Increasing Student Engagement and Student Voice Through Collaborative Reflection

by

Elizabeth B. Sanders

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Graduate Supervisory Committee:

Steven Zuiker, Chair
Michelle Jordan
J. Bryan Henderson

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ABSTRACT

In this study, the current literature regarding student engagement and student voice were reviewed to explore the connection between these two classroom elements. Currently, frequently incorporating student voice in order to increase student engagement most commonly takes place at the high school and university levels. Thus, utilizing Finn's (1989) participation-identification theory, this study set out to implement a practical design intervention in an elementary classroom to increase student engagement through the incorporation of student voice. Using Design-Based Research, I implemented a collaborative reflection process which allowed students, teacher/researcher, and co-educators to provide feedback on classroom task and participant structures. The feedback was then considered for further iterations of the task and participant structures. This was a pilot study of the collaborative reflection process and was implemented in a fourth-grade math classroom with 26 participants. Along with participating in the collaborative reflection process, the student participants also took a 26 question Learner Empowerment Measure to survey their feelings of identity with the classroom before and after the design intervention. After analyzing audio data gathered during the classroom tasks, as well as student feedback, it was found that student participation did increase due to the design intervention. However, there was no measurable difference in students' feelings of identity with the classroom due to the collaborative reflection process. Future studies should consider implementing the collaborative reflection process in multiple classrooms across diverse activities during the school year.

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Chapter 1

Introduction

Over the years, educational researchers have determined several factors that impact the academic achievement of students. One of these factors, student engagement, due to its multifaceted nature, has been explored as a way to increase the success of students, both academically and socially. Due to the importance of student engagement in school from a young age, it is important that educators cultivate a classroom context in which students feel supported by their teachers and peers (Ladd & Dinella, 2009). While educators use their professional knowledge to continuously reflect on the classroom culture and instruction to provide this support, how do they know that they have truly achieved it? Brookfield (2017) warns educators against making assumptions about students' needs in the classroom, stating "...I've become aware of many instances in which I thought I was working in ways that students found empowering, only to discover the opposite was the case." (p.28). While we can observe academic engagement, such as student participation, affective engagement, also referred to in the literature as student identity, can only be measured through surveys and interviews, and still, those results are filtered through the educators' perspective. With this in mind, how can educators broaden our reflection process in order to improve student engagement based on student needs?

This study explored the implementation of collaborative reflection between educators and elementary students as one way to increase student voice in the classroom. The collaborative reflection provided a structure for students to voice their needs without educators needing to infer them from observations and feedback, thus improving both

student identity and participation. The collaborative reflection consisted of the instructor asking questions of students during classroom activities to gain their feedback about classroom practices, such as task and participation structures. This allowed students to contribute to the decisions being made about their learning, increasing their voice and their engagement in future tasks. The primary instructor for the classroom, who was also the researcher, reflected with a peer educator in order to further avoid individual assumptions regarding students' feedback.

Fourth graders were chosen for this study for several reasons. First, they are in a part of the youth development cycle in which children begin to think critically about the world around them (Mitra & Serriere, 2012). Also, student disengagement in grades as early as first grade has been found to affect academic achievement and socialization of students through middle and high school (Alexander, Entwistle, & Horsey, 1997). However, most of the current research surrounding student voice as participation in decision making and their ensuing identity, is focused around middle and high school students (Mitra & Serriere). Finally, as I am the instructor and the researcher in this study, the fourth-grade classroom is a sample of convenience. This research was a pilot study to explore if increasing student voice through collaborative reflection in elementary classrooms has a similar effect as in middle and high school classrooms.

Research Questions

The first and second research questions I explored were "Does collaborative reflection provide students with an increased sense of identity with school?" and "Does collaborative reflection increase student participation in the classroom?" In order to answer these questions, I will be considering whether students feel that their voices are

being heard and monitoring their participation in classroom tasks.Finally, the goal of this research was to gain a better understanding of how teachers and students can use student feedback to collaboratively reflect in order to increase classroom awareness of students' needs and act towards improving student engagement. As such, the final research question of this study was "Do common needs and suggestions arise comparatively between the teacher and the students during collaborative reflection?"

Study Overview

In order to better understand the possible effects of the collaborative reflection process, one must be familiar with the current literature surrounding student engagement and student voice. First, I will discuss the relationship between different types of student engagement through Finn's (1989) participation-identification model and the importance of affective engagement, or identifying with school, for elementary-aged children. Currently, educators participate in constant reflective practices to improve their instruction and classroom context to improve engagement, but this is often based on their individual needs assessments of the learning environment or peer feedback. I will explore the connection between current student feedback for teacher reflection research and student voice research as an alternative to individual teacher reflection.

The methodologies used in this study reflected my role as both researcher and educator, with the idea that research should be conducted in a realistic and messy context. Thus, I used a Design-Based Research approach; the participants in the study, fourth grade students, were part of the unfolding process as their feedback shaped each subsequent iteration. Finally, I will discuss the effects of the collaborative reflection process in the classroom community through the use of observational data and my own

reflections, with implications of implementing collaborative reflection and recommendations for next steps in the research.

Chapter 2

Literature Review

This chapter synthesizes research literature in order to establish the intellectual merit of the present study. It first considers inquiry into student engagement with respect to participation, identity and, in particular, the participation-identification model of academic engagement. Next, the chapter considers engagement in relation to feedback and reflection as well as student voice. Taken together, these literatures provide a general foundation on which to explore the influences of collaborative reflection and its contributions to what is known about academic engagement and student voice.

Student Engagement

Student engagement ranges from participation in learning tasks and following school rules to collaborating with other students and identifying with school. Finn and Zimmer (2012) define student engagement as "the attention…,investment, and effort students expend in the work of school" (p.129). Student engagement is a multifaceted concept in which researchers agree on similar constructs, but have yet to agree on consistent terminology. Reschly & Christenson (2012) note that often in engagement research the same term is used to name different concepts and vice versa. Despite the differences in labels, many researchers agree on at least two categories of engagement: participatory and affective (Reschly & Christenson). Participatory engagement categories can range from academic participation, such as time on task, to behavioral participation, such as school attendance and answering questions in class (Reschly &

Christenson). Meanwhile, affective engagement is defined by some as the perceived relevance of school, and by others as students' emotional attachment to their teachers and peers (Reschly & Christenson). In the end, researchers agree that engagement is not a simple component of the learning environment, but takes many forms. Due to the spectrum of types of engagement, researchers have been able to link increased engagement with various indicators of student achievement.

As one of the objectives of my research is to increase classroom awareness of students' needs to increase student engagement, I will be using Finn's (1989) categories of student engagement outlined in his Participation-Identification model. Finn ascribes to a two-part categorization of student engagement into participation and identity. According to Finn, participation corresponds to what other researchers consider academic engagement, observable behaviors related to the learning process, such as time on task. Participation also encompasses cognitive engagement, which involves students expending energy to go beyond academic classroom expectations, such as studying at home or asking clarifying questions (Finn & Zimmer, 2012). Identity, meanwhile is another name for affective engagement, which relates to students' feelings of belonging in school and their sense of involvement in school and classroom activities (Finn & Zimmer; Finn). My research will explore how collaborative reflection between educators and students can influence identity, and thus participation as well, in an elementary classroom.

Participation. Participation, also sometimes referred to as academic or behavioral engagement, relates to a student's responses to academic requirements, such as completing tasks, but can also be related to students taking initiative in class (Reschly

& Christenson, 2012). Participation is measured through a student's observable actions in the classroom; such as their time on task and persistence with tasks (Reeves, 2012). These behaviors are directly related to the learning process and can be linked to academic achievement and feelings of success in school (Finn & Zimmer, 2012; Swift & Spivack, 1969). Ladd & Dinella (2009) were able to show a correlation between students' active participation in classroom tasks and their performance on standardized tests in as early as first grade and continuing through eighth grade. Furthermore, student disengagement, or lack of participation, in elementary school has been associated as a factor in dropping out of high school (Alexander, Entwistle, & Horsey, 1997). Thus, given that participation plays such a pivotal role in student success in as early as elementary school, elementary classroom practices that ensure students are academically engaged can impact learning immediately and long into the future. Finn (1989) suggests that one key factor in improving participation in elementary school is ensuring students are engaged emotionally.

Identity. Whether a learner is interacting with a certified educator or learning alongside peers, all learning takes place in a social and cultural context. Recently, researchers have been exploring the effects of the social and cultural aspects of formal classroom contexts on students' affective, engagement, or as Finn (1989) labels it, identity. Identity is realized when students value school and have a sense of belonging in the learning environment (Reschly & Christenson, 2012). Identity is measured qualitatively, with methods such as surveys or interviews (Finn). Dotterer & Lowe (2011) found specifically that at-risk students' identity, increased in classrooms with a positive social-emotional climate and low student-teacher conflict. Allen (1995), when

interviewing elementary students, found that they were aware of their level of ability, or inability, to influence decisions about their classroom and that this correlated to their relationships with their teachers. Similarly, in her review of the literature, Osterman (2000) noted that when students feel a sense of autonomy, or power concerning decision-making, in the classroom, they also feel a greater sense of relatedness to their teacher and peers. This in turn was shown to improve students' social and academic behaviors in the classroom, relaying the message that the classroom context plays an important role in increasing student identity and, when planning for instruction, educators must consider, not only the context of the learning that is taking place, but how students are perceiving their role in shaping that context (Osterman). Through collaborative reflection, this study will provide a process for educators to reflect on their classroom context, while also allowing students to help shape the context and increase their sense of identity with the classroom community.

Participation-Identification Model. Finn's (1989) participation-identification model is one way to link academic engagement (participation) and affective engagement (identification). Finn argues that students who identify with school feel like they belong and have a commitment to school-related goals. Patrick, Ryan, and Kaplan (2007) found that fifth grade students' who had positive perceptions of teacher support, peer support, and task-related interaction in their classroom, also had increased engagement in task participation. When discussing high school drop-outs, Janosz, Le Blanc, Boulerice, and Tremblay (2000) found that three factors played a role in students' decisions to drop out: achievement, behavior, and school commitment. , Janosz et. al. also found that students' lack of commitment to school was an underlying predictor for all types of high school

dropouts. As Finn's participation-identification model points out, if students do not identify with school, or feel affective engagement, they are more likely to become academically disengaged. With such high stakes, educators need to reflect on their instructional practices and classroom contexts with the lens of student engagement.

Reflection and Feedback

While the term 'reflection' has a long and varied history in educational research, reflection-in-practice has been widely influential on teacher instructional practices. Schon (1983) emphasized the importance of reflection-in-action for professionals in the workplace, stating that the reflective process was "central to the 'art' by which practitioners sometimes deal well with situations of uncertainty…" (p.50). Schon's idea was that professionals have expert knowledge that allows them to define a problem and use their specialized skills to approach and/or solve those problems.

In response to this call for professional reflective practice, educational researchers across the globe began to deliberate on the best ways to incorporate teacher reflection in classrooms. In April 1987, the American Educational Research Association held a symposium regarding reflection-in-action, followed by several books and articles outlining a variety of individual teacher reflection methods (Grimmett & Erickson, 1987; Clift, Houston, & Pugach, 1990; Calderhead, 1989).

However, critics have questioned the effectiveness of individual teacher reflection on improving instruction and the learning environment. Loughran (2002) notes that, while reflection is essential for pre-service educators, often in-service teachers may fail to recognize a problem with their practice on their own or may rationalize their practice to themselves. Additionally, Fendler (2003) says that "when reflection is understood as a

turning back upon the self, the danger is that reflection will reveal no more than what is already known." (p.21). Consequently, while self-reflection, or professional reflective practice, should be an ongoing process for educators, it can too often become a form a self-aggrandizement due to our inability to "step back" (Lynch, 2000). One strategy for addressing this challenge is teacher-peer reflection.

Teacher-Peer Reflection. Loughran (2002) poses that one answer to these critiques of individual reflection is peer reflection amongst educators. Allowing pre-service educators time to meet in small groups to share their experiences, define the problems they faced, and reflect on possible next steps is a better example of "effective reflective practice" (p.39) than individual reflection. Another framework being used for peer educator reflection is the Japanese practice of Lesson Study. Fernandez & Yoshida (2004) describe the Lesson Study process as teachers collaboratively planning a model lesson, observing the lesson being taught, and coming back together to assess and adapt the lesson based on their evaluations. Fernandez & Yoshida found that Japanese teachers valued the Lesson Study model because it enabled them to improve their pedagogical knowledge through reflective discourse based on the model lessons. The teachers also outlined goals together, using their Lesson Study conversations to hold themselves and each other accountable (Fernandez & Yoshida). Yet, while these alternatives to individual reflection help eliminate individual bias, they do not account for the professional bias of educators. In order to avoid individual and professional bias, this research sets out to provide a process for educators to collaboratively reflect with the other members of their classroom communities, their students.

Student Feedback. Another response to the critique of individual educator reflection and peer reflection is the use of student feedback as a reflective tool. Brookfield (2017) champions the use of student feedback to inform individual and peer reflection. In opposition to Schon (1983), Brookfield argues that while teachers come to the classroom with their own "common sense" assumptions about students' participation levels and feelings of identity based on our own experiences, they are just that, assumptions. Using student feedback to reflect can help educators adjust their teaching accordingly (Brookfield). Especially when reflecting on whether students identify with school, educators are only able to make assumptions about students' perceptions of the learning environment. Brookfield encourages university professors to frequently survey their students and reflect on their feedback to improve the course throughout the semester.

As another example of using student feedback for reflection, Bell & Aldridge (2014) conducted a research study gathering feedback by surveying high school students on topics ranging from school culture to instructional strategies to assessment. Educators were then provided with the student feedback to use for their reflection-in-action. At the end of the study, when students took the feedback survey again, Bell & Aldridge found that teachers who reported they had made changes based on the student feedback received more positive scores on the post-survey.

Further use of student feedback for reflection is seen in Hoban & Hastings (2006) longitudinal study using student interviews, learning logs, and surveys to collect data on students' perceptions of instruction. At the conclusion of their research, Hoban & Hastings found that teachers valued the student interviews the most as the researchers

asked questions to guide the students to reflect on "how" they learned instead of on "what" they learned, which was more useful for teacher reflection.

Yet, while several researchers have found increased effectiveness through individual and peer educator reflection on student feedback, there is little data about student feedback from elementary aged children. Furthermore, even though multiple researchers (Bell & Aldridge, 2014; Hoban & Hastings; Brookfield, 2017) found value in high school and university students' feedback, they did not allow students to collaboratively reflect with each other or the teacher regarding the feedback. Instead, the researcher asked individual students to reflect on interview questions and the teacher was provided with the student responses after the interview or students answered survey questions individually. While this type of feedback does allow students to have more input into the elements of the learning environment, it also requires teachers to interpret students' feedback based on their own perspectives. To avoid teacher misinterpretation of student feedback, this research turns toward a collaborative reflection process between teachers and students to improve task and participant structures, as well as increase student voice in the reflection process.

Student Voice

Student voice is "the many ways in which youth have opportunities to share in the school decisions that will shape their lives and the lives of their peers" (Mitra, 2008). Educational researchers have been interested in finding ways to increase students' voice in their schools for decades (Campbell & Edgar, 1994; Oldfather, 1995; Fielding, 2001) and Mitra (2006) posits that this has been done at different levels, ranging from

incorporating students' opinions into decision-making to students making and implementing the decisions themselves.

At the first level of student voice, allowing students to be heard, the focus of the research is chosen by adults, such as the researcher, educator, or school administration (Mitra, 2006). Then, students are surveyed and/or interviewed regarding the chosen research topic; the ideas the students shared are then considered by the adults, who take action. Much of the research surrounding teacher reflection on student feedback mentioned previously (Bell & Aldridge, 2014, Hoban & Hastings, 2006, Brookfield, 2017) falls into this level of student voice research.

The next level of student voice research, according to Mitra (2006), is students collaborating with adults. At this level, adults and students are conversing together about their needs and potential ideas for meeting those needs. They collect and/or analyze data together and have a shared time in which to discuss possibilities surrounding the data. There are many examples of these youth-adult partnerships, as Mitra (2008) calls them, in the research currently. Peruzzi (2018) details a case where a science teacher "codesigned" a science project with their students by surveying the students about which topics they would focus on for project-based learning opportunities throughout the school year. After collecting the student data, the class was shown the results and the teacher lead a class discussion analyzing the survey data.

Scardamalia & Bereiter's (2010) Knowledge Building communities are another example of students and adults working collaboratively towards a shared goal in schools. Scardamalia and Bereiter posit that Knowledge Building communities help democratize classrooms because the students become "legitimate contributors to the

shared goals of the community" (p.10). In this case, student voice is actualized as participants in the community create and improve upon the collective knowledge of the group.

Mitra (2008) also describes programs at several high schools in which adults and students met to gather data about school wide issues ranging from textbooks to social injustices. The format of these youth-adult partnerships was varied, but all of them were intentional, in that educators and school administrators outlined community norms, practices, and goals from the onset, with the promise that they would implement ideas generated through the partnership if legally able.

Unlike the first level, where adults are filtering student input based on their professional expertise in order to take action, the second level includes students as participants in the decision making processes and ensures their ideas are actualized. Yet, adults are still in charge of data collecting methods and presenting these opportunities for partnership to students. In Mitra's (2006) third level, building capacity for youth leadership, students collect the data, analyze the data, and make recommendations to school or program administrators when necessary. Two examples of this level of student voice research are the "Students as Evaluators" and "Students as Researchers" frameworks (Campbell & Edgar, 1994; Oldfather, 1995; Fielding, 2001).

The "Students as Evaluators" framework was used as a way for students to evaluate non-profit programs and provide feedback to program administrators (Campbell & Edgar, 1994). A diverse group of students were trained by a facilitator on data collection and analysis methodologies; after collecting the data, the evaluators presented their findings to the facilitator and helped write a paper, which was presented to program

leaders (Campbell & Edgar). This framework built the students' capacity for leadership because students were in charge of selecting their research topic, methodologies, scheduling interviews, and following up with program administrators and peer evaluators. Similar to the "Students as Evaluators" framework, is the "Students as Researchers" perspective. In 1995, Oldfather gathered a group of fifth and sixth graders to participate in a research project as "co-researchers". At this point in the six-year endeavor, Oldfather admits that the study was not at the third level of student voice research, but rather the second, youth-adult partnerships. The students participated in choosing research topics and provided ideas, but Oldfather conducted the data collection and analysis. However, over time, the students became more involved with the research and, once in high school, began conducting their own research to present to educators and researchers at multiple conferences (Oldfather).

Fielding (2001) discusses another instance of the "Students as Researchers" framework in use with a group of mixed age (middle school to high school) students in the United Kingdom. The students selected three research topics to pursue over the course of the school year, collected data, and analyzed it as a group; three teachers did provide support to the student researchers when necessary (Fielding). The student researchers presented their findings at many different forums including staff, student council, and parent meetings, which lead to immediate school changes as well as later changes to the structure of the pre-service educator program at the local university (Fielding).

All three of Mitra's (2006) levels of student voice are currently being pursued in the literature, yet there are some gaps worth noting. First, most of the student voice

research in the second and third level, which allow students to take action regarding multiple areas of school structures, occurs with middle or high school aged students. Furthermore, these areas of research, such as the Students as Researchers and Students as Evaluators models, require a substantial time commitment, which is impractical for elementary school educators (Oldfather, 1995; Fieldings, 2001). Second, elementary aged student voice research tends to focus on two topics: social development and academic content, such as literacy or social studies (Oldfather; Mitra, 2012; Angell, 2004). There is little research on youth-adult partnerships concerning *how* students learn in elementary classrooms, such as classroom expectations and activities. This study will attempt to address these gaps in the literature.

Chapter 3

Methods

The research literature above illustrates that providing a process for students' voices to be considered for decision-making in schools gives students a greater feeling of identity with the school or classroom community. By increasing students' identification, with school, Finn (1989)'s participation-identification model claims that students will become more academically engaged as well. Yet, current processes in the student voice literature are often focused on middle and high school students, academic content or social development despite evidence that elementary school experiences shape participation in middle and high school. Furthermore, some processes that have been successful with elementary aged students, such as "Students as Researchers" or "Students as Evaluators", require a time commitment from both teachers and students that can be impractical for most

elementary educators, leading them to rely on their own professional reflective practice to guide classroom improvements (Oldfather, 1995, Campbell & Edgar, 1994).

To address these needs, this study tested collaborative reflection as a structured space where students and educators reflected together on classroom instruction and community. To review, the first research question I focused on was: "Does collaborative reflection provide students with an increased sense of identity with school?" Similarly, my second research question was: "Does collaborative reflection increase student participation in the classroom?" By eliciting feedback from students and making changes based on that feedback through collaborative reflection, students should feel an increased sense of identity with the classroom. Based on Finn's (1989) participation-identification model, if students' sense of identity with the classroom increases, then this also positively affects their participation.

My final research question was : "Do common needs and suggestions arise amongst students and teacher throughout the reflection process or are student providing new insights?" This builds off the idea that while individual teachers can and should reflect on their classroom practices, it can be difficult to accurately reflect on your own instruction. While instructors often reflect with their peers to combat this issue, students, who are crucial members of the classroom community are left out of the reflection process. Thus, this research question insinuates that through collaborative reflection, students may provide unanticipated insights regarding task and participation structures.

Design-Based Research

As a teacher and an educational researcher, I used Design-Based Research (DBR) to approach this study. In DBR studies, researchers "engineer" an intervention for a

specific setting, and after implementing this intervention, systematically study the effects of the intervention of the learning environment (Cobb, Confrey, DiSessa, Lehrer, & Schauble, 2003). DBR takes place in naturalistic contexts, such as classrooms and other learning environments, instead of a laboratory setting. This is because it is almost impossible to predict the multitude of variables that will come into play and affect an intervention in the realistic and messy contexts of learning environments. To this point, Brown (1992) also notes that aspects of systems work synergistically; it is difficult to study or change individual aspects without affecting the whole system. Thus, DBR is an approach that embraces the ambiguity of these real-world contexts, and therefore involves a continuous process of improving interventions based on their effects on aspects of the system.

Furthermore, DBR is a natural methodological choice for practitioner researchers as the overarching purpose is to enhance practice with theory and vice versa. In other words, research should be undertaken with the goal of contributing to theory and practice simultaneously (Brown, 1992). Thus, design-based researchers are constantly striving to better understand the underlying mechanisms of their research context (Barab, 2016). This is done through constant communication and collaboration with participants to improve the interventions (Barab). While experimental design is intended to validate a single hypothesis, DBR is an ongoing process of iterations; the intervention is constantly being adapted based on researcher and participant feedback. However, while the intervention is honed and improved in a specific context, design-based researchers use "selected aspects" of the intervention towards a broader, theoretical goal (Cobb et. al., 2003).

Participants

The context of my research was a fourth-grade mathematics classroom in a public charter school. The school is a Title One school with 62% of students receiving free/reduced lunch. I am the fourth-grade mathematics instructor at the school, and led the research in the dual role of teacher/researcher. As this was a pilot study, the sample was relatively small, one of my classes which has 26 students. Overall, the class is split at 50% for each gender (13 girls, 13 boys respectively).

As this is a design-based action research study, I attempted to keep the participants, or students, involved and informed regarding the research process. The students were told the purpose of the research and were invited to create their own pseudonyms to protect their anonymity in the finished research.

Design Intervention

The design intervention in this research was two-fold. First, in order to ensure that students were able to definitively discern between the task structure and participant structure while reflecting, I introduced a task structure and participant structure to the class that had not been used in the current classroom context. After the students completed the task, I posited questions to the class to elicit feedback in order to refine the task and participant structures for future iterations.

According to Sandoval (2014), task structures are the goals and criteria that students are expected to do during an activity. Up until now in this specific classroom context, students had only solved single step word problems individually or in pairs. For the newly introduced task structure, each group was seated at a set of four desks with two on each side facing each other. There were 6 groups of 3-5 students working collaboratively to

solve a multi-step word problem. This supports the belief that bringing together individuals with different experiences and knowledge to solve a problem in a group setting is more effective than solving problems individually (Miyake and Kirschner, 2014). The students were allowed to use a variety of manipulatives to help solve their problem, but they were required to write down their answer as well as a justification statement for their answer, in order for the groups to verbalize or document their co-construction of knowledge (Miyake & Kirschner). The word problem format and content were the same for each iteration to better compare participation across each future iteration.

Another important aspect of classroom activity to consider are participant structures, which Sandoval (2014) defines as the roles and responsibilities students taken on during activities. For the participant structure in the first iteration, each student in the group was randomly assigned a role: Leader, Time Manager, Supply Handler, and Recorder. The Leader was in charge of keeping the group on task, making sure everyone is being heard, and checking in with the teacher when needed. The Time Manager was in charge of keeping track of how much time the group has left to complete their task. The Supply Handler gathered any needed supplies as they work through the problem and the Recorder wrote down the group's thoughts, answer, and justification statement. However, all students were expected to work together to solve the problem. This participant structure was chosen in order to make the participant structure of the activity recognizable to the students in the focus group. By assigning the roles, the focus group students were better able to refer to the participant structure through these titles and collaboratively reflect on their success or necessary improvements.

At the end of the first activity, I elicited feedback from the students. I put three guiding questions on the whiteboard for the students to discuss with their groups: “Did you like the activity we did today, why or why not?”, “Did you like the roles for each member of the group, why or why not?”, “If you could change one thing about this activity, what would it be?”.

While I posted the questions and circulated around the room, the conversation was open-ended and driven primarily by the students. These conversations were audio recorded for later analysis and began the collaborative reflection process, as seen in Figure 1 below.

As one of the research questions in this study was, “Do common needs and suggestions arise comparatively between the teacher and the students during collaborative reflection?” I also answered these three questions at the end of each iteration, writing down my responses.

After listening to the audio recording from the end of activity reflection, I reflected with a peer educator, in order to further avoid the possibility of bias that may occur during individual reflection. Then, based on the student and peer feedback, I redesigned the task and participant structure of the learning activity to reflect the students’ needs and thoughts. The activity was reimplemented with the changes and I gathered feedback again. This process was then followed for a third iteration.

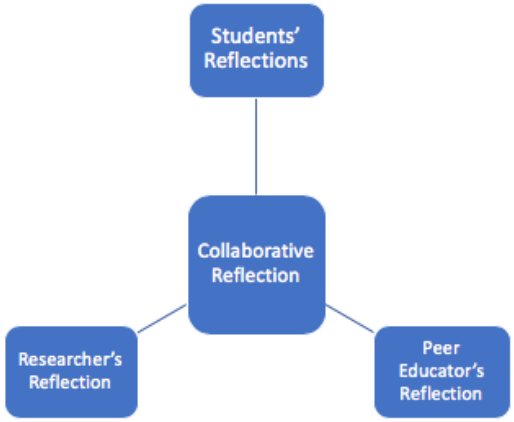

Figure 1. Collaborative Reflection Process.

Data Collection

In order to better understand students' identity with the classroom throughout the study, the students took a pre- and post-survey. The survey used items from the Learner Empowerment Measure (LEM) created by Frymier, Shulman, and Houser (1996). This survey was chosen because it was originally implemented with the goal of creating a communication relationship between educators and students that helps "align their values and actions" (Frymier, Shulman, & Houser). As mentioned previously, surveys similar to the Learner Empowerment Measure have been utilized in student voice and student feedback research at the middle and high school levels as well as in the university setting (Bell & Aldridge, 2014, Hoban & Hastings, 2006, Brookfield, 2017) .

From the LEM, the Meaningfulness and Impact sections were used to create the pre- and post- survey. Frymier, Shulman, and Houser (1996), when writing the measure, defined meaningfulness as "the value of a task in relation to one's own beliefs" (Thomas

& Velthouse, 1990). I used the Meaningfulness questions in the survey due to their connection with student identity research and the belief that student identity is strongly correlated with their commitment to school (Janosz et. al., 2000). Similarly, Glasser (1990) argues that if students do not find classroom tasks meaningful, they will be less likely to fully engage in the task.

The Impact section of the LEM was also used in the pre- and post- survey. The Impact section included items pertaining to both students' feelings of impact in the classroom and their level of choice. This section aligns with the concept of Mitra's (2006) second level of student voice research, in which students are able to share their needs and changes that need to be made to address those needs. The items in the Impact section of the LEM measure whether students feel that they are provided with the opportunities discussed at the second level of student voice research (Frymier, Shulman, & Houser, 1996; Mitra, 2006).

The 26 items were scored on a Likert scale and include items such as: "I have the power to make a difference in this class"., "I cannot influence what happens in this class.", and "The tasks required of me in this class are valuable to me." The full list of survey items can be seen in Appendix F. Before the first iteration, all of the students took LEM to collect data on their feelings of identity with the math classroom and gauge how much they value activities they have participated in previously. At the end of the study, all students again took the LEM as a post-survey, in order to compare their sense of identity with school after participating in the collaborative reflection process.

Once all of the students completed the LMS, the first iteration of the word problem task and the participant structure was enacted. During the activity, audio recording was

used to document students' interactions and I took field notes on student participation as well as their fulfillment of their assigned role during the activity. Specifically, I listened for students to ask clarifying questions about the task, pose ideas related to the task, critique or reevaluate their own or group members' ideas, affirm their own or group members' ideas, and/or fulfill their participant role. The field notes were then compared to the audio data to support a "close interrogation" of the students' interactions during the activity (Jordan & Henderson, 1995). After the first iteration, the same process was used for the subsequent iterations.

Data Analysis

Since Design-Based Research takes place in "messy", real world contexts, it can be difficult to provide evidence and data relating to the enactment of the design intervention. However, one way this can be done is through a design narrative (Mor, 2011). Thus, I will provide a design narrative from my perspective, as the researcher and teacher, documenting the context, my researcher actions, the participants' actions, and the effects these had regarding the design intervention of collaborative reflection (Mor, 2011).

To compose the design narrative, and determine levels of student participation throughout the activities, I first analyzed patterns of students' interactions based on the field notes and transcripts of the audio recordings for each iteration to determine any effects of task and participant structure adaptations. I reviewed the audio recordings from each group's reflection at the end of each iteration, as well as my individual reflection, to analyze and look for connections between interactions and conditions that lead to specific consequences or phenomenon (Maxwell & Miller, 2008). Using the connections identified, I created a narrative to better contextualize each iteration which allowed me to

analyze for similarities in narratives across groups, and later, within a group across several iterations, regarding common student needs or trends the narratives indicated (Maxwell & Miller, 2008).

After utilizing these connecting strategies, I used the categorizing strategy of open coding to compare the students' answers to the reflection questions to my own reflection after each iteration as the researcher-educator. Onwuegbuzie, Dickinson, Leech, and Zoran (2009) contend that the constant comparison method for data analysis is especially helpful for accessing across-group saturation of themes. By reviewing each student's reflections individually, I was first able to identify themes in their suggestions, before using constant comparison on themes across the groups and the teacher's reflection to analyze for common themes. Using constant comparison, I was also able to see if the students and myself were making the same recommendations and if so, consider what this could mean for how the classroom instruction is currently being enacted.

I also used coding to analyze group engagement and individual student engagement based on their participation in the task. As mentioned previously, Reeves (2011) defines participation as students' time on task and perseverance with tasks. Using this as a theory-based code, I coded the transcripts for on task talk and off task talk for the first iteration at both the group level and the individual student level. On task talk was coded based on whether the statement was relevant to solving the assigned task or participant roles. An on task talk turn regarding solving the assigned task was coded as a "Problem Solving" talk turn, and encompassed students' statements concerning their problem solving process, justifying their answers to their group members, negotiating with their group members based on their understanding of the problem, or asking for/giving clarification regarding

the assigned word problem(s). On task talk turns regarding time, students' responsibilities during the task, or completing their group poster were coded as "Participant Role" talk turns. . Off task talk was coded as such if the statement was not relevant to the assigned task or participant roles. When considering levels of student participation based on these codes, lack of talk was also taken into consideration. After identifying three participants who displayed a lack of participation in the first iteration due to either their abundance of off task talk or lack of talk entirely, I focused my analysis on the transcripts of these individual students for the subsequent iterations.

For the pre- and post- LEM, I attempted to compare the results at the class level to see if there was any indication that students' feelings identity with school increased after the design intervention was enacted. Unfortunately, I was unable to conduct a statistical analysis of the pre- and post- survey data sets due to methodological choices made while enacting the design. This is further discussed in the Design Limitations section. identity

Chapter 4

Findings

In order to answer the three research questions, this chapter sets out to provide a narrative description of the enactment of the design intervention of collaborative reflection in a 4th grade math classroom through a design narrative and the insights it provided. It also explores the results of the LEM survey, which measured students' feelings of identity within the classroom. Finally, this chapter describes the effect(s) of collaborative reflection on students' levels of participation during math tasks, especially those students who struggle with engagement.

Design Narrative

As discussed previously, the task structure for the first iteration was that participants would work collaboratively to solve a fourth-grade level, multi-step word problem. After solving the problem, the group was to record their strategy or strategies for solving the problem on to a poster. Before beginning the task, each participant was randomly assigned a number which then corresponded with one of the four participant roles: Leader, Time Keeper, Recorder, or Supply Manager. The participant structure gave each group member a specific responsibility within the task.

As mentioned in the Data Analysis section, I utilized connecting strategies to create a common narrative for most of the groups as seen below in Figure 2. These narratives allowed me to analyze the patterns and levels of student participation at the group level.

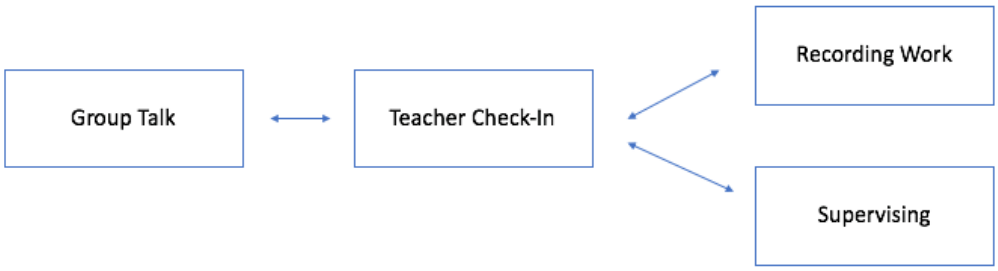

Figure 2. Common narrative of student interaction for Iteration #1.

After the first iteration, I was able to identify three students who were not engaged in the task because on their lack of participation, or on task talk turns. These three participants were Ninja, Ryuga, and Dominus. Due to their lack of participation

during the first iteration, I decided to pay closer attention to their reflection responses in order to improve their participation in the second iteration. Thus, by incorporating their voices into the reflection process and increasing their participation, their identity with the classroom would also improve.

At the end of the task, all of the groups were asked the three reflection questions and I reflected individually. My researcher/teacher answers to the reflection questions regarding the first iteration were focused on the participant structure. While the task structure had seemed to successfully engage the students and ensure their participation, the participant roles limited some students from fully contributing. Several groups had students who wanted to participate during the "Recording Work" section of the activity. However, because they were not the Recorder, they felt relegated to the sidelines, merely supervising the Recorder's work or, when supervision was unnecessary, playing and talking.

One example of this was in the interaction between Tacos, Jacob, and Banana while they were beginning to record their work on the poster. Banana was the assigned Recorder, yet Tacos and Jacob had very specific opinions about how to record the work they had done and struggled to stay in their defined participant roles, as seen in the transcript excerpt below.

17:35	Jacob: Write! Who has good handwriting?	245
17:40	Tacos: Why'd you put an f? (long pause) Oh no! Oh my!	246
17:48	Jacob: Just write it so there could be more…	247
18:14	Tacos: You could've just said that…	248
18:15	Banana: I could've just said what?	249

While this is just one example, the Recorder participant became responsible for a large part of the group task. Thus, when reflecting on the task and participant structures, my initial response was to change the participant roles in a way that allowed more students to feel like they could contribute during the task.

This sentiment was one of the themes present in the participant reflection responses as well. Several participants expressed that they would've preferred to choose their role, instead of it being randomly assigned. Other participants, such as Tacos and Jacob from the transcript above, adamantly took up the response of "No jobs!" (see Appendix A). Even one participant who was assigned the Recorder role, Pug, suggested that she would change the activity so that "everybody got to do something with the project." (see Appendix A). Pug went on to add that "[She] did all the writing and [she] wanted everybody to write something too but we couldn't." (see Appendix A.) Finally, Dominus, who was one of the identified students that did not participate for most of the first activity, made a different suggestion that he felt could also help solve the dilemma of the participant roles. Dominus suggested that he would change "how many questions we had to do, because it was kind of boring on the amount of questions we did." (see Appendix A). While Dominus doesn't mention changing the participant roles explicitly, his suggestion indicates that he felt that there wasn't enough work to go around for all of the group members.

When analyzing the participant reflection responses for the first iteration, there were two other common themes that were not found in my teacher reflection notes: more time for the activity and different group members. One reason that the time suggestion was not considered is because the activities took place during a set time during the school

day which could not be changed. Furthermore, all of the groups completed the task by the end of the given time. This raised the question of why the participants felt that they needed more time for the activity. Similarly, the second suggestion, different group members, wasn't considered due to several outside factors that went into choosing the students' assigned seats in the class, such as student seating preferences, parental requests, behavior, personalities, academic levels, and Individual Learning Plans. However, since two out of three of the groups that made this suggestion had a group member who did not consistently participate or collaborate with the group during the task, I hoped that changing the participant roles and task structure would help engage those students, allowing the groups to work better together during the second iteration.

Before solidifying the changes to the task and participant structures for the second iteration, I presented the student reflection responses and my own responses to a peer educator, Ms. A, who is another 4th grade educator at the school and is familiar with the student participants. Ms. A and I discussed possibilities for adapting the task and participant structures that would meet the needs that the students had expressed in their responses, while also allowing for all students to contribute to the activity for the entire class period. Together we agreed that changing the participant structure to allow all of the students to record their thought processes on the poster would allow all of the group members to feel valued; yet, if the group was only solving a single word problem, as Dominus pointed out in his response, there might not be enough work for all of the participants to record. Thus, Ms. A and I discussed the possibility of assigning multiple word problems for the participants to collaboratively solve and record on their poster,

allowing enough work for each participant to feel their role as necessary throughout the entire task.

Iteration #2. For the second iteration, the task structure was slightly altered so that each group was given four multi-step word problems to solve collaboratively. Again, the group needed to record their strategies for solving each of the problems on a poster. However, the participant structure was very different. Instead of randomly assigning individualized participant roles to each group member, all of the students had two roles: "Problem Solver" and "Recorder". The expectations of the "Problem Solver" role and the "Recorder" role, see Figures 3 and 4 below, were presented to the participants at the beginning of the task and were posted throughout the activity for students to refer to.

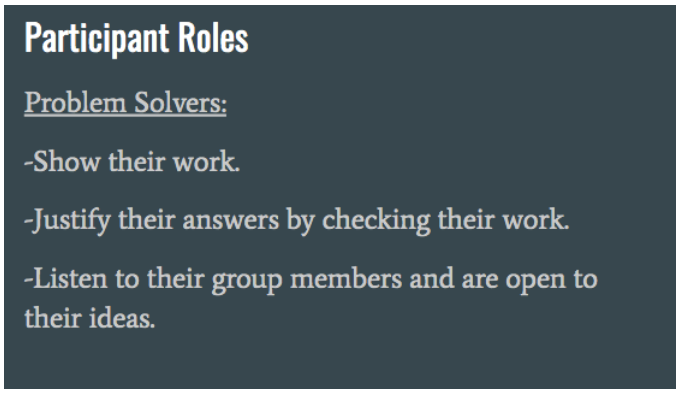

Figure 3. Description of "Problem Solver" role.

A few students who were absent during the first iteration joined the participant groups. Cupcake and Jet joined Group #1 and Daniel joined Group #6. Again, I mapped out a common pattern of interactions that occurred across multiple groups when enacting the activity; see Figure 4 below. In contrast with the first iteration, due to the groups

being assigned multiple word problems, the majority of the groups chose to assign individual word problems to one group member and check in as a whole group once all members had completed their assigned problem.

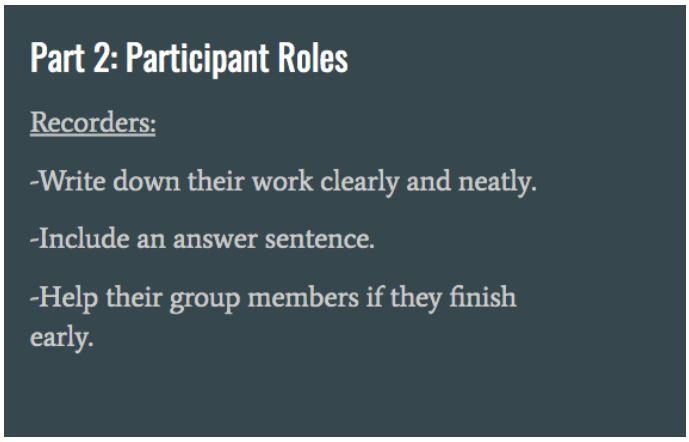

Figure 4. Description of "Recorder" role.

Yet, while it may seem that this would decrease the amount of collaboration amongst the group, on task group talk, such as negotiating, justifying, and strategizing, increased in four of the six groups. This is likely due to the fact that each group member had to discuss their thought processes and solutions for four different word problems, instead of a single word problem.

As discussed in the Data Analysis section, I focused in on analyzing Ninja's, Ryuga's and Dominus' engagement to determine if their participation had increased for the second iteration. Both Ryuga's and Dominus' groups chose to follow the common narrative pattern for this activity outlined in Figure 5. Thus, both students were assigned a word problem that they were responsible for solving and sharing with the group. This increased their time on task and, subsequently, their on-task talk turns. However, they both still had a significant amount of off task talk turns compared to the other members of

their groups. Ninja's group, however, was the only group that followed a different narrative pattern during the second iteration, as seen in Figure 6 below. This was intentional on my part, as Ninja's reflection from the first iteration involved feeling left behind by his group because they were "rushing". Thus, at the beginning of the activity, I informed Ninja's group that they needed to work together to solve the problems instead of assigning each problem to an individual person. This resulted in Ninja being engaged throughout the entire activity, with very few off task talk turns, and also lead the group to enact the most group talk out of all the iterations, with 23 out of 37 minutes of the activity being used to collaboratively solve, negotiate, and justify the solutions to the word problems.

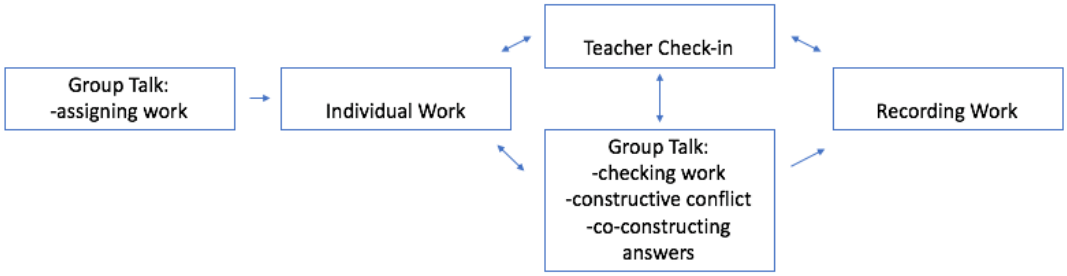

Figure 5. Common narrative of student interactions for Iteration #2.

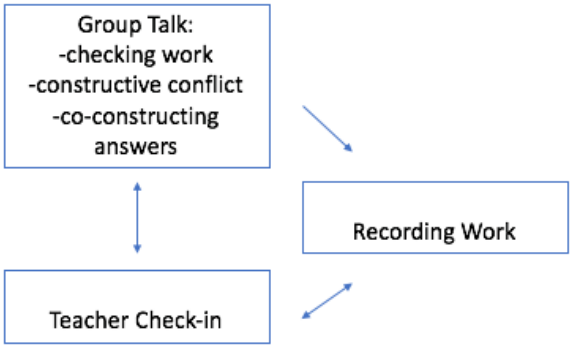

Figure 6. Group #3's narrative of student interactions for Iteration #2.

For the second iteration, my teacher/researcher reflection notes focused on my perceived changes in the group dynamics compared to the first iteration. First, while the groups seemed to complete the task in less time, participants' emotions were running higher. By assigning each individual student a word problem, as most of the groups chose to do, those participants felt responsible for presenting their group with the correct answer. Some students were able to do this with little help, finishing quickly and helping others with their assigned word problems if necessary. However, a few participants became very emotional when they were unable to solve the problem on their own. One participant in particular, Cupcake, refused to continue working with her group after disagreeing on the correct answer to the word problem.

Yet, the changes to the participant structure seemed to have achieved the goal of ensuring more student engagement through participation. My reflection noted that several groups referred back to the "Problem Solver" role description throughout the activity to remind their group to collaborate and explain their problem-solving process. When reviewing the students' reflections, Banana and Jacob, whose group had struggled with the assigned roles during the first iteration, stated that they liked this activity better than the first one because there were no jobs (see Appendix A). In fact, when coding and analyzing the student reflection responses, the most common theme was that the participants did not feel that any changes needed to be made for the third iteration. Besides this, the suggestions varied from more questions to fewer questions, more group members to different group members, and one participant even suggested that I provide cookies for them to eat during the activity.

Due to the variety of suggestions and the numerous student opinions to not change the activity for the third iteration, I relied more on the peer reflection with Ms. A when deciding if and how to change the task and participant structures. I shared my concerns with Ms. A regarding the students' emotional responses to feeling solely responsible for a word problem. We also discussed how some students felt like they needed more questions, while others wanted fewer. However, I also noted that many of the students had enjoyed the activity and did not want to see many changes made for the third iteration. After reviewing all of the students' responses and my personal reflection notes, Ms. A and I decided to further define the "Problem Solver" role to include the expectation of "Help group members who are stuck", in order to keep the groups from moving on without their peers (see Figure 6 below). Changes were also made to the task structure. The groups would need to complete as many word problems as students in the group, which ranged from three to five. Then, instead of creating one poster together, each student would complete a smaller poster. However, each student had a second option; instead of creating a poster for one of the word problems they solved with their group, they could choose to create their own multi-step word problem and use that problem for their small poster. This way, students who were struggling to solve the word problems could still be a "Recorder", showing their work on their poster. But those students who wanted to challenge themselves, were able to take on the role of "Mathematician", as seen in Figure 8 below.

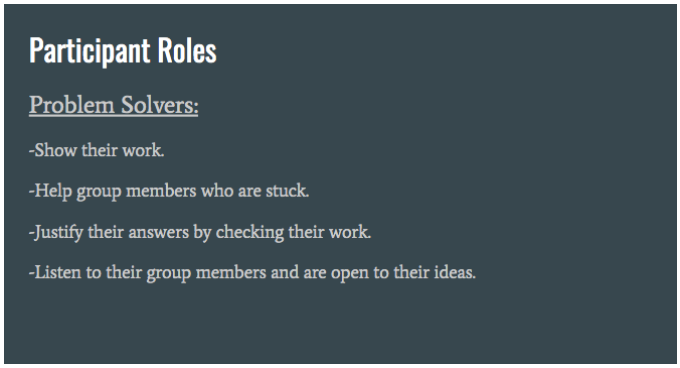

Figure 7. Description of "Problem Solver" role for Iteration #3.

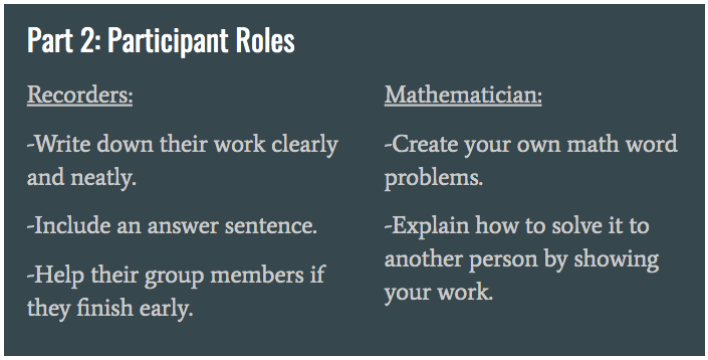

Figure 8. Description of "Recorder" and "Mathematician" roles for Iteration #3.

Iteration #3. The third iteration was the final iteration for the collaborative reflection design intervention. The students were introduced to the new task structure and participant structure prior to beginning the activity. Some students, in prior iterations, had repeatedly suggested that they work with a new group, specifically Ninja and Bread. Due to this I decided to allow Ninja to work in a group with Potato and Bread for the third iteration, as their third group member was absent. Similarly, due to Cupcake's falling out with her group in the second iteration, she worked with a different group as well.

Using my field notes and transcripts from the third iteration, I mapped out the common narrative of interactions that occurred amongst the groups throughout the third iteration. The narrative for the third iteration was similar to the second iteration as many groups again decided to assign individual word problems to participants, which can be seen in Figure E below. However, due to the change in the "Problem Solver" role, several participants who finished their assigned problem quickly went on to help their group members solve their assigned problems as well. Also, a few students chose the alternate role of "Mathematician" instead of "Recorder" after solving the word problems, which lead to group conversations focused on creating a multi-step word problem.

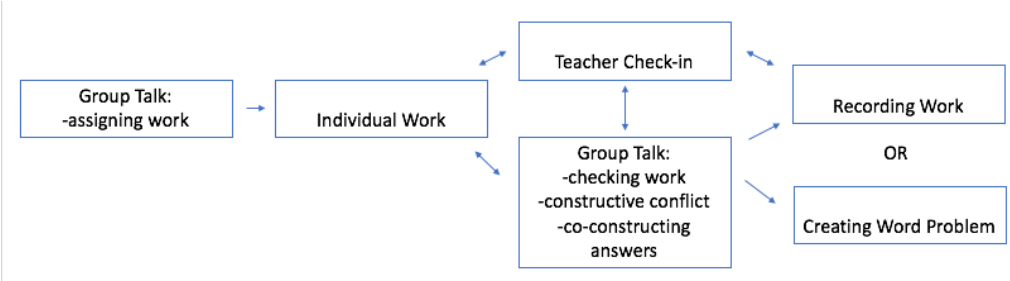

Figure 9. Common narrative of student interactions for Iteration #3.

Yet, my teacher/researcher reflection immediately following the activity garnered mixed feelings towards the third iteration of the task and participant structures. There seemed to have been less group on task talk and several participants did not complete the activity due to off task behaviors. On the other hand, the participants who chose to create their own word problems were able to write grade level appropriate, multi-step word problems about topics that interested them and stayed engaged throughout the task.

Reviewing the students' reflections on this activity, like the second iteration, many of the students expressed that they liked the changes that had been made and did not have any recommendations to improve the activity. The second most prevalent theme was regarding the complexity and amount of word problems the groups were asked to solve. While some participants, such as Pizza and (Oscar), suggested a larger amount and/or more difficult questions, Tacos realized that while she was able to solve her assigned word problem, some of her group members struggled. Reflecting on this, Tacos suggested that there should be "one section of hard questions and one section of easy questions…or we could pick our own questions like place value or rounding or anything." (Appendix A).

Concluding the third iteration, the students answered an extra reflection question of "Did you feel that Mrs. S (the researcher/teacher) changed the activities based on your suggestions? Why or why not?". The student responses to this question were mainly that they felt that I had changed the activities, though few of them were able to expand on why they thought so. A few students gave answers that indicate they may not have understood what the question was asking them. For example, Dominus replied "Yes. I'm not really sure but I can go with it. It's fine." (see Appendix B). However, 7 out of the 22 students who responded to the question did refer back to suggestions they had made in previous iterations. Many of them specifically mentioned that the participant roles had changed from assigned roles such as Leader to everyone working together. Jacob, who had suggested the roles, or jobs as the students called them, be removed from the activity stated "Yes I think [Mrs. S] changed the activity because remember how we said we wanted to change our jobs and get our own jobs…She changed that." (see Appendix B).

Measuring Student Engagement

According to Finn's (1989) participation-identification theory, students' feelings of identityand their engagement through participation in classroom activities are closely linked. Two of my research questions were based on Finn's (1989) theory: "Does collaborative reflection provide students with an increased sense of identity with school?" and "Does collaborative reflection increase student participation in the classroom?" As mentioned in my Methods section, I used a combination of quantitative and qualitative methods to measure the participants' feelings of identification and their participation throughout the iterations. In the following sections, I discuss the impact collaborative reflection had on the students' identity and participation, and what this might mean for future use of collaborative reflection.

Students' Feelings of Identity. In order to measure the participants' feelings of identity with the classroom, I utilized the 26 question Learner Empowerment Measure pre- and post- surveys which asked questions regarding the Meaningfulness and Impact of classroom tasks and students' identity with the classroom. As mentioned previously, I was not able to conduct statistical analysis of the pre- and post- survey data for the LEM due to methodological decisions during the design enactment. First, in order to encourage students to answer the survey questions accurately, I allowed the process to be anonymous. However, this prevented direct analysis of individual growth of students' feelings of identity before and after the enactment of collaborative reflection. Furthermore, the population of students taking the pre-survey to the post-survey differed due to students' feelings of hesitation in taking the survey. Since the same group of students was surveyed, a paired samples T-test would have been utilized to analyze the

data sets. However, due to this difference in population sizes, coupled with the anonymity of the surveys, a paired samples T-test was not possible. An independent T-test was also not a viable option due to the fact that the pre- and post- survey populations were essentially the same group of students with a few new individuals. Thus, the data sets from the LEM pre- and post- surveys could not be used to answer my research question regarding student identity in the classroom. However, at the end of the third iteration, students were asked to reflect on whether they felt I had utilized their suggestions when adapting each task and participant structure for the subsequent iterations. Out of the 22 participant responses, 17 of the students shared that they felt that their recommendations had been considered (see Appendix B.)

While the participant responses at the end of the third iteration are worth noting, future research needs to take into consideration methodologies that allow students to feel secure in their anonymity when completing the survey while also providing data for statistical analysis regarding students' feelings of identity surrounding collaborative reflection.

Increased Student Participation. As previously mentioned, in order to better understand each groups' participation in the assigned tasks, I first used narrative analysis to create the flow of events and interactions amongst group members for each iteration. Then, I used connecting strategies to compare the narrative structures across iterations and groups (Maxwell & Miller, 2008). While comparing the narratives, I began to analyze the amount of participation at the group level; that is the amount of time each group was on task. After analyzing participation at the group level for all the iterations, I then zoomed in to analyze each individual students' participation for the first iteration.

From there I identified three students who exhibited a lack of participation throughout the first activity such as off task talk, silence, or refusal to complete the task. While I continued to monitor participation at the group level for the subsequent iterations, I focused my analysis of the participation at the individual student level on the three students who did not participate with their group during the first iteration. Of those three students, only two were present for all three iterations. Thus, in order to provide a "thick description" of the fluctuations in participation based on the students' suggestions through the iterations, I will use a case study of two of these students to illustrate the impact of the collaborative reflection process.

Ninja. *Iteration #1.* After analyzing Ninja's groups' transcript from the first iteration, Ninja's participation was minimal. In fact, during the entire thirty-five minutes of the activity, Ninja spoke a total of eight times. This is in comparison to his group members, who each spoke over thirty times, including both on task and off task talk, and spent the majority of the activity engaged in on task talk, which can be seen below in Table 1. Ninja's three group mates, Patrisha, Rose, and Unicorn, also helped to record their work onto their group poster after solving the word problem. Ninja, however, did not assist with the group poster.

From the outside, it may seem as though Ninja chose not to participate with his group for arbitrary reasons. However, when analyzing the group's transcript, a few reasons behind Ninja's lack of participation become apparent.

Table 1

Iteration #1 Group #3's Talk Turns

Individual On and Off Task Talk Turns						
Participant Name	Problem Solving Talk Turns	Participant Role Talk Turns	Total of Off Task Talk Turns	Total of Individual Talk Turns	% of Individual Talk Turns: On Task	% of Individual Talk Turns: Off Task
Patrisha	26	56	3	85	96.3	3.7
Rose	18	15	1	34	97.1	2.9
Unicorn	29	61	2	92	97.8	2.2
Ninja	1	4	3	8	62.5	37.5

Note. The total number of talk turns, both on and off task, for Iteration #1 Group #3 was 219 talk turns.

First, all the students were randomly assigned participant roles in the first iteration and Ninja was unhappy with his role as Time Keeper. In the excerpt below, Ninja attempts to enact his Time Keeper role within his group. However, his efforts are quickly squashed by his fellow group members.

0:56	Ninja: We're running out of time.	10
0:57	Patrisha: No we're not.	11
0:58	Ninja: Mmhmm. We have one more minute.	12
1:01	Patrisha: Ninja what? (long pause) No we're okay.	13

Approximately thirty seconds later, Ninja sums up his feelings towards his role as "Time Keeper" by declaring "What's the whole point of being a time person?" (see Appendix C). Without even a minute passing by in the activity, Ninja already felt like his role in the group was pointless; this led to his refusal to participate while his group members worked together to solve the assigned word problem. Later, when his group members tried to redirect him to participate in the task, Ninja whispered directly into the audio recorder, stating "I'm confused" and "It's so hard" (see Appendix C). Ninja only speaks

one more time throughout the task, directing the group on where they should lay the poster.

At the end of the activity, Ninja answered the collaborative reflection questions with his group. When asked if he liked the activity, he stated "I didn't like this activity because all the members in my group were trying to be first and do everything quick." (see Appendix D). Furthermore, when asked what he would change about the activity, he stated "What I would change is my team actually worked together without rushing." (see Appendix D). Ninja also offhandedly requested to work with a different group for the next activity. After analyzing Ninja's reflection and insights, I compared his frustrations with my own observations of the activity and took them into account when adjusting the task and participant structures for the second iteration.

Iteration #2. Due to, not only Ninja's reflection on the first iteration, but also a majority of the students' reflections, the assigned participant roles were adapted for the second iteration. This meant that Ninja was not assigned to be Time Keeper, and shared the roles of "Problem Solver" and "Recorder" with all of the group members. Aware of Ninja's lack of participation in the first iteration, I stressed the importance of collaboration within their participant roles as "Problem Solvers" to his group and required them to solve all the word problems for the second iteration as a team. As noted in the Design Enactment, this led Ninja's group to interact differently than the other groups, spending most of their time participating in on task group talk in which they collaboratively solved the word problems and engaged in constructive conflict, which can be seen below in Table 2.

Table 2

Iteration #2 Group #3 Talk Turns

Individual On and Off Task Talk Turns						
Participant Name	Problem Solving Talk Turns	Participant Role Talk Turns	Total of Off Task Talk Turns	Total of Individual Talk Turns	% of Individual Talk Turns: On Task	% of Individual Talk Turns: Off Task
Patrisha	93	39	9	141	93.6	6.4
Rose	22	10	0	32	100	0
Unicorn	70	24	7	101	93.1	6.9
Ninja	89	49	18	156	88.5	11.5

Note. The total number of talk turns for Iteration #2 Group #3, both on and off task, was 430 talk turns.

Both the sharing of participant roles and the emphasis on collaboration increased Ninja's participation during the second iteration. By the end of the activity, he had contributed 138 on task talk turns. While Ninja frequently needed help solving the word problems from his group members, he still actively participated in co-constructing their problem-solving process and often required his team mates, Patrisha and Unicorn, to justify their solutions through constructive conflict. Below is an excerpt from Group #3's transcript for the second iteration that shows one example of Ninja's participation in the group discussion.

30:29	Ninja: I got 40. (long pause) Wait no I got 54…how did you guys get 34?	279 280
30:42	Unicorn: 70 minus 44.	281
30:44	Ninja: Yeah look. So look 8 take away 2 is 6.	282
30:49	Unicorn: 8 take away 4.	283
30:52	Ninja: 4.	284
30:54	Unicorn: Yeah and then you put 4. 7 minus 4 is 3.	285
30:59	Ninja: No look. Wait you have to take away 4. 1 2 3 4. 3. Oh 34.	286

While in the first iteration, Ninja refused to participate in the assigned task and only contributed eight talk turns out of a total of two hundred nineteen talk turns for the entire group, the adjustments to the second iteration allowed him to feel comfortable collaborating to solve the word problems. Not only did Ninja's percentage of on task talk turns increase from 62.5% for the first iteration to 88.4% for the second iteration, but the focus of his talk shifted. In the first iteration, four out of five of Ninja's on task talk turns were coded as Participant Role talk turns, and three out four of those were regarding the amount of time the group had for the activity. However, in the second iteration, eighty-nine out of Ninja's one hundred thirty-eight talk turns were coded as Problem Solving talk turns. Thus, in the second iteration, Ninja's focus shifted from off task talk and discussing the time to collaborating with his group to solve the assigned word problems. Ninja's reflections after the first iteration allowed me as the teacher to adapt the task accordingly and create task and participant structures to foster this shift in participation.

At the end of the second iteration, Ninja again reflected on the task and participant structures. For this iteration, Ninja stated that he enjoyed the task and that he felt that he "didn't need to try hard this time." This could be due to the improved collaboration between his group or that he perceived the word problems to be easier. However, in the end, Ninja still felt that the one change he would make to the activity was that his group "…should all work together and help each other" and he again requested to join a different group.

Ryuga. *Iteration #1.* Unlike Ninja, Ryuga did communicate with his group during the first iteration. Ryuga's assigned participant role was "Supply Manager" and he made it clear in the first few minutes of the activity that he would only be responsible for

gathering supplies; while one of his group mates began to read the world problem aloud, Ryuga declared "Call me when you need some tape…" (Appendix E). The on task talk turn data for the first iteration for Ryuga's group can be seen below in Table 3.

Table 3

Iteration #1 Group #5 Talk Turns

On and Off Task Talk Turns						
Participant Name	Problem Solving Talk Turns	Participant Role Talk Turns	Total of Off Task Talk Turns	Total of Individual Talk Turns	% of Total Individual Talk Turns: On Task	% of Total Individual Talk Turns: Off Task
Ryuga	11	41	94	146	35.6	64.4
Tyrone	45	48	25	118	78.8	21.2
Bear	40	32	11	83	86.7	13.3
Karla	63	24	12	99	87.9	12.1

Note. The total number of talk turns for Iteration #1 Group #5, both on and off task, was 446 talk turns.

Over the course of the thirty-five minutes, Ryuga spoke 146 times on the audio recording; 94 of these times were coded as off-task talk turns. While Ryuga did have 52 on task talk turns during the activity, 41 of them were regarding the participant roles of "Supply Manager" and "Time Keeper". Furthermore, 27 of these 41 times, Ryuga randomly mentioned a topic specific to one of the participant roles that did not necessarily coincide with the group discussion at that moment. One example of Ryuga's lack of participation can be seen in the excerpt from Group #5's transcript below.

7:10	Bear: [I don't know.] Wait let me see. I don't know if it's correct.	107
7:16	Karla: We have to find out what C is too.	108

7:19	Ryuga: Ha! [It figures…]	109
7:20	Karla: [Because it says] Florist C sold 122 flowers fewer than	110
	Florist B. So we have to [minus that].	111
7:25	Ryuga: [I'm stronger.] I'm faster. [I'm better.]	112
7:27	Bear: [Ok.]	113

While Ryuga makes off task comments, his group members continue to discuss how to solve the word problem, even talking simultaneous to Ryuga. Ryuga's lack of participation continued throughout the entire activity, except when he is asked to retrieve materials for his group, which he does easily, to fulfill his role as "Supply Manager." In another instance, when I asked the group to reflect on what they were thinking, Ryuga responded by stating "I'm thinking I ain't thinking nothing…If we need four pieces of tape I have four pieces of tape."

Also, unlike Ninja, Ryuga did not see his lack of participation as an issue and his reflection at the end of the task mirrored this. When asked if he liked the activity, Ryuga responded by saying "I got to lazy around and say a lot of stuff. I loved it." His group members, however, all stated that they liked the activity, but wished that Ryuga could've been more focused. His off-task comments and refusal to participate in the activity outside of the limits of his assigned role, frustrated the group.

Iteration #2. As stated previously, many students wanted the assigned participant roles to be different for the second iteration. When redesigning the participant and task structures for the second activity, I specifically kept Ryuga in mind. Ryuga was adamant that he fulfills only his participant role during the first iteration, this led me to ensure that I explicitly stated the responsibilities of the shared roles of "Problem Solver" and "Recorder" for the second iteration.

At the beginning of the activity, Ryuga participated with the group in assigning word problems to each individual member. Ryuga solved his assigned word problem quickly and began to look at the other word problems while he was waiting. When I checked in with his group and realized he was finished, I asked him and another group member, Tyrone, to help Karla solve her word problem. In the excerpt below, Ryuga, following his assigned role of "Problem Solver", worked with Tyrone to assist Karla as best as he could. Throughout the activity, Ryuga had 48 on task talk turns, with 31 of them pertaining to solving the assigned word problem individually or collaboratively with his group. Furthermore, while he still had a large number of off task talk turns, many of them occurred while Ryuga was also participating in recording his work on the group poster. Thus, while the group talk was not relevant to solving the word problems, Ryuga was still participating in the math activity by completing the poster.

4:45	Tyrone: What do you need help [on?]	81
4:46	Ryuga: [Ok] it is…	82
4:47	Karla: It's division right?	83
4:50	Tyrone: 3,500…	84
4:53	Ryuga: 59 divided by [1,000.]	85
4:55	Tyrone: [He sold…he sold] some and gave 59 tomatoes to	86
	his neighbors. He had…	87
5:03	Karla: I think it's minus.	88
5:04	Tyrone: How much did he sell? So if he has 1,059…	89
5:10	Ryuga: ( ) a fraction? No it's not.	90
5:11	Tyrone: He sold…and he gave 59 tomatoes away so that's	91
	1,000.	92
5:19	Ryuga: So you have to go all the way to three digits in dividing.	93
5:24	Tyrone: Oh so what's 1,000 minus 87? (long pause) No. What's	94
	87 to get to 1,000? Yeah 1,000 minus…	95
5:38	Ryuga: That's how many he had left.	96

At the end of the second iteration, Ryuga's reflection revealed that, while he had enjoyed the activity and solving his own word problem, he missed his role as "Supply Manager". However, from my perspective as the teacher, not only had Ryuga's participation increased significantly since the first iteration, but the camaraderie amongst his group had improved.

When looking at the talk turn data from the second iteration, however, it is clear that Ryuga still struggled to stay on task during the activity, as seen in Table 4 below. Yet, while in the first iteration Ryuga's "Problem Solving" talk turns were minimal, only accounting for 7.5% of his total talk turns during the activity, in the second iteration Ryuga's "Problem Solving" talk turns did increase to 16.5% of his total talk turns. This shows that, while Ryuga did still spend time off task, he did work towards collaboratively solving the word problems with his group during the second iteration, instead of taking a less active role in the conversation.

Summary. My second research question was to determine if the collaborative reflection process increased student participation across iterations. Using Ninja and Ryuga as case studies with which to reflect on the larger group, both students had a difficult time participating in the first activity due to the participant structure. By utilizing the collaborative reflection process and gathering their feedback, I was able to improve the participant and task structures to specifically meet Ninja's and Ryuga's needs. In this way, the collaborative reflection process increased their engagement with the activities.

Table 4

Iteration #2 Group #5's Talk Turns

On and Off Task Talk Turns						
Participant Name	Problem Solving Talk Turns	Participant Role Talk Turns	Total of Off Task Talk Turns	Total Individual Talk Turns:	% of Total Individual Talk Turns: On Task	% of Total Individual Talk Turns: Off Task
Ryuga	18	24	67	109	38.5	61.5
Tyrone	33	36	36	105	65.7	34.3
Bear	6	24	44	74	40.5	59.5
Karla	15	14	22	51	56.9	43.1

Note. The total number of talk turns for Iteration #2 Group #5, both on task and off task, was 339 talk turns.

Insights for Individual Students

When embarking on this study, my overall purpose was to increase student voice in the classroom regarding task and participant structures through the implementation of collaborative reflection between teachers and students. In order to do this, my final research question resolved to determine if common needs and suggestions arose amongst students and the researcher/teacher throughout the reflection process. To do this I reviewed and open coded the students' responses to the reflection question, "If there is one thing you would change about this activity, what would it be?". Then, I compared the open codes with my own answers to the reflection questions as well as my field notes taken during the enactment of each iteration as described in the Methods section above.

For each iteration my teacher/researcher reflections tended to correspond with the prevalent theme from the students' reflections. In Iteration #1, the participants and myself noticed the lack of collaboration and time on task as a result of the assigned

participant roles. In Iteration #2, many of the students felt that no changes needed to be made for the following iteration of the activity and I did note that the participant structure had improved for the second iteration and more students were engaged in the activity. However, my only concern was with the emotional responses of some of the students due to the task structure. Finally, for the third iteration, the majority of the participants expressed that they did not feel that changes were necessary to the activity.

While I was not surprised to find that my reflections mirrored the majority of the participants' thought about each activity, it was the individual students' responses that were the most eye-opening. As a researcher and teacher, I was able to monitor the overall progress of the class with each iteration during the activity itself. But by giving each individual student time to reflect on the activity and share their reflection with me, I was able to see deeper into the student interactions in the classroom. While the individual student responses may have been outliers when coding and looking for prevalent themes, it gave each student a voice in the classroom with which to inform the teacher of their perceived needs for the task and participant structures.

One example of this was the students' reflections on the difficulty level of the word problems for each iteration. Some participants, such as Daisy, Bear, and Tyrone expressed their desire for more difficult word problems and Daisy, specifically, also requested an extension to the task stating she would make it so "…everybody can do two things because once someone gets done they have nothing else to do." This reflection, stated after the second iteration, was what prompted me to create the "Mathematician" participant role, allowing students to choose the more challenging task of creating their own word problem instead of only recording their work.

Another example of an individual reflection that was important was Bread's continual reflection that he would prefer for Girl to no longer be in his group. After the first iteration, Bread reflected that he wanted to be a part of a different group because his two group members, Girl and Potato, were "arguing too much" (see Appendix A). When reviewing the audio recording for this iteration, it was apparent that Girl and Potato were not taking Bread's ideas into consideration; below is an excerpt from the first iteration in which Bread entreats Girl and Potato to check to ensure that their quotient is correct before moving on to the next step.

3:13	Girl: [Can I do] the next part now?	65
3:15	Bread: We have to…we have to multiply it by something.	66
3:18	Girl: No so…	67
3:19	Bread: Yes just check if it works.	68
3:21	Girl: See so…	69
3:23	Bread: See if it makes sense backwards. (long pause) We need	70
	to check our work! Cause if this is wrong…	71
3:28	Girl: We are. We need to minus 122.	72
3:32	Bread: But <u>this</u> might be the wrong number. That's what I'm	73
	saying.	74
3:34	Potato: [We're double checking though.]	75
3:34	Bread: [It could be the wrong number.] No you're not.	76

Despite Bread's insistence that they check their quotient by using the reciprocal operation of multiplication, his group members move on to the next step with solving the word problem. While I spoke with Group #2 during the activity and encouraged them to check their quotient, Bread had already become frustrated with his group and would only continue the task after my intervention into the situation. His reflection at the end of the activity and hearing the group interactions that took place leading to his reflection caused

me to emphasize the "Problem Solver" characteristic of "Listening to others' ideas" in the following iteration and pay closer attention to this throughout the activity.

Summary. My original research question centered around determining if common needs arose between the teacher and the students when reflecting on task and participant structures. After reflecting on the design narrative and the answers to the reflection questions at the end of each iteration, it is clear that this was the case. While there were occasionally subtle differences of opinion, a majority of the participants and myself agreed on possible changes for each subsequent iteration. However, it was the individual student responses, like Daisy's and Bread's, that provided valuable insights into their needs in the classroom that were not apparent based on their participation in the activity. Similarly, the three students who had a difficult time participating in the first iteration, Ninja, Ryuga, and Dominus, all were able to communicate their specific needs in order to increase their engagement. In the end, while the collaborative reflection process did help to confirm my own reflections, as the teacher, on the group level interactions taking place in the classroom, it was even more essential for allowing each individual student to be heard.

Chapter 5

Discussion

This chapter revisits Finn's (1989) participation-identification theory and explores facets of collaborative reflection that can add to the literature regarding student engagement. This chapter also reflects on design limitations for this study and next steps researchers and/or teachers should contemplate with future research and implementation of the collaborative reflection process.

The purpose of this pilot research study was to implement the design intervention of collaborative reflection in an elementary math classroom in order to measure its effect on student's feelings of identity and participation in tasks. I theorized that by increasing elementary students' voice in the classroom by collecting student reflections and suggestions regarding task and participant structures, the students would then have an increased sense of identity in the classroom. Utilizing Finn's (1989) participation-identification theory, this increase in identity would also increase students' engagement through participation. While the collaborative reflection process was easy to implement and provided insightful feedback regarding individual students' needs, I was unable to measure changes in students' feelings of identity through the Learner Empowerment Measure due to methodological choices during the study (Frymier, Shulman & Houser, 1996). However, by focusing on the suggestions of individual students who struggled with engagement, I was able to increase their participation in the tasks.

Design Limitations

A limitation of this research design was implementing this design intervention of collaborative reflection in the specific context of a fourth-grade math classroom. This study only considers the effects of collaborative reflection on improving student engagement in an elementary math education setting. Furthermore, as fourth graders are just beginning to think critically about the world around them, this may have impacted their fulfillment of the task and participation structures. However, the coding of any talk turns related to co-construction or constructive conflict related to the word problem task as participation, whether a correct or incorrect answer, should help mitigate lack of participation due to underdeveloped critical thinking skills.

Another limitation was the limited number of iterations and students included in this study. With Design-Based Research, interventions need to undergo multiple iterations in order for the researcher to examine how the intervention is affecting all aspects of the classroom system. As the collaborative reflection only occurred three times, this provided a limited amount of data to analyze and discuss. With the limited amount of time for the research, I chose to conduct a pilot study of the collaborative reflection process and focus on a small sample size. This allowed me to go deeper in analyzing the process and its effects on the classroom environment and those particular students. Future research concerning the collaborative reflection process will want to have a larger sample size in order to allow more students' voices to be heard throughout the school year.

A final limitation was regarding the design of the LEM survey. Due to the perceived authority between teachers and students by students, several participants did not feel comfortable putting their name on the pre- and post- survey. Thus, I was unable to compare each individual students' pre- and post- survey results. Furthermore, a few students who originally were hesitant to take part in the study, joined after the first iteration was complete and did not take the pre-survey. This led to the population being different between the pre- and post- surveys, which lead to an inability to use the data sets for accurate statistical analysis via a paired samples T-test.

Next Steps

How can the collaborative reflection process be best implemented in an elementary classroom? While there are several models currently in use at Mitra's (2006) highest level of student voice, these require students to be trained in research methods

and need extended time outside of the classroom for students to conduct their research. Furthermore, many student voice studies take place in a middle or high school context, partially due to the time requirements. Yet, if student voice is going to be increased in the elementary classroom, a realistic and efficient process must be available to elementary educators.

As explained in the Design Narrative, the collaborative reflection followed the process of simultaneous student and teacher/researcher reflection following an assigned task and participant structure. Then, after reviewing the student suggestions and comparing them with my own, I reflected on potential changes to the task and participant structures with a peer educator, Mrs. A.

Reflecting on the overall collaborative reflection design intervention, there were several components that were successful and easy to implement. First, because the students were asked the same three reflection questions at the end of each activity, they became familiar with the task and quickly answered the questions. Another component that worked well was recording the students' reflections using iPads. Each group was given an iPad which recorded the groups' interactions during the activity as well as their reflection discussion. As this was implemented in an elementary classroom, requiring students to write their reflection responses may have taken more time. However, by conducting the reflection discussion orally, the students could quickly and easily share their thoughts at the end of the activity. Finally, as discussed under my final research question, utilizing collaborative reflection allowed me, as the teacher, to gain a deeper understanding of individual students' needs in the math classroom by giving every student a voice.

Overall, while the collaborative reflection process was quick and provided further insight into students' needs regarding task and participant structures, there are a few factors to consider for future use. First, as this was conducted in an elementary classroom, some students had a difficult time being serious when reflecting on the activities. For example, Potato, at the end of the second iteration, suggested that there should be cookies for the students during the activities (see Appendix A). These types of responses are expected working with younger participants, but frequent reminders about the goal of the reflection process should be provided. Another consideration for future utilization of collaborative reflection is the lack of follow-up with the participants after the activity but prior to the next iteration. While I was able to listen to the students' suggestions after each iteration, I was not able to ask them follow-up questions to elicit further elaboration or context behind their recommendations. In the future, another step could be added before the task or participant structures are formally adapted, where the teacher/researcher informally discusses suggestions with individual students that they are curious about and gather more background information.

When considering how to move forward with the collaborative reflection process, some next steps would be to increase the time and depth of the utilization of the design. Due to the nature of this study, a small sample group was considered for only three iterations. Future studies should consider utilizing the collaborative reflection process for a full unit or school year in order to gain a better understanding of the process and if it can increase students' identities with the classroom over a greater period of time. Also, in order to gather a more accurate sense of students' identities in the classroom, the LEM survey should be tracked for individual students to allow for accurate data analysis.

Chapter 6

Conclusion

In conclusion, the collaborative reflection process, which allows for students and teachers to reflect individually and collectively, did increase student engagement in the classroom by providing insightful feedback, especially for participants who were struggling with participation. The process was quickly and easily implemented at the end of an activity, unlike current feedback processes that include student voices utilized in elementary schools. In the end, elementary teachers seeking to improve upon their practice and increase student engagement, should consider the collaborative reflection process for their classroom.

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APPENDIX A

PARTICIPANT ITERATION SUGGESTIONS

Question: "If you could change one thing about this activity what would it be? Why?"

Iteration #1:

Rose: "One thing that I would change is more time. Or more people."

Patrisha: "If I could change the question, it would be good."

Unicorn: "One thing I want to change, if I could, is that more people would want and try to participate."

Ninja: "What I would change is my team actually worked together without rushing."

Alex: "The one thing that I would change was, not that many things, but change the jobs for Dominus because he just looked at the time and did mostly nothing."

Ocean: "I would change one thing only. It is that I would've had more time to finish. But other than that, that's it."

Dominus: "I would change how much questions we had to do, because it was kind of boring on the amount of questions we did. But that was my opinion."

Little: "If I could change anything, the thing I would change is that, like what Ocean said, is that we had more time to finish the poster."

Tyrone: "Ryuga."

"I would like it if maybe…"

"Maybe if you didn't have to write it on a super big paper."

Bear: "Ryuga!" (Bear, Tyrone, and Karla laugh)

"That Ryuga wouldn't talk that much and…"

"More time."

"More people."

“I would change more time. We need more time.”

“We needed to focus more.”

Ryuga: (responding to the group) “I knew you were going to say that!”

“I would change that Karla was alive.”

Karla: “Ryuga.”

“Ryuga. I want Ryuga to leave us.”

“If this had given us the B answer and the C answer and then we just add it.”

“We needed more, more, more, more.”

Bread: “I know what I would change. I want to fly! So I could fly away!”

“I wouldn’t be here.” (Girl replies: “Like not being at this table?) “Um, kind of.”

“Different people, I guess. Cause I don’t like it, you guys are arguing too much.”

Potato: “One thing I would change is knowing the jobs before we actually choose them.”

Girl: “If I could change one thing in the activity I would change actually before picking the numbers I would actually just know the jobs and then we would take turns if someone picked the same one. Like if someone picked the same one they would probably do rock, paper, scissors or something. A little game to know who would win and who would not do it.”

Daisy: “Ok my thing that I would change is that we would all get to do something. Like Pizza only got to put on the poster and Pug only got to write it all down. It would be cool if all of us got to write one step because we had three steps. So that’s what I would change.”

Pug: (in response to Pizza's change) "That was my role! I had to write everything!"

"If I could change a thing about this activity is that everybody got to do something with the project. I did all the writing and I wanted everybody to write something too but we couldn't. And if somebody has to do something than everybody can do something too."

Pizza: "If I could change two things, not being yelled at and not having #4 write a bunch of stuff for nothing."

Summer: "Ok the thing that I would change about this activity is, hmm let me see, is not having a lot of paper cause we didn't really need it. So yeah. We had a big thing of paper."

Tacos: "No jobs!"

"No getting mad."

"I would change everything."

Jacob: "No jobs!"

"Pick our jobs."

"No jobs because if the writer person, they have to write and the other people have to stay there and be bored."

"I would only change one thing. I would change the jobs."

Banana: (no response)

Iteration #2:

Bear: "Nothing."

(jokingly) "I would change all of you I don't want to work with you guys."

"I would change all of you except Tyrone."

Karla: "I would change nothing because this activity was really fun."

Tyrone: "I would change it back but I would want to change my group except Bear."

"I would change the roles. That's the only thing I would change."

Ryuga: "I would change it back to the last activity."

"Cause I didn't like this one except that there was the addition. That's the only part I liked."

"I liked the other one better because this one had addition, but the other one I got to choose my role."

Mrs. Sanders asks Ryuga "So you liked being the supply manager last time?"

"Yep."

"The only thing I wanted to do was addition."

Patrisha: "Have one question for two people and another question for two people."

"Way more time."

Ninja: "And we should all work together and help each other."

Rose: (no response)

Unicorn: "And we could draw colorful pictures and have more time."

Bread: "Girl's not here."

Potato: (in response to Bread) "Don't say that. How about this maybe you guys should try to get along. That's what I would change and that there are cookies. I'm hungry."

Girl: "I would change not there being as many questions like a little bit less. And also that…"

Daisy: "I would say something where everybody can do two things because once someone gets done they have nothing else to do."

"Or we could have more people in a group…I would say that two tables can join so that they all can work together and they solve 8 problems. So like two people can work on 1 problem or stuff like that."

"Or we could still have 4 problems."

Pizza: "More questions."

"We could play Fortnite before we start."

"We can yeah more things and have more challenging questions."

(in response to Daisy's suggestion about more people) "No!"

"Or we could have 10 problems."

Summer: "I agree with both of them because a lot of people like to do questions. And a lot of people like to write. So yeah."

(in response to Daisy's suggestion about more people) "I agree with Daisy actually."

Tacos: "I would change one thing of this activity is the…"

"I would probably change nothing at all because the activity was actually good and fun. And I learned more stuff and I remembered some stuff way in the past."

Banana: "I wouldn't change anything because there were no jobs."

Jacob: "I would not change nothing because Ms. Sanders really took our advice and put her heart into it and changed all the mistakes. For me."

Jet: (in response to Jacob) "You just stole my answer. It's good."

Iteration #3:

Bear: "Harder questions."

Tyrone: (in response to Karla) "They were all easy for me."

"I would change the questions to a little bit harder."

Karla: "I would change nothing because #4 was actually pretty hard for me."

Cupcake: "I would change the questions."

Rose: "One thing I would change is more harder questions."

Patrisha: "I would want us to do one big question. I want us to solve one big question and then we could all solve something and we could all have a part in it. And it would have a lot of steps."

Unicorn: "What I would change is more drawing and creativity like drawing."

Pizza: "More questions."

Pug: "What I would change about the activity is probably do something fun fun like a board game and math at the same time. Yeah so we could be working as a team...like kind of like fractions. Like there's a board game and everybody...they have to work together to solve a problem in order to move. Like you're a team together and you grab a paper and you solve it together. Then if you get it right your whole team moves squares or something like that."

Daisy: "I don't know what I should change about it because all of our suggestions that we would want happened. And we got to do...have more...it be more fun."

Summer: "I wouldn't change anything about this activity because I liked it how the way it is."

(in response to Pug's suggestion) "We already did that."

Dominus: "Not really anything because it was the right amount of challenging and I like it."

Alex: "If you could change you thing about the activity...I want a big poster."

Daniel: "If I could change one thing about this activity it would be nothing because it was very fun and we got our own posters and I think it was better because as a group we had just a big poster but I wouldn't change anything because I got our own poster."

Little: "I would change the activity I would change that we had...I don't really know."

Potato: "One thing I would change is we would do a little bit more better with each other."

Bread: (no response)

Ninja: (no response)

Jacob: "If I could change something I would change basically nothing because everything was perfect for me. I don't know about my partners but for me."

Tacos: "I would change one thing to put one section of hard questions and one section of easy questions. And if someone has a hard time with the answer we could get an easy question or something not that complicated. Or pick our own questions like place values or rounding or anything."

Jet: "I would change nothing."

Banana: "I would change nothing because I liked everything about the activity."

APPENDIX B

PARTICIPANT FINAL REFLECTION QUESTION RESPONSES

Question: "Did you feel like Ms. Sanders changed the activities based on your suggestions?"

Rose: "I like the changes because we get to our own individual thing instead of waiting for everybody."

Patrisha: "I liked the changes because it was like how I wanted it."

Unicorn: "Yes I do think she changed it based on what we wanted to change."

Dominus: "Yes."
"I'm not really sure. But I can go with it. It's fine."

Alex: "Yes whatever she said."

Daniel: "I'm not sure because I didn't see everyone's suggestions. But I like how she changed like what I said kind of and then what they said probably."

Little: "Yes. You did."

Pizza: "Yes! My suggestion will always be more questions."
"I feel like she did use our suggestions because last time I said more questions. And...more questions!"

Pug: "Wait I feel like she did change the things because we weren't all the same. Somebody was doing the poster...somebody not doing the same thing. So we said that we wanted something to do like a different...like not just stick to one part. And she kept changing it and it was good because it was...it turned up into this and it was fun."

Daisy: "Yeah. I would say yes because like when we would say that…"

Summer: "Ok so I think she took our suggestions as we wanted because everybody may not have liked it or they didn't...feel like...or they didn't have...or they didn't either like it so."

Potato: "Yep. I think you did Ms. Sanders. You did change it."

Bread: "Yes. Yes you did."

Ninja: (no response)

Bear: "Yes."

Tyrone: "I think she changed it except the questions because they were too easy. So that's why I don't think she changed it but everything else she did."
"She just needs to make the questions harder and then everything would've been good."

Karla: "I think she did change them because she made the problems a little bit more harder but not too hard."

Cupcake: "Yes."
(after Tyrone) "Yeah I agree."

Jacob: "Yes I think you changed the activity because remember how we said we wanted to change our jobs and get our own jobs and everything. She changed that. So that's how I think she changed the question."

Tacos: "I think so she did. I'll say yeah because people said something like this and this and she actually changed the activities."

Jet: "I think she did change it because she made us work separate instead of all together."

Banana: "I feel like she changed the activities based on our suggestions because...because she took our suggestions and like the jobs we don't have any more jobs. And we each get to do our own questions."

APPENDIX C

GROUP 3's TRANSCRIPTS ITERATIONS #1 & #2

Iteration #1

0:05	Patrisha: Florist A sold 1,572 flowers. Florist B sold half as many	1
	flowers…(long pause) as Florist A. Florist C sold 122 flowers fewer than	2
	Florist B. How many flowers did the three florists sell in all?	3
0:39	Rose: Does it mean subtracting or adding?	4
0:41	Unicorn: So...	5
0:49	Rose: Since it says fewer...	6
0:51	Patrisha: Ok it says. Ms. Sanders?	7
0:54	Rose: Florist A...	8
0:55	Patrisha: Ms. Sanders?	9
0:56	Ninja: We're running out of time.	10
0:57	Patrisha: No we're not.	11
0:58	Ninja: Mmhmm. We have one more minute.	12
1:01	Patrisha: What? (long pause) Ninja, no we're...ok.	13
1:06	Unicorn: Ms. Sanders?	14
1:07	Patrisha: Ms. Sanders? (long pause) Ms. Sanders?	15
1:11	Ninja: What time are we ending?	16

1:14 Patrisha: 2:35! Stop! (long pause) Ninja!

1:15 Unicorn: Well, if it ( ) it's his fault.

1:21 Patrisha: Ms. Sanders? (long pause) So, um...

1:26 Ninja: Exactly. What's the whole point of being a time person?

1:38 Unicorn: Are we adding or like subtracting?

1:40 Ms. Sanders: I would maybe get out a sheet of paper or you could use the whiteboard. But how are you going to solve it?

1:41 Unicorn: I'll grab a whiteboard and a marker. (long pause) And I'm the writer.

1:51 Patrisha: Rose you're not even writing.

1:57 Unicorn: Alright. So what are we writing down?

1:59 Patrisha: Ok. So, I'm going to read it again. "Florist A sold 1,572." So write 1,572. Uh, "flowers. Florist B sold half as many." So half, just write half as many. (long pause) Ok, so write Florist A, Florist B. (long pause) Ok, and then...

2:33 Rose: Florist C.

2:39 Patrisha: "Half as many as Florist", wait ok.

2:43 Rose: Florist C...

2:45 Patrisha: “Florist C sold 122 flowers…” and then “122 flowers fewer than Florist B. How many flowers did the florists have in all?”

3:04 Unicorn: So there’s like a pattern.

3:05 Patrisha: Yeah, so it goes “this much”, “as many”, and then “fewer”. So it would be. So 1,572 flowers. Half as many. So half as many...

3:25 Unicorn: We’d have to divide by 2?

3:26 Patrisha: Yeah. So 1,572 divided by 2. Do long division.

3:36 Rose: Well what’s going to be ( ).

3:37 Patrisha: 2.

3:38 Unicorn: Ninja is not even participating.

4:08 Ninja: I’m confused.

4:12 Patrisha: ( ) this part.

4:13 Ninja: (whispers into the audio recorder) It’s so hard.

4:20 Unicorn: No, you’re ok. Uh 780 flowers.

4:25 Patrisha: So the florist B would be, would have 785 flowers.

4:32 Unicorn: So 122 minus 785. Cause it’s fewer than.

4:36 Rose: Yeah. 52

4:39 Patrisha: Ok. 53

4:41 Unicorn: So 785 minus 122... 54

4:54 Ms. Sanders: How'd you guys get 785? 55

4:55 Patrisha: Long division. 56

4:56 Rose: We did division. 57

4:56 Mrs. Sanders: Ok. So you did, ok 2 goes into 15, 7 times. Ok. 2 goes into 58
17, 8 times, good. And then 2 goes into 12, 5 times? 59

5:06 Rose: See I told you. 6. 60

5:10 Patrisha: Ha ha Unicorn, you're just erasing it. 61

5:14 Unicorn: I need the marker. (long pause) It's 6, ( ). Erase. 62
(counting to herself) 63

Group #3 talking amongst themselves about moving the audio recorder so that it can capture Unicorn's voice better.

5:40 Patrisha: 7 minus 1 is 6. So it'd be 6... 64

5:43 Rose: But how'd you put 6? You put 4. 65

5:46 Unicorn: It's 664. 66

5:47 Patrisha: So the florist, “How many flowers did the…”. Ok so then you add all of those. Wait hold on. Florist C sold 122 flowers fewer than Florist B. So and then you add them altogether. So you add this one, this one, and this one.

6:00 Unicorn: And then in total, oh.

6:06 Patrisha: You have to add them all together.

6:08 Unicorn: Ok so then we should erase a lot of this to have more room.

6:10 Unicorn: Just erase it with your hand. It’s faster. (long pause) Ok there. Ok so it’d be 1,572 plus (long pause) 2 plus...

6:30 Unicorn: (talking to herself quietly)

6:38 Patrisha: There’s no zeroes there.

6:39 Unicorn: I know and I don’t need your...I just like to do it this way. 6, 7, 8, 9 10,11,12

6:53 Patrisha: 7. 6 plus 6 is 18.

6:56 Unicorn: (still counting quietly to herself)

7:03 Rose: It should be 18.

Recording was interrupted. New recording started.

2:57	Unicorn: 122 fewer than Florist B so subtract 786 minus 1,572.	84
	(whispering to herself) 1,572. (aloud) And then, bu 786. 7 minus 8 we	85
	can't do that. And then, oh wait is that a 7? Or is that an 8?	86
3:34	Rose: A 7.	87
3:37	Unicorn: Wait, that's a 5. So ( ) that one and it's...	88
3:45	Rose: 15.	89
3:50	Unicorn: (begins erasing)	90
3:51	Patrisha: Unicorn!	91
3:52	Ardani: Whoops! Sorry I did everything wrong.	92
3:56	Rose: Everybody makes mistakes.	93
3:57	Unicorn: I know. It was supposed to be 786 minus 122. 786...122.	94
4:15	Patrisha: I'll be back.	95
4:17	Unicorn: 6 minus 2 is 4. 8 minus 2 is 6. And then 7 minus 1 is 6. So that	96
	would be that. This one would be 664.	97
4:24	Rose: Florist C would be.	98
4:26	Unicorn: Finally we add all of them.	99

4:27	Rose: Yep.	100
4:28	Patrisha: Ok, so you would add what?	101
4:30	Unicorn: 1,572. Add 786. Then add 664.	102
4:50	Rose: Do we add them <u>all</u> together?	103
4:52	Unicorn: Yeah we add them all together. So 6 plus 4 is ten, then 11,	104
	12. Then 16, then add 6. So 16, 17, 18, 19 , 20, 21, 22. So it's 22.	105
	And then 14, and then 15, 16, 17, 18, 19, 20. Zero, two. Now we have	106
	3,022.	107
5:24	Rose: All of them together?	108
5:25	Unicorn: Yeah. So that's our answer.	109
	Ninja begins singing.	
5:39	Unicorn: Stop Ninja.	110
5:43	Ninja: I'm not messing around. This is ( ).	111
5:44	Patrisha: Yes you are.	112
6:00	Unicorn: So are we going to write our poster now? (long pause) We're	113
	writing the poster now right? Right ok. [I've got a sharpie.]	114
6:07	Rose: [I can do it!]	115

6:08 Patrisha: No we can all do it. 116

6:10 Ninja: Let's go on the floor. Yeah, let's go on the floor. 117

6:13 Unicorn: Ok. 118

6:17 Patrisha: Unicorn, go get a pencil for the black. 119

6:20 Unicorn: Ok. 120

Group #3 adjust the audio recorder so that it is closer to where they are working on the floor.

7:05 Rose: Unicorn, get a pencil. Oh yeah. 121

7:10 Patrisha: ( ) so we can all write. Ok, let me get my pencil. 122

7:18 Rose: Put it ( ) so like that. 123

7:27 Unicorn: ( ) poster right? 124

7:29 Patrisha: Ok so don't erase anything. (long pause) Wait, Unicorn, how 125
about two people write with the pencil and then two people will write 126
with the sharpie. 127

7:45 Unicorn: I'm writing with sharpie. 128

7:47 Patrisha: I'm writing with sharpie. (long pause) Me and Unicorn are 129
writing with sharpie, so somebody else ( ). Ninja! (long pause) 130
131

Ninja you need to come write something. (long pause) No write over there. 132

8:10 Unicorn: Wait, I think we write at the top ( ). 133

8:15 Patrisha: Yeah, right there. 134

8:16 Unicorn: Alright, now... 135

8:17 Patrisha: Ok. 136

Patrisha, Rose, and Unicorn continue to talk but it is too quiet to understand.

8:56 Unicorn: Don't erase the board. 137

8:57 Patrisha: So, A... 138

8:58 Rose: It looks green. 139

8:59 Patrisha: I know.

Group #3 adjusts the audio recorder again.

9:32 Unicorn: I don't ( ). She doesn't write nice at all. 140

9:34 Rose: I don't write nice. 141

9:36 Unicorn: That's why you're writing in pencil.- 142

9:37 Rose: Patrisha... 143

9:38	Patrisha: No, why are you writing it that way! Are you using pencil?	144
9:42	Unicorn: That's why I said she doesn't write nice.	145
9:43	Patrisha: Ok. Ok I'm doing sharpie too. Can I have a sharpie?	146
9:49	Unicorn: Wait you don't write nice and neat either. (long pause)	147
	(Unicorn speaks again but it is too quiet to understand.)	
10:15	Patrisha: How many florists are there?	148
10:16	Unicorn: Uh, three. I call Florist C.	149
10:18	Rose: Awww.	150
10:24	Unicorn: That's yours.	151
10:25	Patrisha: Put 1,000...	152
10:26	Unicorn: 1,572. (long pause) What are you doing?	153
10:34	Patrisha: You're going to ruin the whiteboard.	154
10:36	Unicorn: Write half as many, right?	155
10:44	Patrisha: I need an eraser.	156
10:52	Unicorn: Here. (long pause) Half...as...then write the number 786.	157
11:06	Rose: ( ).	158
11:07	Unicorn: Write...	159

11:09 Patrisha: Then F B... 160

11:10 Unicorn: After that write... 161

11:11 Patrisha: Write half as many, then F B. 162

11:13 Unicorn: Write F B again, but ( ) this. And then write... 163

11:15 Patrisha: Again F B? 164

11:19 Unicorn: Yeah, write ( ). 165

11:23 Patrisha: This is F B though. 166

11:26 Unicorn: Then half as many and then draw a line to it like that. 167

11:27 Patrisha: Oh. Ok. 168

11:30 Unicorn: Then write 786. (long pause) And then...where's Rose? 169

11:37 Patrisha: One hundred, wait...yeah one hundred... 170

11:42 Unicorn: And twenty-two. (long pause) Fewer than F B. (long pause) 171
Than...F B. (long pause) And then put a line right there. And then put 172
664. And then write long division, 1,572. ( ). (Unicorn 173
continues talking but it is too quiet to understand.) 174

12:36 Patrisha: What else? 175

12:37 Unicorn: In this space right here, don't write it way too big, but write it like this. Write long division 1,572 divided by 2. 1,572 divided by 2. And then minus from...just solve it. 176 177 178

13:09 Patrisha: 7, where? Oh. 179

13:12 Unicorn: 7 on top of the 5. Here. 7, and then draw the line right there. 180

13:16 Patrisha: I know. (long pause) 0, ( ), 1. 181

13:24 Rose: Put the 7. 7. 182

13:26 Patrisha: I know what I'm doing. (long pause) 8, 16, equals...I forgot the line. Then 1, 0. Zero right here? 183 184

13:42 Unicorn: Uh, wait. Let me see. 185

13:45 Patrisha: The 0 goes right there and then... 186

13:50 Unicorn: No you don't add a zero anywhere. Erase ( ). 187

13:54 Patrisha: ( ). 188

13:56 Unicorn: You don't add a zero. You just put the zero there but not there. 189

14:05 Patrisha: Wait, hold on. Ok. 190

14:07 Unicorn: Oh wait. Oh oh oh ok. I'm sorry I can barely see upside down. Ok. So then... 191 192

14:14 Patrisha: Bring down the 2? You need to bring down the 2? 193

14:17 Unicorn: Yeah. 194

14:18 Patrisha: All the way down here? Ok, let me ( ) over here. 195

14:26 Unicorn: Then, subtract by 12. 196

14:32 Patrisha: ( ). 197

14:33 Unicorn: ( ) 12. So subtract... 198

14:37 Patrisha: So then put zero, zero? 199

14:38 Unicorn: Yeah. 200

14:40 Patrisha: Oh that zero is too small. 201

14:45 Unicorn: Hey where'd the pencil? Oh. 202

14:48 Patrisha: Uh, now we got to do the other part.(long pause) 203

Do the minus. 204

14:52 Unicorn: Over here. (long pause) ( ) that 786 minus 122 . We just 205

need this last part. 206

15:20 Patrisha: Ok so 221... 207

15:25 Unicorn: Don't add the adding ( ). 208

15:29 Patrisha: 221... 209

15:30 Unicorn: 1,572. (long pause) Wait wait wait. Oh yeah. 210

15:40 Patrisha: Ok. Wait no the 1 goes over here and the ( ) goes right 211
there and the 7 goes right there. The 2 goes right there. 212

15:48 Unicorn: ( ). Don't write that. Erase that. 213

15:50 Patrisha: No,um, I put it in the right position it's just those. 214

15:54 Unicorn: Oh. 215

15:55 Patrisha: No you just have to do this one. So do the 221 again. 216

16:03 Unicorn: Oh well I can't write it again, so...write it ( ). 217

16:07 Patrisha: Ok 0, 7, wait is it 0? 218

16:11 Unicorn: Yeah, that's just cause you can't make it ( ). 219

16:14 Patrisha: This is 0, 0... 220

16:17 Unicorn: I'm going to do a ( ). So that they know. And then…- 221

16:23 Patrisha: 786. 222

16:31 Unicorn: And then add it all. 223

16:34 Patrisha: Do I put [the]? 224

16:35 Unicorn: [Yeah] put the adding sign right there. (long pause) And 225
then add it all together. 226

16:46 Patrisha: Ok so 6 ( ). 227

16:50 Unicorn: ( ). That'll be a 3. (long pause) No because 6 plus 228
4 equals 10, plus 1 equals 11. Carry the 1 up there. Then, ( ). 229

17:12 Patrisha: 6 plus 2 is 8. 230

17:14 Unicorn: So 24. 4 and then a 2. 231

17:21 Patrisha: Then 4, 9…( ). 232

17:32 Unicorn: ( ). 233

Patrisha and Unicorn continue to discuss how to write their work on the poster, however it is too quiet to make it exactly what they're saying.

17:42 Unicorn: And then we circle it. ( ). And then we write the 234
sentence. 235

17:48 Patrisha: Ok. We'll write it right here. Ms. Sanders? Ms. Sanders can 236
we have the paper back? 237

18:03 Unicorn: Cause I need to...ok the sentence is going to be... 238

18:10 Mrs. Sanders: Hold on a second guys. Where did the 221 come from? 239

18:11 Patrisha: Um the where is it? That! Or, what, it's 122! 240

18:17 Unicorn: 122! 241

18:20 Rose: I told you ( ). 242

18:21 Unicorn: Oh! 243

18:22 Mrs. Sanders: Ok fewer. But is it 122 flowers? 244

18:24 Patrisha: No. 245

18:26 Mrs. Sanders: Like that they sold? 246

18:27 Unicorn: So erase that. Rose erase that. 247

18:29 Mrs. Sanders: Yeah. I don't know that you need that. You only need 248
how much Florist A sold, how much Florist B sold, and how much 249
Florist C sold, right? 250

18:40 Unicorn: Ok. 251

18:43 Patrisha: She said you don't need this. (long pause) Now we just got to 252
bump this down. 253

18:58 Unicorn: Wait. 254

18:58 Patrisha: And redo our addition. 255

18:59 Unicorn: Where is that 2? Because we only need to add these three 256
numbers. 257

19:04 Patrisha: 1, 2. We only have two numbers right now. We need to bump 258
this top one down. 259

19:09 Unicorn: But erase ( ). We should only have three numbers. 260

Three numbers. So we have that, then 786 and 664. Do we have that? 261

Oh yeah, then we need to erase the ( ). And then, just add this. 262

19:29 Patrisha: Ok, I'll start doing the other ( ). Ok, 12. 263

19:41 Mrs. Sanders: Timekeepers, now might be a good time to give your team 264

an estimate of about how much time they have left. 265

19:52 Patrisha: How much time do we have? 266

19:53 Mrs. Sanders: Right now it's 2:20. We're done at 2:35. 267

19:54 Patrisha: We have 15 minutes! 268

Patrisha and Rose are discussing the problem but it is too quiet to hear clearly.

20:15 Unicorn: You write it! Erase it and you write it. Hey I'm tracing it's 269

mine. 270

20:23 Rose: Hurry up! No start writing now. 271

20:26 Unicorn: Ok. (Unicorn is quietly talking to herself.) Ok. 272

Patrisha and Unicorn begin discussing tracing the poster.

21:21 Rose: We have 15 minutes left. 273

Patrisha and Unicorn are trying to find another sharpie for Patrisha,

while Unicorn begins tracing.

22:20 Rose: 12 minutes. 274

Patrisha and Unicorn begin discussing erasing all the extra pencil marks from the poster.

24:39 Rose: We never wrote our sentence! 275

24:40 Unicorn: Oh my gosh! Write it, write it! (long pause) The florists...sold...that number, it's 3,022...flowers...in all. In all. Ok we're ready now. 276 277 278

Patrisha, Unicorn, and Rose continue tracing the poster and erasing stray marks.

28:48 Group #4 begin talking about the audio recording and making noises.

28:49 Patrisha: Ok we're done! (long pause) We should draw, yeah we should draw flowers. 279 280

28:56 Rose: Wait let's erase all, erase all the ( ), ok? 281

Patrisha and Unicorn are deciding on which color of markers to use to draw on the poster.

30:12 Unicorn: (Unicorn overhears another student ask about the time) We only have 5 more minutes! 282 283

30:15	Rose: We have 15 silly!	284
30:17	Unicorn: No, Ms. Sanders said 5 minutes.	285
30:20	Patrisha: Ok, we've got to keep going.	286
	The girls begin discussing drawing flowers on the poster.	
30:51	Mrs. Sanders: Ok, your group should be thinking about cleaning up.	287
	You have about 5 more minutes.	288
	Group #4 continues to color their poster.	
31:15	Mrs. Sanders: You have about 4 minutes until you need to be all cleaned	289
	up.	290
	The girls continue drawing flowers on the poster and discussing how it looks ugly.	
34:39	The girls begin cleaning up.	
35:15	Rose: Guys we forgot our names!	291
35:16	Patrisha: It's ok.	292

Iteration #2

0:06	Ninja: Do I have to work with someone?	1
0:13	Patrisha: Here I'm going to go in Rose's seat and you stay right there.	2

0:18	Ninja: I don't want to...	3
0:21	Patrisha: You have to Ninja.	4
0:23	Ninja: I'm not.	5
0:24	Patrisha: You have to work with somebody.	6
0:25	Ninja: I'm not.	7
0:27	Patrisha: You have to work with somebody.	8
0:28	Ninja: I'm not.	9
0:29	Patrisha: Yes you do!	10
0:30	Ninja: I'm not.	11
	Unicorn and Ninja begin playing with the audio recorder.	
0:53	Patrisha: Stop!	12
0:54	Ninja: What?	13
0:55	Patrisha: Ok so...	14
0:56	Ninja: Wait stop what? Patrisha stop what?	15
0:59	Patrisha: Stop saying that.	16
1:01	Ninja: I like turtles?	17

1:02 Patrisha: Yes.

1:03 Unicorn: (talking into the audio recorder) Sorry Ms. Sanders Ninja is messing around.

1:07 Ninja: That's why I hate my group because they never want to work together.

Ninja and Patrisha begin discussing whether or not Ninja can be heard by the audio recorder.

1:32 Ninja: Where's Rose?

1:37 Patrisha: Ok.

1:38 Unicorn: "Connor stole…"

1:40 Ninja: What's Connor stole?

1:42 Patrisha Ok so...Connor had...

1:47 Ninja: Who's Connor?

1:48 Unicorn: "Connor had 1,590 tomatoes."

1:52 Ninja: Tomatoes.

1:53 Patrisha: Wait.

1:55	Unicorn: Tomato, tomato. Potato, potato. What's the difference? (long pause) Oh wait what am I reading. "He sold some and gave 59 tomatoes to his neighbors. [He had 87 tomatoes left.] How many tomatoes did he sell?	32 33 34 35
2:10	Ninja: [Have you seen End Game?]	36
2:16	Patrisha: Unicorn I got a whiteboard.	37
2:16	Unicorn: Oh yay.	38
2:18	Patrisha: Ok. Can I use your marker?	39
2:19	Ninja: She doesn't have one.	40
2:20	Patrisha: Yes she does.	41
2:21	Ninja: No she doesn't.	42
	Unicorn begins singing.	
2:30	Mrs. Sanders: Why do you have a partner? No no no no no. You're all working together...	43 44
2:33	Ninja: Told you!	45
2:34	Mrs. Sanders:...to solve all 4 problems. Then when you do the poster you'll each be in charge of writing one problem on the poster. But right now you need to work together to solve them. Ok?	46 47 48

2:45	Unicorn: (quietly) No.	49
2:46	Rose: I was confused for a second.	50
2:47	Unicorn: We need to divide.	51
2:56	Patrisha: I want to be the...can I write on the whiteboard?	52
3:04	Unicorn: Wait do we need to divide or subtract?	53
3:06	Rose: No you have to do your own.	54
3:08	Ninja: No you don't.	55
3:10	Patrisha: No you don't. We're working on them as a group.	56
	Unicorn is playing with the camera.	
3:25	Ninja and Patrisha tell Unicorn to stop playing with the camera.	
3:27	Patrisha: Ok. Unicorn can I use your marker?	57
3:29	Unicorn: Uh why?	58
3:30	Patrisha: To write it down or to do the recording. Or not the recording but	59
	yeah basically the recording.	60
3:39	Ninja: So we're taking away the 59 and the 10 and the...	61
3:40	Patrisha: Hold on.	62
3:41	Ninja:.....we're taking away the 59 and then there's 87.	63

3:47	Patrisha: [Unicorn].	64
3:47	Ninja: [Wait how] much did he sell?	65
3:50	Patrisha: Marker.	66
3:52	Ninja: It's [1,000 divided by 87.]	67
3:53	Patrisha: [I need a whiteboard or whiteboard marker.]	68
3:57	Ninja: It's dividing.	69
3:58	Unicorn: Is it dividing or subtracting?	70
4:00	Patrisha: Wait let me read it let me read it.	71
4:02	Ninja: We already read it.	72
4:04	Patrisha: It doesn't matter.	73
4:06	Ninja: We're dividing. 1,000 divided by 87.	74
4:12	Patrisha: "Connor had 1,059 tomatoes. He sold some to...he sold some	75
	and gave 59 tomatoes to his neighbors. He had 87 tomatoes left. How	76
	many tomatoes did he sell?"	77
4:30	Unicorn: Huh?	78
4:31	Patrisha: So he has 1,059 in total. He sold 59 so 1,059 minus 59.	79
4:40	Rose: Hmmm.	80

4:41	Patrisha: That'd be 1,000. And then uh "He had 87 tomatoes left. How many…"	81 82
4:51	Unicorn: We have to show our work on here anyways so...	83
4:53	Patrisha: I know. Ok so 1,000...	84
4:56	Unicorn: Dividing?	85
4:57	Patrisha: Huh?	86
4:58	Unicorn: Dividing? Like you said?	87
5:01	Patrisha: No.	88
5:02	Unicorn: Subtracting.	89
5:03	Patrisha: No it's 1,059 minus 59. 1,059 minus 59 equals 1,000.	90
5:13	Unicorn: (speaking into the audio recorder) Ms. Sanders why did we have to use pencil?	91 92
5:18	Ninja: Cancel?	93
5:19	Unicorn: Pencil.	94
	Group #3 members begin commenting on a noise one of them made with a Push-Pop.	
6:06	Ninja: Are you sure we're not dividing?	95

Unicorn begins playing with the camera again.

6:33	Rose: Stop.	96
6:50	Patrisha: Ok so...he has 87 left. How many...	97
6:55	Unicorn: Sold. He sold 1,000.	98
6:58	Ninja: Wait Unicorn.	99
7:00	Patrisha: No! Because he has 87 left. So he would have...so he sold...ok	100
	so 1,000 minus something to get 87. 1,000 minus something to get 87.	101
	So...	102
7:15	Unicorn: Which would be dividing.	103
7:19	Ninja: Told you! I love you.	104
7:21	Patrisha: No it wouldn't.	105
7:23	Ninja: Yeah it would. Oh my god I'm so smart. But now we have to count	106
	from 87 to 1,000.	
7:31	Patrisha: Exactly.	107
7:35	Ninja: Skip count!	108
7:37	Patrisha: That's still a lot.	109

7:38	Ninja: It is. Unicorn can you skip count all the way to 1,000? (long pause)	110
	Hey guys I'll do this one ok?	111
7:52	Patrisha: I want to do #2.	112
7:56	Unicorn: I don't know.	113
7:58	Ninja: I'm good. I'm doing [#3].	114
7:59	Patrisha: [Read it] over again.	115
8:01	Ninja: I'm doing #3.	116
8:01	Rose: I'll do number...	117
8:02	Patrisha: I already called #2!	118
8:03	Rose: I call #3.	119
8:05	Unicorn: You're #4 I already called it.	120
8:07	Ninja: I'm number one!	121
8:08	Patrisha: Oh yeah I'm #2.	122
8:09	Ninja: I'm #3.	123
8:10	Unicorn: She's...no you're #4.	124
8:11	Ninja: I'm #1.	125
8:12	Unicorn: No I'm 1, she's 2, she's 3, you're 4.	126

8:15	Ninja: I get the hardest.	127
8:18	Patrisha: No. We're solving the problems together. And then we just have to do it. On here.	128 129
8:23	Ninja: Ok. Wink wink.	130
8:27	Patrisha: Wait so it'd be 87...	131
8:32	Mrs. Sanders: How are we doing?	132
8:33	Ninja: Confused.	133
8:34	Mrs. Sanders: Well I agree with what you've got so far. We subtracted. We got 1,000. Right.	134 135
8:37	Ninja: We're dividing.	136
8:38	Patrisha: We could do 1,000 [divided by] 87.	137
8:39	Mrs. Sanders: [Ok.]	138
8:41	Mrs. Sanders: Mmm. It says "He had 87 tomatoes left."	139
8:42	Ninja: So...	140
8:43	Mrs. Sanders: After he sold some.	141
8:48	Patrisha: So...	142
8:49	Unicorn: I thought that was the answer.	143

8:50	Patrisha: 87...	144
8:51	Mrs. Sanders: No that's how much he gave away. But then he also sold some. And now [he only has 87.]	145 146
8:57	Unicorn: [Exactly. That's what I think] [is the answer].	147
8:58	Patrisha: [87 minus] something. Or 1,000 minus something to get 87. I told you.	148 149
9:06	Unicorn: Alright.	150
9:08	Ninja: I can't believe.	151
9:10	Unicorn: That would be 0 and that would be 9.	152
9:12	Patrisha: No. You could put 7, 8...	153
9:15	Unicorn: 10. That'd be 10. And that would be 10 minus something to get 8. So that'd be...	154 155
9:21	Patrisha: Oh 1,000 minus 87 equals 87.	156
9:23	Unicorn: Mmmhmm.	157
9:25	Rose: What?	158
9:26	Patrisha: 1,000 minus...	159
9:27	Rose: No close to 1.	160

9:27	Unicorn: 7...	161
9:28	Patrisha: No. Cause you could put a 0 under the 1.	162
9:30	Unicorn: 9 minus what equals 8?	163
9:33	Patrisha: Look it.	164
9:34	Ninja: Why don't we do 1,000...	165
9:35	Patrisha: No Unicorn look it. So you could do it like this. 1,000 minus 87,	166
	0087, equals 87.	167
9:44	Rose: No wouldn't it equal this Unicorn?	168
9:47	Patrisha: Let me see. (long pause) No. We're not dividing.	169
9:53	Rose: It's 1.	170
9:54	Ninja: That'd be wrong. Right?	171
9:56	Rose: I don't know.	172
9:57	Ninja: It'd be wrong.	173
9:57	Patrisha: What?	174
9:58	Ninja: Wait so do you have to put the 1 right here. Then it would be 100.	175
	And if you take that away that'll be 9.	176
10:05	Patrisha: Something to equal 87 though.	177

10:06	Ninja: No that's wrong.	178
10:09	Patrisha: No it's not.	179
10:10	Rose: It's not close to 1.	180
10:10	Patrisha: No.	181
10:11	Unicorn: Got it!	182
10:12	Patrisha: No. We're doing subtracting!	183
10:14	Unicorn: It's 912!	184
10:16	Ninja: Told you.	185
10:17	Patrisha: What?	186
10:18	Ninja: Cause look it. You have to bring the 1 from 100. That'll be 900 because you have to take it away and put another right here. Then there'll be a 9 right here cause...	187
10:25	Unicorn: It'd be 912.	188
10:27	Ninja: I told you it wasn't that.	189
10:29	Rose: Wait what?	190
10:32	Unicorn: (singing) 912.	191
10:33	Ninja: Minus 1,000. (long pause) Right?	192

10:37 Unicorn: That's our answer. 193

10:38 Patrisha: No but how did you get 87 with that? 194

10:40 Unicorn: So look. 1,000 minus 912 you get you can't subtract 0 minus 2 195
so you borrow from all the way over there and then that'd be a 9 and then 196
a 10 and then it'd be a 9 and then that'd be 10. And then yeah. 197

10:56 Mrs. Sanders: How are we doing? 198

10:57 Unicorn: I got...wait we got the answer. 199

10:59 Mrs. Sanders: Is it 9,012? 200

11:01 Unicorn: 912. 201

11:03 Mrs. Sanders: Check your subtraction. Can you do 1,000 minus 9,000? 202

11:09 Ninja: I'm confused. 203

11:10 Mrs. Sanders: Check...do that subtraction Ninja. 1,000 minus 912. Do it 204
and see if you get 87. See if Unicorn is correct. 205

11:18 Unicorn: That's what I did. I subtracted. 206

11:20 Mrs. Sanders: Minus 912. 207

11:23 Ninja: Wait what? 208

11:23 Mrs. Sanders: That's what Unicorn thinks the answer is. So do minus 912 209
to see if she's correct. If you get 87 then she's right. 210

11:32 Ninja: Ok so I take this one and then I put this but it'd by a 9 and then put 211
a 1 and that'll now be a 9. And this will be 10. 212

11:35 Mrs. Sanders: Yep. Yep. 213

11:36 Ninja: Told you. 214

11:36 Mrs. Sanders: 10 minus 2. 215

11:39 Ninja: It's 8. 216

11:42 Patrisha: I am so confused! 217

11:44 Ninja: 8 and then 9 take away... 218

11:45 Patrisha: You guys are confusing. 219

11:48 Unicorn: No look. If you subtract 1,000 minus 912 it gives you... 220

11:53 Ninja: It's wrong for me. 221

11:58 Unicorn: Look I'll show you. 222

12:06 Rose: No that'll be 10 though. 223

12:09 Unicorn: 1,000... 224

12:18 Ninja: Mine's wrong. 225

12:19 Rose: That’s wrong. (long pause) I started... 226

12:25 Ninja: You studied? 227

12:26 Rose: I said I started! 228

12:27 Ninja: Started what? (long pause) What do you have done? Just asking. 229

(long pause) Did you just copy? 230

12:45 Rose: No! 231

12:46 Ninja: Yes you are. 232

12:51 Unicorn: There. Check it and you’ll see. 233

12:53 Patrisha: How do I check it? 234

12:57 Unicorn: Check the subtraction. 1,000... 235

Rose says something but it is too quiet to hear.

13:00 Ninja: It’s right. How did you get 7? (long pause) How did you get 7? 236

13:08 Patrisha: Did I break it? 237

13:09 Unicorn: It’s just right ok. 238

13:10 Ninja: Yeah but if you do 10 minus 2 it’s 8. 239

13:18 Unicorn: Uh. 10 minus 2 equals... 240

13:19 Ninja: 8. (long pause) So that has to change to a 3. 241

13:26	Unicorn: Wait a minute.	242
13:27	Rose: See it's wrong.	243
13:29	Ninja: You just agreed with her!	244
13:31	Unicorn: Just a little tweak.	245
13:33	Ninja: So a 3.	246
13:34	Unicorn: It's just a little tweak.	247
13:37	Ninja: I knew it. (long pause) Now it's right.	248
13:45	Patrisha: It's not 3.	249
13:50	Unicorn: See you still don't get it. (long pause) Why do my nails keep doing this?	250 251
14:09	Ninja: Wait. If the 1 is in the tens place would that be a 10 minus 9?	252
14:15	Unicorn: Oh my gosh.	253
14:16	Ninja: Cause it's in the tens.	254
14:30	Rose: Unicorn I don't get it. Unicorn I don't get it.	255
14:35	Rose: This!	256
14:37	Ninja: Let's just move on to a new one. Who's doing the second one?	257
14:40	Patrisha: Me!	258

14:43	Ninja: Ok yay just tell us all the answers. Who's doing the second one?	259
14:47	Patrisha: I'm doing the second one but...	260
14:49	Unicorn: We all have to work together.	261
14:51	Ninja: Ok let's work!	262
14:58	Unicorn: #2. Who's going to read #2?	263
15:00	Patrisha: Um...	264
15:01	Unicorn: Patrisha you can read #2.	265
15:02	Patrisha: Ok. It says "Vijay had…"	266
15:07	Mrs. Sanders: Ok what'd we get? Was 912 correct?	267
15:09	Unicorn: No.	268
15:10	Ninja and Patrisha: No.	269
15:11	Ninja: I...	270
15:12	Patrisha: It was 913.	271
15:13	Unicorn: It was just a little tweak.	272
15:14	Ninja: I got it right.	273
15:16	Mrs. Sanders: Ok keep going.	274

Mrs. Sanders quietly talks to Rose who is crying.

15:27 Ninja: Wait what? 275

15:33 Another student brings the questions the students will cut out for their poster.

15:35 Ninja: “Vijay had”...can I read? 276

15:37 Patrisha: Rose? 277

Ninja and Unicorn begin playing with the camera.

16:29 Ninja: I got the answer for the second one. (long pause) Guys I got the answer for the second one! 278 279

Patrisha and Unicorn continue to play with the camera.

17:09 Ninja: I got the answer guys. 280

17:11 Patrisha: No that’s not that’s wrong. 281

17:12 Ninja: No it’s not. 282

17:14 Unicorn: We didn’t even read it. 283

17:15 Patrisha: Yeah! “Vijay had”... 284

17:19 Unicorn: You didn’t do anything. 285

17:20 Ninja: Guys the answer is 7,000. 286

17:22 Patrisha: No we have to show our work. I'm trying to read it! 287

17:25 Ninja: I already did. 288

17:26 Patrisha: We have to do it as a... 289

17:27 Unicorn: As a team. 290

17:28 Patrisha: As a group. 291

17:28 Ninja: I did it. 292

17:30 Patrisha: You're not our... 293

17:31 Unicorn: I said that a long time ago. 294

17:32 Ninja: I know I got it right though. (long pause) This one was the easiest! 295

296

17:37 Patrisha: Ok! Um... 297

17:39 Ninja: Can you guys hurry up? 298

17:42 Patrisha: "Vijay had 8,500. He bought a T.V. and a computer"...Stop! 299

Ninja. 300

17:48 Ninja: Stop what? 301

17:51 Patrisha: Stop telling the answer when we haven't figured it out yet! 302

17:54 Ninja: Then hurry! (long pause) Cause you guys are playing. 303

18:00 Patrisha: “After paying for the computer and the T.V. he had 2,500 left. If the T.V. costs 1,500 how much did the computer cost?”

18:09 Ninja: It’s subtracting.

18:10 Patrisha: Yeah I know. 8,500...

18:15 Unicorn: Oh my gosh Rose!

18:19 Patrisha: ...minus 1,500...

18:23 Ninja: You’re still stuck on that one!

18:24 Unicorn: Yes she is.

18:26 Ninja: Now we have to wait for her.

18:28 Unicorn: Nope.

18:29 Ninja: We all have to wait for her.

18:33 Unicorn: I’m not.

18:36 Ninja: I feel like I got it right. I don’t know why.

18:39 Patrisha: No because...no because that’s how much the T.V. costs. That’s how much you have for the T.V. Now you have to do the how much the the other thing costs. 7,000 and you have 2,500 left. So um so it’d be...

Unicorn says something quietly.

19:00 Patrisha: So the T.V. was 500,000 or 5,500... 321

19:06 Unicorn: 9 minus 1 equals 8. 322

19:06 Patrisha: Ha. Cause so you have 8,500 and then...and then to get 7 you 323
subtract 1 which is 1,500. And then you have 7,000. And then you 324
subtract how much to get to 2,000. And that would be 5. 325

19:25 Ninja: So the answer is 5? 326

19:27 Patrisha: No the answer is 2. The answer is 5 yes. 327

19:29 Ninja: 5? 328

19:30 Rose: But how do you get that? 329

19:30 Patrisha: 5,000. 329

19:32 Patrisha: [7,000 minus] 5,000. 330

19:33 Rose: [No this!] 331

19:37 Unicorn: The zeroes don't matter... 332

19:39 Patrisha: 2,000. (long pause) Oh no it's 7, 500...it's 5,500. Or 5,000 yeah 333
5,500. And then it would be... 334

20:04 Unicorn: Wait how do we get 2? What do we subtract it by? 335

20:08 Ninja: 1,500. 336

20:10 Patrisha: What? 337

20:12 Ninja: So you have to...you said 5,500. You're going to have to...um 5 338
minus 0 you can't do that. So you have to take 1 whole from the 7 and 339
then turn into a 6 and 0 turns into a 10 take away 5 that'd be 500. And 340
then minus and then 5 minus 6 equals 1 and then 1,500. 341

20:34 Patrisha: But it has to be... 342

20:35 Unicorn: How did you get 5,500? 343

20:37 Ninja: That's my question! 344

20:39 Patrisha: Because so it's if you...the TV costs 1,500. 345

20:48 Mrs. Sanders rings the bell.

20:49 Ninja: We finished already? 346

20:54 Mrs. Sanders: This is a just a time check in. Right now it is 2:15. So you 347
have about 20 more minutes. Ok? 348

21:04 Ninja: Miss! Can I get water? 249

21:08 Patrisha: We're confused with this question. 250

21:09 Ninja: I'm thirsty. 251

21:11 Patrisha: Cause ok so you have 8,000... 252

21:16 Mrs. Sanders: Where'd you get the 5,500 from? Oh you're trying to get to 253
2,500? Guys instead of doing that subtract 2,500 and it'll tell you how 254
much. Do 7,000 minus 2,500. Whatever you get that'll be your answer. 255
256

21:37 Ninja: Is she on the second one yet? How did you get? 257

21:40 Rose: I'm not done with #1 so I'm skipping it! 258

21:48 Ninja: You're not allowed...whatever. 259

21:53 Rose: I don't get how to do it. 260

21:54 Ninja: It's just we're not allowed to skip... 261

21:55 Patrisha: 4,500! (long pause) 4,500. 262

21:59 Ninja: Ok let's skip all of them. 263

22:02 Patrisha: The T.V. costs 4,500. 264

22:03 Rose: ( ) to come back! Do you not know the difference? 265

22:06 Ninja: We're supposed to be on the poster. 266

22:12 Patrisha: It doesn't matter! Forget about it! (long pause) The answer is 267
4,500. 268

22:22 Rose: Wait what? 269

22:23 Patrisha: Yeah. Because Mrs. Sanders said subtract 7,000 minus 2,500 and then... 270

22:36 Unicorn: Yeah I think she's correct. [4,500.] 271

22:38 Patrisha: [0 minus 0, 0 minus 0,] turn so... 272

22:40 Unicorn: Yeah she's correct. 273

22:41 Patrisha: ...5 minus 0, you can't do it. Or 0 minus 5 you can't do it. So 274
you have to borrow, which is 10. You borrow from the 7 and you get 6. 275
And then you get 2 and then 4. 276

22:59 Mrs. Sanders: (speaking to Rose) That's correct. 913 is correct. (long 277
pause) Ok now that you did that what are you doing to do next? (pause) 278
Yep. 279

23:16 Patrisha: Ok who's doing #3? 280

23:17 Ninja: Me. 281

23:19 Rose: I am. 282

23:21 Patrisha: Somebody read it. 283

23:24 Unicorn: That's Rose. I told you it was 913. 284

23:28 Rose: “Ms. Schraeder had to buy erasers for 1,090 students. She managed to get 456 erasers from WalMart.” 285 286

Patrisha begins playing with the camera.

23:46 Rose: “And 234 erasers from Target. How many more erasers does she need?” 287 288

Ninja, Patrisha, and Unicorn begin talking about the camera.

24:23 Ninja: Wait. It was 1,000 not 190. (long pause) I’m confused what you read. 289 290

24:40 Unicorn: I know what to do. 291

24:42 Patrisha: Ok so 1,000...456 plus 234. 456 plus 234...it is 10...9... 292

24:57 Rose: That’s 1! 293

25:02 Patrisha: 6 so... 294

25:02 Rose: No... 295

25:03 Unicorn: You have to put here and there... 296

25:06 Patrisha: 456 plus 234 [is 690.] 297

25:08 Unicorn: [We’re not supposed to.] 298

25:11 Ninja: 690? 299

25:12 Mrs. Sanders: You added Rose instead of subtraction right here. Can you do 0 take away 5? (pause) No. So go ahead and look at that one. Ok? What are you going to do now? 300 301 302

25:29 Ninja: Um…(long pause) [I know it's]... 303

25:30 [1,900 minus 690.] 304

25:34 Ninja: Yeah. 305

25:35 Mrs. Sanders: (speaking to Unicorn) Next time we need to let someone else try it too, right? Guys don't solve it for other people. Let everybody think about it. If you're going faster than everybody than you need to slow down. 206 207 208 209

25:44 Ninja: I just said that! 210

25:47 Patrisha: Wait so it's wrong? 211

25:49 Ninja: No. It's right. 212

25:50 Patrisha: Oh. So 1,900... 213

25:53 Ninja: Plus? [Minus.] Minus I meant. 214

25:54 Patrisha: [No.] 215

25:56 Patrisha: Minus 690. (long pause) No it's plus I think! 216

26:08 Ninja: No it's minus. I got 1,210. 217

26:15	Patrisha: Uh...8...	218
26:18	Ninja: Did you get the same answer as me? Or no?	219
26:20	Unicorn: I don’t know.	220
26:21	Ninja: What did you get?	221
26:23	Unicorn: Don’t say it yet anybody.	222
26:25	Ninja: Oh.	223
26:25	Patrisha: Ok I got...	224
26:26	Ninja: No wait.	225
26:27	Patrisha: Rose...	226
26:27	Unicorn: Rose is not done.	227
26:29	Patrisha: Ok.	228
26:30	Ninja: See?	229
26:32	Unicorn: I got this.	230
23:33	Patrisha and Ninja: Same.	231
26:34	Ninja: What did you get?	232
26:36	Rose: It’s called I’m still on #2.	233

26:42 Patrisha: We have to wait until she's done with #2. 234

26:43 Ninja: Ok. 235

27:04 Ninja: Mine is hard. Mine's hard. 236

27:14 Patrisha: Ok. Let's do the last one. Ok so "Rosa wrote down a number on 237
a sheet of paper. If you subtract 44 from the number you will be left with 238
78. What is the number?" 239

27:33 Mrs. Sanders is quietly talking Rose through another problem.

27:36 Patrisha: Ok so something minus 4 to get 70 or 7. Or no. 240

27:42 Ninja: Can we do 100? 241

27:44 Unicorn: No 44 minus something equals...no wait. 242

27:47 Ninja: Subtract? (pause) Subtract? 243

27:52 Unicorn: Something minus 44 [equals 78]. 244

27:55 Patrisha: [30 something!] 30 something because if you do 4 or 3 minus... 245
246

27:58 Ninja: Or do 4? 247

27:59 Patrisha: No. 10 minus 3 you get 7. 248

Mrs. Sanders comforts Rose as she begins crying.

28:18 Ninja: Miss? (long pause) I'm confused with mine. I'm confused with mine Miss.

28:32 Patrisha: So we think it's...so if you do 10 minus something to get 7 it's 3 so it's be 30 something. To get [70].

28:39 Unicorn: [I don't] think so because...I don't think so because when you subtract you subtract a lower number from the bottom number.

28:48 Mrs. Sanders: So you're thinking 44 plus something to get 78. This person is saying something minus 44 to get 78. Hmmm.

29:10 Ninja: I'm confused. I got the hardest.

29:14 Unicorn is quietly counting to herself.

29:16 Ninja: I didn't want to be last.

29:22 Patrisha: You could do 4...

29:24 Unicorn: I got it!

29:25 Ninja: You got it? What is it?

29:26 Patrisha: I don't get it.

29:26 Ninja: Oh you can't tell us what you got. No we have to wait for everybody.

29:31 Patrisha: I don't get it.

29:32	Ninja: I don't get it either. Mine's hard.	266
29:34	Patrisha: Unicorn I don't get it.	267
29:37	Unicorn: Wait a minute. (long pause) I got it. We subtract 70 from...	268
29:48	Ninja: 70 from 1.	269
29:49	Unicorn: I'm just going to do it myself because I can't...	270
29:53	Ninja: 79 minus 44. (long pause) I'm confused. Mine is the hardest.	271
30:07	Unicorn: Actually it's not that hard.	272
30:09	Patrisha: Unicorn help me. Please.	273
30:14	Unicorn: Uh fine.	274
30:15	Patrisha: I got it.	275
30:16	Unicorn: ( ) your answer ( ).	276
30:17	Patrisha: It'd be 4. (long pause) It'd be 34.	277
30:25	Unicorn: That's what I put...huh.	278
30:29	Ninja: I got 40. (long pause) Wait no I got...54. Wait how did you guys	279
	get 34?	280
30:42	Unicorn: 78 minus 44.	281
30:44	Ninja: Yeah look. So look 8 take away 2 is 6.	282

30:49 Unicorn: 8 take away 4. 283

30:52 Ninja: 4. 284

30:54 Unicorn: Yeah and then you put 4. And 7 minus 4 is 3. 285

30:59 Ninja: No look. Wait you have to take away 4. 1,2, 3, 4. 3. Oh 34. (long pause) Ok let's ask for a thing now. 286 287

31:17 Unicorn: Sure. Let's ask for our poster. 288

Unicorn, Patrisha, and Ninja begin talking about Unicorn's backpack.

31:42 Ninja: Uh Miss? We need our poster now. 289

31:44 Mrs. Sanders: Ok. Go ahead and get it. 290

31:45 Patrisha: The answer is 34. 291

31:54 Mrs. Sanders: (rings the bell): Ok. This is just a 10 minute warning. A 10 minute warning. 292 293

32:00 Patrisha: We can do it in 10 minutes. No Unicorn we can write it on the floor. 294 295

32:04 Mrs. Sanders: Remember you don't have to write your word problems. You can just cut them out and paste them. That saves a lot of time. Ok? So cut your poster up into four parts. 296 297 298

32:35 Patrisha: Wait can I write? 299

Patrisha, Ninja, and Unicorn talk about markers and how to organize their poster.

33:17 Ninja: Can I draw mine? 300

33:20 Patrisha: Miss? Oh we've got to cut out the...Unicorn do you have the scissors? 301 302

33:23 Unicorn: Yeah I have scissors. 303

33:25 Ninja: Can you write mine cause I'm not a good... 304

Ninja goes to get a drink of water. Patrisha and Unicorn cut out the questions.

34:48 Mrs. Sanders: Just cut them out. 305

34:50 Ninja: Cut what out? 306

34:51 Mrs. Sanders: You guys don't have enough time to write them. 307

34:58 Patrisha: Ok Unicorn who's #1? 308

35:00 Ninja: That's her. 309

35:01 Unicorn: I'm #1. 310

35:02 Patrisha: Ok I'm #2. Ok Unicorn start writing your question. 311

35:09 Unicorn: We glue it there. We glue it. 312

35:11 Patrisha: Which one is #1? (long pause) Which one is #1? 313

35:14 Unicorn: Uh it's... 314

35:16 Patrisha: Connor! Give me glue! Give me glue! 315

35:20 Unicorn: I don't have glue. 316

35:21 Patrisha: Then get glue from over there! Run Ninja! 317

35:22 Ninja: I can't! 318

Patrisha, Ninja, and Unicorn work frantically to glue their word problems on their poster.

36:28 Ninja: Can I start writing my question? 319

36:29 Patrisha: No Ninja. 320

36:30 Ninja: What? 321

36:32 Patrisha: I'm just kidding! Go! Hurry up Ninja! 322

36:33 Ninja: Mine's the shortest. 323

Ninja, Patrisha, and Unicorn continue to frantically try to finish their poster.

37:20 Patrisha: We have to write an answer sentence! 324

37:21 Ninja: No we don't. 325

APPENDIX D

NINJA & RYUGA'S REFLECTION RESPONSES

Questions:

1. Did you like the activity today? Why or why not?
2. Did you like the participant roles? Why or why not?
3. If you could change one thing about today's activity, what would it be? Why?

Iteration #1:

Ninja.

1. "I didn't like this activity because all the members in my group were trying to be first and do everything quick."
2. No response
3. "What I would change is my team actually worked together without rushing."

Ryuga.

1. "It went from bad to worse. I got to lazy around and say a lot of stuff. I loved it."
2. "It was fun cause I really didn't get to do anything. I really didn't do anything."
3. "I would change that Karla was alive."

Iteration #2:

Ninja.

1. "Yes cause we didn't need to try hard this time. And we didn't try hard."
2. No response
3. "And we should all work together and help each other."

Ryuga.

1. **“**If I hadn’t had addition I wouldn’t have liked this at all. Addition is one of my favorite things.”
2. “I would change it back to the last activity.”
3. “Cause I didn’t like this one except that there was the addition. That’s the only part I liked. I liked the other one better because this one had addition, but the other one I got to choose my role.”

APPENDIX E

GROUP 5's TRANSCRIPTS ITERATIONS #1 & #2

Iteration #1

0:32	Karla: So let me see it. Who's going to read it?	1
0:36	Tyrone: I'll read it.	2
0:37	Ryuga: Not me!	3
0:39	Tyrone: "Florist A sold 1,572 flowers. Florist B sold half as many	4
	flowers...half, half as many flowers as Florist A. Florist C sold 122	5
	flowers fewer than B. How many flowers did they...did the three florists	6
	sell in all?"	7
1:12	Ryuga: Call me when you need some tape or something else.	8
1:14	Tyrone: We need tape. No we need the poster.	9
1:16	Karla: This is an adding problem.	10
1:17	Bear: What?	11
1:17	Karla: What? (long pause) Cause it has [in all at the end.]	12
1:20	Tyrone: [So 1,572].	13
1:24	Bear and Karla: Wait.	14
1:25	Karla: This is an adding problem cause it says [in all].	15
1:28	Tyrone: [Wait, let me see.]	16

1:29	Karla: What?	17
1:39	Ryuga: Tell me whatever you need and I'll go get it.	18
1:45	Bear: I like this because I don't have to do anything at all. (long pause)	19
	Tyrone has it. Tyrone, use this one.	20
1:57	Karla: Let me see.	21
2:00	Mrs. Sanders: Oh, you're going to use Read, Draw, Write?	22
2:03	Ryuga: RDW. I thought that was red, durple, and white. (long pause) I	23
	actually thought that was ( ) for something like...	
2:12	Bear: I'm supposed to write. Karla, I'm supposed to write.	24
2:17	Tyrone: Yeah. He's the [writer].	25
2:18	Bear: [I'm the writer]. I'm the [recorder.]	26
2:21	Ryuga: [This is] loose.	27
2:23	Karla: You're the recorder.	28
2:23	Bear: Yeah.	29
2:24	Ryuga: ( ).	30
2:26	Tyrone: Wait, how do we know how much time we have?	31
2:28	Karla: Wait did you fold the problem?	32

2:31 Bear: No the problem is right here.

2:32 Karla: Oh.

2:35 Bear: I'm the write. (long pause) I'm the writer. (long pause) But I'm the writer!

2:44 Ryuga: Do you like how much time we've been doing it? How much time we've been doing it?

2:48 Mrs. Sanders: You have about 30 minutes. I'm just telling you about how much time you have left.

2:52 Tyrone: She is...I mean he is the, um,...

2:54 Bear: I'm the writer.

2:55 Tyrone: Yeah.

2:56 Mrs. Sanders: He's the recorder? (long pause) So Karla, can Bear write it since he's the recorder? Yeah? And you can tell him what you're thinking, yeah?

3:07 Ryuga: I'm thinking I ain't thinking nothing. (long pause) Stop that. If we need 4 pieces of tape, I have 4 pieces of tape.

3:17 Karla: Florist...

3:21 Ryuga: Y'all need any crayons?

3:24	Karla: Has half...as many as Florist...A.	51
3:33	Ryuga: Tell us how much time we have.	52
3:34	Tyrone: She said about 30 minutes.	53
3:39	Ryuga: A minute has passed since then.	54
3:42	Tyrone: I said <u>about</u>. So if we have...	55
3:48	Ryuga: You should've known that at least a minute has passed by since	56
	that time.	57
3:52	Karla: Florist C sold...	58
3:58	Ryuga: Minutes.	59
4:00	Karla: Florist. [C sold 122]	60
4:01	Ryuga: [How sad.] Woah, no no.	61
4:07	Karla: Fewer than [Florist B.]	62
4:08	Ryuga: [Get a chromebook.] It's not even alive. (long pause) It's dead.	63
	It's going dead for real. It's going dead like a chromebook that hasn't	64
	been plugged in.	65
4:20	Bear: Ok, Draw. What do we draw?	66
4:24	Karla: Let's see.	67

4:29	Ryuga: Watch this. I'm putting the lead up against this...	68
4:31	Karla: First we have to find out what B is.	69
4:34	Ryuga: B! (long pause) It's bologna. (long pause) Watch this I'm going	70
	to sharpen it.	71
4:46	Tyrone: I'm drawing...	72
4:47	Ryuga: This kid. This kid had ( ).	73
4:53	Tyrone: What?	74
4:54	Karla: We need to find out [what B is.]	75
4:56	Ryuga: [Life hack.] (long pause) Sharpening the pencil with scissors.	76
	Sharpen it yourself. (long pause) How sad. (long pause) I just cut the top	77
	off.	78
5:19	Karla: We have to, we have to find out what Florist B is.	79
5:22	Bear: Yeah that's what I'm doing.	80
5:23	Karla: Oh. (long pause) K.	81
5:44	Bear: Ok, plus...	82
5:48	Ryuga: Me and Tyrone don't have to really do anything. We are the	83
	really don't care about the group.	84

6:07	Bear: Oh my god.	85
6:14	Ryuga: You just got to draw?	86
6:17	Karla: Do you remember what 7 plus 7 is?	87
6:20	Ryuga: Yeah. 14. (long pause) Who wants some coffee?	88
6:25	Tyrone: We've got about 15...	89
6:27	Ryuga: Did you say [15 minutes?]	90
6:28	Tyrone: [20.]	91
6:20	Ryuga: I was about to be like...	92
6:35	Karla: Let me see it.	93
6:37	Ryuga: Call me Mr. T!	94
6:44	Tyrone: They call you Mr. T.	95
6:47	Bear: They call you Mr. ( ).	96
6:48	Ryuga: Huh? What if this actually slipped in my hand and cut off my ear	97
	like Mike Tyson.	98
6:54	Bear: What.	99
6:55	Ryuga: Oh my gosh it's Mike Tyson!	100
6:59	Tyrone: What does that mean? Show me ( ).	101

7:01	Bear: Here, here's ( ).	102
7:05	Ryuga: So. Faster. Better. Stronger.	103
7:07	Tyrone: Is it that?	104
7:09	Ryuga: Couldn't grip this.	105
7:10	Karla: [C is]...	106
7:10	Bear: [I don't know.] Wait let me see. I don't know if it's correct.	107
7:16	Karla: C. We have to find out what C is too.	108
7:19	Ryuga: Ha! [It figures…]	109
7:19	Karla: [Because it says] Florist C sold 122 flowers fewer than Florist B.	110
	So we have to [minus that.]	111
7:25	Ryuga: [I'm stronger.] I'm faster. [I'm better.]	112
7:27	Bear: [Ok.]	113
7:29	Tyrone make a comment but it is too quiet.	
7:30	Bear: What's 2 divided by 1,000?	114
7:32	Karla: 1,000? How am I supposed to know [that?]	115
7:34	Bear: [500.]	116
7:38	Karla: I'm not that smart.	117

7:40	Tyrone: We have been recording for [7 minutes.]	118
7:42	Ryuga: [Mike Tyson.]	119
7:49	Tyrone: You know that you just got ( ). You just got recorded.	120
	(long pause) Wow.	121
8:04	Ryuga: (begins singing) So now brain you are now gone. Please come	122
	back I really need you.	123
8:11	Karla: (singing to same tune as Ryuga) Hello darkness my old friend.	124
		125
8:15	Bear: 700...	126
8:16	Ryuga: My brain was...I had my head like. (makes raspberry noise) Wait	127
	did I just say that?	128
8:27	Tyrone: Huh?	129
8:32	Karla: Ms. Sanders.	130
8:36	Tyrone: Really? (long pause) Stop.	131
8:42	Bear: Ok what's 1,572 divided by [2]?	132
8:44	Ryuga: [10].	133
8:46	Tyrone: 572?	134

8:50	Bear: No. 1,517 divided by 2.	135
8:55	Ryuga: (Ryuga burps)	136
8:57	Tyrone: 2, 4, 6...	137
9:00	Karla: 2, 4, 6, 8, 10, 12. 12.	138
9:04	Tyrone: 14.	139
9:05	Karla: 14, 16.	140
9:06	Tyrone: No 14.	141
9:08	Ryuga: Ok, how much, how long...	142
9:09	Karla: Oh yeah 14. So that's 7 times right?	143
9:13	Ryuga: Yeah and then like minus...Wait, why did you do that? Bring	144
	down the 7 and the 2. And then you like go by 2's to bring it back and to	145
	see how many times it goes in.	146
9:28	Tyrone: (counting quietly to himself) 2, 4, 6, 8, 10, 12, 14...	147
9:33	Ryuga: You forgot the T.	148
9:36	Karla: What?	149
9:38	Ryuga: I mean not T. I thought that 7 was T. Spell at, ok, spell two with	150
	numbers.	151

9:49	Tyrone: 7. [7].	152
9:50	Ryuga: [Spell two with numbers.]	153
9:52	Tyrone: 786.	154
9:53	Ryuga: Tyrone, spell tattoo with numbers.	155
9:55	Bear: That's what I got.	156
9:56	Tyrone: You did?	157
9:58	Bear: Yeah but add 786 plus 786.	158
10:03	Ryuga: Tyrone…[Tyrone]	159
10:06	Bear: [What does it equal?]	160
10:09	Karla: (counting quietly to herself) 2, 4, 6, 8, 10	161
10:10	Ryuga: Tyrone spell tattoo in numbers.	162
10:12	Tyrone: 12...	163
10:14	Ryuga: Do it. Now.	164
10:19	Tyrone: 12. 9. 15? 14. 15. 1,552.	165
10:25	Ryuga: Tyrone. Tyrone.	166
10:28	Bear: Then I was correct.	167

10:30	Tyrone: 1,570. But you put 1,572.	168
10:34	Ryuga: Wait get rid of this. You don't need that.	169
10:36	Bear: No I put 86, that's [my second answer].	170
10:38	Ryuga: [You only need 1,000.] You don't need that part.	171
10:39	Bear: Minus 120...	172
10:40	Ryuga: It's not even in the right spot. (long pause) Tyrone. Spell tattoo in numbers.	173 174
10:50	Bear: Oh! I got it.	175
10:56	Ryuga: 7. 4. (long pause) 7. 0. 0.	176
11:04	Bear: So you add all three of the answers.	177
11:09	Tyrone: 7, 4, 0, 0?	178
11:13	Ryuga: 7, A. Since A is 4, 7, 0, 0.	179
11:20	Tyrone: 7, A...	180
11:22	Ryuga: 7, 4, wait, 7, 4, 7, (long pause)	181
11:28	Karla: What are you saying?	182
11:29	Ryuga: Oh. I spelled tattoo in numbers.	183
11:33	Karla: I got the same exact answer.	184

11:34 Bear: Yeah. I know. 185

11:36 Karla: But he got 1, 5, 5, 2. He got that. 186

11:40 Bear: No he didn't. 187

11:41 Karla: Yeah. I saw his page. 188

11:44 Bear: No he got 786. 189

11:48 Tyrone and Ryuga are having a conversation in the background.

11:59 Mrs. Sanders: Are you guys all talking about it together? 190

12:00 Bear: Yeah. 191

12:02 Karla: We have to do... 192

12:03 Bear: Ok so... 193

12:04 Ryuga: I don't know what you're doing so. 194

12:05 Tyrone: Now what do we do? 195

12:07 Karla: C. We have to minus B... 196

12:13 Tyrone: What's C? 197

12:15 Karla: C? 122. 198

12:17 Tyrone: 122. 199

12:18	Ryuga: Yeah C must be [122].	200
12:20	Karla: [Because it says]...	201
12:21	Tyrone: [Minus] what? Minus what?	202
12:22	Karla: The answer that you got.	203
12:23	Ryuga: Do you want me to go get the poster paper?	204
12:24	Tyrone and Karla are counting quietly to themselves.	
12:26	Ryuga: Do you want me to get the poster paper? Do you want me to get	205
	the poster paper?	206
12:34	Karla: No not yet we're not done yet.	207
12:36	Tyrone: It's 664.	208
12:38	Ryuga: 666.	209
12:39	Tyrone: 7 minus 1...	210
12:40	Ryuga: It's 4 plus 2...	211
12:42	Bear: Yeah that's what I got!	212
12:45	Ryuga: Plus 2...plus 2.	213
12:50	Tyrone: 6. 6. 6.	214
12:56	Ryuga: Do you want us...do you want me to get anything?	215

13:03	Karla: So this is C and this is B.	216
13:07	Ryuga: And I don't know division so...	217
13:12	Tyrone: Division is easy.	218
13:14	Ryuga: Division is the hardest.	219
13:15	Karla: What? (long pause) And this is A.	220
13:17	Bear: 2,682!	221
	Tyrone and Ryuga continue a side conversation.	
13:23	Karla: So...	222
13:31	Bear: Put this away.	223
13:36	Karla So...6.	224
13:36	Bear: I got the answer.	225
13:39	Tyrone: I feel like we should move the chromebooks.	226
13:41	Bear: We have...	227
13:42	Ryuga: How about you don't touch (Student #1)'s chromebook.	228
13:47	Bear: They have 260...2,682...uh...flowers in all.	229
14:00	Karla: (continues counting quietly to herself)	230

14:28	Ryuga: You have to see the most uncool thing ever when Tyrone gets back.	231 232
14:34	Tyrone: Actually no.	233
14:37	Ryuga: Actually yes.	234
14:39	Bear: Hey we need our poster.	235
14:41	Tyrone: Go get the poster.	236
	Ryuga begins speaking into the audio recorder.	
14:45	Tyrone: Scoot your desk. (long pause) They should be lined up. (long pause) Scoot your desk forward.	237 238
15:04	Ryuga: So what are we going to do with this poster?	239
15:07	Tyrone: We're going to write.	240
15:08	Ryuga: This poster is bigger than the table. Don't take the tape off yet. No, don't take the tape off.	241 242
15:16	Bear: We have to.	243
15:17	Ryuga: Where are we going to put this?	244
15:19	Bear: We're going to put it...put it down, put it down.	245
15:25	Ryuga: It's bigger than the table man.	246

15:27 Karla: Which way do you go? Did you go that way? Or this way? 247

15:30 Ryuga: We're going down. 248

15:32 Karla: I feel like this way. 249

15:35 Bear: Yep. 250

15:37 Tyrone: This way. 251

15:44 Bear: It's getting all squished together. 252

15:47 Karla: Wait, I don't get. Like right from left? Or left to right? 253

15:50 Ryuga: Losers. 254

15:51 Karla: Like this? Or like this? (long pause) Would you ( ) like that or 255
that? 256

15:58 Tyrone: We should do it that way. 257

16:00 Ryuga: 16 minutes have recorded! 258

16:07 Karla: How did you add it? Like did you add it left from right? Or right 259
from left? 260

16:11 Ryuga: There's 14 more minutes! (long pause) I just know there's 14 261
more minutes. 262

16:17 Karla: Cause you're always supposed to go from the ones to the tens. Or thousands. 263 264

16:24 Ryuga: Retard. 265

16:26 Bear: Ryuga. 266

16:30 Ryuga: You just got outwitted by me. 267

16:34 Tyrone: You just said it like 5 times. 268

16:38 Ryuga: I just got outwitted by an inanimate object. 269

16:43 Mrs. Sanders: How are you guys doing? 270

16:44 Karla: I got a different answer than them. 271

16:47 Mrs. Sanders: Ok so maybe Tyrone or Ryuga has to check addition if Bear and Karla aren't getting the same answer. 272 273

16:52 Ryuga: Addition? That's my jam! 274

16:54 Mrs. Sanders: Yeah. You can do it. Ok? 275

16:56 Tyrone: Ok. What addition? 276

16:58 Bear: Ok, what's 2 plus 6 plus 4? 277

17:00 Tyrone: So what numbers are there? 278

17:02 Bear: Yeah what's 2 plus... 279

17:03	Ryuga and Tyrone: No!	280
17:04	Tyrone: No, what's...	281
17:05	Ryuga: No!	282
17:06	Tyrone: No, stop stop stop stop stop. What's the number? What's the numbers?	283 284
17:11	Bear: 12.	285
17:12	Ryuga: [12?]	286
17:12	Tyrone: [What's] the numbers?	287
17:13	Bear: What?	288
17:14	Tyrone: What's the numbers?	289
17:15	Ryuga: 2, 4, 6.	290
17:17	Bear: 1,572.	291
17:18	Karla: Yeah, it's 12. It's 12, you're right.	292
17:21	Bear: 786...	293
17:23	Karla: I did my math wrong.	294
17:24	Bear:...and 664.	295
17:25	Ryuga: You never do your math right.	296

17:29	Karla: I do. Do my math right sometimes.	297
17:31	Ryuga: You sure about that?	298
17:32	Karla: Yes!	299
17:33	Tyrone: 10, 12, that is 12. (long pause) 16. What's 16 plus 6?	300
17:45	Bear: I don't know.	301
17:48	Tyrone: 6,7. 22.	302
	Ryuga begins playing with the camera.	
18:11	Tyrone; What did you get? I got 2,922.	303
18:14	Ryuga: 2018!	304
18:17	Bear: How?	305
18:18	Tyrone: What did you get?	306
18:19	Karla: Me? I don't know. He's right. (long pause) Bear's right.	307
18:25	Tyrone: Wait hold up.	308
18:27	Ryuga: If I go down, you're not going anywhere.	309
18:29	Tyrone: 12 plus 6 is...	310
18:32	Karla: Bear's right!	311

18:33	Ryuga: Your momma! Wait what? What? Wait what?	312
18:37	Tyrone: It's 2,...	313
18:41	Ryuga: Answer this. Did that make any type of sense?	314
18:43	Tyrone: Guess what you just got recorded. I think you guys are right.	315
	2,000. What did you get?	316
18:50	Ryuga: You'd think you might know that already!	317
18:52	Tyrone: No. Cause you keep singing.	318
18:57	Ryuga: How stupid do you think I am? Don't you. What?	319
19:00	Karla: Wait so...	320
19:01	Ryuga: Oh my gosh I am stupid.	321
19:04	Karla: (counting quietly to herself)	322
19:05	Ryuga: Oh wait. Camera you are stupid, wait no you're not.	323
19:10	Tyrone: If it's stupid then why...	324
19:12	Ryuga: Forget everything I just said. Yeah anything every one of us just	325
	said.	326
19:15	Karla: What's B again? [7?]	327
19:17	Ryuga: [Tyrone] how much time is left?	328

19:20 Tyrone: Here I'll tell you. (long pause) About 15 ish minutes. 329

19:29 Ryuga: 11. 330

19:32 Tyrone: 15 ish. 331

19:33 Ryuga: It's 11 more minutes. Oh! (long pause) I'm going your job better than you! Maybe I should've been time keeper. 332 333

19:44 Karla: It's about the time! Not this time, that time! 334

19:47 Ryuga: Yeah but that's how long we've been recording. And by the time she said it was 30, so I'm counting everything back up to 30. 335 336 337

20:01 Tyrone: You have about 15 more minutes. (long pause) Ryuga! Go get markers! 338 339

20:12 Mrs. Sanders: Is he your supply manager? (long pause) Ok. (counting quietly to herself) 12, 15,... 340 341

20:23 Tyrone: You guys are right. You guys are right. 342

20:27 Mrs. Sanders: Wait, ok so [we have]... 343

20:28 Ryuga: [There are no markers.] 344

20:31 Mrs. Sanders: 14, 21, 22, ok. 2, so this should be 2? Yeah? 345

20:36 Tyrone: Yeah, so... 346

20:37 Mrs. Sanders: And then 7, 14,... 347

20:39 Tyrone: 14... 348

20:40 Karla: Yep. 349

20:41 Mrs. Sanders: Plus 6? 350

20:42 Karla: This is 12. 351

20:43 Tyrone: 14 plus 6 is 20. 352

20:44 Bear: 3,000! 353

20:45 Mrs. Sanders: Mmmhmmm. That should be a 0. And then this should be 354
a? 355

20:49 Karla: 1? 356

20:50 Mrs. Sanders: 2. 357

20:54 Karla: (counting to herself) 6, 7, 8... 358

20:55 Tyrone: So it's 3,022. 3,022? (long pause) We all got [it.] 359

21:00 Ryuga: [Make sure] to say cheesy jokes. 360

21:04 Tyrone: Why? Where are the markers? 361

21:06 Ryuga: There weren't no markers! Deal with it man! 362

21:09 Tyrone: Ok. 363

21:10 Bear: I knew it was ( ) around 3,000. 364

21:12 Ryuga: (makes a comment about the markers) 365

21:17 Tyrone: Huh? 366

21:18 Bear: Why don't we write it in pencil? 367

21:20 Tyrone: Yeah we need to write in pencil first. So if we mess up. 368

21:26 Ryuga: Get your pencils out then. There ain't no pencil over there. 369

21:31 Bear: Hey Tyrone! 370

21:32 Tyrone: What? 371

21:34 Bear: Let's stick this right here. On the side. 372

21:35 Tyrone: Where do you want me to put it? In the middle? 373

21:36 Bear: Uh... 374

21:39 Ryuga: Boy gets some real help if you need any. 375

21:41 Karla: What did you get? 376

Ryuga begins says "Huh?" in an increasingly higher pitched voice.

21:45 Ryuga: I think I need help. (Ryuga begins singing and making silly 377

noises.) 378

21:52 Tyrone: Oh no. One dropped... 379

Group #5 all begin laughing.

21:59 Ryuga: Oh no, it's falling off. 380

22:02 Mrs. Sanders: Ryuga, Tyrone, and Karla I think Bear wants you guys to work on the floor. 381 382

22:04 Tyrone: Ok. 383

22:05 Ryuga: Yes me too, I wanted to work somewhere on the floor cause it's so big! 384 385

22:10 Karla: You got it different. Ms. Sanders, I got a different thing though. 386 387

22:17 Mrs. Sanders: Ok let's double check it. Ok, so 8 plus 4 is 12, carry the 1. Ok? Ok. 1 plus 7 is? 388 389

22:25 Karla: 6. 390

22:27 Mrs. Sanders: 1 plus 7? 391

22:29 Karla: Oh 8. 392

22:30 Mrs. Sanders: 8. Plus 8 is? 393

22:32 Karla: 16. 394

22:33 Mrs. Sanders: 16 plus 6? (long pause) Ok, should be a 2. 395

22:45 Ryuga: We need to move the iPad. 396

22:46 Mrs. Sanders: Then we got to carry the 2. Ok. What's 6 plus 5? 397

22:53 Karla: 6 plus 5? 398

22:54 Mrs. Sanders: Mmmhmm. 399

22:54 Ryuga: We need to move the iPad. 400

22:56 Karla: 11. 401

22:56 Mrs. Sanders: 7 plus 7? 402

22:57 Karla: 14. 403

22:58 Mrs. Sanders: Plus 6? 404

Ryuga takes the iPad away from Karla to the spot on the floor where the rest of the group is working.

23:03 Bear: What are you doing? 405

23:06 Ryuga: Give it to me. I want to put my name. Actually you can spell it. 406

23:10 Bear: How do you spell it? 407

Ryuga spells out his name for Bear.

23:32 Tyrone: Karla! 408

Bear asks Karla to spell her name.

23:41 Ryuga: I can be in people's business. I can be in people's business from a mile away if I want to.

23:44 Karla: Oh my...

23:45 Ryuga: Yeah that's right.

Karla has Bear fix her name on the poster.

23:57 Tyrone: Look we're so smart. We have the color ( ). Cause we have to add details.

24:03 Karla: Oh my god.

24:04 Ryuga: Details.

24:08 Bear: Purple.

24:09 Ryuga: Purple like the ( ) on the ( ).

24:10 Karla: Purple.

24:16 Ryuga: That looks like one of Joker's old costumes.

24:17 Karla: Ok can you move?

24:21 Bear: How can it write?

24:24 Ryuga: Hello Joker, we are recreating one of your old costumes.

24:35 Karla: Oh...my...gosh. That's horrible lines.

24:28 Bear: I know. (long pause) I don't have a ruler. 425

24:43 Tyrone: Ryuga, go get a ruler! 426

24:44 Karla: Go get a ruler! 427

24:47 Bear: I already did it. 428

24:49 Ryuga: [I'll rule you out. I will.] 429

24:49 Tyrone: [No, just erase it.] (long pause) Erase it. 430

24:51 Bear: Ok. 431

24:53 Karla: How are you supposed to erase that? It's big. 432

24:56 Tyrone: It's smaller. (long pause) I'm the colorer. Just so you guys know 433
we've got about 10 minutes.

25:05 Ryuga: A ruler for the lady. 434

25:08 Tyrone: Bear! Make it straight! 435

25:13 Ryuga: More straight than ( ). 436

Ryuga, Tyrone, and Karla begin joking around.

25:43 Bear joins in on their conversation about hair lines.

25:59 Mrs. Sanders: Are we talking about florists selling flowers? Yeah that's 437
what I thought. 438

26:18 Karla: I write really big. (long pause) While you're doing that I'm going to ( ). Cause your job is that, so... 439 440

26:50 Mrs. Sanders: Timekeepers, now might be a good time to give your team an estimate of how much time they have left. 441 442

26:56 Tyrone: 4 more. 443

26:57 Ryuga: Ok there's only like 3 more minutes. 444

26:57 Karla: About 4 more. 445

26:58 Ryuga: There's 3 more minutes. 446

27:00 Tyrone: No there's not. I'm the time keeper. (long pause) Right supply manager? Are you the time keeper? 447 448

21:10 Ryuga: No. 449

27:12 Tyrone: Then why are you trying to do my job? 450

27:14 Ryuga: Cause you're not doing it. 451

27:16 Tyrone: Yes I am. (long pause) The theme is going to be orange and purple. 452 453

Ryuga makes a noise like an alarm.

27: 25 Karla: About 3 more minutes. 454

27:30 Ryuga: If I go down, you're coming with me. (long pause) There's 3 more minutes! 455 456

27:35 Tyrone: More like 5. 457

A few students from Group #4 begin talking to Group #5.

27:55 Karla: This is about how many minutes we have! (long pause) About 4 more minutes! 458 459

27:59 Tyrone: I'm the time keeper! Do your job and let me. 460

28:03 Karla: Ok. Could you please ( )? (long pause) Oh by the way your sister said you were...never mind. 461 462

28:16 Tyrone: Said I was what? 463

28:18 Karla: Ugly. 464

Ryuga has been singing a line over and over for about one minutes.

28:22 Tyrone: So? 465

28:26 Bear: Not everybody thinks that. 466

28:29 Ryuga: Did you hear me? What are you doing? Wait I can fix that. 467

28:35 Tyrone: Stop. 468

28:37 Karla: Leave it alone. 469

Ryuga, Karla, and Tyrone begin another side conversation.

28:55 Tyrone: Man Bear... 470

28:56 Bear: You messed me up. 471

28:57 Tyrone: Sorry. 472

28:59 Ryuga: Oh no. You can erase your pen. 473

29:03 Tyrone: It's not a pen. 474

29:06 Ryuga: What do you call it then? 475

Ryuga and Tyrone begin reading the poster.

30:09 Bear: Who reminds us to work? 476

30:10 Ryuga: [Your momma!] 477

30:10 Tyrone: [Karla]. 478

30:12 Ryuga: And I'm your momma for today. 479

Ryuga begins talking to the audio recorder.

30:53 Ryuga begins singing.

30:55 Tyrone: This was kind of easy. 480

Ryuga, Tyrone, and Karla have another side conversation.

31:16 Bear joins the side conversation.

32:01 Ryuga: That paper is not a bed. Stop laying on it. 481

Bear, Tyrone, and Ryuga continue to play around.

33:02 Tyrone: How are they already done? 482

Karla and Bear discuss drawing flowers on their poster. Ryuga tries to shoot baskets with crayons into the trash can.

33:56 Karla: It says how many they sold! 483

33:58 Bear: Yeah they sold. (long pause) It says sell right there. 484

34:10 Tyrone: Can I draw [flowers]? 485

34:12 Karla: [The florists]...(long pause) I want to draw a flower. 486

Ryuga continues to talk.

34:41 Tyrone: I'm drawing a sunflower. 487

34:48 Ryuga: (singing) You're a sunflower. Fail. 488

34:50 Bear: What? 489

34:51 Tyrone: (singing) You're a sunflower. 490

34:54 Ryuga: I called it. Pearl Harbor bombing. The Pearl Harbor bombing 491
right here. 492

35:05	Bear: Pearl Harbor crayon bombing. Hey let me see that ( ) there.	493
		494
35:10	Tyrone: We draw a lot.	495
35:35	Ryuga: We've got 5 extra, 5 extra minutes.	496
35:43	Tyrone: We have honestly like 5 minutes left.	497
	Ryuga begins playing with the camera and filming the group's whiteboard.	
	Ryuga and Tyrone begin having a side conversation about water.	
	Ryuga is throwing crayons. The group begins to talk about this and ask him to stop.	
	Karla begins to play with the camera. Karla films Bear and Tyrone drawing flowers on their poster.	
39:57	Tyrone: Stop get the materials away.	498
40:00	Bear: Ryuga, get the materials away.	499

Iteration #2

0:58	Tyrone: Who wants to do #1?	1
0:59	Ryuga: Me! No wait let me see the problem. (pauses to read) Nope!	2

1:08	Tyrone: I'm going to do #2.	3
1:11	Bear: I'm doing #1.	4
1:12	Karla: I'm ( ) my nail.	5
1:14	Tyrone: Are you doing #3 or 4?	6
1:16	Karla: I'm doin...	7
1:17	Tyrone: Ryuga?	8
1:18	Ryuga: I'm doing #4.	9
1:20	Bear: Ok then...	10
1:22	Tyrone: No I'm doing #3.	11
1:23	Karla: I'm doing #1.	12
1:24	Tyrone: So I'm doing this one. Who's doing #1? Karla.	13
1:38	Ryuga: Um what's the number?	14
1:50	Karla: You're the first person to actually spell my name right.	15
1:52	Ryuga: Karla?	16
1:53	Tyrone: That's easy.	17
1:55	Ryuga: Am I going to be the first one to finish? Don't worry it's not a race. I'm probably lose anyway.	18 19

1:58	Bear: Is that how you spell it?	20
1:59	Tyrone: Wait. If anybody needs help ask. Basically.	21
2:02	Bear: Nobody needs help from you.	22
2:04	Ryuga: Oh! Why you got to do that to Tyrone?	23
2:09	Tyrone: (begins reading his word problem) “Vijay has $8,500. He wanted to…”	24 25
2:13	Tyrone continues to read his word problem aloud, but Ryuga sings loudly over him.	
2:24	Tyrone: Oh my god this is so easy!	26
2:26	Ryuga: I know.	27
2:28	Tyrone: It’s $3,500!	28
2:29	Ryuga: I was about to do that you bully.	29
2:32	Tyrone: Mine’s so easy!	30
2:35	Ryuga: Mine’s the easiest though.	31
2:36	Tyrone: Bear read mine.	32
2:37	Bear: Mine’s easier.	33
2:39	Tyrone: Mine’s so easy cause I just need some ( ).	34

2:42	Ryuga: 8 plus 2...	35
2:46	Karla: I just pulled off my nail.	36
2:47	Ryuga: 8 plus...	37
2:48	Bear: Mine is harder than yours.	38
2:50	Ryuga: 8 plus 2.	39
2:53	Karla: Look at my nail.	40
2:55	Tyrone: I don't care.	41
2:57	Bear: These are all easy.	42
2:58	Ryuga: Yes! Yes! I'm not complaining either.	43
	Group #5 members whisper to each other to try not to be heard by the audio recorder.	
3:10	Ryuga: (whispering) They need to be nice and easy so they don't take forever.	44 45
3:15	Tyrone: 4,000.	46
3:17	Ryuga: I'm going to do #2. (makes a noise) I'm just kidding.	47
3:21	Tyrone: (muttering to himself) How much was that?	48
3:26	Ryuga: #2 is too easy.	49

3:27	Tyrone: #2 is so easy!	50
3:28	Ryuga: I'm betting Karla has one of the hardest ones. Probably.	51
3:33	Karla: I love division.	52
3:34	Ryuga: Oh we all got what we like! This is awesome and perfect!	53
3:39	Tyrone: I'm perfect.	54
3:41	Ryuga: I love addition, it's [my favorite type of…]	55
3:42	Tyrone: [Ms. Sanders #2] is so easy!	56
3:45	Ryuga: #4 is easy too. It's the second easiest one.	57
3:49	Tyrone: But look at mine.	58
3:51	Ryuga: (referring to his own problem) All you have to do is add 44 and [78].	59 60
3:53	Tyrone: [Ms. Sanders] #2 is very easy.	61
3:55	Ryuga: And #4 I mean yeah.	62
3:56	Mrs. Sanders: Let me see.	63
3:58	Tyrone: Because you have...	64
4:01	Mrs. Sanders reads Tyrone's word problem aloud to herself.	

4:08	Mrs. Sanders: So then how much did the computer cost? What's your answer?	65 66
4:10	Tyrone: Um $4,000. No wait this was [uh 4,000. So $4,500].	67
4:13	Ryuga: [I finished #4 almost right after Tyrone.]	68
4:17	Mrs. Sanders: Circle your answer.	69
4:18	Ryuga: I finished #4 almost right after [Tyrone.]	70
4:19	Mrs. Sanders: [Oh did] you finish [#4?]	71
4:21	Karla: [Ms. Sanders?]	72
4:21	Mrs. Sanders: 122?	73
4:22	Ryuga: All I had to do was [add these two.]	74
4:24	Karla: [Ms. Sanders?] Ms. Sanders?	75
4:25	Mrs. Sanders reads a few sentences of Ryuga's word problem.	
4:28	Mrs. Sanders: Oh ok. So see if you can help Karla and Bear...or see if you guys can help Karla with #1. Are you #1 Karla?	76 77
4:36	Karla: Can I say something?	78
4:43	Tyrone: Wait what do you need help on?	79
4:44	Karla: ( ) it is?	80

4:45	Tyrone: What do you need help [on?]	81
4:46	Ryuga: [Ok.] It is...	82
4:47	Karla: It's division right?	83
	Tyrone and Ryuga try to talk at the same time.	
4:50	Tyrone: 3,500...	84
4:53	Ryuga: 59 divided by [1,000].	85
4:55	Tyrone: [He sold. He sold] some and gave 59 tomatoes to his neighbors.	86
	He had...	
5:03	Karla: I think it's minus.	87
5:04	Tyrone: How much did he sell? So if he has 1,059...	88
5:10	Ryuga: ( ) a fraction. No it's not.	89
5:11	Tyrone: He sold...and he gave 59 tomatoes away. So that's 1,000...	90
5:19	Ryuga: So you have to go all the way to 3 digits in dividing.	91
5:24	Tyrone: Oh so what's 1,000 minus 87? (long pause) No. What's 87 to get	92
	to 1,000? Yeah 1,000 minus...	93
5:38	Ryuga: That's how many he had left.	94
5:39	Tyrone: 1,000 minus 87. What's that?	95

5:44	Karla: 1,000...	96
5:46	Tyrone: That would be...	97
5:47	Ryuga: Oh great listen. (Ryuga begins reading the word problem.)	98
5:53	Tyrone: 923 right? Bear right? 923?	99
5:58	Karla: 1,000 minus 87? You can't take 0 away from 7 so…(Karla	100
	continues whispering the problem to herself)	101
6:03	Tyrone: Wait that's...neighbor neighbor neighbor.	102
6:09	Ryuga: Wait! I think there's addition in here somewhere.	103
	Karla is still whisper thinking-aloud to solve the problem.	
	Tyrone is also whisper thinking-aloud about borrowing across the 1,000.	
6:14	Ryuga: Yeah I think the 3 minus 10 is right. There's some multiplication.	104
	Um I don't get this. We had all the easy ones so we finished quickly.	105
		106
6:23	Tyrone: Yeah. 913 is the answer.	107
6:27	Ryuga: You're 913.	108
6:29	Tyrone: 913.	109
6:30	Ryuga: I finished second.	110

6:33	Tyrone: 913 is the answer.	111
6:35	Ryuga: #4 was pretty easy.	112
6:37	Bear: How many days old are you?	113
6:38	Tyrone: Huh?	114
6:39	Ryuga: A billion!	115
6:40	Bear: How many days old are you?	116
6:43	Tyrone: How many days old am I? I don't know.	117
6:46	Bear: That's a lot.	118
6:47	Ryuga: No! I'm 30 days old. In this month.	119
6:52	Bear: You're a month...	120
	Ryuga begins saying "dab" over and over.	
7:03	Tyrone: 324 days until my birthday!	121
7:04	Ryuga: [You want to see the ugliest dab ever?]	122
7:04	Bear: [No how old are you in days?]	123
7:07	Tyrone: 365 times 8. Plus...	124
7:09	Ryuga: You're at least a billion days old. No I'm a billion seconds old.	125

7:14	Bear: For reals?	126
7:18	Tyrone: You're older than that.	127
7:19	Bear: Octillion seconds old!	128
7:24	Tyrone: If you're 100 years you're like infinity...	129
7:27	Ryuga: You're like how is this possible?	130
7:34	Tyrone: Do you know how many seconds are in a year? Guess.	131
7:36	Ryuga: Your momma.	132
	Group #5 members keep talking about off topic things and Karla plays with the camera.	
8:11	Bear: Tyrone is yours 4,500?	133
8:17	Tyrone: Thanks Karla. Huh?	134
8:18	Bear: Is yours 4,500?	135
8:19	Ryuga: No. Not even close.	136
8:22	Tyrone: Yeah.	137
8:25	Ryuga: Who's Vijay? Sashay Vijay.	138
	Karla keeps playing with the camera. Tyrone, Ryuga, and Bear tell her to stop. But soon Tyrone and Ryuga are playing with the camera too.	

9:22 Bear: Is yours 122? 139

9:23 Ryuga: Yeah. 140

9:27 Karla (speaking to Mrs. Sanders): I got an answer but it's different. 141

9:28 Mrs. Sanders: You got an answer different than? 142

9:29 Karla: Than Tyrone. 143

9:31 Mrs. Sanders: Ok so I see you did 1,059 minus 87. But what about the 59 144
tomatoes that he gave to his neighbors? 145

9:39 Karla: I can minus this one from this one. 146

9:45 Tyrone: ( ) minus 59. 147

9:49 Ryuga: Wait can you only have...how many neighbors can you have? 148

9:52 Karla: ( ) add it. 149

9:53 Mrs. Sanders: Neighbors? What do you mean sweetie? It depends do you 150
live in an apartment building or do you live in a house? 151

9:57 Ryuga: Apartment. 152

9:58 Mrs. Sanders: You can have a lot of neighbors then. [Right?] 153

9:59 Ryuga: [Oh gosh.] 154

10:00 Karla: I got... 155

10:02 Tyrone: But there's only one neighbor.

10:04 Mrs. Sanders: Ok you guys might want to check with each other's answers to see if you all agree.

10:05 Bear: Yeah we did.

10:06 Mrs. Sanders: You did?

10:07 Ryuga: I only have one neighbor though. Most of them don't have any because well there's no one else in the apartments.

10:15 Tyrone: Your mom.

10:17 Ryuga: The baby doesn't count cause he's in Kansas City where I should be. I'm alone...

10:21 Mrs. Sanders: Your mom is in Kansas City right now?

10:24 Ryuga: No.

10:25 Mrs. Sanders: Oh.

10:26 Ryuga: My grandma and everyone else. That's where I belong in Kansas City. With all my friends that I've known for over four years.

10:37 Mrs. Sanders: If Karla gets the same answer and you guys agree with her you guys can grab your poster. Ok?

10:43 Ryuga: Oh I'm grabbing the poster. I didn't even do number...can we put #2 on the board only? 173 174

10:49 Tyrone: No! 175

10:51 Ryuga: #2 and #4 yeah. 176

10:52 Tyrone: For #3 if you do this. Wait you're supposed to add it. If you subtract it it's 222. 177 178

11:01 Karla: ( ) add it. 179

11:03 Tyrone: 10. 180

11:05 Ryuga: Stop recording me! 181

11:09 Tyrone: 9. (long pause) It is 6. 690... 182

11:17 Ryuga: This is why I hate when technology is used against me. (long pause) You wanted me gone from the group. Bullies! 183 184

11:38 Tyrone: You're a bully. 185

11:43 Bear: It's 913. 186

11:45 Ryuga: So is your age. 187

11:46 Karla: We already knew that. 188

11:48 Bear: I was making sure. (long pause) Ok we need our poster. 189

11:56	Ryuga: Wow you are dumb. You just went the wrong way.	190
11:59	Tyrone: You don't need to do those. I'm just making sure.	191
12:02	Ryuga: Wait I'll go get a ruler so we can...	192
	Tyrone is counting to himself.	
12:10	Tyrone: Bear! Is your answer 1,210?	193
12:11	Bear: Yeah. Wait check mine.	194
12:39	Karla: We're working on the floor.	195
12:42	Ryuga: Crayons and...	196
12:44	Tyrone: We're going to need more rulers. Put it on the floor Karla.	197
12:48	Bear: Why do we need more?	198
12:50	Tyrone: So we can measure it.	199
13:02	Karla picks up the audio recorder and takes it to her group members by the supply bin.	
13:02	Karla: Did you get the rulers?	200
13:02	Ryuga: Yep.	201
13:03	Karla: Can I get the pink one?	202
13:16	Tyrone: We need to measure it. (long pause) Line it up.	203

13:18 Ryuga: Show your work. 204

13:36 Tyrone: Ok Bear give me your pencil. 205

14:14 Bear: We messed up. (long pause) Ladies and gentlemen we messed up. 206
207

14:29 Tyrone: Ryuga! Stop hitting me with the ruler! 208

14:33 Bear: No no no. 209

14:38 Ryuga: I can hit you in a vital spot. But I don't want to. 210

14:42 Tyrone: Ok now in the middle. I call doing it in the middle. 211

14:46 Ryuga: Stuck in the middle. 212

Ryuga begins singing.

Group #5 members begin to talk about watching T.V. shows while Tyrone and Bear draw lines on their poster.

Bear begins playing with the camera. Ryuga joins in later.

15:39 Tyrone: Bear erase this! (long pause) Everybody erase it. Everybody 213
erase! 214

Ryuga and Bear continue to play with the camera.

15:48 Tyrone: Ryuga erase some. Bear erase some. 215

15:52 Ryuga: It smells like my baby cousin's diaper in here. Oh my god. 216

Ryuga continues to take about how it smells bad. Bear and Karla have a quiet conversation about how Karla never listens.

16:12 Bear: (singing) I hate you. You hate me. We all hate each other. 217

16:21 Karla: Oh we have to cut that out. 218

Ryuga and Bear begin making noises and singing.

16:24 Tyrone: I'll cut out mine. Cut your own out! 219

Bear continues singing.

16:30 Tyrone: I call this square! 220

16:33 Bear: I call #3! I call this square. 221

16:35 Tyrone: Ryuga gets this one. Ok. Everybody get scissors. 222

16:44 Bear: I got scissors. 223

Karla tells a "Your momma" joke.

16:57 Bear: You're just rude. 224

16:59 Ryuga: Karla I'm going to destroy your thing. 225

17:05 Bear: I think ( ). 226

17:06 Tyrone: Your turn to cut. (long pause) Cut it out very very neatly. 227

Ryuga begins making a “shoop” noise. Tyrone says “Stop” after every time Ryuga says “shoop”.

17:26 Ryuga: You’re a bully. 228

17:27 Bear: You’re a bully. 229

17:28 Ryuga: You left me nothing to cut out. 230

17:32 Tyrone: No I ripped mine! I always rip mine. 231

17:39 Bear: That’s what you get. 232

Group #5 members talk about the audio recorder.

Then, the group begins to talk about Ryuga and Tyrone’s heights.

18:39 Bear: Ok let’s get to work. Who has the... 233

Ryuga and Tyrone continue to talk about off topic things.

Karla begins playing with the camera again.

19:25 Tyrone: I’m going to color mine. 234

19:33 Ryuga: Am I supposed to be over there with Karla? 235

19:44 Tyrone: No. You’re right here. 236

19:51 Ryuga: Ok cause that’s way too close to Karla. 237

Ryuga and Tyrone begin making up a song.

20:32 Karla: You're gluing it down already? 238

20:33 Ryuga: Yes! [I'll glue you down.] 239

20:35 Karla: [It's upside down.] It's upside down. 240

Ryuga begins making a beeping noise.

20:38 Ryuga: Wait what? 241

20:42 Tyrone: What if mine was upside down? 242

20:45 Ryuga: It's not. Your face is upside down! 243

21:15 Mrs. Sanders: (rings the bell) Ok. This is just a time check-in. Right now 244
it is 2:15. So you have about 20 more minutes. 245

21:23 Tyrone: We forgot. We're all timekeepers. 246

21:30 Ryuga sings about how they have about 20 minutes left.

21:34 Tyrone: We have about 20 to 25 more minutes. 247

21:40 Ryuga begins making up another song.

21:45 Tyrone: I don't like group stuff. I wish it was in pairs of two. Actually I 248
don't. 249

Ryuga and Karla are singing.

21:53 Tyrone: I wish these were a little bit harder. 250

21:56 Ryuga: I don't. I don't! I wish these were easy. Man they are easy and 251
that's how I like it. 252

22:04 Tyrone: I'm glad none of them were division. 253

22:08 Ryuga: Yeah no division. That's just wise. It makes me cry. 254

22:13 Tyrone: No division that's good. 255

22:15 Ryuga: Math? Yes. Multiplication? Yeah. 256

22:19 Mrs. Sanders: Which number is yours? 257

22:20 Ryuga: 20! 258

22:21 Mrs. Sanders: #4? 259

22:24 Ryuga: 4! 24! 260

22:25 Mrs. Sanders: Ok. Come on over. Get started. 261

Ryuga and Tyrone begin singing.

22:38 Ryuga: Why are you...stop stop stop stop. I don't want your ( ) on my 262
paper. 263

22:49 Karla: I'm not ( ). 264

Ryuga is singing again.

23:21 Ryuga: 44! You're sitting on my paper. 265

23:25 Tyrone: (talking to a member of Group #4) Don't! Go away Summer! 266

24:15 Bear: Ryuga please. Why'd you throw my pencil again? 267

24:17 Ryuga: You're a bully. 268

24:24 Mrs. Sanders: Tyrone. You're sitting squarely on Ryuga's... 269

24:32 Ryuga: 4. 4. (long pause) 4. 4. (long pause) 7. This better be 8. Oh here it 270
is. 271

Group #5 members take turns singing different songs and saying random things to each other.

Ryuga and Tyrone take turns inserting lyrics into a song they know.

26:16 Tyrone: I already finished. I just need to color. 272

Bear and Ryuga take turns making noises into the audio recorder.

26:31 Tyrone: Ryuga! Stop throwing pencils! 273

26:32 Ryuga: Double shot! 274

26:36 Karla: If you hit me in the eye how would you feel? 275

26:37 Tyrone: Yeah! 276

26:39 Ryuga: Um I'd be happy. 277

26:42 Tyrone: Ryuga stop throwing pencils at my head. 278

26:45 Karla: Really? Cause I could die. 279

26:47 Ryuga: Um [ok.] 280

26:48 Bear: [No] you can't. 281

26:48 Karla: Yes I can. Cause [if it]... 282

Bear and Karla debate if she can die if the pencil gets stuck in her eye.

27:04 Ryuga: I'm done. 283

27:06 Mrs. Sanders: Ok. Don't forget the answer sentence. 284

27:07 Tyrone: Ok. 285

27:08 Karla: They gave me this whole entire space and I'm only writing ( ). 286

27:09 Mrs. Sanders: No you need to write bigger Karla. People aren't going to 287
be able to read that outside. 288

27:16 Mrs. Sanders (talking to the whole class): Don't forget an answer 289
sentence on your poster! Show your work and an answer sentence! 290

27:19 Bear: My answer is this... 291

Karla makes a moaning noise.

27:24 Bear: You sound like a dead peacock. 292

27:25 Karla: Nooo. 293

27:30 Tyrone: Yes. You have to change it. Dying peacock. 294

27:44 Bear: Why are you erasing it? That's sad. 295

27:47 Karla: (in a whining voice) I have to. 296

Bear, Ryuga, and Tyrone make weird noises into the audio recorder.

28:06 Karla: Oh my gosh you're stepping on the paper. 297

28:10 Tyrone: It's Ryuga. 298

28:11 Bear: Move your hand. (long pause) Oh my god. You just messed me up. 299

(long pause) Mrs. Sanders is going to be like "Ahh! You laughed so 300

loud!" 301

28:28 Ryuga: Karla's butt just messed up poor Bear's writing. 302

28:38 Tyrone: What do you put as answer sentence? 303

28:40 Bear: I got these answers. 304

28:41 Ryuga: I did addition. That's enough... 305

28:43 Karla: I got this answer by subtraction. 306

28:45 Bear: I got this answer. (long pause) I'm not a therapist Math so do your 307

own problems! 308

28:54 Tyrone: Ryuga. Stop. 309

Bear moos into the audio recorder.

28:57 Bear: Where's my paper? My precious paper. (long pause) Why'd you steal my paper? Can you give me it back? (long pause) I'm done.

29:18 Karla: My legs!

29:20 Bear: Give me it.

29:21 Karla: Give you what?

29:22 Bear: This.

29:22 Karla: What? Oh.

29:23 Bear: He stole it.

29:25 Karla: No he didn't.

29:27 Bear: Why's it all the way over there?

29:29 Karla: You put it there.

29:30 Bear: No I didn't.

29:31 Karla: Yes you did.

29:31 Bear: I did not.

Bear and Karla continue to go back and forth.

Bear begins singing into the audio recorder. After a few second he begins talking to himself.

30:26 Bear: How much more time do we have? 324

Bear resumes singing. Karla begins playing with the camera again.

Bear and Karla begin joking around.

31:32 Karla: I'm doing the problem! 325

31:35 Bear: You just stepped on it! You're crumpling the paper! Let me show 326
you how tragic this is. Stop moving it! (long pause) Oh my gosh Tyrone 327
you stepped on everything! 328

31:53 Tyrone: I'm sorry I'm sorry I'm sorry. 329

31:57 Bear: You stepped on everything. 330

31:58 Tyrone: No I didn't. 331

32:07 Tyrone: Well my pencil broke. 332

32:10 Bear: Oh my god! Stop stepping on it! 333

32:14 Mrs. Sanders: (rings the bell) This is just a 10 minute warning. 10 minute 334
warning. 335

32:23 Bear: Oh no 10 minute warning. 336

32:24 Ryuga: Tyrone. You are the definition of a bully. 337

32:28 Bear: Yeah you're bullying us. (makes weird moaning sound) 338

Karla pretends to start crying.

32:37 Ryuga: You sound like a dying horse. Stop. 339

Ryuga and Tyrone begin singing and playing around.

33:08 Mrs. Sanders: How are you guys doing? Good? 340

33:10 Ryuga: Tyrone destroyed everything. 341

33:13 Mrs. Sanders: Are you going to trace that? 342

33:16 Karla: I finished! 343

33:17 Mrs. Sanders: Where's your answer sentence? 344

33:19 Ryuga: I did addition. 345

33:20 Mrs. Sanders: No. So right now you're question is "What is the number?" 346

You need to write your answer in a sentence. 347

33:31 Bear: (laughing) "I did addition." 348

33:37 Ryuga: That's my answer sentence. That's how I got my answer. It's in a 349

sentence. 350

34:24 Bear: (laughing) “I did addition.” He put that as his answer sentence. “I did addition.” “I did addition.” Duh what else would I do? Subtract? Oh wait yeah. 351 352 353

34:43 Tyrone: You’re so crazy. 354

34:45 Bear: I did addition! 355

34:49 Tyrone: Everything was so cool. 356

34:52 Bear: Not here! Woohoo! 357

34:54 Ryuga: Tyrone you’re not cool. 358

34:56 Bear: Hey what’d you say? 359

34:59 Ryuga: I said I got 122 after doing addition. 360

35:06 Bear: No you’re supposed to put like...Ms. or Rosa wrote down the number that she started with was. Like that. 361 362

Tyrone and Ryuga are playing around.

35:24 Bear: Hey he put “I did addition.” for his answer sentence. He put “I did addition.” 363 364

35:38 Ryuga: For my first answer sentence. 365

35:31 Bear and Tyrone: “I did addition.” 366

35:34 Ryuga: I addition you. 367

Ryuga begins saying nonsense words into the audio recorder.

Karla picks up the camera.

Audio recording cuts out for last 3 minutes.

APPENDIX F

LEARNER EMPOWERMENT MEASURE

Impact

1. I have the power to make a difference in how things are done in this class.
2. I have a choice in the methods I can use to perform my work.
3. My participation is important to the success of this class.
4. I have freedom to choose among options in this class.
5. I can make an impact on the way things are run in this class.
6. Alternative approaches to learning are encouraged in this class.
7. I have the opportunity to contribute to the learning of others in this class.
8. I have the opportunity to make important decisions in this class.
9. I cannot influence what happens in this class.
10. I have the power to create a supportive learning environment in this class.
11. My contribution to this class makes no difference.
12. I can determine how tasks can be performed.
13. I make a difference to the learning that goes on in this class.
14. I have no freedom to choose in this class.
15. I can influence the instructor.
16. I feel appreciated in this class.

Meaningfulness

1. The tasks required of me in this class are personally meaningful.
2. I look forward to going to this class.
3. This class is exciting.
4. This class is boring.
5. This class is interesting.

6. The tasks required of me in this class are valuable to me.
7. The information in this class is useful.
8. This course will help me achieve my future goals.
9. The tasks required in this course are a waste of my time.
10. This class is not important to me.