



## **Big Bang = Big Change Evaluation Report**

### **Executive Summary**

A partnership was developed, pairing a newly consolidated school, Morgan Maxwell K-8, with Odaiko Sonora, a southern Arizona taiko group, and Opening Minds through the Arts (OMA), an arts integration program. The goal was to provide weekly taiko instruction to 5<sup>th</sup> and 6<sup>th</sup> grade students at Morgan Maxwell. This instruction and accompanying performances were designed to impact students in various ways; increase student achievement in mathematics, improve attendance rates, and play a role in the development of a stronger community the participating classrooms.

Student achievement was measured using district ATI pre-post scores in relevant standards. Attendance was measured on Tuesdays and Thursdays. (Thursdays were Taiko days and Tuesdays were considered as control days.) Teachers were asked to fill out surveys related to their understanding of arts integration and their feedback about the impact of the program in their classrooms. Students were asked to write about what they felt about the taiko experience.

Results in ATI scores and attendance were analyzed for differences within Maxwell as well as when compared with a control school. The control school was chosen because of its similarities with Maxwell in enrollment numbers, ethnic breakdown, and socio-economic level. These results showed a positive impact in all three areas of potential impact. Students who participated in the taiko lesson showed a positive increase in the number of students meeting the standard for the standards addressed in the lessons. This increase was greater than the increase gained at a comparable control school in 5 of the 6 standards reviewed. Attendance rates increased on Thursdays as compared to Tuesdays, to a greater degree than the Control school. Feedback from teachers and students showed a positive impact related to community building and self-confidence.

# **Big Bang = Big Change Evaluation Report**

## **Introduction**

### **Background Information**

The program partnered Odaiko Sonora, southern Arizona's leading taiko group; Morgan Maxwell K-8 School in Tucson Unified School District, and Opening Minds through the Arts (OMA), a nationally recognized arts integration program, for a collaborative pilot arts project that integrated ancient Japanese drumming with the tested curriculum. The Odaiko Sonora taiko drumming group provided weekly instruction to all 5<sup>th</sup> and 6<sup>th</sup> grade students in the art of ancient Japanese drumming, tying their lessons to 5<sup>th</sup> and 6<sup>th</sup> grad mathematics standards. The year included public performances in December and again at the end of the year.

### **Importance of this topic**

Morgan Maxwell School was reconstituted from the closure of two elementary schools. As schools merge, there are issues of building a new community while continuing to focus on student achievement. The power of the taiko project, the emphasis on collaboration as well as the integration of the math standards could help unite the students from the two schools and build a new, unified community, and create a diverse, rigorous learning environment that is focused on high academic achievement for every student.

### **The Intent of the Study**

The intent of this study is to determine whether student achievement was impacted by the presence of weekly Taiko lessons, as well as whether attendance improved on Thursdays, when the Taiko duo were at the school. There is also interest in whether the program helped the school build a sense of community among students who in the previous year had attended different schools.

### **Theoretical Framework**

OMA has a long history of providing high quality arts integration instruction, developing collaborative teams and building strong communities, with a record of supporting and improving student achievement. Odaiko Sonora's teaching artists have joined the OMA teaching artist team recently, and in that short time, they have had successful and highly enjoyable experiences introducing taiko drumming to students to both middle and elementary school children. Given that the taiko drumming team has provided arts integrated instruction, it is believed that this program will also have an impact on student achievement and community building.

This belief is based on sound research results. *Champions of Change*, the landmark report on arts education, indicates that music instruction helps the students that need it the most, and not just in the area of math. "Students of lower socioeconomic status gain as much or more from arts instruction than those of higher socioeconomic status," (Fiske, *Champions of Change*) and "students (of lower SES) who took music increased their math scores significantly . . . but just as important, reading, history, geography and even social skills soared by 40 percent." (Catterall et al., *Champions of Change* 1999). In one of the many research examples, a test group that received music instruction as well as math instruction scored 15 percent higher than the comparison group that received only math instruction. (Graziano, A., Peterson, M., and Shaw, G. (1999, March, *Neurological Research*).

## **Structure of the paper**

Following a description of the study methodology, the paper will present results in the following order:

- ¤ Student achievement data, in the form of 5<sup>th</sup> and 6<sup>th</sup> grade pre-post math scores, as measured by the Assessment Technology Incorporated (ATI) assessments, developed for TUSD.
- ¤ Attendance data results, comparing Tuesday and Thursday rates at Maxwell as well as comparing rates with a control school.
- ¤ A review of anecdotal data about students' perceptions of the benefit of the taiko drumming experience in their classrooms
- ¤ A summary of feedback from classroom teachers, both on their progressive understanding of arts integration as well as their thoughts about the presence of the program in their classrooms.

## **Methodology**

The Big Bang = Big Change program was believed to have had impact in several ways. One area was academic achievement, specifically with the math standards addressed in the lessons. Attendance rates were also thought to be affected, with students more inclined to attend school on days when there were taiko lessons. Also, because Morgan Maxwell was a newly consolidated school, participation in taiko lessons and performances would have an positive impact on classroom community and student self-confidence. These aspects were measured in four ways:

- ❖ Focusing on the 5<sup>th</sup> and 6<sup>th</sup> grade students who engaged in the program on Thursdays, throughout the year, ATI assessments mathematics assessments were analyzed, comparing pre-test data (August/September) and post-test data (March 2014). Comparisons will be made with a school with similar demographics.
- ❖ Attendance rates were compared within Morgan Maxwell, comparing rates on Tuesdays versus Thursday, in addition to comparing rates with the control school.
- ❖ Teachers completed a Self-Assessment survey, measuring their familiarity with and implementation of arts integration in their classrooms. The survey was administered twice; once in January and once at the end of the year. The survey in January asked them to reflect on how their knowledge has changed over a 3 to 4 month period. The end of the year survey asked them to reflect on their end-of-year knowledge.
- ❖ Students were given writing prompts after some Taiko sessions, in one 6<sup>th</sup> grade class in particular. The end-of-the-year prompts were analyzed for insight into students' perceptions of the benefit of the Taiko instruction.

## **Evaluation Results**

### **ATI Student Assessment Data**

ATI standards assessments are given to students in TUSD, beginning in the 2<sup>nd</sup> grade, three times a year. The assessment in August/September is a pre-test, the assessment in November/December provides progress monitoring information, and the assessment in March is the post-test. These assessments are highly correlated with the state administered AIMS assessment, which is given in April. The ATI assessments are used to gauge student growth and success on the AIMS.

In both 5<sup>th</sup> and 6<sup>th</sup> grade Taiko drumming lessons, three mathematics standards were the primary focus. Therefore it is anticipated that students who had received weekly taiko lessons would have improved scores on those standards, as compared to a control school.

The fifth grade math standards were as follows:

- ◆ **AZ-5.NF.A.1** Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
- ◆ **AZ-5.NF.A.2** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.
- ◆ **AZ-5.NF.B.3** Interpret a fraction as division of the numerator by the denominator ( $a/b = a \cdot b^{-1}$ ). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.

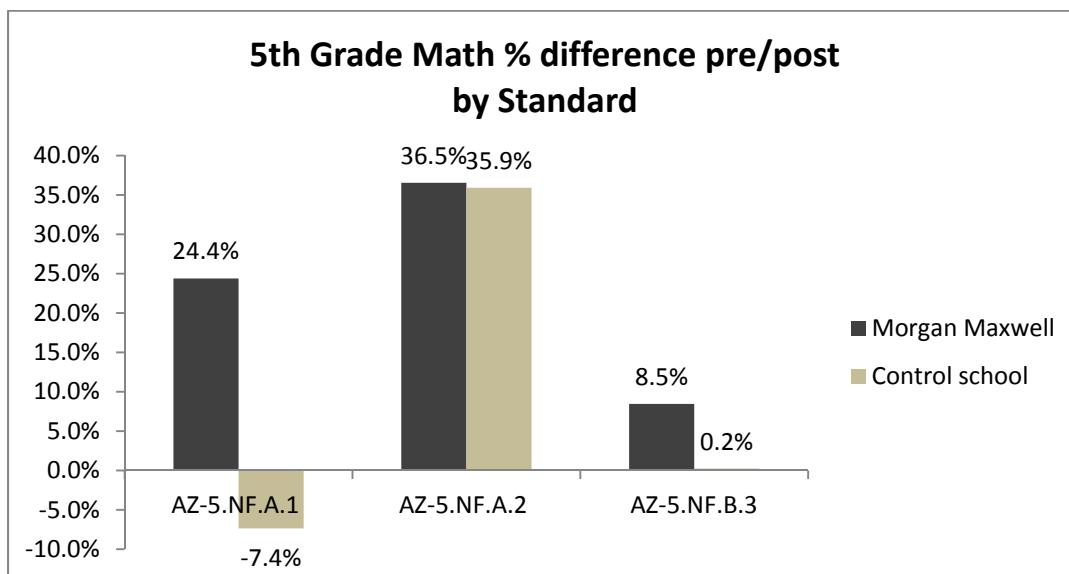
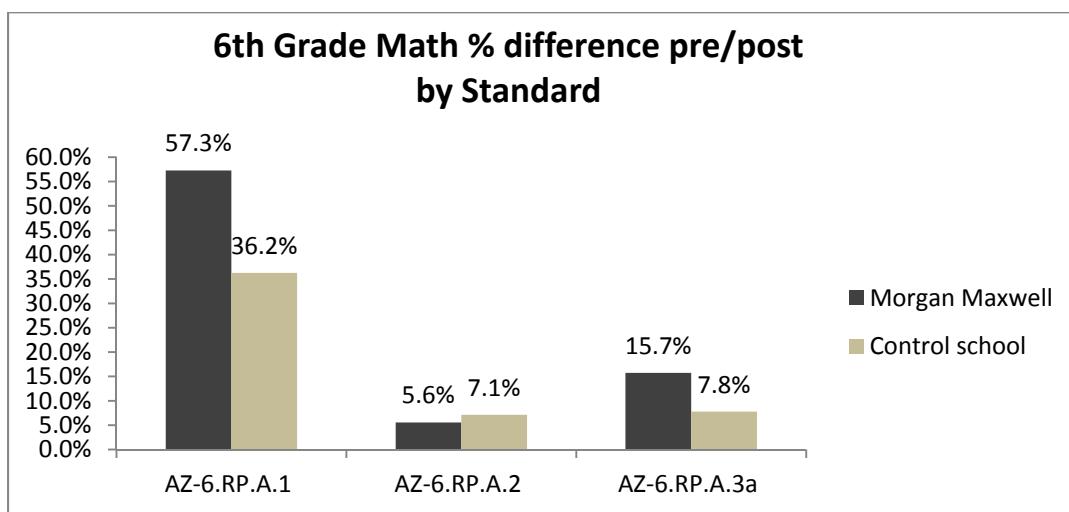
The sixth grade math standards were as follows:

- ◆ **AZ-6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
- ◆ **AZ-6.RP.A.2** Understand the concept of a unit rate  $a/b$  associated with a ratio  $a:b$  with  $b \neq 0$ , and use rate language in the context of a ratio relationship.
- ◆ **AZ-6.RP.A.3a** Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

The data used for comparison were pre- and post-test data, looking at the gain in the percentage of students who met each of the standards. This was determined by finding the difference between the pre-test percentage meeting the standard and the post-test percentage. Tables 1 and 2 provide the comparison data.

Fifth grade math results show Morgan Maxwell students with greater gains in the percentage of students meeting the standard, as compared to students at the Control school. For the standard **AZ-5.NF.A.1**, the difference was 31.8 percentage points; for **AZ-5.NF.A.2**, the difference was just .6 percentage points; and for **AZ-5.NF.B.3**, the percentage point difference was 8.3.

Sixth grade math results show Morgan Maxwell students with greater gains in the percentage of students meeting the standard on two of the three standards, as compared to students at the Control school. For the standard **AZ-6.RP.A.1**, the difference was 21.1 percentage points; and for **AZ-6.RP.A.3a**, the difference was 7.9 percentage points. For **AZ-6.RP.A.2**, the percentage point difference was 1.5, with the Control school making slightly greater gains.

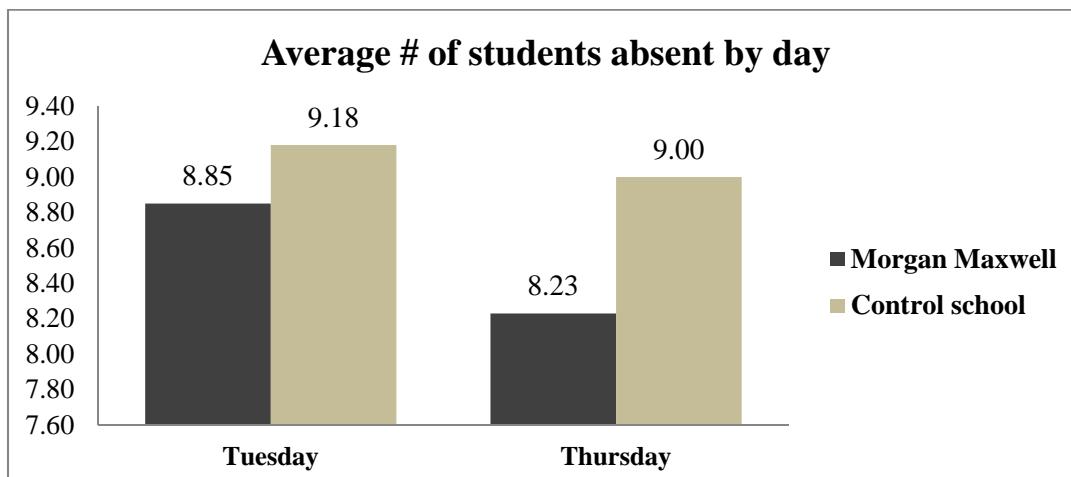
**TABLE 1****TABLE 2**

### Student Attendance Data

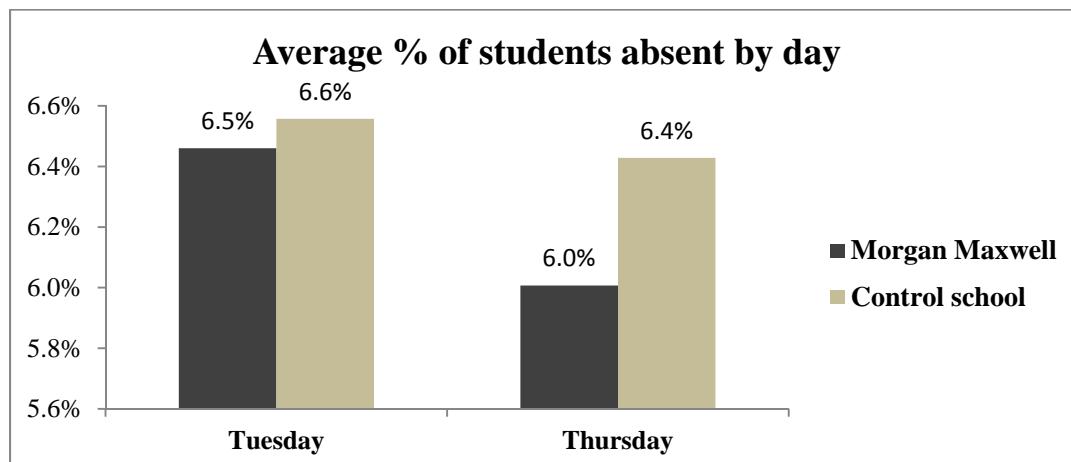
Data were collected for all 5<sup>th</sup> and 6<sup>th</sup> grade students at both Morgan Maxwell and the Control school. Comparisons were made between the two schools in addition to comparing Tuesday's and Thursday's attendance rates at Morgan Maxwell. Thursdays were measured because Taiko sessions were held on those days. Tuesdays were measured as a control day. Tuesday was chosen because historically in most schools, Monday and Friday have higher absentee rates than Tuesdays and Thursdays, and Wednesday is an early release day. Table 3 shows the average number of students absent each day at each school. Because the difference in total enrollment varied throughout the year, with the Control school having from 3 to 8 more students enrolled in 5<sup>th</sup> and 6<sup>th</sup> grade than Morgan Maxwell, Table 4 shows the average percent of students absent each day.

Both schools show a slightly higher attendance rates on Thursdays, as compared to Tuesdays. The Morgan Maxwell attendance rate showed a greater improvement on Thursdays, as compared to the Control school. Morgan Maxwell showed a decrease of .62 students absent, or a decrease of .5% of the enrollment. The Control school showed a decrease of .18 students absent, or a decrease of .2% of the enrollment.

**TABLE 3**



**TABLE 4**



### Teacher Feedback

Participating teachers were sent a self-assessment survey in January, asking them to assess their understanding of arts integration, as measured by their self-ratings on eight statements. (see Appendix A) They were asked to reflect on their understanding the previous September, as well as their understanding in January, using the scale of **1=“not at all” to 5= “to a great extent.”** Four participants responded to that survey. The survey was also sent in mid-May, asking for their understanding of arts integration in May. Three participants responded; two had also completed the January survey and one was completed by a teacher new to Morgan Maxwell in February.

Comparisons were made between ratings at the beginning of the year compared to either January or end of the year ratings. The differences between the average scores in September and the

average scores in January/May were calculated. Increases in understanding ranged from 1 point to 2.5 points. The greatest increases were related to an understanding of integrating the arts in the classroom (2.0), as well as the actual level of arts integration in the participants' classrooms (2.5). See Table 5.

**TABLE 5**

<b>Arts Integration Self-Assessment</b>		
<b>Arts Integrated Lessons</b>		<b>Student Collaboration</b>
My understanding of how classroom lessons can integrate the arts with content area concepts	<b>2.0</b>	My understanding of collaborative learning strategies <b>1.3</b>
The level of arts integration with content area concepts in my lessons.	<b>2.5</b>	Opportunities for my students to be engaged in collaborative learning. <b>1.5</b>
<b>Authentic Performance Assessment</b>		<b>Student Engagement</b>
My understanding of how authentic assessments could be developed using the arts to assess student knowledge of the curriculum.	<b>1.8</b>	My understanding of different ways to motivate and engage students. <b>1.0</b>
My use of authentic assessment to assess my students' knowledge of the curriculum	<b>1.7</b>	My students level of self-motivation and engagement in their own learning. <b>1.5</b>

Participants were also sent a feedback form at the end of the year (see Appendix B), asking them for feedback regarding various aspects of the program. They were asked to rate 5 statements on a scale of 1 to 5, with **1=“not at all”** and **5= “to a great extent.”** Three teachers completed the form. Their average ratings ranged from 4.00 to 4.67. See Table 6.

**TABLE 6**

<b>Big Bang=Big Change Feedback Form</b>	
The experience my students with the Taiko artists and the opportunity to learn and play Taiko songs helped build a sense of community in my classroom.	<b>4.67</b>
The experience my students with the Taiko artists and the opportunity to perform Taiko songs helped my students gain a sense of pride and self-discipline.	<b>4.67</b>
My students gained a deeper understanding of the math standards that were addressed through Taiko.	<b>4.00</b>
My experience with the Taiko artists gave me ideas about how to integrate the arts in my instruction.	<b>4.67</b>

<p>My comfort level with arts integration has increased because of the Taiko experience.</p>	<b>4.33</b>
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Comments included the following:

“My class was unable to get along at all and now, I look at the friendships that have been built and I KNOW that Taiko played a huge part in that.

Having students work together on drums, even when they didn’t “like” each other made a big difference.”

“The students really felt empowered by their taiko experience. Many people who visited my classroom commented on how much my students seemed to care about each other.”

“Most of my students stated the year feeling less than wonderful. Today they are self-confident and so proud of themselves. Taiko helped a great deal in that!”

“While that sense of pride and self-discipline was evident in the taiko classroom, some of them carried that feeling through the curriculum. Several of my IEP students made tremendous improvements over this school year. There were a few, however, who felt good about taiko, but still have behavioral difficulties during the rest of the day.”

Math scores went up dramatically after the fraction lessons. They begin to really understand, and their scores went up on Math tests with this concept.”

“When working with fractions and ratios, several students made remarks about the ratios they learned in taiko.”

## Student Feedback

Forty-eight 6<sup>th</sup> grade students were asked to write about their taiko experience and what the experience meant to them. All of them responded. Their responses dealt with their nervousness about learning something new, their interest in drums and drumming, and the performances they were involved in. They talked about their sense of accomplishment about learning the songs and performing in front of a large audience. They also talked very positively about their taiko instructors and thanked them for the opportunity to learn to play taiko. They felt privileged to be able to be involved in taiko and hoped that they could have taiko again next year.

Typical comments from twelve of the students are below:

1. “The performance was exciting and nerve-wracking. We faced our fears of performing in a performance. That was the best day of my life because we played our first taiko performance.”
2. “I am really proud of our class. I really enjoyed playing and learning taiko. I hope we have taiko next year.”
3. “Taiko helped me this year with my ratios and to teach me self confidence. Taiko also taught me that I can accomplish anything in life.”

4. “To tell the truth, I have a lot of energy. Sometimes the classroom feels like, well, a holding cell. This is when taiko practice can’t come soon enough. This break from class helps me to focus my energy better.”
5. “Taiko keeps me calm when I play a song with my class. Taiko made me feel like I had a great talent. Talent doesn’t come from strength and not beauty, it comes from the heart.”
6. “May 3<sup>rd</sup> was both a happy time and sad time. It’s happy because we got to perform at Sahuaro High School but sad because that was our last taiko performance. I did feel nervous and messed up once or twice, but I messed up with a smile. That’s what counts.”
7. “When we learned our first song it was exciting for me because it was the first song I learned. I felt like I accomplished something with I learned that song.”
8. “I was scared at the Showcase because there were a lot of people there and I was o a drum by myself. Once we were done I wanted to perform again. I was so happy I didn’t mess up.”
9. “What taiko meant to me? It was a great honor for me to be in taiko. Taiko drums are the best instrument I ever learned to play. I want to be an amazing taiko player like Hamner sensei and Levesque sensei.”
10. “I think playing taiko was the best thing we ever had.”
11. “I had no idea that, by the end of the year, I would have already performance an awesome song!”
12. “Now that I have thought and wrote about it a little bit, I enjoyed taiko. I learned more than I thought I would. Mostly, I learned that learning new things and doing them with others can be a lot of fun.”

### **Discussion and Limitation**

The above-mentioned results show an over-all positive impact of the “Big Bang=Big Change” program at Morgan Maxwell school. Students who participated in the taiko lesson showed a positive increase in the number of students meeting the standard for the standards addressed in the lessons. This increase was greater than the increase gained at a comparable control school in 5 of the 6 standards reviewed. Attendance rates increased on Thursdays as compared to Tuesdays, to a greater degree than the Control school. Feedback from teachers and students showed a positive impact on the school and the students.

There are limitations to generalizing these results. The positive impact that was shown by the program were consistent trends, but no attempt was made to find statistical significance. Both the achievement and attendance gains are also tied to the commitment of the classroom teachers and quality of the taiko instructors. Of the 5 participating classroom teachers, only 2 showed a high level of commitment, as measured by their constant attendance and participation and their willingness to support taiko lessons in their classrooms. End of year feedback forms were only completed by 3 of the teachers, so there is no way of knowing how the remaining two felt about the program. Student essays about the impact of taiko on the students were only assigned by two of the teachers. While it is believed that similar responses would come from the other students, this is theoretical speculation.

## Appendix A

### Big Bang=Big Change Self-Assessment

Date: \_\_\_\_\_ Name (optional): \_\_\_\_\_

As part of the ***Arizona Commission on the Arts*** grant, we are asked to evaluate the success of the “Big Bang = Big Change” residency. The following survey is designed to help with that evaluation by measuring your level of knowledge about arts integration, both prior to the “Big Bang = Big Change” residency and again mid-year and at the end of the residency. The intent of this survey is to gauge the success of the residency and is in no way an evaluation of the individual teachers involved. Please think back to September to rate the statements prior to the residency, as well as how you would rate your knowledge currently. Rate the following statements from a scale of 1 to 5, with 1 = “not at all” and 5 = “to a great extent.”

{1="not at all" to 5="to a great extent"}  
Prior to residency                              Currently

Arts Integrated Lessons										
❖ My understanding of how classroom lessons can integrate the arts with content area concepts	1    2    3    4    5					1    2    3    4    5				
❖ The level of arts integration with content area concepts in my lessons.	1    2    3    4    5					1    2    3    4    5				
Authentic Performance Assessment										
❖ My understanding of how authentic assessments could be developed using the arts to assess student knowledge of the curriculum.	1    2    3    4    5					1    2    3    4    5				
❖ My use of authentic assessment to assess my students' knowledge of the curriculum	1    2    3    4    5					1    2    3    4    5				
Student Collaboration										
❖ My understanding of collaborative learning strategies	1    2    3    4    5					1    2    3    4    5				
❖ Opportunities for my students to be engaged in collaborative learning.	1    2    3    4    5					1    2    3    4    5				
Student Engagement										
❖ My understanding of different ways to motivate and engage students.	1    2    3    4    5					1    2    3    4    5				
❖ My students level of self-motivation and engagement in their own learning.	1    2    3    4    5					1    2    3    4    5				

## **Appendix B**

### **Big Bang=Big Change Feedback Form**

Name: \_\_\_\_\_

We appreciate the opportunity to spend time in your school this past year. We hope it was a positive experience for you and your students. Please take a minute to give us feedback about the Taiko experience. Indicate your agreement with each statement on a scale of 1 to 5, with 1 = "not at all" and 5 = "to a great extent."

**{1="not at all" to 5="to a great extent"}**

<p>My students' experience learning and playing Taiko songs with the Taiko sensei helped build a sense of community in my classroom.</p>	N/A    1    2    3    4    5
<p>Comments:</p>	
<p>My students' experience learning and playing Taiko songs with the Taiko sensei helped my students gain a sense of pride and self-discipline.</p>	N/A    1    2    3    4    5
<p>Comments:</p>	
<p>My students gained a deeper understanding of the math standards that were addressed through Taiko. (fractions, ratios, angles, and others you remember)</p>	N/A    1    2    3    4    5
<p>Comments:</p>	

My experience with the Taiko sensei  
gave me ideas about how to integrate the  
arts in my instruction.

N/A    1    2    3    4    5

Comments:

My comfort level with arts integration has  
increased because of the Taiko experience.

N/A    1    2    3    4    5

Comments:

We are constantly looking for ways to improve our programs. Do you have any suggestions that might help us fine tune the experience?

Additional thoughts:

**Thank you for your feedback!**