning templates or tools. The intention is to illustrate the type of questioning that should occur consistently with any planning process when considering the instructional shifts implicit in the Colorado Academic Standards.

Shift in Instructional Design	Lesson Elements and Design	Metacognitive Reflection
<p><i>The Unit Generalization and Focusing Lens asks students to ...</i></p> <p>Interdisciplinary, Project-Based, Creative</p>	<p>Lesson Focus:</p> <p>The teacher will model using a playlist so that the students can create their own playlist to meet their physical education needs.</p>	<p><i>How does this specific lesson advance the big idea or generalization of the unit? What connections might be made between other content areas?</i></p> <p>This lesson connects current understandings in Music and Physical Education with background knowledge in Math. The authentic performance task that students are asked to do is relevant to the way these subjects might interact in the real world. The lesson promotes critical listening, problem solving, and creativity.</p>
<p><i>This lesson objective / learning target is critical to student understanding because...</i></p>	<p>Objectives / Learning Targets: Students will understand the correlation between target heart rate and music texture by creating a strategic playlist of music for a cardiovascular workout. Students will explain and defend their playlist choices, aurally and in writing, using content language.</p>	<p><i>In what ways does the learning target support the generalization?</i></p>
<p><i>Instructional strategies</i></p>	<p>Instructional Strategy Menu (not exhaustive):</p> <ul style="list-style-type: none"> • Questioning • Teacher Guided Instruction • Teacher Modeling • Hands-On Participation • Project-based learning • Trial and Error • Visual Literacy 	<p><i>Which instructional strategies will foster learning the lesson’s skills, processes, or content?</i></p> <p>This lesson provides enough variety of instructional strategies to meet the needs of a diverse group of learners, whether they be music students or P.E. students. The lesson highlights the shift toward project-based learning, with the understanding that real-world learning does not exist in silos (singular subject areas).</p>

<p><i>In the first 3-7 minutes of the lesson</i> using questioning in the lesson introduction, rather than direct instruction, students are able to begin to “unpack” their own understandings.</p>	<p>Opening (hook / anticipatory set / lesson launch) Instructional Strategy chosen: Questioning Why is this strategy impactful: Hook – Workout Music</p> <ol style="list-style-type: none"> Play a few measures of song from your own workout playlist (15-30 seconds or so). As they are listening, students should imagine which type of physical activity the song would be good for. After listening, have students share their ideas on matching activities and why the song is appropriate for the activity. Listen for any mentions of music characteristics such as beat, tempo (speed of the music), style, dynamics (changes in volume) and other expressive features. Next, ask students why they think music aids a workout. What is it about music that “gets our hearts pumping”? What is it about music that motivates us? <p>Explain why you chose to share the song you played. What activity do you use the music for? How does it help you through your workout? How does this strategy support meeting the “creating relevancy”? This opening activity helps students to realize that, even though they may not all be enrolled in a music class, they are all consumers of music. The questions asked help students to begin a metacognitive process to understand why they choose certain songs for their workouts and why certain types of music work better for working out than others.</p>	<p><i>In what ways does the chosen strategy work toward a larger purpose at the beginning of the lesson (e.g., engaging students, increasing curiosity, stimulating student-generated questions, etc.)?</i></p> <p><i>In what ways does the chosen strategy(ies) work toward a larger purpose (e.g. increasing collaboration; interacting with complex texts; situating students in real-life, relevant experiences; increasing student agency; stimulating student discourse; etc.)?</i></p>
<p>The Learning Experience will</p>	<p>Learning Experience / Lesson Instructional Strategy chosen: Teacher Guided Instruction, Teacher Modeling Why is this strategy impactful: Calculate Cardiovascular Training Zone¹</p> <ol style="list-style-type: none"> Estimate Maximum Heart Rate (MHR). $MHR = 208 - (.7 \times \text{Age})$ Check Resting Heart Rate. Have one person (or teacher) watch the second hand and count 10 seconds while students take their pulse. Multiply x 6 to get the RHR. Determine the heart rate reserve (HRR). This is done by subtracting the resting heart rate from the maximal heart rate ($HRR = MHR - RHR$). The heart rate reserve indicates the amount of beats available to go from resting condition to an all-out maximal effort. $HRR = MHR - RHR$ Calculate the training intensities (TI) at 50, 70, and 85 percentages. Multiply the heart rate reserve by the respective 50, 70, and 85 percentages, and then add the resting heart rate to both of these figures: a. Example: $85\% TI = HRR \times .85 + RHR$ Example of entire formula: The 50, 70, and 85 % Training Intensities for a twenty-year old person with resting heart rate of 68 bpm would be: <ol style="list-style-type: none"> $MHR: 208 - (14.0) = 194$ beats per minute (bpm) $RHR = 68$ bpm $HRR 194 - 68 = 126$ $50\% TI: (126 \times .50) + 68 = 131$ bpm $70\% TI: (126 \times .70) + 68 = 156$ bpm $85\% TI: (126 \times .85) + 68 = 175.1$ bpm Cardiovascular Training Zone: 131-175.1 bpm <p>If time and space allows, have students test the accuracy of these calculations by performing a workout, checking their heart rate throughout the workout.</p>	<p><i>In what ways does the chosen strategy cement the learning?</i></p> <p><i>What evidence will show that the strategies impacted student learning? Were the strategies effective through the learning process?</i></p>

	<p>How does this strategy support meeting the “just-right challenge,” or “building relationships,” or “creating relevancy,” or “fostering disciplinary literacy”? This most relevant strategy support for this section is “just right challenge”. With guidance, students can rely on previous math skills to calculate their Cardio Training Zone.</p>	
<p><i>The closing activity reinforces the learning.</i></p>	<p>Closure Instructional Strategy chosen: Project Based Learning, Trial and Error Why is this strategy impactful: Select Songs (Can be done for Homework!) – Students should use their personal iTunes library or other online resources to select a number of songs that:</p> <ol style="list-style-type: none"> last the entire workout (list exact length of each song in minutes/seconds) build, maintain, and then decrease in intensity according to Training Zone match the heart rate training zone with similar or matching tempos (list tempo(s) of each song) fit music characteristics identified in Step 5 <p>How does this strategy support meeting the “just-right challenge,” or “building relationships,” or “creating relevancy,” or “fostering disciplinary literacy”? The most relevant strategy support is “relevancy. Requiring students to justify their choices not only creates relevancy, it builds in a higher level of rigor.</p>	
<p><i>Technological resources that will support student learning and move students toward the learning target.</i></p>	<p>Technological Resource and application: Using MP3 player and personal play list of tunes.</p> <p>How: In what ways does this chosen resource support meeting the “just-right challenge,” or “building relationships,” or “creating relevancy,” or “fostering disciplinary literacy”? he most relevant strategy support is “relevancy”. Students are able to apply previous knowledge and experience.</p>	<p><i>How will my students and I strategically use technology resources to enhance the learning experience (and support “meetingthe just-right challenge,” “building relationships,” “creating relevancy,” and/or “fostering disciplinary literacy”)?</i></p>
<p><i>Formative assessment will be a quick Check for Understanding in which students will demonstrate they are or are not on track.</i></p>	<p>Formative Assessment Formative Assessment tool/method: Trial and Error Learning indicators of success: Try it Out – During PE or on their own, students should try their new playlist and make appropriate adjustments as necessary</p>	<p><i>What “indicators of success” will show that the students are gaining mastery? How will I use that evidence in a feedback loop?</i></p>

Reflection:

General Reflection:

- Integrated arts lessons are accessible to all teachers because students will bring background knowledge with them from their other classes. It creates an environment where students apply knowledge to new problems and situations in a real-world context.
- After teaching this lesson with adult learners, suggestions for differentiation were added to the Metacognitive Reflection column.

Peer Feedback:

- I'm wondering what extensions could be made with algebra. I'm thinking there might be something around estimation and predictions of functions both graphically and algebraically. Then there might be something around making mathematical comparisons within the texture graph and then in step 6 they could use the math/graph descriptors as a way to determine best-suited songs for various purposes.
- Love that this lesson is low-floor, high ceiling, allowing access for all students and also opportunities for unlimited analysis and application.

Connection to Performance Goal: *(What did I do in this lesson that gives evidence or may be used as an artifact for my professional growth plan?)*

Student Feedback: *(What did students say about the lesson? Did they find it engaging, interesting, appropriately challenging? Did their feedback confirm my own perception of the lesson?)*

<i>Time Suggested</i>	Two 50-Minute Class periods
<i>Materials Needed</i>	Access to music sources (personal mp3 devices, internet access, etc.), Watch or Clock with a second hand, Worksheets, Personal Fitness Plan notes
<i>Co-teaching Opportunity</i>	
<i>Cross-Content Connections</i>	Music Physical Education Mathematics

Integrated Arts Lesson

Lesson Title	In the Zone, Creating a Personal Cardio Playlist	Length of Lesson	Two 50-minute Class Periods
Content Area	Physical Education	Grade Level	High School
Arts Area	Music		
<h3>Colorado 21st Century Skills</h3> <p>Critical Thinking and Reasoning: <i>Thinking Deeply, Thinking Differently</i></p> <p>Information Literacy: <i>Untangling the Web</i></p> <p>Collaboration: <i>Working Together, Learning Together</i></p> <p>Self-Direction: <i>Own Your Learning</i></p> <p>Invention: <i>Creating Solutions</i></p>			
Content Unit Title and/or Focusing Lens(es):	Content Standards:	Arts Unit Title and/or Focusing Lens(es):	Arts Standards:
CDE Sample Unit: Personal Fitness Planning Focusing Lenses: Wellness, Cardiovascular Endurance	PE 2.1 Establish goals based on fitness assessment data, and develop, implement, achieve, and monitor an individual health and fitness plan.	Focusing Lens: Music Analysis	Music 3.3 Evaluate music using critical, informed analysis; identify basic elements of written examples of music using appropriate musical vocabulary.

Logistics (Materials needed, Room Configuration, Technology Requirements)	Access to music sources (personal mp3 devices, internet access, etc.), Watch or Clock with a second hand, Worksheets, Personal Fitness Plan notes
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Integrated Arts Lesson

Lesson Outline (How will students “unpack” understanding of Inquiry Question and/or Concept through the hands-on arts lesson?)

Shift in Instructional Design	Lesson Elements and Design	Metacognitive Reflection
<p>The Unit Generalization asks students to...</p> <p>Shift for this lesson: Interdisciplinary, Project-Based, Creative</p>	<p>Lesson Objective: Students will understand the correlation between target heart rate and music texture by creating a strategic playlist of music for a cardiovascular workout. Students will explain and defend their playlist choices, aurally and in writing, using content language.</p>	<p>This lesson connects current understandings in Music and Physical Education with background knowledge in Math. The authentic performance task that students are asked to do is relevant to the way these subjects might interact in the real world. The lesson promotes critical listening, problem solving, and creativity.</p>
<p>Intentional Instructional Strategies</p>	<p>Instructional Strategy Menu: This lesson uses the following Instructional Strategies:</p> <ul style="list-style-type: none"> ● Questioning 	<p>This lesson provides enough variety of instructional strategies to</p>

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	<ul style="list-style-type: none"> ● Teacher Guided Instruction ● Teacher Modeling ● Hands-On Participation ● Project-based learning ● Trial and Error ● Visual Literacy 	<p>meet the needs of a diverse group of learners, whether they be music students or P.E. students. The lesson highlights the shift toward project-based learning, with the understanding that real-world learning does not exist in silos (singular subject areas).</p>
<p>By using questioning in the lesson introduction, rather than direct instruction, students are able to begin to “unpack” their own understandings.</p>	<p>8. Hook – Workout Music</p> <ol style="list-style-type: none"> a. Play a few measures of song from your own workout playlist (15-30 seconds or so). b. As they are listening, students should imagine which type of physical activity the song would be good for. c. After listening, have students share their ideas on matching activities and why the song is appropriate for the activity. Listen for any mentions of music characteristics such as beat, tempo (speed of the music), style, dynamics (changes in volume) and other expressive features. 	<p>Instructional Strategy Chosen: Questioning</p> <p>This most relevant strategy support for this section is “creating relevancy”.</p> <p>This opening activity helps students to realize that, even though they may not all be enrolled in a music class, they are all consumers of music. The questions asked help students to begin a</p>

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	<p>d. Next, ask students why they think music aids a workout. What is it about music that “gets our hearts pumping”? What is it about music that motivates us?</p> <p>e. Explain why you chose to share the song you played. What activity do you use the music for? How does it help you through your workout?</p>	<p>metacognitive process to understand why they choose certain songs for their workouts and why certain types of music work better for working out than others.</p>
<p>Interdisciplinary Connection</p>	<p>9. Review Personal Fitness Plan</p> <p>a. Have students take out the FITT worksheet of their Fitness Plans (blank template attached) or other chart and review their Cardiovascular Endurance goals. For this lesson, we will be working with Intensity and Time. Students will choose one cardio workout to design a playlist for.</p>	<p>This section of the lesson connects previous learning. If students have not completed a FITT plan (music students will not likely have one), they may choose a cardiovascular workout to use for the purpose of this lesson.</p>
<p>Interdisciplinary Connection, Relevancy</p>	<p>10. Calculate Cardiovascular Training Zone²</p> <p>a. Estimate Maximum Heart Rate (MHR). $MHR = 208 - (.7 \times \text{Age})$</p>	<p>Instructional Strategies Chosen: Teacher Guided Instruction, Teacher Modeling</p>

² From “Calculating Heart Rate” Lesson by Jenny Danford http://jdanfordhome.weebly.com/uploads/1/5/3/6/1536988/cross_curricular.pdf

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	<p>b. Check Resting Heart Rate. Have one person (or teacher) watch the second hand and count 10 seconds while students take their pulse. Multiply x 6 to get the RHR.</p> <p>c. Determine the heart rate reserve (HRR). This is done by subtracting the resting heart rate from the maximal heart rate ($HRR = MHR - RHR$). The heart rate reserve indicates the amount of beats available to go from resting condition to an all-out maximal effort. a. $HRR = MHR - RHR$</p> <p>d. Calculate the training intensities (TI) at 50, 70, and 85 percentages. Multiply the heart rate reserve by the respective 50, 70, and 85 percentages, and then add the resting heart rate to both of these figures: a. Example: $85\% TI = HRR \times .85 + RHR$</p> <p>i. Example of entire formula: The 50, 70, and 85 % Training Intensities for a twenty-year old person with resting heart rate of 68 bpm would be:</p> <ol style="list-style-type: none">1. MHR: $208 - (14 \times 0) = 194$ beats per minute (bpm)2. RHR = 68 bpm3. HRR $194 - 68 = 126$	<p>This most relevant strategy support for this section is “just right challenge”. With guidance, students can rely on previous math skills to calculate their Cardio Training Zone.</p> <p>Differentiation for struggling students: Have all students work collaboratively to calculate the Training Zone for a sample student their age (i.e. a 16-year old female) using a predetermined resting heart rate.</p>
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	<p>4. 50% TI: $(126 \times .50) + 68 = 131$ bpm 5. 70% TI: $(126 \times .70) + 68 = 156$ bpm 6. 85% TI: $(126 \times .85) + 68 = 175.1$ bpm 7. Cardiovascular Training Zone: 131-175.1 bpm</p> <p>If time and space allows, have students test the accuracy of these calculations by performing a workout, checking their heart rate throughout the workout.</p>	
<p>Interdisciplinary Connection</p>	<p>11. Intensity in Music: Tempo – Now that we know our Training Zone, let’s select music that gets us into the zone and helps us maintain it. This requires music with the correct tempo.</p> <p>a. Ask Students: What does the word “tempo” mean? (sounds like the Spanish word “tiempo”.) Tempo = speed of the music.</p> <p>Tempo and Heart Rate are calculated the same way, by counting the number of beats per minute. For example, a relatively fast song with a tempo of 120 means that there are 120 beats per minute of the song. How would a song with a tempo of 60 sound?</p> <p>b. Listen to a few different examples of music (can be any kind of music). For each example, first have students</p>	<p>Instructional Strategy Chosen: Hands-On Participation</p> <p>The most relevant strategy support is “fostering disciplinary literacy” because the activity requires students to actively use the terms tempo and heart rate synonymously.</p> <p>Tempo in music is important as a selection factor because it can directly affect the tempo of a</p>

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	<p>“find the beat” by quietly clapping or tapping to the steady beat. You can also count out loud in groups of 4 beats. For a challenge, have students conduct a 4-beat pattern with their right hand while listening (Down, In, Out, Up).</p> <p>c. Once the beat has been established, have one student follow the clock for 10 seconds while the other students count the number of beats. $\# \text{ of Beats} \times 6 = \text{Tempo}$ (in beats per minute or bpm)</p>	<p>person’s movement (e.g. stride) during exercise.</p> <p>For music and non-music students alike, finding the beat is a physical activity. This section allows students to stand up and to physically identify beats.</p> <p>Differentiation for Struggling students: If students are comfortable with one another, you could have a student who has found the beat tap the beat on the shoulder of the student who cannot find the beat. You may also use visual representations of beat such as props or lights.</p>
<p>Students conducting investigations and engaging in discussions with teachers’ guidance</p>	<p>12. Intensity in Music: Texture – The density and range of simultaneous sounds forming layers of harmony.</p>	<p>Instructional Strategies Chosen: Visual Literacy, Teacher Modeling, Trial and Error</p>

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	<p>Using a song of your choice, students will form small groups to collaboratively map the texture of the song as they listen.</p> <ol style="list-style-type: none">a. Post (chart paper) the baseline and the melodic contour already drawn.b. Divide into small groups or pairs and send to chart paper.c. Listen once just to the melodic contour and have them follow with a pointer/ruler etc. Then, identify other instruments or voices heard.d. Have each student choose a layer of sound to listen for (Sung Vocal Line, Rapped Vocal Line, Lead Guitar, Rhythm Guitar, Bass Guitar, Strings, Piano/Keyboard, etc.)e. As they listen a 2nd time, each student will map the appearance, volume, and relative pitch of their chosen layer using a distinct color marker. The Vocal Lines are the baseline for pitch. Students will need to determine if their layer is relatively higher or lower in pitch than the baseline.f. Have students combine all layers into one map that will show the full range of textures.	<p>The most relevant strategy support is “just right challenge”.</p> <p>By charting the appearance and changes in various layers of musical texture (via different instruments, synthetic sounds, and/or voices), students will be able to visualize where the texture changes in the song. Breaking down the song into individual layers of texture will also help students to listen more critically to music (during this lesson and in the future). A connection to technology can be made here by looking at how music is charted electronically in a grid.</p> <p>Differentiation: Have</p>
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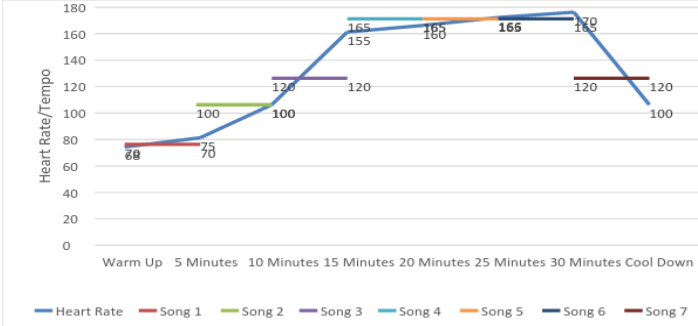
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	<ul style="list-style-type: none">g. Listen a 3rd time to allow students to make corrections or fill in places that were missed.h. As a group, have students identify the sections of the song that have a more complex texture.i. Discuss why texture is a criteria for selecting appropriate music for the cardio playlist. (e.g. A song with a simple range and less density might not be suitable for cardio because it is too relaxing. A song with alternating textures may be good for an interval workout.) <p>6. Other Music Selection Factors – Discuss personal preferences and other music characteristics that make songs better suited for Cardio workouts. Characteristics may include:</p> <ul style="list-style-type: none">i. Instrumentation (types of instruments and/or voices)ii. Dynamics (Changes in volume)iii. Genre/Style <p>Advanced music students should be given a few examples of the music in written form for analysis.</p>	<p>students work in small groups, each person being responsible for listening for and charting one layer of texture.</p> <p>Having students examine their own preferences for music based on prescribed criteria will help them to become more informed consumers of music.</p>
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<p>Range of possible outcomes that collectively lead to a deep understanding of established core ideas</p>	<p>13. Select Songs (Can be done for Homework!) – Students should use their personal iTunes library or other online resources to select a number of songs that:</p> <ol style="list-style-type: none"> a. last the entire workout (list exact length of each song in minutes/seconds) b. build, maintain, and then decrease in intensity according to Training Zone c. match the heart rate training zone with similar or matching tempos (list tempo(s) of each song) d. fit music characteristics identified in Step 5 	<p>Instructional Strategies Chosen: Project Based Learning, Trial and Error</p> <p>The most relevant strategy support is “creating relevancy”.</p> <p>Requiring students to justify their choices not only creates relevancy, it builds in a higher level of rigor.</p>
<p>Students create reports, posters, and/or media presentations that explain and argue</p>	<p>14. Graph Workout</p>	<p>Instructional Strategies Chosen: Project Based Learning, Trial and Error</p> <p>The most relevant strategy support is “just right challenge”.</p> <p>Students are able to apply previous knowledge and experience with graphs and charts to create a visual</p>

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	<p>a. Students will graph one cardio workout using Intensity (in terms of Heart Rate) and Time. Any length of time can be used as long as it aligns with the student's Personal Fitness Plan. Students should include a written playlist that describes each song in greater detail according to selection criteria.</p>  <p>The example is for a 35-minute run. Additional Data Collection tools may be accessed here: http://asq.org/learn-about-quality/data-collection-analysis-tools/overview/overview.html</p>	<p>representation of their workout and song selections.</p>
<p>Time for reflection and revision (Creative Cycle)</p>	<p>15. Try it Out – During PE or on their own, students should try their new playlist and make appropriate adjustments as necessary.</p>	<p>Instructional Strategy Chosen: Trial and Error</p>

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		<p>The most relevant strategy support is “relevancy”.</p> <p>By having students try out their playlists with an actual workout, they are conducting their own research and development, a useful 21st century skill in any context.</p> <p>Reflection is also a vital step in the creative cycle that is sometimes overlooked in music lessons/units.</p>
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Reflection

General Reflection:

- Integrated arts lessons are accessible to all teachers because students will bring background knowledge with them from their other classes. It creates an environment where students apply knowledge to new problems and situations in a real-world context.
- After teaching this lesson with adult learners, suggestions for differentiation were added to the Metacognitive Reflection column.

Integrated Arts Lesson

Peer Feedback:

- I'm wondering what extensions could be made with algebra. I'm thinking their might be something around estimation and predictions of functions both graphically and algebraically. Then there might be something around making mathematical comparisons within the texture graph and then in step 6 they could use the math/graph descriptors as a way to determine best-suited songs for various purposes.
- Love that this lesson is low-floor, high ceiling, allowing access for all students and also opportunities for unlimited analysis and application.

Co-Teaching or Cross-Content Connections: Music, PE, Math (added based on Peer Feedback)