ORAL ROBERTS UNIVERSITY
COLLEGE OF EDUCATION
TEACHER WORK SAMPLE:
ANALYSIS OF STUDENT LEARNING

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NAME OF SCHOOL: METRO CHRISTIAN ACADEMY

CONTENT AREA: SECONDARY MATHEMATICS

GRADE: HIGH SCHOOL

TWS NUMBER: _____

TABLE OF CONTENTS

FACTOR 1: CONTEXTUAL INFORMATION AND LEARNING ENVIRONMENT

A. Contextual Information Sheet

The Contextual Information Sheet can be found in Appendix A

B. Contextual Information Narrative

A. Description of the Learning Environment

Metro Christian Academy is a private school located in just south of Midtown Tulsa. Metro has just under a thousand students from Pre-School to twelfth grade, with a little fewer than four hundred of those being high school students. In order to apply to be a student at Metro, students must have a minimum 2.5 GPA. In addition, both students and parents are required to acknowledge the Statement of Faith and understand that Metro is governed by Biblical standards. These constraints alone create a community of students that are very different from the typical high school students. Because it is a private school with the parents paying for the student's tuition, the students generally come from affluent families with very involved parents. As a teacher, having students who are getting motivation both at home and in the classroom is an incredible support system. Another crucial component of the learning environment at Metro is that the ultimate educational goal is college readiness. There is an expectation, whether it is voiced or not, that these students are all going to attend college or at least further their education by some means. The pressure of wanting to get into a good college tends to provide students with the proper motivation to do well in school.

Metro is an extremely tight-knit community. Due to its smaller size, both parents and students develop close relationships with the teachers. Many students have been going to Metro

their entire lives, and as a result they are very comfortable in the classrooms. This allows the teachers the capability to mentor these students and use their position as a platform for ministering to the lives of these students. However, sometimes the students are a little too comfortable, feeling a sense of entitlement. As students are more comfortable with their teachers, some subconsciously begin to view their teachers as friends rather than teachers, showing slightly less respect than they are due. Not to say that this does not happen at public schools, but many students come from homes where they are used to getting what they want and tend to become argumentative when they do not. As a whole, the students are pretty well behaved, and there are few behavioral issues.

My particular class is an Honors Algebra II course, comprised of students from ninth through eleventh grades. This particular class is made up of mostly upper class Caucasian students with no learning disabilities. My main challenge this semester is to keep the students challenged so they will stay engaged during the lesson. The bottom line is that this class is a bright group of well-behaved students who are learning well in their current environment. As long as I keep the students engaged and involved, I do not see any major changes other than challenging them and encouraging self-discovery whenever possible.

C. Specificity

Socially and physically speaking, these students are at the normal stages of development for their age group. Most are at social stage where they are really defining who they are as individuals. Many of my students need a large amount of attention and rely on sarcastic remarks, being the first one to know an answer, or other disruptions to receive the attention from their peers. With this in mind, I am going to maintain an orderly classroom environment, where students raise their hands to answer questions, talking out of turn is kept to a minimum, and

students respect both myself and their fellow students. Academically speaking, these students are the cream of the crop. They are the highest performing in their grades, and most are getting As and Bs in this class. Teaching this class, I have to realize that these students can go a little further than the typical Algebra II student. Most students do not need ten examples of a problem in order to understand the concept. With this in mind, I have to pay close attention to both the verbal and nonverbal feedback from the students to determine my course of teaching.

As I view the class, I can easily divide them into a few different subgroups. There is the obvious division based on gender (12 males, 6 females), for which I would teach students of the different groups the same. There is another apparent distinction based on grade (three 9^{th} graders, eleven 10^{th} graders, and four 11^{th} graders). The social and mental differences between the two extremes are very obvious. An eleventh grader is closer to graduation and applying for colleges, thus they are generally going to realize the importance of their grades and be more focused in their classes. While a ninth grader is just starting high school and may not have college on their mind as much, a ninth grader who is in a class as advanced as Geometry has to be fairly focused on their grades as well. As evident from the fact that all students perform above grade level, all three grades will be on a similar performance level. The less obvious separation among the class is the one that I believe will be the one to have the greatest distinction between their performances. This separation is those who were recommended to take the Honors section and those who were recommended to take the regular class (advice that went unheeded). I believe that these four students who were advised to take the regular class are going to be those who struggle the most. I will have to pay close attention to these students to make sure they are keeping up.

FACTOR 2: UNIT LEARNING GOALS AND OBJECTIVES

1. Students will be able to classify polynomial functions (Cognitive low level).

Students will raise hands to classify polynomials in class (Affective low level).

NCTM: Algebra Standard – to understand and compare the properties of classes of functions, including exponential, polynomial, rational, logarithmic, and periodic functions

2. Students will be able to model data using polynomial functions (Cognitive middle level)

NCTM: Representation standard - to use representations to model and interpret physical, social, and mathematical phenomena.

3. Students will be able to analyze the factored form of a polynomial (Cognitive middle level).

NCTM: Algebra standard - Represent and analyze mathematical situations and structures using algebraic symbols – to write equivalent forms of equations, inequalities, and systems of equations and solve them with fluency.

4. Students will be able to reconstruct a polynomial function from its zeros (Cognitive high level).

NCTM: Algebra Standard – to understand relations and functions and select, convert flexibly among, and use various representations for them

5. Students will be able to divide polynomials using long division and synthetic division (Cognitive low level).

Students will debate both the advantages and disadvantages of using synthetic or long division to solve polynomial functions (Affective middle level).

NCTM: Number and Operations Standard – to judge the effects of such operations as multiplication, division, and computing powers and roots on the magnitudes of quantities

6. Students will be able to solve polynomial equations by graphing (Cognitive middle level).

NCTM: Algebra standard - Use mathematical models to represent and understand quantitative relationships – to identify essential quantitative relationships in a situation and determine the class or classes of functions that might model the relationships

7. Students will be able to solve polynomial equations by factoring (Cognitive middle level).

NCTM: Algebra standard - Represent and analyze mathematical situations and structures using algebraic symbols – to write equivalent forms of equations, inequalities, and systems of equations and solve them with fluency.

8. Students will be able to apply the Irrational Root Theorem and the Imaginary Root Theorems (Cognitive Middle Level).

NCTM: Reasoning and Proof Standard – to make and investigate mathematical conjectures

9. Given a polynomial function, students will be able to judge which method is the most efficient way to evaluate a polynomial function (Cognitive high level).

NCTM: Problem Solving Standard: to apply and adapt a variety of appropriate strategies to solve problems.

10. Students will take notes on every section (Affective low level).
11. Students will respect the teacher and fellow students (Affective middle level).
12. Students show self-reliance when working independently (Affective high level).
13. Students cooperate in group activities (displays teamwork)(Affective high level).

FACTOR 3: INSTRUCTIONAL DESIGN

I. Instructional Design Table

The Instructional Design Table can be found in Appendix B

II. Instructional Design Narrative

A. Multiple Instructional Strategies

Just as every student has different likes and dislikes, each has different learning styles. To make sure all students are given every advantage possible, it is crucial to match my teaching to as many learning styles as possible. For my visual learners, I will create PowerPoint and Smart Board lessons as well as show several examples in class. My auditory learners will also benefit from these styles, as I will verbally explain everything on the board or projector in more detail. In addition, I will also have students work in groups and talk through the concepts, which will solidify what they learn. Kinesthetic and tactile learning are a little more challenging to incorporate in the classroom, but I will provide hands on projects or examples to the lesson whenever applicable. All students will be required to take notes on the lessons, an activity that will especially benefit those who prefer a tactile way of learning.

Although Algebra II may come easier to individuals with higher logical-mathematical intelligence, it is my firm belief that everyone can succeed in this course. Each of Gardner's multiple intelligences is somehow connected to math, so it is my job to incorporate those connections in my classroom. This can be achieved, many times, through word problems and real world examples. Because this class is an honors section, I am able to give students more difficult problems that require higher-level thinking and challenge their understanding of a particular concept. Another way that I challenge my students is by having them talk through the steps of a particular problem and defend the reasoning behind their methods in small groups. While they are attempting to explain their processes, I am given the invaluable opportunity to walk around and observe how well they actually understand the concepts. Other ways that I check their progress is by daily assignments, quizzes, and tests. In addition to these, I try to be very attentive to their body and facial expressions when I teach the lessons.

B. Adapt Instructional Strategies

In this particular class, the learners are bright students, all of whom are performing above grade level. In planning my lessons, I have had to make adaptations to the material in order to make it a little more challenging to maintain the students' interest. They all pick up on the topics quicker than the average student, meaning that I have to provide them with a little more to spark their curiosity. In respect to the different subgroups of students in this class, the adaptations required are minimal. I do not need to make adaptations to the curriculum based on gender or grade level, as all students have proven that they are able to grasp the concepts and perform on similar levels. The main adaptation I will need to make is in relation to those students who were advised against taking the honors level class. These students are the ones who were identified by their teachers as not high performing. The challenging problems for these students might frustrate them to the level of giving up rather than challenging them to further investigation. For this reason, I selected problems that challenge them just enough but won't cause them to give up.

C. Active Inquiry

While this class may seem like the ideal group of students, they are not without their challenges. I believe the biggest challenge is keeping the material interesting. Once they understand a concept, they are ready to move on. Sometimes this means to the next topic, but more often than not it is to a deeper understanding of the current topic and its applications. Everyday, I hear things along the lines of, "I understand that it works, but why does it work? And how does this apply the real world?" As a teacher, I need to be prepared for such questions, meaning I need to make sure I know the ins and outs of each lesson I teach. Once again, because this is an honors class, I have the freedom to challenge students to do some independent investigation for further information. Sometimes this is as easy as searching online, but many

times it requires seeking out additional resources such as higher-level math textbooks or other places where mathematical proofs and explanations are housed. As an informed educator, I am aware that I have students with different learning styles in my class. I build a lot of examples into my lessons for those active learners, but also give the students time at the end of class to reflect on the lesson (for the reflective learners) or start their homework (for the active learners).

Math is a subject that lends itself well to both the sensing and intuitive learners. There is a certain level of repetition, but the tougher problems cause the students to be innovative in the way they choose to solve the problem. Unfortunately for the global learners, math is a subject that continues to build on previous knowledge. Math follows a logical sequence where everything is connected, which is ideal for the sequential learners. In my class I try to discourage that global learner tendency by requiring students to show their work, as it is vital that they fully understand not just how, but why a topic works before they are ready to move on to the next. One other thing that I find myself constantly doing while I am lecturing is trying to gauge the students' comprehension. Sometimes this is as easy noting a look on their face, but other times it requires further investigation. I ask the students numerous questions throughout the lesson to check their understanding and roam the room while they work to observe their progress.

D. Collaborative/Instructional Groups

I have found collaborative groups to be extremely useful in my classroom. If they are going to be spending more than a few minutes in these groups, I am careful to select the groups so that they are conducive to student learning. I do so by avoiding groups of best friends where they will do little other than talk. I make sure to mix up the groups so that the students have the opportunity to get to know everyone in the class and have the opportunity to discuss and learn

from different individuals. I find that group learning usually gets the students talking more, as they are only having to talk in front of a couple of people as opposed to having the entire class' attention on them. I love when the students get into debates trying to argue their answer and prove that their rationale is sound! Also, explaining their rationale will cause the student to understand it more fully themselves as well as be much more likely to retain the information. My ultimate goal is for my student to understand the subject and be able to apply it beyond this course. These group discussions and activities help to take the math out of the classroom and more into their everyday life.

E. Technology

I use technology on a daily basis in my classroom. I create Smart Board and PowerPoint presentations for each lesson. I find the Smart Board to be very useful for examples and adapting the lesson based on my observations on the students' understanding. I can easily add more examples if they struggle with a particular subject or take out examples if they understand it quickly. The students also use calculators every day. They are extremely useful for graphing, simplifying, and checking their solutions. There are some sections where the use of the calculator is necessary to do their work.

F. Knowledge of Factors in the Students' Environment Outside of School

Most of the students are from middle to upper socio-economic status, and all are on track to attend college. These students know that graduating high school is not the end, but merely an important event on their journey to education. They know that the grades they make in this class, as well as others, are going to be a determining factor to whether or not they will get into the school of their choice. Also, this is an honors class, made up of students who perform at the top level among their classmates. In addition, I do not need to worry about students having a

lack of resources such as a computer, calculator, or any other materials the student may need in this class.

G. Alignment of Objectives, Activities, and Assessments

Aside from some objectives relating more towards classroom management, all of the objectives are taken directly from the unit goals outlined in their textbook. The lesson activities are all designed to supplement the classroom lessons taught on these objectives. The assessments used to measure how well they understand and can apply the same instructional objectives.

FACTOR 4: ASSESSMENT PLAN

I. Assessment Table

The Assessment Table can be found in Appendix C

II. Assessment Narrative

A. Assessment Plan

All assessments were designed with the goal of understand how far along the students are in grasping the objectives. The test that serves as both the pre- and post-assessment was designed to test their knowledge of the unit goals and objectives (See Appendix D). I used the formative assessments to check the students' progress, allowing me to readjust my lesson plans as needed. The formative assessment that requires the students to verbally classify polynomials in class is directly related to the first objective that will be tested on the post-test. This assessment was designed so that I could get immediate feedback on which students understood how to classify polynomials and which did not. I will be able to observe the results of this assessment immediately, so I will be able to re-explain the parts that the students don't

understand while the lesson is still fresh on their mind. Because Algebra II is a subject where many of the concepts require a little bit of time for the students to work out the problems, a majority of my assessments include some sort of written work for evaluation.

The quiz that I am giving to the students about halfway through the unit will be an asset to me in planning my instruction. This will give me ample time to go over any misunderstood concepts before the students are tested. Daily homework, such as the polynomial worksheet described and other assignments from the book, which is graded the day after the lesson is taught, also serves to reveal to the students and teacher how well they are grasping the concepts. While I will be using different formats to assess the students' skills throughout the lesson, I will emphasize those that mirror the problems that the students are going to see on the post-test. Technology was not necessary for the assessments that I used during my unit. However, I did use technology to create visual representations to model how the students did on the assessments.

B. Types of Assessments

I used a variety of assessments during this unit. Both informal and formal assessments were used. Included in the table are 4 formative assessments in addition to the pre- and post-test. Three out of four are pencil and paper assessments testing the students' knowledge and application of the objectives, and one tests their verbal skills as well as their knowledge of the objectives. I chose the paper and pencil format frequently because I believe that it is the most accurate way to measure the students' level of comprehension. I also chose the verbal questioning because it is important to have immediate results, making it easy to reiterate or re-explain concepts. I chose the questions for the pre- and post-assessment to test the students' understanding of the TWS objectives. The test was designed based on the objectives for the unit, with each question directly related to a different TWS objective, making the test valid. This test

is also reliable, as each question has only one right answer.

C. Assessment Challenges

The questions on these assessments are challenging for a variety of reasons. The questions involve vocabulary and methods that the students have not seen before. As a result, someone who either missed class or failed to pay attention would not be able to answer correctly. The questions are objective, thus the only way they can receive credit is if they are able to correctly apply the knowledge they learned in class. In addition, these concepts are not simplistic; every problem requires multiple steps. All students are considered capable of completing these tasks, so no adaptations were made. All the questions asked on the assessment instruments come directly from the material covered during instruction. The assessments were designed to cover the all the different concepts taught in class, with a greater number of questions coming from those that are decidedly the most essential content and skills for their future math careers.

FACTOR 5: ANALYSIS OF PRE-ASSESSMENT RESULTS AND INSTRUCTIONAL ADJUSTMENTS

I. Pre-Assessment Table And Graph

The Pre-Assessment Table can be found in Appendix E

Graphical Representation of the Pre-Assessment can be found in Appendix F

II. Instructional Design Adjustments

The Instructional Design Table with Adjustments can be found in Appendix G

II. Analysis of Pre-Assessment Results and Instructional Adjustments

After examining the scores of my students, my assumptions that this was almost all

brand-new material to the students was confirmed. While taking the pre-test, many students had problems even attempting some of the problems, as the concepts were completely foreign to them. Seven students out of eighteen did not know how to do any of the problems. Not a single person even answered half of the questions correct, the highest score of four out of ten being achieved by only two students. After doing an item analysis of the pre-assessment, I realized that there was only one item, a question about factoring, that more than half of the students answered correctly. The students had recently been introduced to factoring, and the problem on the assessment was close enough to things they had learned that many students were able to apply the same reasoning to arrive at the correct answer.

After examining the disaggregated pre-assessment data, I had difficulty finding clear patterns of evidence regarding student background and student scores. Females and males performed at similar levels on this test. There was not a noticeable difference between the grades of students from different grade levels, so age was not a factor related to the students' performance levels. Out of the students that were not recommended for the class, none of them got any questions right except for one student, who got two questions correct. As a subgroup, their scores were on the lower end of the scores, but their average was only a little lower than the average of the class as a whole. For this reason, I do not feel like I need to make any adjustments during my instructions for these students. Based on the pre-test, I questioned my teacher on how some of the students knew how to do more than the particular factoring problem that might have looked familiar from class. He told me that some of the students were involved in a "Math Counts" competition, where they competed with students from all levels of high school. The test could include anything from Algebra I or II, Geometry, or even Trigonometry. So these students learned some of the material covered in this unit in advance in order to be

prepared for the test. Based on this information, I decided to create a subgroup of the students who were in this competition (Students 1, 2, 3, 10, 11, 12, 13 and 14). Each of these students got at least one question correct on the exam, and their average (23%) was higher than the class average. I understand that these students are a little further along than their peers and already have prior knowledge of some of the objectives I will be covering in this unit.

As a whole, the class scored extremely low. This did not discourage me, but rather made me realize that the students were right on track based on the curriculum. All of the objectives cover new material that they have not been taught before, so there is no way they would know how to do it unless they had previously been taught. If they had previously been taught this material, I would completely have to change Instructional Design as it would not be the best use of our time for me to re-teach concepts they already understand. Based on the pre-assessment, there are not any major changes I need to make to my unit lesson plans. I will, however make some minor changes based on my observations of the class. I have included more group activities, as the students have proven that they learn more with the conversations that come up in their group activities. I also will use more hands-on activities whenever possible to give the students a variety of instructional methods.

The last adaptation that I will make is related to the sub-group I identified based on the pre-assessment. These students already understand some of the concepts that I will be teaching in this unit. In order to give the students the chance from to hear someone different than myself, I will give the students from this subgroup the opportunity to explain some of these concepts to the class during instruction. Almost everything in math can be explained more than one way, and some of the students might understand the way they explain it better than the way I explain it. I will be there to correct them if they make a mistake or guide their reasoning if they get lost,

and explaining it will further solidify the concepts in their own minds.

FACTOR 6: ANALYSIS OF LEARNING AND ASSESSMENT PROCEDURES

I. Pre/Post Assessment Table and Graph

The Pre/Post Assessment Table can be found in Appendix H

Individual Learning Score Calculations can be found in Appendix I

A Graphical Representation of the Pre/Post Assessment Data can be found in Appendix J

An item analysis comparing the Pre/Post Assessment results can be found in Appendix K

II. Evaluation of Learning Results Narrative

A. Evaluation of Learning Progress

I used the pre, formative, and post assessment data to determine how to proceed with my instruction. The students demonstrated through the pre-assessment that they did not have prior knowledge of the unit objectives, so I was able to proceed as planned. Through the formative assessments, the students showed that they understood the concepts I taught in class, once again allowing me to proceed as planned. While I did not adjust the speed at which I planned my instruction, I did enrich the lessons quite a bit. From discussions with my supervising teacher, I added many more interactive learning, such as group working and hands-on activities. I also started beginning the lessons by giving the students a real-world application of the lesson that I was teaching. I found both of these changes to be extremely helpful. I observed the group activities encouraging much more discussions about the topics than ever happened either in class or during independent studying. I also perceived beginning the lesson with some real world applications to spark the students' interest in the lesson by showing them the concepts were useful outside of the classroom.

After analyzing the students' assessments, I was very pleased with the results. Every student showed significant learning gains, and the class average was above mastery level. Everyone improved their scores by at least 40%, with the average improvement being 70%. After examining the learning results, I found that, overall; the learning goals were achieved for each of the learning objectives. There were a couple of more difficult problems, such as numbers 10, which quite a few students answered incorrectly. However, most of the students answered the other question that dealt with the same learning objective correctly. In reviewing the question and checking the students' work, I realized that the students were able to apply the correct method to solve the problem. However, the problem included a result that never came up in the problems we worked in class, leading many students to second-guess their answers and answer the problem incorrectly.

In order to get a better understanding as to the learning gain scores in respect to subgroup, I arranged the students according to these scores (Appendix L). I found that there was not really a correlation to the student's gender or grade level. I did, however, recognize that most of the students that were discouraged from taking this course were in the lower third in relation to how much they learned. There was an exception to this, as one student had the highest learning gain score in the class. The subgroup I created after the pre-test, the students that were involved in Math Counts, made less of a difference on their learning gain scores than it did on their original ability to perform on the test. This conclusion is very logical, as a student who does poorly in the beginning obviously has more room for potential learning gains. In my opinion, the instructional time was adequate to cover all of the stated learning goals and objectives. The learning gain scores support this opinion. I believe the assessment results accurately reflect the degree of learning that I witnessed in the classroom. Of course, being a

math class, a student could understand both the concept and the application and still get the problem incorrect due to mathematical errors. This is the reason I set the mastery level at 8/10 rather than 10/10, to take into account the possibility of such errors.

B. Interpretation of Student Learning

Based on the pre- and post-assessments, the student clearly increased their knowledge of the learning objectives. All but four out of eighteen students scored in the pre-determined mastery level of this unit. As mentioned above, many of the students who got a problem wrong made errors in the basic mathematical operations. As a whole, the class showed that they understand and are able to apply the concepts learned in this unit. As mentioned in the contextual information, I do not believe that the class as a whole has any barriers to overcome in terms of achieving the learning goals. Their scores on the post-test support this theory, as they were able to arrive at the mastery level for the unit objectives. As with any data, there were "outliers" to consider, students that either did better or worse than grade that I defined to demonstrate that they had mastered the material. However, when we look at the class average, it falls in the range of the mastery level.

I do not believe that any subgroup or individual student had any barriers that would have kept them from reaching the mastery level. As with anything, there are students who are going to understand the concepts without even trying as well as those whom will really have to work to fully comprehend the material taught in this unit. While not all students were recommended to be in this class, the students would not have been allowed to enroll in this class if the teachers did not think that the class was within their reach. The greatest barrier for these students is their willingness to put in the time and dedication that it requires to comprehend the lessons. Those that put in the time were all able to accomplish the learning goals.

C. Insights on Best Practices and Assessments as Related to Students

While they were certainly a high-achieving class, they are still high school students. In other words, they have a lot of energy and they do not always make the best choices of to spend it. Fortunately, I did not have any major behavioral issues, only the usual chattiness and occasional trouble focusing. One of the best decisions that I made was adjusting my original Instructional Design plans. Adding the applications before the lessons really motivated the students, as it gave the students an immediate use for their newfound knowledge.

One of the other main benefits I found after adjusting my unit plan was the social interaction that came from having the students work in groups. It was good for some of my more shy students to have more practice working with their peers.

As mentioned in Factor 1, my students are very self-motivated, which made my job a little easier. In looking at my lesson plans, I found a common thread that created chaos and caused students to lose their focus more than anything else, free time. I tried to time the lessons so they could finish their homework in class if they worked diligently (per my cooperating teacher's instructions), but sometimes we were left with more time that I had anticipated. Once students finished, they were generally a distraction to those who were trying to complete their work. I was able to remedy this by learning to pace my lessons better, but there were still times that I did not time it quite right. When this happened, I quickly discovered that it was a great time to pull those who were finished aside and spend time getting to know them better.

D. Alignment of Learning Goals with Assessment Data

Looking at the results from the pre- and post-assessment, I determined the student's total progress, from the beginning to the end of the unit. The assessments I conducted throughout the unit allowed me to monitor the students' progress throughout the unit, both on an individual and

class basis. With the data that I collected, I was able to make changes in my instruction based on the student needs. Based on the data, I realized that the students were doing well on the course that I had mapped out for the class, and no changes needed to be made in terms of the speed or content of my lessons. I used a variety of instructional methods including lecture, class discussions, note taking, questioning, and even hands on activities. Using different instructional methods allowed me to reach each student through a technique that they learn the best from.

When I broke down the scores based on objectives, I was very please with the way my students performed as a class. As a whole, they appear to have grasped all of the concepts that I set out to teach them in this unit. In preparation for this unit, I started with my list of objectives that I wanted my students to be able to take away from this lesson. From there, I built my instructional plan. Along the way, I fine-tuned my instruction based on the results of the assessments. Following this plan allowed me to have an idea of where the students were in their level understanding at different stages throughout the unit. I found this plan to be very effective in my classroom.

FACTOR 7: REFLECTION ON TEACHING AND LEARNING

A. Impact on Student Learning

In my classroom, I found that I had a lot of success with group activities. The group activities included anything from doing problems, taking notes, or even doing a small project together. The fact that these students are so social is one of the reasons that I felt these activities were successful. Having a student sit at a desk by himself is boring, but let them work with their friends and it becomes a lot more fun. Another reason that I believe the students did better in groups is that they had the chance to help one another. Those who understood the concepts were

able to explain it to those who did not, an action that benefit both parties. For the students that are doing the re-teaching, it solidifies their understanding while simultaneously remediating other students' misconceptions, misunderstandings and weaknesses. There is always more than one way to explain a concept, and chances are that some of the students are going to explain it in a different way than I did. This gives the students a variety of ways by which they can understand a concept. Group work also gave me the opportunity to see how well the students understand a topic, as they are generally more transparent in a smaller group of their peers.

Another activity that was successful in my class was starting the class off with a warm-up. I found this to be a great way to get students in class and on task, not leaving students the opportunity to find trouble or get off-task. I strategically picked the warm-up problems based on the lesson I was teaching for the day. The problems I selected were chosen to review prerequisites and gauge student mastery, to get their mind thinking critically, or to spark their interest in the concepts I would be teaching on for the day. I found that showing the students the use for a particular math concept before actually teaching them how to apply it made them much more interested in learning.

Unfortunately, not everything I tried out in my classroom was as successful as I had expected. For example, my students were extremely unimpressed when I made a Smart Board Lesson that took advantage of some of the more fun functions that I learned about in the technology section of my Pedagogy class. For example, I used a function that allowed the students to spin a wheel (by tapping on the board) and solve a problem using the number they landed on. I thought it would be a way to do something different and allow the students to take part in the instructional process. Unfortunately, they thought it was cheesy, and that they were above such lame technology.

Another activity that was not nearly as successful as I expected was giving the students time to work on their assignment in class individually. It only took one or two disruptions to get the class distracted from their work and completely off task. This frustrated the students who wanted to use the time to complete the assignment, as they were unable to focus when the class was not quiet. The students also had more questions when they were working on their own, and there was only one of me to answer the questions of up to eighteen students. I also found it difficult to manage the class while I tried to help a student one-on-one. Once I put the student in pairs or groups, they were more confident in their answers as they had someone with whom they could check their answers with or ask questions to.

After evaluating myself mid-way through the unit, I made some adaptations that I felt would improve the students' learning experience. For example, one of the main changes I made was giving the students more real-world applications to the lessons I was teaching them, preferably before the lesson. I had students ask me how the information was going to be useful in everyday life, and too many times I did not have a good enough answer. I learned to research the daily lessons a little more thoroughly in order to be able to answer questions that the students might ask. This caused me to be more confident in my teaching abilities and made the students more interested in learning the concepts. I also decided to use more class time with the students in groups or doing other things to keep them actively involved in learning. This really increased the amount of discussion and the level of student involvement. It also helped the students to teach and learn from one another. Through this entire experience, I gained so much confidence in my own ability to manage a classroom. Overall, I feel that the decisions I made were beneficial to the students' progress. The pre- and post-assessment data backs up the fact that the students learned a great deal from me and were able to apply the concepts addressed in the unit.

B. Implications for Future Teaching

In discussing my strengths and weaknesses with my cooperating teacher, we were able to determine a few areas where my teaching strategies could use the most work. First of all, my lesson planning skills could be improved. One activity that would improve my instruction is to have detailed lesson plans for each day. I had lesson plans for each day, but my lesson plans mostly hit the high notes, noting mainly the big objectives of the day and listing the assignment. I had a Power Point or Smart Board lesson for each day, but I did not include extra notes that would have helped me with transitions and in guiding the class discussions. Having such notes would have decreased the downtime between activities, made my transitions smoother, and helped me to guide the class in the direction I wanted it to go. This would improve the quality of my lessons and give more time in class for the students to really grasp the concepts. Another part of teaching that I struggled with was figuring out the proper relationship between student and teacher. My cooperating teacher and I discussed that this was one of the areas where he saw the most improvement during my placement, but he agreed that it was something I could work on. Due to the fact that I was closer to the age of my students than I was to their teacher, they saw me more as a college students than as a teacher. While I understand the importance of developing relationships with my students, I also understand that there needs to be a clear distinction between student and teacher. They need to see me as an authority figure rather than as a friend. I definitely want my students to like me and enjoy being in my class, but it must be in a way that they understand that I am in charge and proper respect is given. The proper relationship between student and teacher provides a more consistent and structured learning environment, which everyone benefits from.

C. Implications of a Christian Worldview in the Learning Community

I was very fortunate to be placed in a Christian school for my first classroom experience, where the students and teachers have similar values to my own. It is also much easier to share my faith with my students when I can openly discuss my relationship with Christ. But I also realize it is not always going to be this way. There will be some instances where I will have to share my faith with my students through my actions alone. As a Christian, the decisions I make and the way I live my life is to be pleasing to Christ, demonstrating the qualities commonly referred to as the "Fruits of the Spirit" (Galatians 5:22-23). James 3:1-2 points out those who choose to teach will are called to an even higher standard than the average Christian and will be judged more strictly. I do not think I really comprehended the weight of that before this placement. Being a teacher is so much more than just making sure that my students understand the material required for them to pass the class.

While student comprehension is definitely an aspect of teaching that I do not take lightly, the students are going to learn so much more from me than just the information I test them on. The way I conduct myself and the decisions I make could potentially impact my students for the rest of their lives. I need to constantly be in communication with the Holy Spirit, carefully following his directions. There are going to be many situations that I will not be privy to the full story behind a student's actions; but the Holy Spirit knows it all. He knows their hurts and their pains that they hide so well, and he knows how to meet them where they are. If I am willing and listening, He can use me to touch their lives and lead them to the Lord and his unending love. Knowing this motivates me to keep my relationship with the Lord as a priority, as I am responsible for more than just myself. I need to be spending time daily renewing my mind through prayer and reading the Word so that I can be led by His voice!

D. Implications for Professional Development

The area that I feel I need the most improvement in is my classroom management. With student teaching, it is hard to come into a classroom mid-year and reinvent the wheel. For this reason, I felt kind of trapped into doing things the way my cooperating teacher did them. The students generally responded well to him, but he did not have a specific discipline plan in place, preferring to deal with things on an individual basis. As a result, the students seemed to get away with more and were less likely to change their behavior. I also had a hard time trying to decide what sort of consequence should result from a student's misbehavior, as there was no standard to follow. I plan to have a discipline plan in my future classroom. I will also spend the first day going over the procedures rules in my classroom, as well as the corresponding rewards and punishments. It is important that my students and I begin the year on the same page, so that they know what I expect of them as students and what they can expect from me as their teacher. Consistency is another extremely important quality for a teacher to possess, as every student wants to be treated fairly.

Another major lesson that I can take away from this experience is the importance of student-teacher relationships. Although this is a tricky relationship to navigate for young teachers, it is one where the reward is definitely worth the effort I will put into it. My cooperating teacher commented that one thing he could really tell from observing me teach is my love not only teaching, but for the students. I also found that the students I had closer relationships were more likely to pay attention in class and encourage other students to do the same. For this reason, I am determined to spend the time it takes to get to know my students and be the type of teacher that merits their respect. I honestly believe that the best resource to learn from when it comes to teacher-student relationships is the teachers who have had years of experience in building relationships with their students. I have already discussed this at length

with my cooperating teacher, and I plan to find out what other advice other teachers can give me on this topic.

I am so thankful that I had the opportunity to complete my first placement at Metro Christian Academy. The other teachers were so welcoming, and they taught me a lot. I made some mistakes and had some rough days, but I learned a lot. Overall, I am extremely pleased with these past eight weeks. I found out things that work for me as a teacher and things that do not. I have grown more in love with teaching and determined why it is the profession God called me to. I have only scratched the surface on my teaching experience, and I am really looking forward to whatever comes next.

APPENDIX A

CONTEXTUAL INFORMATION FORM

APPENDIX A: CONTEXTUAL INFORMATION SHEET

Please indicate:

Semester (Fall or Spring) Spring Year: 2013

Your certification/licensure level (check all that apply):

_____ Early Childhood (Birth - Grade 3) __x___ Secondary (Grades 6 - 12)

_____ Elementary (Grades K - 6) _____ Dual (Elem. and Secondary, Grades PK - 12)

_____ Middle School (Grades 5 - 8)

Your certification/licensure area(s) (check all that apply):

_____Art	_____Lang. Arts, Middle Level	_____Physics
_____Biology	_____French	_____Psychology
_____Business	_____Health	_____Science, General
_____Chemistry	_____Journalism	_____Science, Middle Level
_____Early Childhood Ed.	__x__Mathematics	_____Social Studies-Middle Level
_____Early Child., handicap	__x__Mathematics, Middle Level	_____Social Studies
_____Earth-Space Science	_____Music	_____Spanish
_____Elementary	_____Physical Education	_____Speech and Theatre
_____Language Arts	_____Physical Science	_____Other:_____
_____ESOL		

Identify the course, unit content area, (e.g., "Language Arts," "Biology," "Math," Social Science," etc.), and grade level(s) of your Teacher Work Sample.

Course Math Content Area: Algebra II (Honors)

The grade(s)/level of students in your classroom (check all that apply):

_____Preschool	_____4th Grade	__x___9th Grade
_____Kindergarten	_____5th Grade	__x__10th Grade
_____1st Grade	_____6th Grade	__x__11th Grade

_____2nd Grade _____7th Grade _____12th Grade

_____3rd Grade _____8th Grade

Please note: Some of the following information must be obtained directly from the teacher or the school's administrator(s)

A. Class/Classroom Information

Grade levels in class (List all that apply.) ____9,10,11___

Ages in class (List all that apply.) ____14-17_____

Number of students enrolled in class ____18_____

Number of students typically present ____17-18_____

Time available each day to teach all students (in this class) ____10:45-11:35_

How would you rate the overall socio-economic status represented in classroom? (Provide approximate percentages of students that represents each category.)

Upper class _80%_
Middle class _20%_
Lower class _____

Ethnicity(ies)/Cultures represented (please specify):

Ethnicity	Number of Students
African American	__1___
Asian	_____
Hispanic	_____
Caucasian	__17__
Pacific Islander	_____
Other	_____

Gender make-up:

Number of males __12__
Number of females ___6__

Number of students who perform at the following levels:

Below grade level _____
At grade level _____

Above grade level __18__

If students are above or below grade level, identify the different grade levels represented.

Teaching interruptions (ex. frequent intercom messages, student, parents, or teachers who enter class etc.):

Few ___x___
Some _____
Many _____

B. Resources (equipment and supplies) available for this class (Mark all that apply.)

Overhead/Elmo projector _____
Number of computer(s) ___1___
Video projector ___x___
Phone/intercom ___x___
TV ___x___

Please list additional resources (ex. maps, lab equipment, manipulatives, reading resources, etc.—please list):
Smart Board with Advanced Mathematics Package, TI 84 Plus Calculators

C. Personnel resources available to you (Indicate all that apply.)

Instructional assistants(s) _____
Peer (student) tutors ___x___
Parent volunteers ___x___
Resource Teachers (describe) ___x___
Other (describe) _____
Metro has a media specialist and a curriculum and staff development specialist, both of which are full-time.

D. Individual Differences

Number of ESL students in class ___0___
(Students can speak basic or broken English, however, their primary language is NOT English)

Number of non-English speaking students ___0___
(Students who do not speak English at all)

Number of students in class with IEP's ____0___
(Students who have an Individualized Education Plan on file with the teacher or school)

Number of identified 504 students in class ____0___
(Students who have been officially tested and are physically or mentally impaired in

some fashion)

Number of identified gifted students in class ___0___

E. Number of students in pull-out or supplementary programs

Title I ____0__
Gifted ____0__

Other (please list, for example: remedial reading, math, etc.)

This is an honors section, so all of the students are honors students

F. Please briefly describe the school's immediate community:

Population (city or town) _396,466___

Please list major industry(ies) (ex. oil, farming, steel mills, technology, automotive, etc.):

Oil, Healthcare Industries, Aerospace

Please list major employer(s) (ex. American Airlines, IBM, Wal-Mart, etc.)

There is not one main employer for Metro parents, but rather only a handful of parents work are employed by each various employers. Many parents are lawyers, doctors, business men and women, or other white-collar professionals.

Students in your classroom mostly from:

Rural areas _____
Urban areas _____
Suburban areas ___x__

Describe the school district:

Number of elementary schools ___1___
Number of junior high or middle schools ___1___
Number of high schools ___1___
Other types of school configurations ___1___
(i.e. 4^{th} & 5^{th} grade centers, etc.)

Are there any of the following in your community? (Mark all that apply):

Community Colleges ___x___
Career Technology schools ___x___
Colleges or University ___x___

APPENDIX B

INSTRUCTIONAL DESIGN TABLE

APPENDIX B: INSTRUCTIONAL DESIGN TABLE

Timeline	Learning Objectives	Instructional Activities	Assessments	Resources and Technology
Day 1	• Students will learn the properties of exponents	Class review and discussion on properties of exponents. Go over examples together in class.	Chapter 6 paper and pencil test (pre-assessment)	Exponent PowerPoint, Algebra 2 Textbook (Review Excercises used for Pre-Assessment)
Day 2	• To classify polynomials • To model data using polynomial functions	Class notes and discussion classifications of polynomials based on degree and number of terms. Provide and work through examples.	Observation, questioning, and homework assignment	6-1 PowerPoint, Algebra 2 Textbook
Day 3	• To analyze the factored form of a polynomial • To write a polynomial function from its zeros	Class notes and discussion on polynomial functions and linear factors. Provide and work through examples using both factoring and graphing calculator.	Observation, questioning, and homework assignment	6-2 PowerPoint, Algebra Textbook, TI 84 Graphing Calculator
Day 4	• To show students the real world applications of yesterday's lesson.	Class review and discussion on the previous day's lesson. Apply the concepts to real world applications and other word problems.	Discussion, questioning, and homework assignment	6-2 PowerPoint, Algebra 2 Textbook
Day 5	• To divide polynomials using long division	Discuss long division and build on it to include long division using polynomials. Work through a few examples, then have volunteers do and explain examples to the class.	Discussion, observation, and homework assignment	6-3 PowerPoint, Algebra 2 Textbook
Day 6	• Clarify and Review Sections 6.1-6.3 for Quiz	Assign students into groups to work on Polynomial Worksheet.	Observation, in-class assignment	Polynomials Worksheet
Day 7	• Assess student's understand of polynomial	Students take Quiz 6A. Students will work in groups on the box problem	Quiz, Observation	Quiz 6A; Box Problem worksheet,

	functions. • Apply concepts to solve real world problems	(using an actual piece of cardboard and actually making the cuts specified in the worksheet).		cardboard, scissors, rulers
Day 8	• Divide polynomials using synthetic division	Show students synthetic division and its correlation to long division. Discuss the benefits and drawbacks of each. Work through examples in class.	Discussion, questioning, and homework assignment	6-3 PowerPoint, Algebra 2 Textbook
Day 9	• Solve polynomial equations by factoring	Review difference of cubes. Teach sum and difference of cubes. Teach factoring of quartic functions. Go through examples, then have students pair up and expain the concept to a partner.	Discussion, observation, and homework assignment	6-4 PowerPoint, Algebra 2 Textbook
Day 10	• Solve polynomial equations using graphing technology	Class notes and discussion on solving polynomial equations using calculators. Work through examples in class.	Discussion, Observation, and homework assignment	6-4 PowerPoint, Algebra Textbook, TI 84 Graphing Calculator
Day 11	• To solve equations using the Rational, Imaginary, and Irrational Root Theorems • Find conjugates • Differentiate between discrete and continuous	Discuss conjugates and how they relate to the different theorems. Go through examples of each. Discuss continuous vs discrete functions and how it translates to the real world.	Discussion, Questioning, and homework assignment	6-5 PowerPoint, Algebra Textbook,
Day 12	• Review for Exam	Have students individually do the post-test. Have students do the review exercises in groups.	Pencil & Paper Assessment, Observation	Alg 2 Textbook
Day 13	• Determine how much students have learned.	Chapter 6 Test	Pencil & Paper Assessment	Chapter 6 Test.

APPENDIX C

ASSESSMENT PLAN TABLE

APPENDIX C: ASSESSMENT PLAN TABLE

Assessments	***TWS Objectives***	**Type of Assessment** (Include a brief description and *mastery* level.)	***Adaptations***
1. *Pre-Assessment*	All TWS objectives.	10 constructed response questions requiring the students to classify polynomials, graph functions, and use various methods and apply theorems to solve equations. *Mastery* criteria will be defined by getting 8 out of 10 questions correct.	No adaptations will be made for any students for this assessment. All students in this class are considered capable to take the assessment without adaptations according to both the classroom teacher and previous student performance.
2. *Formative Assessment*	- Students will be able to classify polynomial functions.	This assessment will be a way for me to quickly determine if the students understand this topic. I will put some examples of polynomial equations on the board and have the students classify them orally.	If I notice that some students are answering all of the questions, I will have them either write down the answer and put their thumbs up when they know the answer. Once everyone has their thumbs up, I will call on someone. Another option would be to just call on students at random.
3. *Formative Assessment*	-Students will be able to classify polynomial functions. -Students will be able to model data using polynomial functions. -Students will be able to reconstruct a polynomial function from its zeros. Students will be able to divide polynomials using long division.	The students will take a paper and pencil quiz mid-way through the chapter so I can see which sections they are grasping and which I need to go over.	Students will be allowed to use their notes on this quiz. My cooperating teacher always allows students to use their notes on the quizzes for two main reasons: it motivates the students to make sure they take excellent notes, and it makes the quizzes less stressful on the students.
4. *Formative Assessment*	-Students will be able to divide polynomials using long division and synthetic division. -Students will be able to solve polynomial equations by graphing or	Students will be given several polynomial functions to solve using any method of their choosing, provided that they use each method at least once.	The assignment will be done in class, where the students are free to ask question on any problems they don't understand. This way I will be made aware if they don't fully understand a concept and be able to guide them in the

	factoring Students will be able to judge which method is the most efficient way to evaluate a polynomial function		correct path rather than telling them the answer.
5. ***Formative Assessment***	All TWS objectives	Paper and pencil test over the entire unit. Includes some graphing problems, word problems, equations to solve and model, and graphs and equations to classify.	No adaptations will be made for any students for this assessment. All students in this class are considered capable to take the assessment without adaptations according to both the classroom teacher and previous student performance.
6. ***Post-Assessment***	All TWS objectives.	Same as pre-assessment.	No adaptations will be made for any students for this assessment. All students in this class are considered capable to take the assessment without adaptations according to both the classroom teacher and previous student performance.

APPENDIX D

PRE/ POST ASSESSMENT

APPENDIX D: PRE/POST ASSESSMENT

Chapter 6 Pre/Post Test

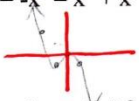
Write in standard form. Then classify by degree and by number of terms.

1. $3x^2 - 7x^4 + 9 - x^4$

$-8x^4+3x^2+9$; quartic trinomial

Graph. Approximate the real zeros to the nearest hundredth.

2. $P(x) = -x^3 - x^2 + x$



Write a polynomial function with rational coefficients in standard form with the given zeros.

3. $x = -1, 1, 1$

$(x+1)(x-1)(x-1)$

$(x^2-1)(x-1)$

$y = x^3 - x^2 - x + 1$

Solve each equation.

4. $(2x - 3)(3x + 2)(x + 2)(x + 2)(x - {}^7/_8) = 0$

$x = 3/2, -2/3, -2, -2, 7/8$

5. $x^3 - 2x^2 + x = 0$

$x(x^2-2x+1)=0$

$x(x-1)(x-1)=0$

$x = 0, 1, 1$

Divide using long division.

6. $(x^2 + 3x - 4) / (x - 1)$

$x+4$

$x-1 \overline{)x^2+3x-4}$

$x^2 - x$

$4x-4$

$4x-4$

Divide using synthetic division.

7. $(3x^2 - 3x + 4) / (x + 1)$

$-1 \mid 3 \; -3 \; 4$

$\downarrow \; -3 \; 6$

$3 \; -6 \; 10$

$3x - 6$ R. 10

8. $(x^3 + x^2 + x - 14) / (x + 2)$

$-2 \mid 1 \; 1 \; 1 \; -14$

$\downarrow \; -2 \; 2 \; -6$

$1 \; -1 \; 3 \; -20$

$x^2 - x + 3$ R. -20

Use synthetic division and the Remainder Theorem to find P(a).

9. $P(x) = 6x^4 + 19x^3 - 2x^2 - 44x - 24$; $a = -2/3$

$-2/3 \mid 6 \; 19 \; -2 \; -44 \; -24$

$\downarrow \; -4 \; -10 \; 8 \; 24$

$6 \; 15 \; -12 \; 36 \; 0$

0

10. $P(x) = -x^3 - x^2 + x$; $a = 0$

$0 \mid -1 \; -1 \; 1 \; 0$

$\downarrow \; 0 \; 0 \; 0$

$-1 \; -1 \; 1 \; 0$

0

APPENDIX E

PRE-ASSESSMENT DATA TABLE

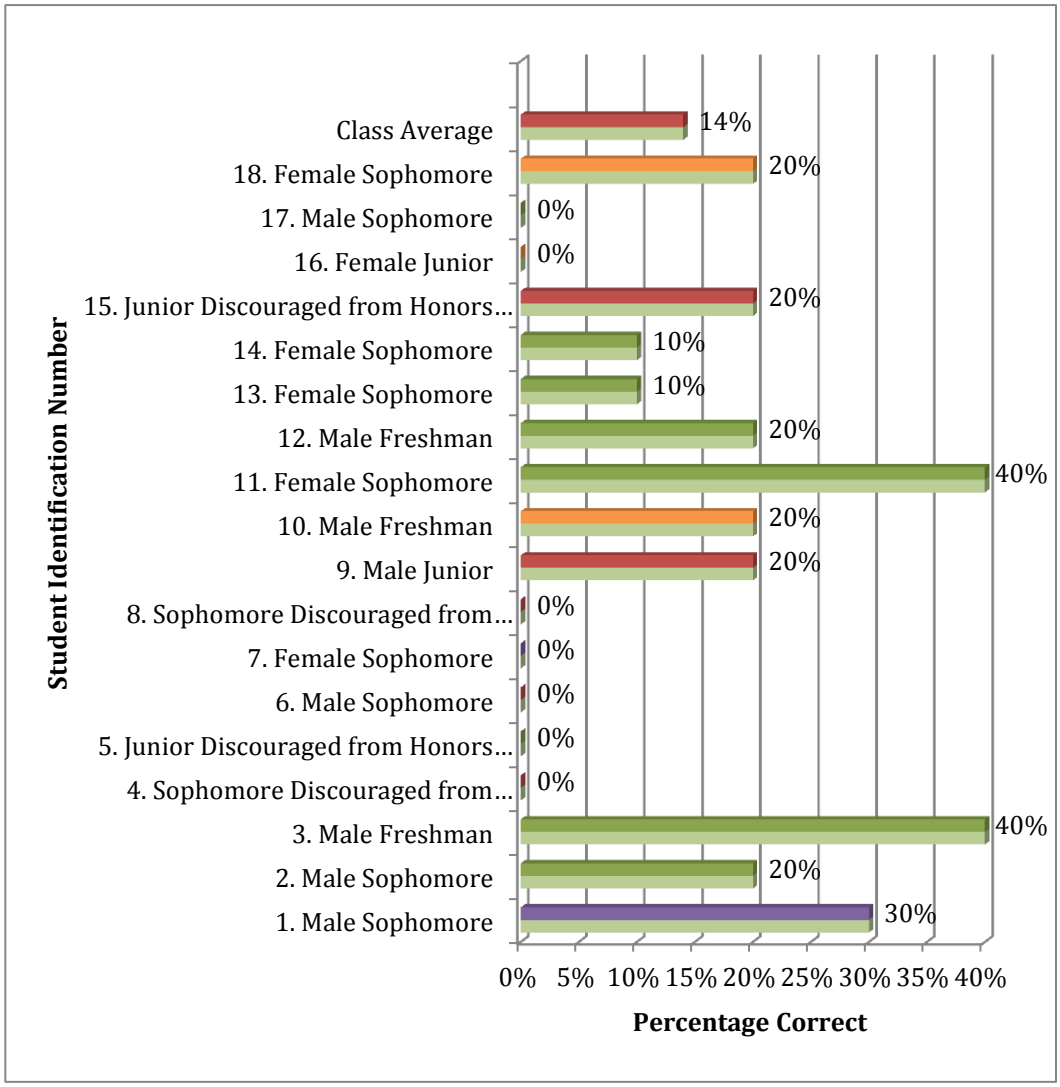
APPENDIX E: PRE-ASSESSMENT DATA TABLE

Student Identification Code	Number Correct	Percentage Correct
1. Male Sophomore (Math Counts Participant)	3/10	30%
2. Male Sophomore (Math Counts Participant)	2/10	20%
3. Male Freshman (Math Counts Participant)	4/10	40%
4. Sophomore Discouraged from Honors Placement	0/10	0%
5. Junior Discouraged from Honors Placement	0/10	0%
6. Male Sophomore	0/10	0%
7. Female Sophomore	0/10	0%
8. Sophomore Discouraged from Honors Placement	0/10	0%
9. Male Junior	2/10	20%
10. Male Freshman (Math Counts Participant)	2/10	20%
11. Female Sophomore (Math Counts Participant)	4/10	40%
12. Male Freshman (Math Counts Participant)	2/10	20%
13. Female Sophomore (Math Counts Participant)	1/10	10%
14. Female Sophomore (Math Counts Participant)	1/10	10%
15. Junior Discouraged from Honors Placement	2/10	20%
16. Female Junior	0/10	0%
17. Male Sophomore	0/10	0%
18. Female Sophomore	2/10	20%
Class Average	1.4/10	14%

APPENDIX F

GRAPHICAL REPRESENTATION OF PRE ASSESSMENT SCORES

APPENDIX F: GRAPHICAL REPRESENTATION OF PRE ASSESSMENT SCORES



APPENDIX G

INSTRUCTIONAL DESIGN TABLE WITH ADJUSTMENTS MADE FROM PRE ASSESSMENT DATA

APPENDIX G: INSTRUCTIONAL DESIGN TABLE WITH ADJUSTMENTS MADE FROM PRE ASSESSMENT DATA

Student Identification Code	Student Identification Code	Pre-Assessment Number Correct	Post-Assessment Number Correct	Pre-Assessment Percentage Correct	Post-Assessment Percentage Correct	Learning Gain Scores*
1. Male Sophomore (Math Counts Participant)	1. Male Student	3/10	10/10	30%	100%	1.00
2. Male Sophomore (Math Counts Participant)	2. Male Student	2/10	9/10	20%	90%	0.88
3. Male Freshman (Math Counts Participant)	3. Male Student	4/10	9/10	40%	90%	0.83
4. Sophomore Discouraged from Honors Placement	4. Discouraged from Honors Placement	0/10	7/10	0%	70%	0.70
5. Junior Discouraged from Honors Placement	5. Discouraged from Honors Placement	0/10	6/10	0%	60%	0.60
6. Male Sophomore	6. Male Student	0/10	8/10	0%	80%	0.80
7. Female Sophomore	7. Female Student	0/10	7/10	0%	70%	0.70
8. Sophomore Discouraged from Honors Placement	8. Discouraged from Honors Placement	0/10	10/10	0%	100%	1.00
9. Male Junior	9. Male Student	2/10	7/10	20%	70%	0.63
10. Male Freshman (Math Counts Participant)	10. Male Student	2/10	9/10	20%	90%	0.88
11. Female Sophomore (Math Counts	11. Female Student	4/10	8/10	40%	80%	0.67

Participant)						
12. Male Freshman (Math Counts Participant)	12. Male Student	2/10	10/10	20%	100%	1.00
13. Female Sophomore (Math Counts Participant)	13. Female Student	1/10	9/10	10%	90%	0.90
14. Female Sophomore (Math Counts Participant)	14. Female Student	1/10	9/10	10%	90%	0.90
15. Junior Discouraged from Honors Placement	15. Discouraged from Honors Placement	2/10	8/10	20%	80%	0.75
16. Female Junior	16. Female Student	0/10	8/10	0%	80%	0.80
17. Male Sophomore	17. Male Student	0/10	8/10	0%	80%	0.80
18. Female Sophomore	18. Female Student	2/10	9/10	20%	90%	0.88
Class Average	Class Average	1.4/10	8.4/10	14%	84%	.81

APPENDIX H

PRE/POST ASSESSMENT DATA TABLE

APPENDIX I: PRE/POSTASSESSMENT DATA TABLE

Student Identification Code	Student Identification Code	Pre-Assessment Number Correct	Post-Assessment Number Correct	Pre-Assessment Percentage Correct	Post-Assessment Percentage Correct	Learning Gain Scores*
1. Male Sophomore (Math Counts Participant)	1. Male Student	3/10	10/10	30%	100%	1.00
2. Male Sophomore (Math Counts Participant)	2. Male Student	2/10	9/10	20%	90%	0.88
3. Male Freshman (Math Counts Participant)	3. Male Student	4/10	9/10	40%	90%	0.83
4. Sophomore Discouraged from Honors Placement	4. Discouraged from Honors Placement	0/10	7/10	0%	70%	0.70
5. Junior Discouraged from Honors Placement	5. Discouraged from Honors Placement	0/10	6/10	0%	60%	0.60
6. Male Sophomore	6. Male Student	0/10	8/10	0%	80%	0.80
7. Female Sophomore	7. Female Student	0/10	7/10	0%	70%	0.70
8. Sophomore Discouraged from Honors Placement	8. Discouraged from Honors Placement	0/10	10/10	0%	100%	1.00
9. Male Junior	9. Male Student	2/10	7/10	20%	70%	0.63
10. Male Freshman (Math Counts Participant)	10. Male Student	2/10	9/10	20%	90%	0.88
11. Female Sophomore	11. Female Student	4/10	8/10	40%	80%	0.67

(Math Counts Participant)						
12. Male Freshman (Math Counts Participant)	12. Male Student	2/10	10/10	20%	100%	1.00
13. Female Sophomore (Math Counts Participant)	13. Female Student	1/10	9/10	10%	90%	0.90
14. Female Sophomore (Math Counts Participant)	14. Female Student	1/10	9/10	10%	90%	0.90
15. Junior Discouraged from Honors Placement	15. Discouraged from Honors Placement	2/10	8/10	20%	80%	0.75
16. Female Junior	16. Female Student	0/10	8/10	0%	80%	0.80
17. Male Sophomore	17. Male Student	0/10	8/10	0%	80%	0.80
18. Female Sophomore	18. Female Student	2/10	9/10	20%	90%	0.88
Class Average	Class Average	1.4/10	8.4/10	14%	84%	.81

APPENDIX I

LEARNING GAIN SCORES CALCULATION WORKSHEET

APPENDIX I: LEARNING GAIN SCORES CALCULATION WORKSHEET

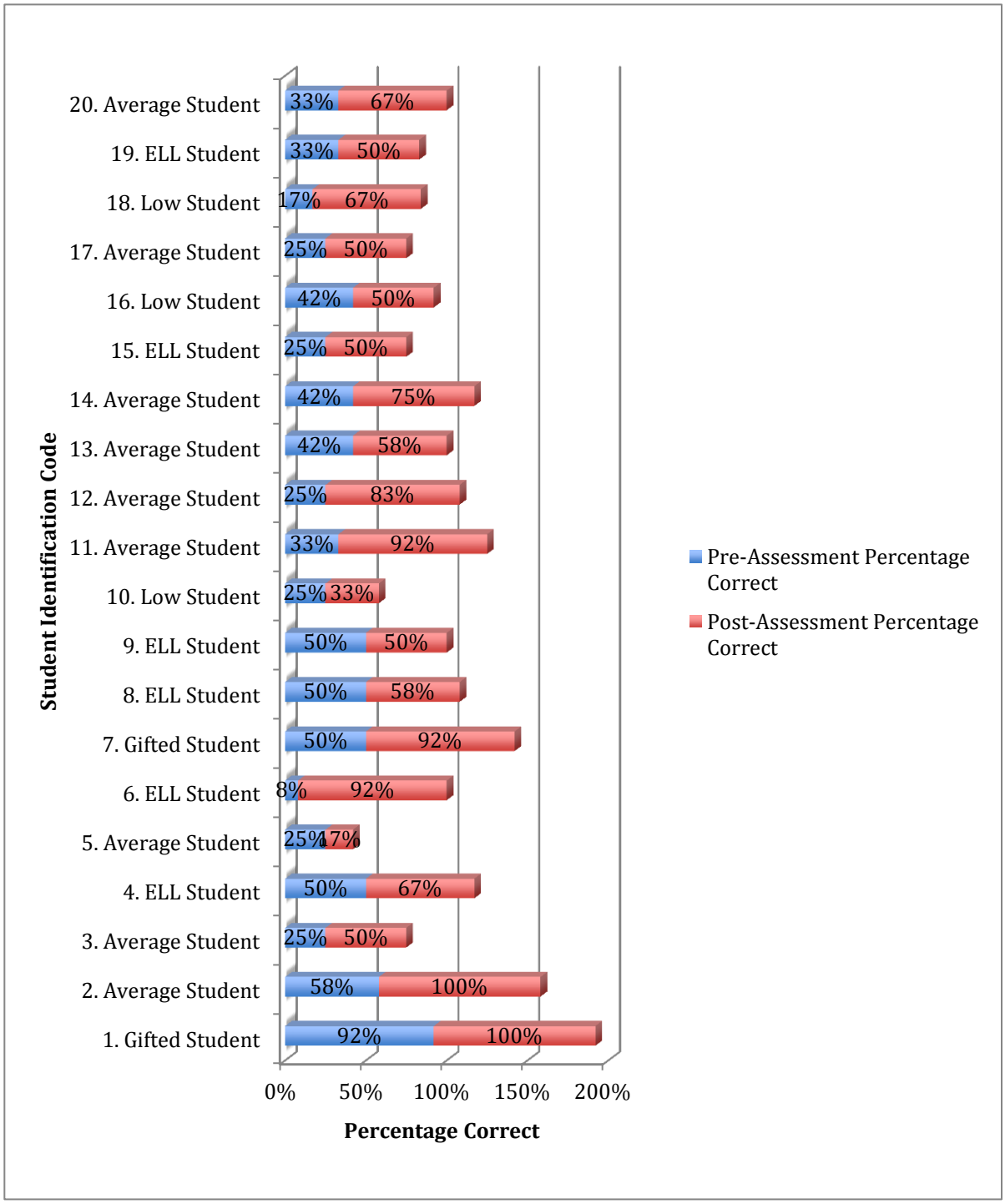
Formula: $\dfrac{\text{(Post-Assessment – Pre-Assessment)}}{\text{(100\% -- Pre-Assessment)}}$

Student 1:	(100 – 30) / (100 – 30)	=	1.00
Student 2:	(90 – 20) / (100 –20)	=	0.88
Student 3:	(90 – 40) / (100 – 40)	=	0.83
Student 4:	(70 – 0) / (100 – 0)	=	0.70
Student 5:	(60 – 0) / (100 – 0)	=	0.60
Student 6:	(80 – 0) / (100 – 0)	=	0.80
Student 7:	(70 – 0) / (100 – 0)	=	0.70
Student 8:	(100 – 0) / (100 – 0)	=	1.00
Student 9:	(70 – 20) / (100 – 20)	=	0.63
Student 10:	(90 – 20) / (100 – 20)	=	0.88
Student 11:	(80 – 40) / (100 – 40)	=	0.67
Student 12:	(100 – 20) / (100 – 20)	=	1.00
Student 13:	(90 – 10) / (100 – 10)	=	0.90
Student 14:	(90 – 10) / (100 – 10)	=	0.90
Student 15:	(80 – 20) / (100 – 20)	=	0.75
Student 16:	(80 – 0) / (100 – 0)	=	0.80
Student 17:	(80 – 0) / (100 – 0)	=	0.80
Student 18:	(90 – 20) / (100 – 20)	=	0.88
Class Average:	(84 – 14) / (100 – 14)	=	0.81

APPENDIX J

GRAPHICAL REPRESENTATION OF PRE AND POST ASSESSMENT RESULTS

APPENDIX J: GRAPHICAL REPRESENTATION OF PRE AND POST ASSESSMENT RESULTS



APPENDIX K

ITEM ANALYSIS OF PRE AND POST ASSESSMENT RESULTS

APPENDIX K: ITEM ANALYSIS OF PRE AND POST ASSESSMENT ITEMS

Item Number	TWS Objective Assessed	Number of Students That Answered Correctly	Number of Students That Answered Incorrectly
1	-Student will be able to classify a polynomial	1	17
2	-Students will be able to model data using polynomial functions -Students will be able to solve polynomial equtions by graphing.	1	17
3	Students will be able to reconstruct a polynomial function from its zeros	1	17
4	-Students will be able to analyze the factored form of a polynomial equation	0	18
5	-Students will be able to solve polynomial equations by factoring.	2	16
6	Students will be able to divide polynomials using long division.	1	17
7	Students will be able to divide polynomials by synthetic division.	5	13
8	Students will be able to divide polynomials by synthetic division.	1	17
9	Students will be able to apply the Remainder Theorem to solve for P(a)	4	14
10	Students will be able to apply the Remainder Theorem to solve for P(a).	13	5

APPENDIX L

LEARNING GAINS FOR INDIVIDUAL STUDENTS SORTED FROM GREATEST TO LEAST

APPENDIX L: LEARNING GAINS FOR INDIVIDUAL STUDENTS SORTED FROM GREATEST TO LEAST

Student Identification Code	Learning Gain Scores*
1. Male Sophomore (Math Counts Participant)	1
8. Sophomore Discouraged from Honors Placement	1
12. Male Freshman (Math Counts Participant)	1
13. Female Sophomore (Math Counts Participant)	0.9
14. Female Sophomore (Math Counts Participant)	0.9
2. Male Sophomore (Math Counts Participant)	0.88
10. Male Freshman (Math Counts Participant)	0.88
18. Female Sophomore	0.88
3. Male Freshman (Math Counts Participant)	0.83
6. Male Sophomore	0.8
16. Female Junior	0.8
17. Male Sophomore	0.8
15. Junior Discouraged from Honors Placement	0.75
4. Sophomore Discouraged from Honors Placement	0.7
7. Female Sophomore	0.7
11. Female Sophomore (Math Counts Participant)	0.67
9. Male Junior	0.63
5. Junior Discouraged from Honors Placement	0.6