



# STRATEGIES FOR SCHOOL CHANGE THROUGH MUSIC AND THE ARTS

## EXPLORING THE PREMISES OF LEARNING THROUGH MUSIC IN A LABORATORY SCHOOL SETTING: INTERDISCIPLINARY FEATURES AND FUNDAMENTAL PROCESSES

by

LYLE DAVIDSON, CARYN CLAAR, & MASAMI STAMPF

TEACHERS BELIEVE THEY HAVE A GIFT FOR GIVING;  
IT DRIVES THEM WITH THE SAME IRREPRESSIBLE  
DRIVE THAT DRIVES OTHERS TO CREATE A WORK  
OF ART OR A BUILDING.

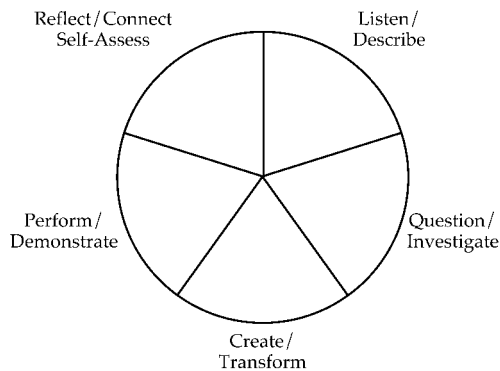
- A. BARTLETT GIAMATTI

What makes *Learning Through Music* instructional processes different from conventional teaching? How do “five process” lessons transform the use of musical concepts or content as a tool for teaching elements of math, language, or science? This paper represents an attempt to map out such distinctions. It presents three perspectives on teaching a first grade math lesson on patterns. The sample class took place at the Conservatory Laboratory Charter School, a school that is based on the premises of Learning Through Music (LTM Handbook, 1999). The first version is a transcript of the actual lesson analyzed from the point of view of a Skillful Teacher, related to Bloom’s Taxonomy of Learning Objectives, or as an interdisciplinary lesson based on concepts shared across music and math.. The second recasts that lesson as an interdisciplinary lesson, and the final version represents the same lesson on patterns, but this time using the five fundamental processes of Learning Through Music as a framework for engaging students through a more comprehensive set of procedures or learning strategies for exploring the concepts presented in the first two examples.

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## Five Fundamental Processes of Learning Through Music



*The Conservatory Lab Charter School has adopted the Five Fundamental Processes of Learning Through Music developed by faculty at New England Conservatory as a premise and standard for teaching throughout the curriculum.*

There are several reasons to present these three different views of the same lesson on patterns. It shows some of the complexity of teaching; it shows different formats for teaching; it illustrates how an interdisciplinary lesson that uses music might be taught; and finally, it illustrates how the five *LTM* processes might be used to *enhance engagement* of learning in either circumstance.

The section following the transcript of the first lesson contains three different analyses of that lesson. It is intended to demonstrate that what one sees in a class depends on the observer's perspective. A lesson that is conducted without making the structuring premises explicit can be interpreted in different ways; the lack of an explicit focusing structure allows an observer to select certain features and ignore others—perhaps critical ones.

One premise of *LTM* is that a lesson is stronger when the model used to structure the lesson or the organizing principle that supports the structure of the lesson is made *explicit* throughout the lesson. This level of explicitness accomplishes two things. First, it shows the observer what is important about the teacher's intended structure of the lesson (it specifies what to look at). Second, it provides the students with a generalized structure that they can use as a scaffold for their independent work during the lesson, and generalize as a tool to use in their own learning in other subjects.

### PART 1: A FIRST GRADE LESSON ON SHAPES AND PATTERNS<sup>1</sup>

The lesson takes place just before lunch, between 10:55 and 11:45 on a warm January day. This lesson builds on previous work on shapes and patterns (based on TERC les-

sons suggested in Wright et. al., 1998). The students are making the transition into the math presentation. They will follow up on the lesson with independent work at their tables later.

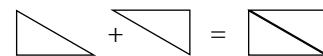
**T(eacher):** We'll start talking even though all our friends are not here. Be nice and move over, please. (The students push together as they move into the meeting space and find a place on the line that is taped onto the carpet.)

**T:** We are working with shapes. We will be filling big shapes with little shapes. For example, a diamond can be filled with two triangles. What other shapes can we use like this?

**S(student)1:** Can we use a square?

**S2:** We can make a square out of two triangles.

**T:** Maybe. Let's try it. (She begins to illustrate, but does not have the necessary triangles in the pile). I can draw it for you (and she does on the flipchart).



We can make lots of shapes with other shapes. Today we are going to make patterns of different shapes. (She begins a pattern: Blue, Green, Blue, Green, \_\_\_\_\_).



Can you tell me what would come next?

(There is no clear response from

the class. Some say Blue while others say Green, and still others respond with names of shapes.)

**T:** What is a pattern?

**Several students:** Something that repeats itself.

**T:** Yes. A B A B A is an example of a pattern using letters. If the pattern uses 1's and 2's like this (1 2 1 2 1 ), what number comes next?

**Many students:** 2!

**T:** Yes. Now how can we make more complex patterns of shapes?

**S3:** Add something to it.

**S1:** You have to count what to do while you are doing it. Like Blue, Green, Red, Blue, Green, Red, Blue, Green, Red.

**T:** How else can you read this?

**S4:** 1 2 3 1 2 3 1 2 3. (In her response, the student successfully transforms the sequence of colors and shapes into numbers.)

**T:** How else could you read this? Andrew?

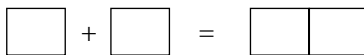
**S5:** A B C A B C A B C

**T:** That is the same as we have here. How else can you read it? (Pause) For example, you could say the shapes.

**S5:** You could say, "Put 2 squares to make another \_\_\_\_."

**T:** You mean a rectangle. (She mod-

ifies the pattern.) This can be a pattern for other patterns, too. (She illustrates it.) (The students then realize the pattern in different ways, i.e., using different shapes.)



**11:15 T:** This looks different from the original one. It is a little harder. But this is what we are going to do today. Now I want you to go to your seats and try to make more large shapes out of smaller kinds of

shapes. I will put worksheets on your desks, so use your worksheets to keep track of what you do. Be sure to identify the shapes and keep track of how many you use. Make a sloppy copy first. Use the blank construction paper. You can borrow shapes from one another.

**S6:** Do you mean we should glue it on?

**T:** Yes. I want you to use your simple shapes to make more unusual



*Students identify and create geometric forms as they inquire and reflect on the concept of patterns that the shapes can make.*

shapes. Now tell me, what will you do today?

**S7:** You mean we have to make patterns?

**T:** Yes. I need a friend to help put papers on the tables. Derek (will you help me)?

**S8:** What shapes do you want us to use?

**T:** There is construction paper at the back table. When you have shown your pattern to the assistant teacher or me and it has been approved, you can bring it to the back table and get the construction paper to use for your final copy.

**S1:** (in a whine) D is copying me

**T:** If he is copying you that means he likes what you are doing.

**S9:** Makes the figure of a man with the shapes he has and then says "a b c d e...etc." while pointing to the different colors and shapes he has used.

**S5:** Draws a complex figure and repeats it four times. He points and identifies the colors as he works.

Other children do the same, constructing other patterns, coloring them, and pasting them in.

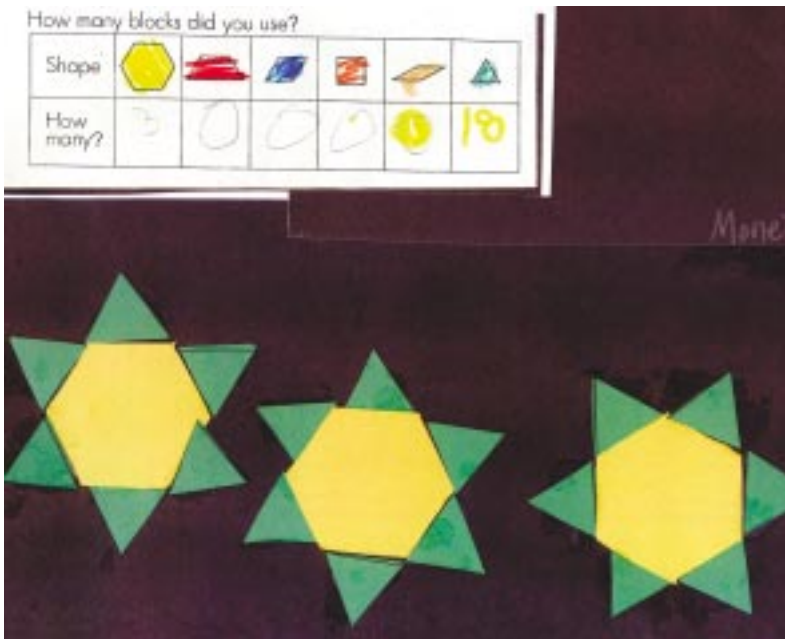
After a while, all the children appear to have the idea of patterns and of how to make more complex patterns out of shapes. However, four of the children do get stuck on

making figures out of the shapes as they work. The lesson is fast paced and the work with patterns engages them.

### **A RORSCHACH TEST: SEEING WHAT WE LOOK FOR**

There are many ways to consider this class: as fifty minutes from a teacher's day, as a math lesson, as an example of effective questioning, etc.. The absence of an explicit framework makes it possible to view it from perspectives that may or may not be intended by the teacher, that may or may not be relevant to the lesson. Imagine what three different observers might make of this lesson: one is trained in the Skillful Teacher program,





Later on, students demonstrate additional structural understanding of their geometric patterns by analyzing and counting the various types of shapes used.

another is using Bloom's taxonomy of the cognitive domain, and a third is looking for evidence of attributes that can be shared across disciplines.

### THE SKILLFUL TEACHER: PRINCIPLES OF LEARNING

One way to view this class is as a snapshot of instructional practices that reveals some of the complexities of teaching. It shows a model of teaching that shares more with an improvised performance than with a rehearsed presentation. In conducting the lesson, this teacher makes use of various principles of discipline and learning, such as applying concepts, isolating critical attributes, modeling, supporting

active participation, and creating a positive feeling tone (Saphier & Gower, 1997).

These principles are carried out flexibly as the occasion demands, not according to a pre-determined and rigid structure. For example, she helps her students make the transition between one activity and the next by supporting a cooperative atmosphere and encouraging students to consider one another (*We'll start talking even though all our friends are not here. Be nice and move over, please.*). She supports collaborative learning and working together (*You can borrow shapes from one another, and if he is copying you that means he likes what you are doing.*); and she helps them confront new task requirements with more confidence by forecast-

ing that they may find the work demanding, or that they can use what they know to help them with a new task (*Use your simple shapes to make more unusual shapes.*).

The instruction begins with establishing connections to past work (*We are working with shapes.*), and creating a connection and focus to the work of the lesson about to begin (*We will be filling big shapes with little shapes.*). As instruction proceeds, the teacher provides support for student participation by taking their suggestions seriously and incorporating them into the lesson (*Student: Can we use a square? Teacher: Maybe. Let's try it?*). She also refocuses the task as necessary (*Today we are going to make patterns of different shapes.*). Students are expected to develop multiple ways of representing what they are doing (*How else can you read this?*) and show how patterns can be extended (*This can be a pattern for other patterns, too.*).

Before releasing the students to do independent work, the teacher makes sure they know what they are supposed to be doing (*Tell me what you will do today.*). Finally, she establishes the criteria for work (*When you have shown your pattern to AT or me and it has been approved, you can bring it to the back table [and get the construction paper for your final version].*).

In summary, the teacher establishes a positive climate for learning, presents a clearly defined task, checks for understanding, designs a task that elaborates from the instruction and requires independent thinking,

ensures time for individual application and work, and provides a way of evaluating work as it is completed.

However, this is only one perspective. Another observer might consider this lesson from the perspective of the framework of Bloom's taxonomy (Bloom, 1956).

### **BLOOM'S TAXONOMY: A COGNITIVE PERSPECTIVE**

The observer using Bloom's taxonomy as a reference sees other dimensions of the lesson. For example, realizing the need to check for basic content **knowledge**, the teacher asks, "What is a pattern?" Satisfied that most students know the facts, she goes on to check their understanding by setting up a task in which they have to demonstrate their knowledge (*Yes. A B A B A is an example of a pattern. If the pattern uses 1's and 2's like this (1 2 1 2 1), what number comes next?*). Successful completion of the tasks requires analytic skills. When the students respond correctly, she checks up on depth by having them apply what they know (*Yes. Now how can we make more complex shapes?*). Satisfied, she goes on to deepen their comprehension by asking for a synthesis of what they know by asking them to invent new ways of representing what they know (*through using multiple representations: How else can you read this?*). Finally, she provides a process for evaluating work on an as-needed basis. The evaluation process also conveys steps to take after the work is approved (*When you have shown your pattern to AT or me and it has*

*been approved, you can bring it to the back table get the construction paper to use for your final copy.*).

Watching students at work provides evidence that many of them have grasped the content of the lesson (*A: Draws a complex figure and repeats it four times. He points and identifies the colors as he works.*). He shows that he has action knowledge (shown through his actions) and command of the basic facts of pattern making. He understands how to apply them on his own, he can use what he knows in new contexts, and he can assess his work satisfactorily.

These perspectives are informative and reveal some of the particulars of this strong example. But another perspective is relevant to the lesson, especially because *Learning Through Music* offers so many opportunities for interdisciplinary lessons by design.

### **INTERDISCIPLINARY TEACHING STRATEGIES**

From the perspective of interdisciplinary teaching, certain features appear in lessons that are shared across disciplines and subjects. These features include 1) concepts, 2) strategies, 3) contexts, 4) representations, and 5) assessment devices.

Various concepts are used in this lesson. For example, the concepts of **part-whole relationships**, **sequence**, and **symmetry** are focal (*We are working with shapes. We will be filling big shapes with little shapes. For example, a diamond can be filled with two triangles. What other shapes can we use like this?... We can make lots of shapes with other shapes.*). There is also evidence that such concepts as **empathy** are in use (*We'll start talking even though*



*Finally, students are challenged to represent another dimension of their understanding of geometric shapes by creating and performing a musical piece based on the assignment of an instrument to each shape and then listening to make sure the proportion of sound is in correct relation to the visual design.*

*all our friends are not here. Be nice and move over, please.)*

Strategies are also part of the features of this lesson. One challenge is to develop the skills that make it possible to see undifferentiated shapes as assemblies of various component parts. Whole shapes are **parsed** into component shapes (*We will be filling big shapes with little shapes. For example, a diamond can be filled with two triangles. What other shapes can we use like this?*). A **critical thinking** strategy is used when a student responds with the strategy that she uses to maintain her control over a developing pattern (*You have to count what to do while you are doing it.*).

**Multiple representations** are encouraged (see also Scripp, 2000). (*N:... Like B G R B G R B G R. Teacher: How else can you read this? K: 1 2 3 1 2 3 1 2 3...Teacher: How else could you read this? A? A: A B C A B C A B C...*).

Finally, **assessment guidelines**, strategies, and rubrics are suggested so students have some means for evaluating their work before bringing it up to the teacher or her assistant (*Be sure to identify the shapes and keep track of how many you use... . When you have shown your pattern to AT or me and it has been approved, you can bring it to the back table ...*).

In summary, these three perspectives on a single lesson in patterns reveal different ways to understand the teaching and learning that takes place under the direction of a strong teacher. There is a period of focused instruction (with ample

opportunities to review and consolidate understanding) and time for independent work that allows students to integrate and begin to internalize their understandings. However, the analytical constructs used to analyze the lesson are *implicit* in these lessons; there is no *explicit evidence* or *acknowledgment* that any of these constructs were used to structure the learning processes engaged by the lesson. Furthermore, it is hard to determine underpinnings of the teacher's lesson design or its implementation.

## **PART 2: SAMPLE MUSIC - MATH INTERDISCIPLINARY PROJECT (AN INVENTED LESSON)**

It is easy to imagine combining the study of Math/logic and Music in a lesson that is devoted to patterns. Both areas of math and music include opportunities to discuss concepts such as proportion, order, sequence, patterns, hierarchy, systems (i.e., comprehensive consideration of wholes) thinking, etc. that are shared between these disciplines. If this lesson were conducted as an interdisciplinary project, it might have taken place like this:

**T:** Do you remember the song we sang yesterday?

**Several students:** Do you mean, "Are you sleeping?"

**T:** Yes. Let's sing it and see how much we remember.  
(Class sings song. A few are able to begin right away, others drift in as

they recall how the song goes.)

**T:** Good work. Do you remember what we found out about the song?

**Several students:** It has different parts. It has different patterns.

**T:** Yes, and what are they?

**S1:** the first one goes (sings the first phrase 1 2 3 1), and then it goes (singing the second phrase 3 4 5-)...

**S2:** (interrupts): And each one is repeated.

**T:** Yes, but don't interrupt, please.

**S1:** (continues without a pause)... then it goes (singing 5 6 5 4 3 -1-) and then Ding dong ding (singing 1-5-1-)

**T:** Yes, that's it. Now who can tell me about the phrases of the song using alphabet patterns?

**S:** I know. It's A A B B !

**T:** That's a good start. Who can add onto it?

**S:** A A B B C C D D.

**T:** Good job. Who can write that on the board? (S1 gets up and does it.) Let's sing the song again and keep track of the phrase patterns by pointing to the letters. The class sings the song while the student points to the letters representing the phrases of the song.

**T:** We have been working with shapes in our pattern lessons.. Now we have discovered that songs use

## The Learning Through Music Five Process/Skill Matrix

	Listen	Question	Create	Perform	Reflect
Listener/ Perceiver	The ability to focus, discern, remember  <i>The Learner as a perceptive listener, sees</i>	The ability to discern, understand the parameters of a line of inquiry and possible avenues of investigation	The ability to discern and experience an aesthetic object, an act of creation, a worthy object of study	The ability to attend and discern aspects of performance	The ability to attend to and respond to modes of reflective awareness and understanding
Questioner/ Investigator	The ability to question, investigate, and analyze an experience, perception,	The ability to inquire, investigate, discover  <i>The Learner as one who demonstrates an inquisitive, analytic, investigative word</i>	The ability to investigate, analyze an act of creation, an aesthetic experience, a worthy object of study	The ability to investigate, analyze aspects of performance	The ability to investigate multiple facets of reflective thinking
Creator/ Inventor	The ability to respond to or elaborate on an experience or observation imaginatively	The ability to formulate a line of inquiry, research, or experimental investigation	The ability to compose, invent, improvise  <i>The Learner as someone covestantly engaged in the process of creation</i>	The ability to create and demonstrate an original interpretation of an act of creation (worthy object of study)	The ability to accommodate or assimilate products of reflective thinking
Performer/ Interpreter	The ability to describe, interpret what has been perceived or experienced	The ability to conduct a line of inquiry, research, or an experiment	The ability to perform, execute, interpret or demonstrate an act of creation	The ability to demonstrate, present, interpret  <i>The Learner as one who demonstrates skill as an essential aspect of knowledge and understanding</i>	The ability to demonstrate reflective thinking in action
Reflective Thinker/	The ability to reflect, and make connections to, what has been perceived, observed, or experienced	The ability to reflect the implications of a line of inquiry, research findings, or experimental data	The ability to reflect, reconsider, re-interpret an act of creation, an aesthetic experience, a worthy object of study	The ability to reflect critically on an act of creation. Performance, worthy object of study	The ability to make connections, revise, self-assess  <i>The Learner as a reflective thinker and practitioner</i>

This Matrix categorizes: (a) the many subtle cross-relations among the Five Fundamental Processes employed in Learning Through Music lessons, teaching, and practices and (b) the Five Learning Trait objectives for all students at a Learning Through Music school (diagonal, shaded squares).

different shapes or phrases, and that the whole song we just sang is made of smaller parts. And we have named those parts by giving each of a different letter. We can also find different shapes in shape of the whole song. For example, we discovered earlier that a diamond can be filled with two triangles. What other shapes can be made out of two triangles?

S: Can we use a square?

T: Maybe. Let's try it. (makes a square out of two triangles). Today, we are going to make patterns out of different shapes, phrases, colors,

letters.. If I begin a pattern like this: Blue, Green, Blue, Green, Can you tell me what would come next?

**Several students:** Various responses of Blue and Green.

T: So, what is a pattern? Remember the song?

**Several students:** Something that is repeated.

T: Yes. (sings the opening of the song) That is an example of a pattern that we called A. What comes next?

**Several students:** B (some say the letter; others sing the phrase with words or numbers).

T: Yes. Now how can we make more interesting patterns?

S: Add something else to it.

T: How else can we read this? (pointing to the drawing of the pattern on the board).

S: 1 2 3 1 1 2 3 1

T: That is the same as we have with letters. Could you describe these

shapes or melody patterns in the song?

**S:** You could say, “Go up two times and then down.”

**T:** Yes. That’s right. I think you have it. We are going to work with shapes today. I want you to go to your seats and try to make more interesting patterns out of shapes, just like we have with letters or numbers in the song. I will put worksheets out on your desks....

In this lesson on patterns, a song that had been sung and analyzed for patterns as part of an earlier music lesson became the reference point for a lesson that used patterns to make shapes. The structure of the lesson remains the same as the original, but it now employs a higher degree of multiple representations of the patterns, part-whole relationships, and linguistic structures discovered through the emphasis on musical patterns. It may take a little more time because of the need to cover the lesson in music and extend it to the geometric shapes.

### **PART 3: FIVE FUNDAMENTAL PROCESSES (INVENTED LESSONS)**

Both the original math lesson and the interdisciplinary lesson engaged students in a variety of activities, but neither related the activities to an explicit set of learning processes associated with *LTM*. It is unlikely that students grasped the underlying array of processes that *LTM* could have provided as a tool for



*Paul Ouellette leads the recorder/violin ensemble at the Conservatory Lab Charter School’s Learning Through Music culminating event.*

learning. Using the same lesson on patterns, it is possible to frame it in terms of the five *LTM* processes required of every *LTM* lesson at the Conservatory Lab Charter School: listening and perceiving, performing and interpreting, creating and transforming, questioning and inquiring, and reflecting and making connections.

The following is an example of how the *LTM* processes can be made explicit in music class and a math class. Each class contains a period of focus on each of the five fundamental processes. The classes can be taught independently, or can be merged to create an interdisciplinary *LTM* lesson.

**Teacher:** First graders: What can we do when we want to learn something?

**A few students:** We can listen and see what it is.

**T:** Good. What else can we do? There are five things. Remember?

**Ss:** Singing: “We can listen, we can see; we can question easily; we create and we perform; connecting learning on and on”. (The students chant the words to the melody - indicated by number patterns - in a sing-song chorus.)

2 3 5 5 6 5 5  
We can listen, we can see—  
1 2 3 3 3 2 2  
we can question easily

2 3 5 5 6 5 5  
We create and we perform,  
1 1 2 3 3 2 1 1  
connecting learning on and on.

The two-column format below highlights the parallels between the study of patterns in both the music and math contexts. They can be considered independently or combined as an interdisciplinary lesson.

*Focus on Listening and Questioning (Processes 1-2)*

<i>Music</i>	<i>Math</i>
<p><b>T:</b> Today, I want you to listen first. I am going to sing a song you know, but I am going to make some changes. Can you tell me what I change? (Sings “Are you sleeping” using the syllable “la” instead of the words and omits the repetition of the second phrase, so the song is sung A A B C C D D.) Okay, who heard what was different?</p>	<p><b>T:</b> Today, I want you to watch closely. I am going to make a pattern that you have seen before, but I am going to make some changes. Can you tell me what I change? (Makes a pattern of shapes, but changes some of the colors of the shapes).</p>
<p><b>Ss:</b> You only sang one “Brother John.” (nearly all of them declare).</p>	<p><b>Ss:</b> You changed the colors on the triangles (nearly all of them declare).</p>
<p><b>T:</b> Good work. You were able to hear the difference that I made in the song. Even without the words.</p>	<p><b>T:</b> Good work. You were able to see the difference that I made in the pattern.</p>
<p><b>T:</b> Now, What about our questions? What questions would you like to ask about the song and the different patterns?</p>	<p><b>T:</b> Now what about our questions? What questions could we ask the different patterns?</p>
<p><b>Ss:</b> (There are several questions) Can anything be made into a pattern? Can we make new patterns with different songs? Can different patterns be made out of the same song?</p>	<p><b>Ss:</b> (There are several questions) Can anything be made into a pattern? Can we make new patterns with different shapes? Can different patterns be made out of the same colors or the same shapes?</p>
<p><b>T:</b> Those are good questions that need further investigation. Let’s write them for our “question wall” so we can keep track of our questions during the year. We have listened, performed, made something, and thought of questions. What is left for us to do?</p>	<p><b>T:</b> Those are good questions that need further investigation. Let’s write them for our “question wall” so we can keep track of our questions during the year. We have listened, performed, made something, and thought of questions. What is left for us to do?</p>
<p><b>Ss:</b> We need to find other ways to perform the song.</p>	<p><b>Ss:</b> We need to make some patterns ourselves and demonstrate how they work.</p>

**CONVERSATION QUOTE**

*I’ve had the good fortune to work in Nahant for a year and a half, where I was able to see in a public school the effects of the Learning Through Music program, which is a theory-based program, unlike many programs. It’s not based on the personality and charisma of a given artist; it’s based on a theoretical construct. I think that makes it a theory of education, and that’s very important. Then, in part in reaction to that, I’ve shifted focus to one school, the Conservatory Lab School, where I’m in a sense acting as an ethnographer on one hand, and, on the other hand, as a professional developer. Working with the staff there, I’m very concerned about issues of adult development, or teacher learning, professional development.*

Lyle Davidson

The teacher, or an assistant, notes what was done in terms of perception and inquiry on a flip chart. This provides important documentation of the lesson. The resulting record becomes evidence of what is taught and how students respond to the teaching. It is kept as part of the teacher's portfolio and as part of the class portfolio.

*Focus on Creating and Performing (Processes 3-4)*

<i>Music</i>	<i>Math</i>
<p><b>T:</b> What do we need to do to make a new pattern in the song? Who can use parts of the song to make a new pattern?</p>	<p><b>T:</b> What do we need to do to make a new pattern with these shapes? Who can use the shapes and parts of the first pattern to make a new pattern?</p>
<p><b>S:</b> 1 2 3 1 3 4 5-1 2 3 1 3 4 5-(etc.)</p>	<p><b>S:</b> Repeat something.</p>
<p><b>T:</b> Good for you. Can someone make a different pattern? (Several students offer different versions) Good work, first graders. Those are all different patterns. Now, what do we still have to do with this song?</p>	<p><b>S2:</b> (takes shapes and rearranges them into another pattern.)</p> <p><b>T:</b> Good for you. Can someone make a different pattern? (Several students offer different versions)</p>
<p><b>T:</b> Okay, now that you have created a new pattern, who can perform both the original pattern and the new one? It will be hard to do, but who wants to try it?</p>	<p><b>T:</b> Now, can you make the pattern without the repeated part? It will be hard to do, but who wants to try it.</p>
<p><b>S1:</b> sings 1 2 3 1, then pauses and sings 3 4 5-, pauses again and sings <u>5 6 5 4</u> 3-1-, pauses and sings the final phrase.</p>	<p><b>S1:</b> (takes out the first three shapes, then pauses and takes out the three shapes that form the next pattern, pauses again and removes the repeated shapes of the last pattern.)</p>
<p><b>T:</b> Good work! How did you do that?</p>	<p><b>T:</b> Good work! How did you do that?</p>
<p><b>S1:</b> I sang the first part out loud and then the next part to myself.</p>	<p><b>S1:</b> I took out the parts that were copied.</p>
<p><b>T:</b> Let's see, what else can we do?</p>	<p><b>T:</b> First graders: What happened to the pattern?</p>
<p><b>Ss:</b> It's time to reflect on what we have done.</p>	<p><b>Ss:</b> It disappeared!</p>
<p><b>Ss:</b> It's time to reflect on what we have done.</p>	<p><b>T:</b> Let's see, what else can we do?</p> <p><b>Ss:</b> It's time to reflect on what we have done.</p>

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**THE LTM PROCESSES HELP FOCUS THE OBSERVATIONS. THE OBSERVER CAN SEE THE CONTENT BEING TAUGHT (THE LESSON ON PATTERNS) AND ALSO THAT BOTH THE TEACHER AND THE STUDENTS UNDERSTAND THAT THE APPROACH TO THE CONTENT IS STRUCTURED IN A SPECIFIC WAY.**

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The processes of 1) listening and perceiving, 2) questioning and inquiring, 3) performing and making interpretations 4) creating and transforming, and 5) reflecting and making connections are *deliberately* and *explicitly* used in both *designing* and *conducting* the LTM lesson.

The differences between this LTM lesson and the first two lessons (the actual lesson and the interdisciplinary lesson) are important. Let's review them.

The teacher provides explicit instructional framework. Except for the statement of lesson goals, the sample class (and the invented interdisciplinary lesson derived

The teacher, or assistant, in both classes keeps quick notes on the flipchart, recording who created the new patterns and what the patterns were, and how well the students performed, demonstrated, or interpreted, their patterns.

*Focus on Reflecting and Making Connections (Process 5)*

*Music*

**T:** That's right. Where have we seen patterns before? Can you remember?

**S:** On the sidewalk when we go to the playground.

**Ss:** In our math class we have been looking for patterns. We made patterns with our math designs.

**T:** So what would you say about patterns now?

**Ss:** There are patterns everywhere!

**T:** Now it is time to write or draw your reflections in your journal. Be sure to say what you have learning and what connections you can make from music to math, and to your own life.

*Math*

**T:** That's right. Where have we seen patterns before? Can you remember?

**S:** On the sidewalk when we go to the playground. On the stones in the church across the street.

**Ss:** We have been looking for patterns everywhere. We made patterns with our music, when we draw, when we learn our letters.

**T:** So what would you say about patterns now?

**Ss:** There are patterns everywhere!

**T:** Now it is time to write or draw your reflections in your journal. Be sure to say what you have learning and what connections you can make from music to math, and to your own life.

from it) do not refer to any framework that might have been used to shape the lesson. In contrast, the *LTM* class clearly takes place by design. The teacher uses the *LTM* five processes in designing the instruction. They provide a deliberate and explicit framework that helps the students internalize this approach to learning. The forces driving the lesson are demystified. The students know the processes and are expected to use them as they co-structure the different phases of the lesson.

Students learn both process and content. When considering student learning, one need not only seek evidence of content outcomes (having learned the focal concepts of the music or math lesson, for example); one can also consider students' understanding of the process of learning the content. One measure of understanding might be the degree to which students are able to use the processes in a different context. That is, as students internalize the five *LTM*

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**STUDENTS LEARN BOTH PROCESS AND CONTENT. WHEN CONSIDERING STUDENT LEARNING, ONE NEED NOT ONLY SEEK EVIDENCE OF CONTENT OUTCOMES (HAVING LEARNED THE FOCAL CONCEPTS OF THE MUSIC OR MATH LESSON, FOR EXAMPLE); ONE CAN ALSO CONSIDER STUDENTS' UNDERSTANDING OF THE PROCESS OF LEARNING THE CONTENT.**

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processes, one expects to see them make increasing use of the processes during class and in their seat work as well. Eventually, with sufficient scaffolding, students can be expected not only to use the five processes as a reference in their assessments of one another's work, but to use them in designing their own learning as well.

The framework shapes a specific perspective for observing a class. The sample class (and the invented interdisciplinary lesson derived from it) does not provide an explicit framework for structuring an observation. Observations can take

place from any number of perspectives perhaps missing the one intended. In contrast, the *LTM* processes help focus the observations. The observer can see the content being taught (the lesson on patterns) and also that both the teacher and the students understand that the approach to the content is structured in a specific way. The lesson consists of the **concepts** being taught as well as the **structure** used to design it—both the content and the process. The observer can see that engaging multiple perspectives is central to the lesson; that students are able to participate in the design of the lesson; and that the five processes reveal students' individual differences in learning and master-

ing the concepts of the lesson.

The sample class (and the invented interdisciplinary lesson derived from it) provide no explicit structure for evaluation. The *LTM* processes provide a framework for evaluating a class. In addition to being considered for its content, the lesson can be evaluated for the structure used, and for the fullness with which the subject was investigated as students considered patterns from the perspective of each of the five processes.

In summary, in an *LTM* lesson, the teacher uses the five processes, to help students deepen and broaden their understanding of the focal con-

cepts of the lesson. The deliberate cultivation of multiple perspectives ensures that students have opportunities to make connections among the concepts. The explicit work in perception, performance, creation, questioning, and reflection ensures that students have opportunities to exercise and develop their understanding in a variety of modes. Here, individual differences come to the foreground, as students differ in their ability and inclination to make use of the processes. Finally, the explicit reaching out to make connections across lessons, subjects, and contexts ensures opportunities to realize the degree to which the focal concepts are a part of different areas of school and life.¶

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- <sup>1</sup> Eston, R. & Economopoulos, K. (1998). *Pattern Trains and Hopscotch Paths: Exploring Pattern*. Cambridge: TERC Investigations in Number, Data, and Space. Cambridge. Menlo Park: Dale Seymour Publications. and Wright, T., Neminovsky, R., & Tierney, C. (1998). *Timelines and Rhythm Patterns: Representing Time*. Cambridge: TERC Investigations in Number, Data, and Space. Cambridge. Menlo Park: Dale Seymour Publications.

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## FIVE PROCESSES AT WORK: EXCERPTS FROM CARYN CLaar’S TEACHER PORTFOLIO AT THE CONSERVATORY LAB CHARTER SCHOOL

The following photo essay represents an essential element of being a professional educator: the creation of a teacher’s portfolio. Excerpts from Caryn Claar’s portfolio not only reveal the artful work of a skilled teacher at an innovative school, but also show how standards for Learning Through Music are often best understood from the point of view of the teacher and her student’s work.

Caryn Claar is a founding teacher at the Conservatory Lab Charter School, an Elementary School community dedicated to furthering the role of music in public school education. Although this school originated with the vision and support of New England Conservatory faculty, administrators, trustees, and overseers, it is the teachers and staff of the lab school who bring the vision of the school to life. Hence, the excerpts from this teacher portfolio illustrate more than promising practices of a laboratory school; they embody the premises of Learning

Through Music (illustrated in the table on the following page). Through Ms. Claar’s work, we see music’s equal role in the curriculum, music as a medium and model for employing the Five Fundamental Processes and Fundamental Concepts shared across disciplines, as well as music as a resource for social-emotional development, a tool for more expansive assessment of learning, and the building of a strong school community.

The following pages are also integrated with quotations from Caryn Claar’s portfolio annotations as well as interview excerpts from members of the school and conservatory communities who attended the Making Music Work for Public Education conference. The interviews were conducted and first presented on the “Arts for Learning” website project sponsored by National Young Audiences, Richard Bell, Executive Director, and are now posted also on New England Conservatory’s Music-in-Education website ([nec.musicined.org](http://nec.musicined.org)).

### INTERVIEW QUOTE

**THE LEARNING THROUGH MUSIC “FIVE LEARNING PROCESSES” ARE FORMED BY LOOKING CLOSELY AT HOW MUSICIANS DEVELOP THEIR PRACTICE AND THEIR ARTISTRY. AS MUSICIANS LISTEN, PERFORM, CREATE, AND INVENT, THEY ALSO ARE VERY INVOLVED IN QUESTIONING AND REFLECTING ABOUT WHAT THEY DO. THUS, THE FIVE PROCESSES REPRESENT A DESIGN AND IMPLEMENTATION STANDARD FOR ENGAGING LEARNING ACROSS SUBJECT AREAS.**

**—Lyle Davison, Undergraduate Theoretical Studies and Music-in-Education Faculty, New England Conservatory**

Teaching With The 5 Processes



Caryn Solomon  
2001-2002

*Teachers at the Conservatory Lab Charter School are asked every year to summarize their year's work in a teaching portfolio. Caryn Claar took this requirement as an opportunity to present hew view of the Learning Through Music Premises and to illustrate their practical application to a public school first-grade classroom.*

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This portfolio is designed to illustrate the premises of a Learning Through Music Classroom. The core concept of a Learning Through Music classroom involves a teaching style and curriculum that values music. Music is treated as an academic subject as well as a model for learning. One imagines a performer and the skills he/she must maintain and use consistently in order to learn a piece of music. These skills or fundamental processes are listed below.

**Listening:** observing, discriminating, perceiving, describing

**Creating:** inventing, transforming, improvising, and producing

**Perform:** demonstrate, interpret, and follow through, mastery of skill

**Inquiry:** question, investigate, analyze

**Reflect:** connections, self assess, establish goals, revise work

The teaching style and curriculum in my classroom value these processes.



## PHOTO ESSAY

### Practicing Good Listening

We want children to become better listeners in first grade. Listening is important for learning. Children need to listen to lessons, listen to and follow directions, and participate in discussion which all require good listening. The children learn how to be good listeners by not talking, putting their eyes on the speaker, and by facing their body towards the speaker. We call this our school listening look position. To practice being good listeners we complete activities that require much listening and concentration. For this activity the children listened to the music and had to write down the name of the song and the instruments that they heard.

Listen to the music and draw the instruments that you hear.

The image shows four rows of hand-drawn sketches and text. Each row contains a drawing of an instrument, a label for the instrument, and a handwritten song title. The first row shows a drawing of a clarinet with the label 'clarinet' and the song title 'twinkle twinkle'. The second row shows a drawing of a french horn with the label 'french horn' and the song title 'oh to Joy'. The third row shows a drawing of chimes with the label 'chimes' and the song title 'Happy Birthday'. The fourth row shows a drawing of a drum and a clarinet with the label 'clarinet' and the song title 'its a Hot New World'.

Write the name of the song.  
twinkle twinkle

Write the name of the song.  
oh to Joy

Write the name of the song.  
Happy Birthday

Write the name of the song.  
its a Hot New World

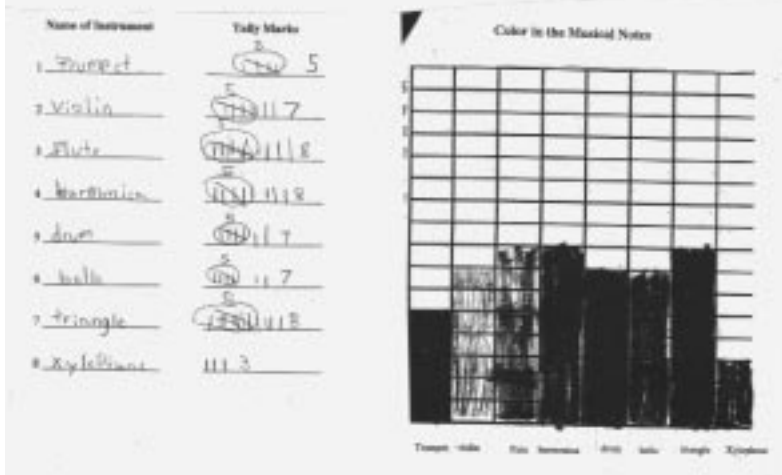
*This page demonstrates how good listening is valued in the classroom as a skill for its own sake and as a tool for developing perceptual skills through music.*



## PHOTO ESSAY

### Collecting Data

The Massachusetts Frameworks states that First Graders need to be able to collect and describe data. For this activity children were listening to music and recording the names of the instruments that they heard and how many times they heard specific instruments. The children learned how to use tally marks to record the number of times played. Following this collection of data, children were asked to graph their results. Using a bar graph, first graders were able to show which instruments they played the most and least of. Questions given to the children after the graph was completed showed their understanding of the data collected.



## TEACHER QUOTE

CHILDREN ARE NATURALLY CURIOUS. THIS CURIOSITY IS WONDERFUL FOR THE LEARNING PROCESS. THROUGH A DISCOVERY PROCESS OF QUESTIONS AND ANSWERING CHILDREN LEARN TO BE INDEPENDENT CRITICAL THINKERS. QUESTIONS ARE ASKED THAT REQUIRE THE CHILDREN TO RECALL FACTS AS WELL AS INTERPRET INFORMATION. CHILDREN IN FIRST GRADE LEARN THAT EVERY QUESTION IS A GOOD QUESTION AND THE APPROPRIATE WAYS TO ASK A QUESTION. STUDENTS ALSO LEARN THE DIFFERENCE BETWEEN QUESTIONS AND COMMENTS. QUESTIONING CAN BE SEEN THROUGHOUT THE DAY IN BOTH TEACHER-LED AND SMALL STUDENT GROUPS.

—Caryn Claar, Conservatory Lab Charter School first-grade teacher (from her Teacher Portfolio)


**Feelings**

In the beginning of the year we talk a lot about feelings. We talk about all the different emotions and situations in which we feel these ways. We also role-play situations that make us feel a certain way and how to make ourselves feel better. For example, we act out things that make us angry or mad and what we can say to our friends to help the situation. For this activity we listen to music and make a face to show how the music makes us feel. We talk about the elements in the music that make us feel a certain way. Listening to music and writing how we feel helps the children begin to start talking about their own feelings.

**Music Listening**  
**Music By Vivaldi—The Four Seasons**

How would you describe this music?

happy joyful 😊      sad unhappy 😞      mad angry 😡

- Song 1 
- Song 2 
- Song 3 
- Song 4 
- Song 5 

*The Music Listening Program at the Conservatory Lab Charter School is designed not only for children to be perceptive about the music, but also to be perceptive about themselves.*

**Sorting Instruments**

The students' become really good at sorting objects by size, color, thickness, and by number of sides. Children watch their teachers and peers for new ways to sort at first. After a while, children are able to look at the properties of an object and begin sorting the objects by themselves. In this activity, children were sorting different instruments by the material they were made of, the sounds they made, and the orchestra groups they belonged to. Many children had to really think about the instruments and reflect upon its properties before deciding how to sort them.

**INTERVIEW QUOTE**

IT IS NOT ENOUGH FOR HIGHER EDUCATION TO PROVIDE PRE-SERVICE TRAINING FOR TEACHERS FOR CONVENTIONAL MUSIC EDUCATION PROGRAMS. WE NEED TO INFLUENCE SCHOOLS AS TO WHAT KIND OF PROGRAMS WE ARE TRAINING OUR TEACHERS FOR. WE AT THE CONSERVATORY HAVE DECIDED THAT WE NEED TO IMPLEMENT LEARNING THROUGH MUSIC PROGRAMS TO SET A STANDARD FOR WHAT CAN BE DONE IN PUBLIC SCHOOLS AND, AT THE SAME TIME, LOOK DEEPLY AT OWN PROGRAMS AND ASK, WHAT KIND OF EDUCATORS CAN OUR STUDENTS BECOME?

—Larry Scripp, Chair Music-in-Education, New England Conservatory and Founding Co-Director, Conservatory Lab Charter School

### **Making Patterns**

Our math curriculum invites children to find patterns everywhere. We investigate the one hundred square, the calendar, our classroom, and our clothes for patterns. We make patterns with pattern blocks, our bodies, and with music. For this activity children made a pattern with pattern blocks. Next the children decided which instrument was represented by each shape. Children read their pattern block pattern as they played their instruments, creating a beautiful sounding pattern.



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## INTERVIEW QUOTE

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WE ALWAYS ASK KIDS QUESTIONS THAT SHOW THEIR KNOWLEDGE. WE ASK THE KIDS TO REFLECT ON THEIR WORK, AND WE TRY TO HAVE THE KIDS ACTUALLY DOING ACTIVITIES SO THEY COME UP WITH GOOD FIRST-HAND KNOWLEDGE.

—Caryn Claar, first grade teacher, Conservatory Lab Charter School

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## PHOTO ESSAY

### Number Stories

Children write number stories for both separating (subtraction) and combining (addition) situations. Children are capable of writing two sentences with information and then a question sentence. We discuss words like "altogether," "more than," and "least" so that children are able to answer word problems independently. For this activity children were asked to listen to a piece of music and write a word problem using the instruments they heard in the piece. Listening to music gave the children an exciting context to write about.

Word Problem:

I heard 8 Flute Beats then I heard  
4 Trumpet Beats how many beats  
did I hear?

$$\underline{00000000 + 0000 = 12}$$

$$\underline{8 + 4 = 12 \text{ I heard 12 beats}}$$

all.

## INTERVIEW QUOTE

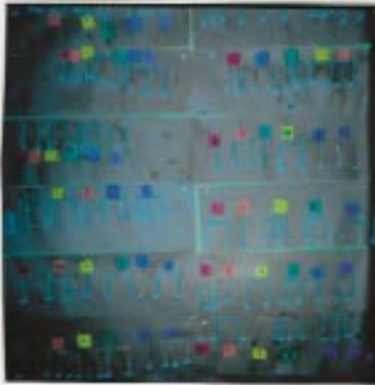
MUSIC IS AN EXTREMELY RICH KIND OF EXPERIENCE IN THE SENSE THAT IT REQUIRES COGNITION, IT REQUIRES EMOTION, IT REQUIRES AESTHETICS, IT DEVELOPS PERFORMANCE SKILLS, INDIVIDUAL CAPABILITIES. THESE THINGS HAVE TO BE DEVELOPED AND ALL HAVE TO BE SYNCHRONIZED AND INTEGRATED SO THAT, AS A PERSON LEARNS MUSIC, THEY STRETCH THEMSELVES MENTALLY IN A VARIETY OF WAYS. WHAT WE ARE FINDING IS THAT THE KIND OF MENTAL STRETCHING THAT TAKES PLACE CAN BE OF VALUE MORE GENERALLY, THAT IS, TO HELP CHILDREN IN LEARNING OTHER THINGS. AND THESE OTHER THINGS, IN TURN, CAN HELP THEM IN THE LEARNING OF MUSIC, SO THAT THERE IS A DIALOGUE BETWEEN THE DIFFERENT KINDS OF LEARNING.

—Martin Gardiner

## PHOTO ESSAY

### **Patterns With Music Notes**

The students wrote their own music using q-tips to create takis and chas. Following the creation of a music score, children were asked to play their notes on the xylophone. Students learn how to read their music at the same time as playing the instrument. Children listened carefully to each of the performances and were able to guess the pattern being played.



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## TEACHER QUOTE

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CHILDREN BEGIN TO PERFORM AS SOON AS THEY LEARN TO CREATE. READING IN THE AUTHOR'S CHAIR, SINGING A FAMILIAR SONG, SOLVING A MATHEMATICAL PROCEDURE, YOUNGSTERS ARE SHOWING EXAMPLES OF HOW USEFUL PERFORMANCE IS THROUGHOUT THE DAY. STUDENTS' ABILITY TO PERFORM BECOMES MORE NATURAL AS THEY LEARN TO SPEAK IN FRONT OF AN AUDIENCE AND GAIN THE CONFIDENCE TO COMPLETE A TASK INDEPENDENTLY. STUDENTS PERFORMANCE BECOMES MUCH MORE MEANINGFUL WHEN THEY GAIN THE SKILLS TO PLAN AND DEVELOP THEIR IDEAS BEFORE THEY PRESENT THEM. STUDENTS ARE GIVEN OPPORTUNITIES THROUGHOUT THE DAY TO DEMONSTRATE AND SHOWCASE THEIR WORK, WHICH HELPS CHILDREN FIND THEIR VOICES. PERFORMANCE IS AN INTEGRAL PART OF OUR DAY BECAUSE IT NOT ONLY SUPPORTS THE LEARNER, BUT ALSO THE OBSERVER.

—Caryn Claar, Conservatory Lab Charter School first-grade teacher (from her Teacher Portfolio)

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## PHOTO ESSAY

### Reflection In The Classroom

We ask children to think about the class as a whole and their own individual behavior using rubrics throughout the day. First graders are starting to realize that their actions have consequences, good and bad, and that they can look at their behavior to improve themselves and the class. Children during the year learn how to rethink problems and question their beliefs. Students become self-reliant and motivated to improve their own work. Students throughout the year make connections by establishing goals and continuously revising their work.



### Rethinking Cooperation

After reading the story, "Swimmy" by Leo Lionni, students are able to think about cooperation. Students are able to look at their day and think about when cooperation is necessary and what they can do to be a better team player. Students write their reflections on a small fish that eventually becomes one large fish.

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## INTERVIEW QUOTE

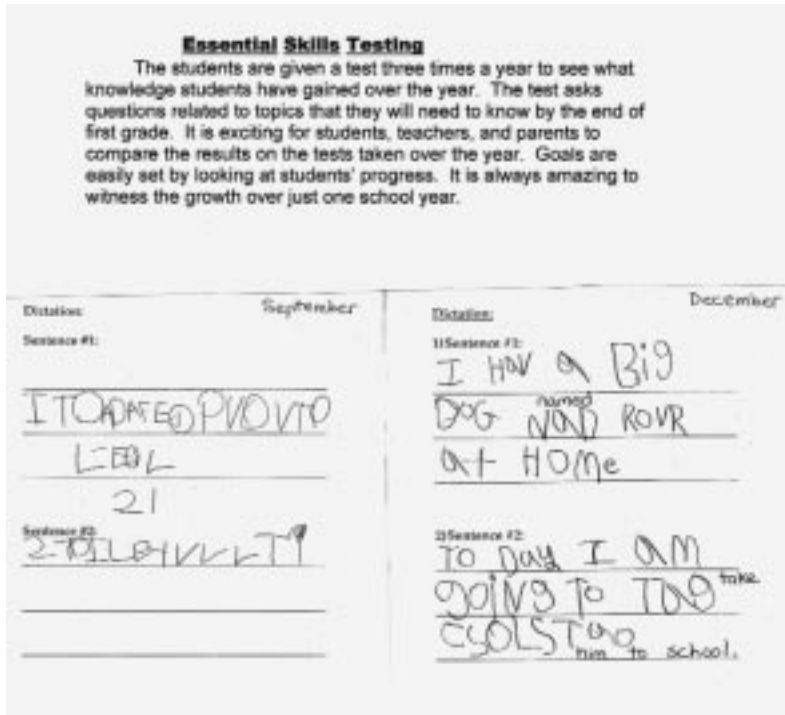
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LEARNING IS COMPLEX ENOUGH THAT IT'S DOUBTFUL THAT WE'RE GOING TO SEE A DIRECT "CAUSE AND EFFECT" ONE-WAY RELATIONSHIP BETWEEN ANY ONE FACTOR AND LEARNING, ESPECIALLY IN MUSIC, BECAUSE MUSIC IS NOT A SOLITARY THING THAT CAUSES LEARNING. ON THE CONTRARY, MUSIC ENGAGES A COMPLEX SET OF LEARNING PROCESSES SIMULTANEOUSLY, PROCESSES THAT CREATE INTERACTIONS AMONG OTHER KINDS OF AESTHETIC, PHYSICAL, COGNITIVE, AND SOCIAL-EMOTIONAL PROCESSES. INTERACTIONS SUPPORTED BY INTEGRATIVE LEARNING SHOULD BE WHAT INTERESTS US IN EDUCATION— THAT IS, CREATING OPTIMAL CONDITIONS FOR LEARNING SUCH THAT, IF YOU STUDY HARD IN ONE AREA OF THE CURRICULUM, IT'S GOING TO BENEFIT LEARNING IN ANOTHER.

—Larry Scripp, Research Center for Learning Through Music, New England Conservatory

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# PHOTO ESSAY



Reflection is a cognitive skill that includes the ability to self assess and understand progress over time. Whether using pre-post writing skills tests (above) or the use of invented symbols to notate music from one year to the next (see next page), Conservatory Lab Charter School portfolio samples provide a vehicle and an occasion to assess the relationship of music to literacy skills in math and language at the same time.