THE INFLUENCE OF CURRICULUM BASED READER'S THEATER ON SCIENCE
STUDENTS' PERFORMANCE ON IN-CLASS ASSESSMENTS

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Abstract

This study explored the implementation of Curriculum Based Reader's Theater in a 5th grade science classroom. Traditional Reader's Theater is often used in classroom as an engaging activity for students. The instructional purposes of traditional Reader's Theater range from supporting story comprehension, increasing reading fluency, and boosting the motivation to read. This study used a variation of Reader's Theater, known as Curriculum Based Reader's Theater (CBRT), to introduce science students to new content information. The participants of this study were 13 fifth grade students and a science teacher from a Title I school located in New York City. The purpose of this study was to measure the impact of Curriculum Based Reader's Theater on both students' acquisition of new knowledge per in-class formative and summative assessments and their motivation to learn science. Over the course of four lessons, students were introduced to the topic of astronomy through teacher created scripts. On day five, the final day of the unit, students were given a ten question quiz to assess the content learned. Results suggested that Curriculum Based Reader's Theater is an effective teaching strategy for introducing new science content knowledge. Curriculum Based Reader's Theater also supports students' acquisition of new science content knowledge, while increasing students' levels of motivation and participation in science. The researcher suggests that adaptations to the implementation of Curriculum Based Reader's Theater may increase the effectiveness of the strategy.

Keywords: Reader's Theater, Curriculum Based, CBRT, science, comprehension, scripts

Table of Contents

Table of Figures

Table of Tables

Chapter 1: Conceptual Framework

When we read a story or piece of informational text our main goal is to read for comprehension. In order to read for comprehension, readers must acquire the skill of reading with fluency at the level that the text is written. From a very early age, even before beginning their educational careers, children are asked questions that require them to recall information from various parts within a story or in reference to the story as a whole. Fluency of the reader often plays a large part when determining if comprehension has occurred. Reading fluency and comprehension operate together; if there is a lack of one, presumably there will be a lack in the other (Kabilan & Kamaruddin, 2010).

From as early as Kindergarten, teachers teach their young readers how to read with fluency and how to comprehend what they have read in the passage. Teachers provide their students strategies that support reading for the main idea, supporting facts and details, the author's purpose, cause and effect, sequence, and ultimately comprehension (Young & Vardell, 1993). Students are taught how to highlight important information, annotate the text, complete graphic organizers, and write responses all to support the purpose of reading. Teachers will commonly model for students how to complete the above successfully in order to benefit the students' comprehension and ability to read. While supporting the skills and strategies through modeling with applied text, teachers are also indirectly modeling for students how to read with fluency.

There are a variety of strategies that teachers can use in order to support students' comprehension and fluency. The appropriateness of the strategy often depends on the structure of the text and genre. One strategy found most effective across texts and genres is known as Reader's Theater.

What is Reader's Theater?

Reader's Theater is an instructional method of teaching that requires students to learn content through repeated readings. Reader's Theater focuses on the ability to read text with fluency and expression. Rehearsals and repeated readings ultimately lead the students to comprehend the text. The first reading exposes the student to the vocabulary, main idea, and author's purpose of the text. Following readings allow the students to focus on understanding the terms used in the script, the true meaning of the text, how the text can be read with expression, and repeated exposure to the text as whole. Repeated exposure to the text familiarizes the students with words and ideas that are placed throughout the sections of the text. Soon students will begin to recall the information and words of each section. When reading the text, students will be able to read the words accurately and automatically. The students' need to decode the text will decrease as the text becomes a natural part of reading (Kinniburgh & Shaw, 2007).

Students are motivated to participate in Reader's Theater as reading is not viewed as a chore, but a fun classroom activity. Reader's Theater enables students to create a new world by exploring texts and stories more than just one time. Students are able to step on stage and take on the role of a different person, becoming someone other than themselves for a short period of time. Since students are taking the reins of their learning they are motivated every step of the process (Kinniburgh & Shaw, 2007).

Reader's Theater can be used in any classroom as a remedial strategy or instructional method to teach curriculum content. Often teachers hesitate to use Reader's Theater as a remedial strategy or instructional method due to the lack of time in the classroom in a given day (Flynn, 2004).When introducing Reader's Theater it is best to

start small; build rules for carrying out Reader's Theater and expectations for behavior. Beginning the process with modeling fluent and expressive reading is beneficial for the students. The teacher can slowly involve the students through choral readings or informal round robin readings. Depending on the judgment of the teacher and the abilities of the students the teacher can continue in choral readings and informal round robin readings, or can begin introducing the students to scripts and script writing. It is suggested that the first script be created by the class as a whole. With practice the students can be broken up into groups, where each group receives a different script (Prescott, 1999).

Most of the time Reader's Theater scripts are based on fictional stories. Content books, especially ones that contain many pictures, are great resources for turning text into Reader's Theater scripts (Stewart, 2008). Non-fiction books provide a great source of material when met with the brilliant imaginations of the students. Students can transform any specialized content textbook and the material on the pages into a script with ease by personifying every element, bringing the text to life. By using textbooks to make a Reader's Theater script the teacher and students are choosing grade level appropriate material. Through the use of grade level appropriate text students will be able to analyze, acquire, and comprehend the story or text information successfully.

In order to construct a script that the students will enjoy, they must first pick a book or a section of a book to their liking. Ideally the passage should only take five minutes to perform or create a script that is between two to three pages. Books suited for adaptation should contain rich dialogue and exciting characters. Students should read with a lens identifying a compelling storyline, steady pace, action, and conflict (Prescott, 1999). Using books from a series or by a particular author make the most of familiarizing the students

with the format authors use to write their stories, such as language style and character and plot development. Poetry and speeches are written to be spoken aloud and allow the reader to recite with natural ease as one would do in a conversation. Poetry and speeches often convey meaningful text that students are able to analyze and make meaning of. Allowing students to create their own poetry about content material or personify elements of the text creates an opportunity for students to manipulate text according to their own understanding.

Texts are scripted by the teacher or groups of students. The original text can be kept as written, or modified to meet the needs of the teacher, students, or lesson. The teacher should focus on the parts of the text that will connect and remain with the student population. It is acceptable to cut out material that may seem too advanced for the student (Stewart, 2010). Ideally the text is divided into meaningful parts, similar to acts and scenes in a theatrical play. Students are assigned a part of the text and can be grouped based upon how the experience will be beneficial to all students, for example by interest or reading level. Lines can be given to students individually, in pairs, small groups, and whole group, giving each student the opportunity to perform. Students focus on the words of the script and the gestures they make to explain the content of the script, rather than focusing on acting out the scenes of a play (Flynn, 2004). In Reader's Theater students are not solely required to write scripts. Students can create poems, songs, or raps in order to present the content material precisely. Students often create more pieces of work with heavier imagination than pieces written by the teacher, resulting in highly engaged students and audiences (Worthy & Prater, 2002).

Rehearsal, or repeated readings, is an important part of Reader's Theater. The amount of times a student practices amplifies the final performance, fluency in reading,

and comprehension of the material. Struggling readers benefit from repeated readings because it helps the students to understand and comprehend the material and vocabulary when text is initially difficult (Prescott, 1999). Through repeated reading students learn the text and text structure more fluently, but also revisit the content information multiple times. Revisiting the text multiple times supports the acquisition of new knowledge. By the end of the process, students are able to provide clear, fluent, and thorough explanations of the text, communicating the text to the rest of the class in a way that is comprehensible and pleasurable.

In the middle school grades, students are developing independent literacy skills that they will use for the rest of their lives, especially in high school and college years. Middle school grades are crucial for academic development (Worthy & Prater, 2002). Similar to Reader's Theater in the elementary grades, Reader's Theater in the middle school grades focuses more on the analysis and ability to convey meaning through their interpretive readings. Reader's Theater is an opportunity for middle school students to rewrite their textbooks into exciting, comprehensible, and even hilarious material. Due to the higher levels of reading and writing skills of students in the middle school grades, Reader's Theater can be used as a common instructional activity in order to acquire and comprehend new knowledge. Reader's Theater allows students to take control of the dense material that fills their textbooks and bring it to life. Why read numerous amounts of pages, filled with content that is complex, followed by an activity that is just as dry as the text, when you can become the text and perform the text with expression, excitement, and comprehension? Many habits developed in rehearsing for Reader's Theater carry over to any style of reading the student may partake in. Reader's Theater is based upon the theory of effectively

addressing and increasing reading fluency, comprehension, and motivation (Worthy &

Prater, 2002).

Without the extensive preparation of a play, such as costumes, props, sets, and

memorization, Reader's Theater is limited only by the imagination of the teacher and the

students. Students can explore the world, battle dragons, sail the high seas, and climb to

the highest peak in the world all without leaving the four walls of the classroom and their

very own seats (Young & Vardell, 1993). When students are able to perform the text with

intonation, expression, and gestures they create a world of information that the audience

members can be a part of (Young & Vardell, 1993).

Comprehension

Difficulty with comprehension for some readers may occur when the reader spends

too much time trying to decode the words in the text while reading. In order to comprehend

what is being read, individuals must be able to decode words accurately and automatically.

Fluent readers are able to do just that. Fluent readers are able to decode words accurately

and automatically when reading, giving the brain the opportunity to comprehend the text.

Fluent readers are able to process meaning at the same time that they are able to decode

words. The mastery of any skill depends on the ability to perform multiple tasks at a given

time allowing the brain to carry on with other functions. Mastery of skills also requires the

brain to focus consciously on a function while unconsciously executing other functions.

Ultimately, if two or more tasks are being performed at the same time, then one or more of

the tasks are being performed automatically (Homan, Klesius, & Hite, 1993).

Reader's Theater also requires students to move around while practicing and

performing, which can aid in comprehension and memory. Movement and gestures make

Reader's Theater more interesting to perform and watch when the readers accentuate the dialogue with appropriate movements and gestures to support the text and further explain the content. Gestures that are relevant and significant to the script content promote increased retention of the material. It is said by researchers, observed by educators, and most importantly defined in Howard Gardner's (1983) multiple intelligences, learning that incorporates a physical process is more likely to be recalled (Flynn, 2004).

Repeated reading supports students in retention of the material. Through repeated reading students are reading, reciting, repeating, and reviewing the material, all aiding in retention, critical thinking, and making meaningful connections with the text. Being able to retain information supports the students in many situations. With standardized testing being one of the many focuses of education, being able to retain information only supports the students during times of testing. Being able to retain information largely requires the use of semantic memory; semantic memory requires the brain to remember words, such as names, facts, figures, dates, locations, and other textbook information. Unfortunately semantic memory is the weakest of the human's retrieval systems (Bullion-Mears, McCauley, & McWhorter, 2007). By dramatizing the information of the textbook and using Curriculum Based Reader's Theater to rehearse and perform curriculum content material students are strengthening their semantic memory. Curriculum Based Reader's Theater ideally takes the content material that has been scripted and rehearsed numerous times and enters it into the students' long term memory, in turn being available when it comes to perform and be assessed.

Through writing their own scripts, students come in contact with the content of the textbook first hand. Through the process of writing students begin Reader's Theater with

a familiarity of the content. In addition, writing often supports the learning process through the movements our hands make as we write, creating opportunities of success for the students when the time comes to perform written assessments (Flynn, 2004).

Fluency

Repeated reading, as used in Reader's Theater, plays a role in increasing fluency. Repeated reading provides students with multiple exposures to a text, allowing for fluency to develop over a short period of time. The National Reading Panel defines fluency as reading a text with speed, accuracy, and proper expression (Stewart, 2010). Other definitions of fluency refer to oral reading ability, but neglect the idea of comprehension when in fact comprehension is equally a goal of reading. Pikulski and Chard (2005) synthesized a definition from the *Report of the National Reading Panel* (NICHD) and the *Literacy Dictionary* (Kinniburgh & Shaw, 2007) that includes comprehension:

> Reading fluency refers to the efficient, effective word recognition skills that permit a reader to construct the meaning of text. Fluency is manifested in accurate, rapid, expressive oral reading and is applied during, and makes possible, silent reading comprehension. (p. 17)

Most definitions of fluency focus on the student's ability to read with accuracy, automaticity, and prosody. When determining if a student is reading with accuracy teachers are looking for repeated moments of reading where the student is able to recognize words in the text without any error in pronunciation. Accuracy also refers to the ability to decode words properly and pronounce each letter with the correct letter sound. Automaticity refers to the student's ability to read words in a given text correctly and effortlessly. By reading with automaticity the student's brain is able to function and apply cognitive resources

simultaneously while reading. Prosody is the ability to analyze a text for emotion and expression while reading and portray it orally. The student's phrasing will reflect the semantic and syntactic content of the passage (Young & Rasinski, 2009).

Although reading with speed is an aspect of reading that students try to increase, teachers must be aware of the role speed plays on the student's comprehension. Reading for speed is not a means of seeing how fast a student can read. When students read for speed they should focus on how fast they speak, as fluency is modeled after natural speech: if one is speaking too fast it is difficult to understand what he or she has said, resulting in a listener who is unable to comprehend the speaker. The exact opposite applies when a speaker speaks too slowly and is dragging out his or her words; the listener may lose focus and attention, unable to comprehend the point of the speaker's message. The same theory applies to fluency in reading. If students read with an emphasis on speed, comprehension of the text will be lost; students pay minimal attention to the content, reading without meaningful expression (Young & Rasinski, 2009).

Repeated reading is a valuable strategy teachers use in order to support fluency and comprehension simultaneously. Repeated reading of the same passage, orally, is an effective strategy for developing fluency in reading by providing students with the practice needed to increase automaticity. Students receive the practice of repeated reading by practicing the script over and over in preparation of the final performance (Flynn, 2004). Fourth grade teacher Lorraine Griffith used Reader's Theater with her students to improve their reading abilities. After ten weeks of implementing Reader's Theater, every child in Lorraine Griffith's class gained a full grade level in reading. By the end of the year students' gains had totaled up to three years of growth (Prescott, 1999).

The student's ability to read with fluency demonstrates more than just the ability to sound good when he or she reads. Reading with fluency is evidence that students are reading with comprehension. Many researchers debate that fluency and comprehension are related. Does fluency lead to comprehension? Does comprehension lead to fluency? Through repeated reading students are gaining control of the text and recalling how they read the text the previous time, in addition to reading with a new lens, correcting errors they had made and recalling the information the comes next (Worthy & Prater, 2002).

Motivation

Reader's Theater creates opportunities for struggling or less skilled readers to receive support from classmates who are more advanced readers. By listening to classmates read aloud, the more advanced readers model for struggling readers how a fluent reader reads and what a fluent reader sounds like to listeners. Struggling readers can practice reading the script or any text with more advanced readers simultaneously in order to hear how the words are supposed to be spoken and how the text is supposed to sound. Through group practice, struggling students practice the skills of correct punctuation, intonation, and expression. In addition, teamwork stimulates focused reading, as the students must pay close attention to solo lines, group lines, cues, gestures, and the script overall (Flynn, 2004).

Reader's Theater is intended to grasp the interest all students, including students who have minimal to no interest in reading at all. When a student is able to choose his or her own role based upon interest he or she is often eager to participate in other scripts, taking on as many roles as possible. Sixth grade teacher Rick Swallow used Reader's Theater in his classroom to teach *Where the Wild Things Are.* Even the most reluctant

reader eagerly awaited the performance of the script after receiving the role of Max. The student quickly became an avid reader (Prescott, 1999).

Rick Swallow used Reader's Theater particularly to focus on students who needed academic success to boost their self-esteem and confidence. Reader's Theater effectively changed the students' outlooks on reading, emerging into lively readers. Reader's Theater soon became a contest between students who could read the role more convincingly. Swallow recalls one reader in particular who was hindered by extreme shyness. This young girl was often too shy to even raise her hand in class. After receiving the role of Mrs. Clause the young girl became a new person to the teacher. The young girl could not wait to receive future roles in every script. In the end, the young girl overcame her shyness and mastered reading. Third grade teacher Risa Sterns recalled a young boy in one of her workshops who was emotionally disturbed and a non-reader. The student often sat off the side, isolating himself, refusing to participate or take part in any of the activities with the other students in his class. By the following year the student would edge closer and closer to the stage, itching to participate. By the time the student reached fifth grade he became a full and active participant in Reader's Theater. A once reluctant reader began to develop a love for reading. Stern recalls at the end of one session the young boy looked up to her with a smile, a smile that had shown he knew the progress he had made and was proud of his achievements (Prescott, 1999).

Reader's Theater provides the teacher and students with opportunities for developing interpersonal, social, and collaborative skills with members of the classroom. These skills will be later carried throughout life with the students. Developing the above skills particularly supports struggling students. Reader's Theater supports the needs of

every student, enabling the students to express their knowledge creatively in a manner that best suits his or her needs. Reader's Theater indirectly boosts the students' self-esteem and can affect the students' behavior in and outside the classroom. In boosting the students' self-esteem, Reader's Theater reaches out to students who are particularly shy or have anxiety. Without the pressures of a true theatrical performance students are able to relax and perform with ease and confidence (Young & Vardell, 1993).

Drama, and most of the arts, is not commonly found in many schools anymore. The loss of the arts is unfortunate due to the fun created and the many skills that are learned through participation. Drama is a fun activity for children that can foster emotional growth, motivation, and engagement. Reader's Theater not only fosters reading fluency, listening and speaking skills, but also emotional growth, motivation, engagement, confidence, and transforms reluctant readers into book lovers (Prescott, 1999).

A Variation of Reader's Theater: Curriculum Based Reader's Theater (CBRT)

"If playwrights can take pieces of information, historical episodes, or narratives and adapt them as scripts with lines of dialogue, couldn't teachers and students do something similar with the contents of a textbook, a novel, or a collection of facts? If playwrights create lines of dialogue for a given number of characters, couldn't teachers and students write lines so that every member of their group- or even the entire class- has a speaking role?" (p. 360)

Curriculum Based Reader's Theater, also known as CBRT, is a variation of Reader's Theater that, as Flynn (2004) suggests, uses the topics and content material of the curriculum to develop teacher and student created scripts. Curriculum Based Reader's Theater activities require students to demonstrate comprehension, paraphrasing,

summarizing, synthesizing information, and communicating ideas and information orally (Flynn, 2004). CBRT scripts are written to address a variety of local, state, and national standards of the curriculum content.

Teaching through Curriculum Based Reader's Theater begins with a script based on curriculum content material. The teacher must examine the standards that need to be addressed and met once the lesson or unit is completed. Textbooks are a form of appropriate text, but teachers may also provide the students with other resources where information can be derived from, such as a fact sheet, piece of literature, or set of instructions. Students review the information while simultaneously thinking about roles that can be created from the text; students should develop the roles of characters and a narrator(s), in addition to individual lines and group lines. Students must remember that they are playwrights and playwrights create a script that delivers material in an energetic way that grasps the attention of the audience. Students can use humor, contemporary references, expressions, sarcasm, and other uses of language in their scripts to seize the audience. Script writing will depend on the ability of the student. Older, more capable students may be able to write the entire script on their own or with the help of group mates, once they have grasped and mastered the skill of script writing. Younger or less capable students may not be able to write the script on their own, but rather support the teacher in the script writing by offering a variety of ideas (Flynn, 2004).

Students are assigned parts and are directed to highlight their lines. The initial rehearsal focuses on reading the lines correctly, listening for cues, and unison speaking. Rehearsals to follow focus on vocal volume and expression. Rehearsals and performances increase the students' abilities to read a given text with fluency. Reading with fluency will

support the students in expressing the content of the script, recognizing words accurately, understanding the content, and reading with expression all at the same time. Due to the connection between fluency and comprehension, students are gaining knowledge and comprehension of the content, supporting higher achievement (Flynn, 2004).

Curriculum Based Reader's Theater has many benefits that affect students throughout the course of the learning process. Due to the limitless amount of opportunity for student involvement, every student in class has a part in the performance of a Curriculum Based Reader's Theater script. Students are simultaneously engaged and attentive throughout the process. There is never a group size that is too large or small to accommodate the script and purpose of Curriculum Based Reader's Theater (Flynn, 2004).

Curriculum Based Reader's Theater is fun, as students enjoy being involved in their own learning, solving problems, and creating something of their very own. During the process students partake in interesting creations, collaborate with others, meet challenges, move around, and make discoveries on their own. Curriculum Based Reader's Theater is especially exciting to use in content areas where the material is dense and dry. Being able to create your own twist on numbers in math class, or the animal kingdoms in science class brings new life to the material. Students continue to acquire and learn new information in a manner that is more appealing than solely reading the textbook or doing a worksheet. Ultimately, Curriculum Based Reader's Theater improves the students' abilities to read with fluency and motivation to write, as well as it models revising, increases retention of content information, addresses the standards of learning at multiple levels, integrates the arts into the curriculum in a more feasible manner, and incorporates theater skills, making every student a successful star performer (Flynn, 2004).

Conclusion and Need for This Study

Research shows the many benefits Reader's Theater possesses for readers of all grades and reading levels. Reader's Theater increases reader's fluency through repeated exposure to the same text multiples times a day over the course of week. Students become familiar with the words in the text and are soon able to read the words in the text with accuracy and automaticity. Through repeated exposure and repeated readings students gain a clearer understanding of the concepts and ideas of text. Each time the student reads the text new ideas and vocabulary become clearer in understanding, developing meaningful comprehension of the text. Reader's Theater puts the students in control of their learning, motivating students to practice something they have created and work hard towards a successful final piece. Students are supported every step of the way, receiving modeling from the teacher and their peers. In addition, Reader's Theater is a helpful teaching tool in terms of making complex texts more comprehensible and enjoyable for students of all ages. At the middle school level science becomes increasingly difficult, as it often requires the application of more complex and abstract thinking in order to master a variety of concepts.

Much research shows the benefits of using Reader's Theater with fiction books to support students' story comprehension and reading with fluency, in addition to boost motivation towards reading. Curriculum Based Reader's Theater is a variation of Reader's Theater that is not commonly found in a classroom. Through this study I will explore the use of Curriculum Based Reader's Theater to teach new content in a science classroom. I will also explore how students acquire new knowledge through the use of Curriculum Based Reader's Theater. This study will focus on the influence Curriculum Based Reader's Theater has on science students' performance on in-class assessments:

a. How does Curriculum Based Reader's Theater (CBRT) impact science students' acquisition of new knowledge, per in-class formative and summative assessments?

b. How does CBRT impact in-class assessment scores?

c. In what ways does CBRT impact student motivation towards learning science content?

Chapter 2: Literature Review

Reader's Theater is commonly implemented to enhance, support, and advance students in the comprehension of text, reading fluency, and the motivation to read. Research has shown that implementing Reader's Theater in the classroom is an effective strategy for accomplishing the common above three goals. Teachers and researchers have published data that supports Reader's Theater as an effective strategy, meeting the needs of all students from those who thrive to those who strive.

Repeated Readings and Fluency

In 1979, Samuels studied the effectiveness of repeated readings on the fluency of average and poor readers, including mentally retarded students. The results of the study showed that the number of repetitions needed to master fluency decreased over a period of time as the students repeatedly read a passage. In addition it was also found that repeated reading of one passage transferred to the reading of new materials. Another researcher by the name of Knupp carried out a similar study in 1988. The students in Knupp's study practiced repeated readings four days a week, for one hour each day, for eleven weeks. The pretest scores showed an average rate of 69 words correct per minute. The posttest scores showed an average rate of 91 words correct per minute. Five of the eight students in Knupp's study reduced their error scores by 50 percent. Six of the eight students improved by seventeen percent or more on the comprehension posttest (Hite, Homan, & Klesius, 1993).

Young and Rasinski conducted a study in the 2007-2008 school year, incorporating Reader's Theater into the daily instruction of Chase Young's class. The class contained 29 general education, Title I students in second grade. The students' reading levels at the beginning of the study ranged from early kindergarten to midyear third grade; the average

reading level was end of first grade. Young delivered the Developmental Reading Assessment (DRA) at the beginning and end of the year to assess each student's reading level based upon word recognition accuracy and comprehension. In addition, the students were tested using the Texas Primary Reading Inventory (TPRI) to assess their reading rate and prosody. Both assessments were delivered at the end of the year, after the implementation of Reader's Theater, to assess the improvements in reading rate, prosody, comprehension, and word recognition (Young & Rasinski, 2009).

The students were tested for prosody and reading in September through the use of Developmental Reading Assessment (DRA) and Texas Primary Reading Inventory (TPRI). In the spring DRA was tested in April and TPRI was tested in May. In the Fall students began with a strong word recognition accuracy with a class average of 98.9%. Students remained strong throughout the year and increased by .3%, raising the class average to 99.2%. Based on a scale of 1-4, with four being the max, students began in the Fall with a class average of 2.2 in prosody. The class average increased by 0.8, or 20%, raising the average to 3.0. The increase in prosody resulted in students reading higher level texts with greater prosody. In the Fall the class DRA average was 19.4. After the final DRA test in April the class average rose 11.8, increasing the average to 31.2; Chase's students scored above the goal for second grade by 3.2. The students made the largest gains in automaticity. At the beginning of the school year the class averaged 62.7 words correct per minute. By the end of the year the class growth was 64.9, an increase of almost 65 words. The class average rose to 127.6 words correct per minute. This tremendous gain pushed the students out of the 50th and 75th percentiles and into the 75th and 90th percentiles for second graders (Young & Rasinski, 2009).

The qualitative results showed just as significant gains as the quantitative results. Reader's Theater had many positive and motivational effects on the students as well. Students highly enjoyed the opportunities to practice and perform the Reader's Theater scripts. Young recalls one student's response, "Mr. Young, Reader's Theater rules!" Many students found Reader's Theater to be challenging because it required more reading (repeated readings), but it was "fun reading" and required the students to learn more. Struggling readers enthusiastically awaited "Fluency Friday." Young and Rasinski observed that the struggling readers often chose the longest or most difficult parts because they loved the task of rehearsing and the final performance. Students were exposed to a very wide variety of text due to the ability of incorporating all genres into Reader's Theater. Student feedback led Young and Rasinski to accomplish the goal successfully of implementing Reader's Theater into the classroom: "creating a fun and creative means to increase wide reading, to promote repeated readings to foster reading fluency, to build confidence, and to make meaning." (Young & Rasinski, 2009)

In 2006 Casey and Chamberlain had students practice and perform a new Reader's Theater script every week during the 12-week study. The study found that students most enjoyed scripts that were adapted from books that they had been exposed to previously. Teachers observed that within two months students transferred skills learned in Reader's Theater to other reading activities and unfamiliar texts. Over two thirds of the students improved their reading rate with an average of eighteen more words per minutes read correctly. From 43% to 52% percent of the students increased their phrasing, smoothness, and pace (Clementi, 2010).

Hollingsworth, Sherman and Zaugra (2007) and Neumann, Ross, and Slaboch (2008) conducted action research studies that found that students responded best towards activities that included elements of Reader's Theater: repeated readings and performances. Reader's Theater was a forerunner in the variety of methods used to improve student comprehension of text and motivation to read. The researchers found that student comprehension increased due to repeated readings until the students obtained a thorough understanding of the text. Reader's Theater increased the students' academic success, enthusiasm, and motivation (Clementi, 2010).

Assisted Reading and Non-Repetitive Strategies

In 1987 Dowhower and in 1990 Rasinski studied the comparisons of assisted reading with repeated reading. Both researchers found in their data that assisted reading and repeated reading methods resulted in substantial improvements in reading rate and accuracy. Even below average readers increased in their reading rate and comprehension, decreasing in the amount of word errors made. Stoddard added, after her study in 1988, that students were trained to segment sentences scored higher when tested for comprehension (Hite, Homan, & Klesius, 1993).

A study conducted by Hite, Homan, and Klesius examined the effects of repeated reading and assisted nonrepetitive strategies such as echo reading, cloze reading, and unison reading on reading rate, error rate, and comprehension. The purpose of the study examined two research questions: do the instructional methods of repeated reading and assisted nonrepetitive reading strategies have an effect on sixth grade Chapter I students' reading performances? And, is the effect of repeated reading instruction significantly greater than that of assisted nonrepetitive reading methods on the reading performance of sixth grade Chapter I students? Participants in the study were 26 sixth graders who were

part of a Chapter I program in two different centers of a metropolitan area. The 26 sixth graders were below grade level readers (Hite, Homan, & Klesius, 1993).

The students were given pre- and post- tests that included six passages that were selected from a commercially prepared informal reading inventory or Silver Burdett and Ginn Basal Series workbook. The reading passages were narratives and on reading levels between fourth and seventh grade. Two forms of the tests were given: Form A and Form B. The two treatments were executed by three teachers, three times a week, 20 minute sessions, for seven weeks (Hite, Homan, & Klesius, 1993).

The results showed there were noteworthy improvements between the pre- and post- test scores. Students who participated in repeated reading and assisted non-repetitive reading strategies made significant gains in comprehension. The results demonstrated that there are no additional benefits of one strategy over the other. In the discussion the researchers made connections between the increase of comprehension and the amount of time focused on connected reading. In both repeated reading and assisted non-repetitive reading strategies are great remedial strategies, even if used for short periods of time (Hite, Homan, & Klesius, 1993).

Reader's Theater for Learning Disabled Students

A study conducted by Carol Corcoran was designed to assess the effectiveness of Reader's Theater as a fluency program. Corcoran studied 12 learning disabled students in a combined second and third grade exceptional learners classroom. Oral reading fluency tests were previously given to the start of the study in addition at the conclusion of the study. After each oral reading fluency text was given, students received a survey in regards to reading attitude (Corcoran, 2005).

The pre and post surveys were designed so that the first six questions would elicit the students' comfort levels with reading in different contexts and situations. The students scored their answers on a scale from one to four. After the post survey results were analyzed the students comfortability levels increased by 2 to 16 percent. Students' comfort level jumped 14% from 81% to 95% in regards to how Reader's Theater made the students feel. Previous to Reader's Theater 52% of students felt comfortable reading out loud in school. After Reader's Theater 68% of students felt comfortable reading aloud in school, an increase of 16% (Corcoran, 2005).

Fluency scores were tested at the end of January and beginning of April. Overall the class average for words read correct per minute increased by 17 additional words correct from the initial text given in January. Students' gains led them to approach on grade level quartiles (Corcoran, 2005).

Although the data showed gains for the students who participated, it is difficult to hold much of the data with high value due to the fact that the group of participants was a small number. In addition only a short period of time passed between pre and post oral reading fluency tests. Unfortunately in this study there was no control group to compare findings. Further research would need to be conducted in order to measure the effects of Reader's Theater on reading and fluency achievements for students with learning disabilities (Corcoran, 2005).

In the study of Mraz, Nicholas, Caldwell, Beisley, Sargent, and Rupley (2013), a third grade teacher implemented Reader's Theater to improve fluency levels of the struggling readers in her class. Like many teachers' first thought, the classroom teacher agreed that Reader's Theater is a great instructional method in theory, but "will it work in

my classroom?" Nineteen third graders participated in the study, ranging in age from seven to nine. Three of the nineteen students were repeating the third grade, as an additional three students received special services four days a week due to learning disabilities. At the beginning of the study none of the students were on grade level (Mraz, Nichols, Caldwell Beisley, Sargent, & Rupley, 2013).

Johns Basic Reading Inventory was used to determine the pretest scores of the students. Scores ranged from 81 words correct per minute to 9 words read correct per minute; the class average was 55 words read correct per minute. The suggested district goal set for all second graders by the end of the year was 90 words read correct per minute. The students' prosody was also tested using Rasinski's Multidimensional Fluency Scale, graded on a four point scale with the highest achievable score of a 16. Students' scores ranged from four to seven, with a class average of 5. The class average scored in terms of measuring comprehension was 49%. All scores were based upon reading the same third grade passage (Mraz, Nichols, Caldwell, Beisley, Sargent, & Rupley, 2013).

The teacher chose six Reader's Theater scripts that were at the students' challenging instructional level. The scripts were read and practiced for the first 30 minutes of the two hour literacy block. Each script, from initial reading to final performance, was practiced for five days. Each day the students read the script using a different technique. For example, on day one students read the script through shared reading, day two through echo reading, day three through paired/partner reading, and day four through choral/expressive reading (Mraz, Nichols, Caldwell, Beisley, Sargent, & Rupley, 2013).

When analyzing the results of the study, the teacher focused on the effects Reader's Theater had on the students' oral reading fluency, word recognition accuracy, word

recognition automaticity, and prosody; automaticity was measured by reading rate and prosody was measured using Rasinski's Multidimensional Fluency Scale. Post-test scores showed that students' word recognition accuracy ranged from 21 words correct per minute to 64 words correct per minute. Scores showed that all students improved beyond the approximate yearly gain of 17 words correct per minute; the highest scores were 47 words above the yearly gain. The class as whole raised their average of 55 words correct per minute from to 93 words correct per minute at the end of the study. Pretest scores showed that the students had an average of 6.7 errors made when reading. Post-test scores showed much improvement as errors dropped down to a class average of 1.2 errors (Mraz, Nichols, Caldwell, Beisley, Sargent, & Rupley, 2013).

When given Rasinski's Multidimensional Fluency exam at the beginning of the study, each student scored an 8, indicating much difficulty when reading with prosody. Due to such low scores, it can provide a possible explanation of misinterpreted and misunderstood text, in addition to a lack of meaningful reading. Before Reader's Theater the class average for prosody and comprehension was 49%. At the end of the six week study the class average rose to 86%. The class average rose from a 5 to an 11 on Rasinski's Multidimensional Fluency Scale. Students showed signs of increased understanding of phrasing and syntax, overall increasing the understanding and interpretation of the text. Ultimately over the six week period the class as whole went from a level of frustration readers to almost independent readers in comprehension (Mraz, Nichols, Caldwell, Beisley, Sargent, & Rupley, 2013).

Griffith and Rasinski conducted an action research project in 2004 surrounded by the method of Reader's Theater. The study observed four Title I students who struggled

mostly with word recognition. After implementing Reader's Theater over the course of a year the students increased their silent reading comprehension by 2.5 years. The students increased their word recognition by 1.25 years. The remaining students in the class were observed to have tremendous gains in independent reading levels. Due to full class participation, the study showed that all students had an increase in motivation and enjoyment in reading. Gains in reading enjoyment are critical for struggling readers who tend to view reading as a chore and avoid reading because it may be too difficult (Clementi, 2010).

Corcoran conducted a study in 2005 that focused on the effects of Reader's Theater on the attitudes of second and third grade students in a self-contained class. After the eight week study students were found to be more comfortable reading aloud. Almost all students recognized the need to practice reading the scripts multiple times. The class averaged a gain of 17 words read correctly per minute. Reader's Theater soon became the most favorite part of the day as 97% of students stated that Reader's Theater made them feel positive about their reading (Clementi, 2010).

Curriculum Based Reader's Theater

Reader's Theater is a technique often found in Language Arts classrooms, but would you think to find this method of teaching in a Science classroom? Brooks' class used the book *Search for the Golden Moon Bear: Science and Adventure in the Asian Tropics* by Sy Montgomery to reinforce the topic of using genetics to identify species. Through creating a script via Reader's Theater, Brooks ended the unit on genetics with a performance. In addition, the book chosen also supported the current unit on geography in Social Studies. As part of the school's state mandated curriculum standards, each content area is required to follow the read-across-the-curriculum standard, requiring the students

to read books that support all their school subjects and spark engaging discussions (Brooks & Nahmias, 2009).

The students manipulated the text of the book, creating scripts developed on their own for the purpose of the assignment. Heterogeneous groups of three were created based upon the data collected from the Fall reading assessments in order to ensure that each group had at least one strong reader. The strongest reader was delegated the role of doing a read aloud of the chapter for the group while others followed along and took notes. After each chapter was completed the group discussed the notes written down and added additional notes if needed. In total, six 55 minute class periods were spent on creating a Reader's Theater for science content; the first 5 days were spent on developing the scripts and the last day was designated for final performances (Brooks & Nahmias, 2009).

The students showed a very high level of engagement throughout the week in completing their scripts. The students were very successful in script writing and were very focused on creating quality scripts. In their self-assessments, students were very honest about their levels of engagement. Rubric scores showed the majority of students achieved mastery of the learning objectives. Multiple exposures to vocabulary words in context yielded a high level of science vocabulary learning (Brooks & Nahmias, 2009).

Kabilan and Kamaruddin conducted a study over the course of six months, involving 20 Form Two learners of different ages and grade levels; the average student was age 14. Students were selected at random from two advanced level classes. Based upon previous text scores, the students were considered average to good English language learners. English was not the students' first language, or favorite study subject, but second/third/foreign language (Kabilan & Kamaruddin, 2010).

The study was conducted in two stages. Stage one consisted of the students reading a selected text class wide. Students were given a week to read and understand the text on their own; the text chosen was *Potato People* by Angela Wright. Literature lessons were conducted as normal without any exposure to Reader's Theater. An interview and questionnaire was delivered between the initial reading and implementation of Reader's Theater (Kabilan & Kamaruddin, 2010).

Stage two was carried out over the course of four phases. Throughout the four phases students were broken up into groups and given two chapters of the book to read. Based upon the readings the groups were to create scripts on their assigned chapters. Students developed scripts, often facilitated by the teacher, practiced the self-created scripts, and ended the sessions with a final performance. The final performances were videotaped for class wide feedback and self/group reflection. At the end the same questionnaire and interview were delivered (Kabilan & Kamaruddin, 2010).

The questionnaire consisted of 10 questions, scored on a five point scale, one being the lowest, five being the highest. The purpose of the questionnaire was to explore the students' perceptions of the comprehension level of the text read and their interest and motivation to learn literature. The researchers administered the questionnaire two times in order to explore the differences in the students' answers after experiencing and participating in Reader's Theater.

The findings showed that questionnaire scores nearly doubled after participating in Reader's Theater. Before Reader's Theater the scores to the 10 questions averaged between 2.40 to 3.80. After Reader's Theater the average scores for the same 10 questions ranged from 3.45 to 4.50. Before Reader's Theater students scored understanding the literary text

easily with an average score of 2.40. After Reader's Theater the average score rose 1.40 points, resulting in a 4.00. Students rated literature lessons based upon stimulating their creativity with an average score of 2.65. After Reader's Theater the score increased to 4.30 points. Similar results were shown when rating literature lessons as enjoyable. Before Reader's Theater students gave an average score of 2.85. After Reader's Theater the score averaged at 4.45 points. Students' motivation to learn literature increased by 1.35 points, resulting in an average score of 3.85 (Kabilan & Kamaruddin, 2010).

Previous to Reader's Theater students admitted in their interviews that they were not happy with the texts that the teacher selected because they could not understand the text and would often not finish the text independently. Questionnaire scores showed the average score of motivation was 2.50. After Reader's Theater the students stated in their interviews that they were able to visualize the scenes easily and relate to the characters in the novel when they read and acted out the text at the same time; Reader's Theater better supported the students' comprehension of the text, better than when the teacher was the sole outlet for explanation. The teacher noted an obvious increase in student motivation and initiative to understand the text. Overall the final performances supported both performers and audience members in understanding and comprehension of the text; audience members who were not part of the class expressed high interest in Reader's Theater (Kabilan & Kamaruddin, 2010).

In addition to increased comprehension of text and motivation to learn literature students also gained highly important personal skills. Due to group work, students were placed in situations that promoted collaboration. Students would delegate a group leader who would aid in delegating scripts' roles. Delegations had to be done in a timely fashion

in order to be able to take full advantage of script writing and rehearsal time. Situations arose where the students were required to problem solve while writing the script, rehearsing, and performing, often resulting in improvisations. Students even faced an occasion where the issue of morality arose in the text and students felt it was important that the issue be included in their section of the play in order to convey a message to the audience; students received support from the teacher in order to come to a final decision (Kabilan & Kamaruddin, 2010).

The 20 learners benefited from participating in Reader's Theater due to intensive construction and development of the characters, scenes, narrations, dialogue, and plot, experiencing the text through performance, and the process of evaluation and reflection (Kabilan & Kamaruddin, 2010). Since Reader's Theater was performed more than once with multiple scripts, students experience Reader's Theater multiple times and each of its elements, enhancing the experience and benefits of Reader's Theater. Students highly benefited from Reader's Theater due to high levels of involvement from the very beginning of the process all the way to end beyond the final performance. At each level of the process students demonstrated critical thinking. Students made connections between learning literature and how they perceived and valued learning. Student growth proved that students were better able to understand and critically analyze literature, in addition to improving their comprehension of the text and better remembering numerous elements of the text. The students were better able to understand the story through repeated readings and writing of the script from their own perspective and understanding. The continuous revisiting of the text and the script encouraged the students to make meaningful connections between the text (Kabilan & Kamaruddin, 2010).

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Chapter 3: Methods

The purpose of this study was to measure the impact of Curriculum Based Reader's Theater on both students' acquisition of new knowledge per in-class formative and summative assessments and their motivation to learn science. This study questioned the ways in which students can successfully acquire new knowledge of science content when the content material is indirectly taught through a theatrical performance. This study observed and measured the extent of students' acquisition of new knowledge, motivation, and performance on in-class assessments.

Participants

The participants in this study were thirteen students currently enrolled in 5th grade at a private Title I school located in New York City. The participants ranged from ten to eleven years old. Of the thirteen participants, five were boys and eight were girls. Eight of the thirteen participants identified as African American, three as Caucasian, one as Asian, and one as Hispanic. Twelve of the thirteen students in the class participated with full attendance in the whole class study; one of the young boys was absent three out of the five days during the week of Curriculum Based Reader's Theater. Of the students whose parents consented to their child's participation in the study, all were selected to participate because of the small sample size. The teacher has taught science to grades 5 through 8 for seven years, all of which have been spent at this Title I school.

In this study, the teacher was given a permission form to sign allowing the researcher to conduct the study with his students. Consent forms (See Appendix A), stating the purpose of the study and the option to discontinue participation in the study at any point in time, were sent home to parents and returned to the researcher with signatures indicating

consent to allow their child(ren) to participate in the study. The consent forms also noted that participation in this study would not harm their student's grade for the class. Consent forms were signed and returned before the start of the study. Participants were asked to remove their names from all assignments completed and returned to the researcher. The grades from Week One's quiz were given to the researcher in a spreadsheet without students' names attached to the quiz score. Grades were released through signed permission of the teacher and school principal.

The study began with a week-long formal observation of how the teacher introduces and teaches new science content. The study continued with one week of instruction using Curriculum Based Reader's Theater. Before each session, the researcher presented the teacher with a Curriculum Based Reader's Theater script created by the researcher. During each lesson, the teacher and students read and acted out the day's script. At the end of each performance students were given time to identify science content knowledge. At the end of the week the students were given a quiz to assess the information introduced and acquired during the week.

Each script was based upon the next topic in the current Astronomy unit. The content material that the students were required to learn was taken from the grade level science textbook provided by the teacher and was embedded within a fictional story created by the researcher. The content of each script was based upon each lesson within the chapter, resulting in four scripts with a central topic related to the overarching topic of astronomy. Real people, especially the participants in the study, were not used as characters in the plays; instead they were based upon realistic and science fiction characters.

Procedure

During Week One, the researcher observed students' motivation, as shown by their interest, participation and engagement in the traditional lessons. For this study, multiple behaviors were included under the broad heading of "motivation." A checklist was used each day to observe specific student behaviors such as on topic engagement in discussions, raising hands to ask or answer questions, eyes focused on the speaker, participating in individual or partner work, appropriate body placement and seating, type of conversation involvement, the attention to distractions, and remaining on task. The latter could be observed if students sat with their feet on the floor and faced forward; raised their hands to ask or answer a question; asked relevant questions and gave topic-related answers; tracked the speaker when listening; focused on the task requirements and content when working independently or in a group; and avoided off topic conversations or distractions.

In addition to observing student behavior, the researcher observed the teacher and instructional procedures, the styles of teaching, instructional methods, and tools used during traditional lessons. The impact of these procedures on student learning and behavior were also noted. At the end of Week One, the students' summative quizzes were collected. The quizzes were used to identify evidence of students' acquisition of new knowledge through traditional instruction.

Traditional Day	Procedure	Materials	Data Collected
1	• Journal question and review • Introduction to speed and velocity lecture notes • Speed and velocity practice problems and review • Mousetrap cars speed experiment	Student behavior checklist Journal question Speed and velocity lecture notes Mousetrap cars iPads	Background knowledge of speed Field notes about students' levels of participation, interaction, and motivation
2	• Mousetrap cars speed experiment • Data calculations • Presentation of data	Student behavior checklist Mousetrap cars iPads	Field notes about students' levels of participation, interaction, and motivation Recall of speed and calculating speed
3	• Introduction to Newton's Laws of Motion notes • Whole class discussion of Law #1 • Demonstrations of Law #1	Student behavior checklist Newton's Laws of Motion notes	Field notes about students' levels of participation, interaction, and motivation Recall of speed and velocity
4	• Review of Newton's Laws of Motion • Whole class discussion of Law #2 • Demonstrations of Law #2 • Whole class discussion of Law #2 • Demonstrations of Law #2	Student behavior checklist Newton's Laws of Motion notes	Field notes about students' levels of participation, interaction, and motivation Recall of Law #1
5	• Summative Quiz	10 question, teacher created content quiz	Students' content knowledge about speed, velocity, and Newton's Laws of Motion

Table 1: Breakdown of Traditional Instruction Week

During Week Two, the researcher observed the students' interest, participation, and engagement throughout the Curriculum Based Reader's Theater lessons. The student behavior checklist used in Week One was also used in Week Two. The data collected from the researcher's observations of the students was later used to identify a relationship between the levels of interest, participation, and engagement and the types of activities that took place during the lessons. Researcher observations of the teacher were also conducted to gather data on how the teacher delivered each lesson, motivated and engaged the students, sustained participation, answered questions, and followed the structure of the Curriculum Based Reader's Theater lesson plans. At the end of Week Two, students' summative quizzes were collected to identify evidence of students' acquisition of new knowledge through Curriculum Based Reader's Theater instruction.

CBRT Day	Procedure	Materials	Data Collected
1	- Student Survey - Journal question and review - Introduction to CBRT - Initial reading - Role assignment - Reading #1 - Script annotation and review - Reading #2 - Exit Ticket	Student behavior checklist Pre CBRT Student Survey (Appendix C) Journal question (Appendix B) Script #1 (Appendix D) Exit Ticket (Appendix B)	Students' interest towards learning Science content and Science class Background knowledge of astronomy Field notes about students' levels of participation, interaction, motivation, and content learned
2	- Initial reading - Role assignment - Reading #1 - Script annotation and review - Exit Ticket	Student behavior checklist Script #2	Content recalled Field notes about students' levels of participation, interaction,

		Exit Ticket (Appendix B)	motivation, and content learned
3	• Initial reading • Role assignment • Reading #1 • Script annotation and review • Exit Ticket	Student behavior checklist Script #3 Exit Ticket (Appendix B)	Content recalled Field notes about students' levels of participation, interaction, motivation, and content learned
4	• Initial reading • Role assignment • Reading #1 • Script annotation and review • Exit Ticket	Student behavior checklist Script #4 Exit Ticket (Appendix B)	Content recalled Field notes about students' levels of participation, interaction, motivation, and content learned
5	• Summative Quiz • Post Student Survey • Post Teacher Survey	10 question, researcher created content quiz (Appendix E) Post CBRT Student Survey (Appendix F) Post CBRT Teacher Survey (Appendix G)	Students' content knowledge of astronomy Students' interest in learning Science through CBRT Teacher's interest planning and teaching through CBRT

Table 2: Breakdown of CBRT Week

Context

During the first week of the study, the researcher observed five days of traditional instruction. The researcher noted how the teacher and students interacted with one another, how the teacher introduced new material, and how the students acquired new knowledge all centered around a science topic. Throughout the observation week, the teacher introduced to the topics of velocity and speed, and Newton's Laws of Motion. During each lesson the teacher engaged the students in clarification discussions to assess their

comprehension of the content material before they participated in the application portion of the lesson. The clarification discussions served as a formative assessment. At the end of the week the students completed a ten question quiz as a form of summative assessment.

The first lesson began with a journal question regarding the topic of speed. The teacher orally provided the students with real life examples of how fast different forms of transportation move on average per hour. Using the information given, the students were asked to explain how they would feel when driving down a small street at two different speeds: an average speed and an extremely fast speed. Three students were chosen to share their explanations to the journal question.

The teacher presented a definition of "speed" through lecture notes. Then, he explained the concept in detail and added a drawing of a speeding car as a visual example. Next, he provided the formula for computing the speed of a moving object and guided students in using the formula to solve a story problem step by step. Students independently completed three more problems about speed. Then, they collaboratively reviewed each step of how they solved the problems to arrive at an answer. Next, velocity was defined and explained in the same manner as speed. A visual was drawn on the board as a transition into the formula for velocity. Based on the formula given, the example was presented to the students to try and solve independently before being reviewed as a class. Multiple students were called on to solve the answer. The student who correctly solved the question was asked to explain to the class how she derived at the answer. Together, the student and the teacher explained in more detail the meaning of velocity. The teacher provided the students with three examples of velocity that would be reviewed by the class, step by step. The lecture notes were concluded with five mixed examples of speed and velocity for the

students to solve. Each question was reviewed and students explained step-by-step how they solved the question correctly. After using the procedure for solving problems about speed, the teacher and students followed the same steps for solving problems about velocity.

During the remainder of day one students completed an experiment using cars they made the previous week. The cars were constructed from Legos, one spring mouse trap per car, and rubber bands. With their partners, the students marked off an area in the classroom that was five feet long. Using iPads, the students recorded how long it took their cars to travel five feet. The students collected data for ten successful trials and kept records in their notebooks; successful trials were indicated by the car crossing over the finish line without any obstructions or mishaps.

Students began day two began by completing the previous day's experiment and continuing with their initial ten trials. If the ten trials were completed the students were instructed to run another ten trials before time was up. Once all the data was collected, the groups returned to their seats to review the formula for speed. In pairs, the students calculated the average speed of their cars for the first ten trials and the average speed of all their trials. Each group revealed their car's average speed for ten trials and the average speed for all trials completed.

On days three and four the teacher used an educational video connected to the Science Channel to introduce Newton's Laws of Motion, one law at a time. The teacher read each law aloud and explained it simply. Based upon class conversation, the students derived an explanation of each law and wrote in their notebooks. They watched a short, animated clip that provided a visual to accompany the law. Additional visuals, including

drawings, pictures, video clips, and student/teacher demonstrations provided the students with additional real life examples to show how each law of motion is used in everyday life.

Day five was quiz day. The students were given 45 minutes to complete a ten question quiz comprised of short answer, true or false, multiple choice, and math (solve for speed and velocity) questions. Each question was worth ten points and a bonus question about Newton and his scientific work was worth an additional five points.

The following week, Curriculum Based Reader's Theater was used for instruction on four of the five days. The schedule and lesson plans for the week were developed by the researcher and the lessons were taught by the teacher (See Appendix B). Prior to Week Two, the teacher and researcher discussed the upcoming topic and the content of the assessment, and created a list of ideas and facts for the Curriculum Based Reader's Theater lessons. Exit ticket questions for students to answer at the end of each lesson and review discussion topics to use before starting a new topic were also developed. Both served as formative assessments and enabled the teacher to monitor student understanding. The researcher developed four scripts with the following topics: the solar system, the phases of the moon, how a telescope works, and the sun and stars. The teacher planned to practice one script each day with the students and anticipated making on the spot changes as needed, such as rearranging roles to match the number of students.

Before beginning Curriculum Based Reader's Theater instruction, students completed a survey that gathered information about the students' current interest and motivation towards traditionally taught science (See Appendix D). Students were asked to complete the survey anonymously. The information gathered through the survey would enable the researcher to understand the students' views towards the subject of science, their

science class, the elements of the class they enjoy, and changes to the class to better meet their learning needs.

Day one was a double period of science for 90 minutes. Before the scripts were handed out, the students were introduced to the teaching method of Curriculum Based Reader's Theater. The teacher explained that they would be learning astronomy over the next four days through four different Curriculum Based Reader's Theater scripts. Each day they would receive a script with a different topic as the main idea; each lesson in the class textbook provided the content material for the scripts.

The lesson began with the following journal question: List as many things you know about space. The students were given 30 seconds to complete their list. Then, the students picked one or more items from their list and compared and contrasted what scientists know about this topic currently with in what scientists in the past knew and studied. Three volunteers shared their answers aloud to the journal question and activity. Next, the students and the teacher choral read the script one time completely through in chorus (See Appendix D). After, the teacher assigned each student a role by naming the part and having students raise their hands. Each student was able to have his or her own role. Once all roles were assigned the students and the teacher read through the play role by role. At the end of the reading, the teacher assessed students' understanding of the script content by eliciting questions. This served as a formative assessment. Then the teacher answered all student questions. As an additional review, the students were given three minutes to review and annotate the entire script for content; students were allowed to highlight important information and write notes for comprehension purposes. Students were asked to annotate with a "quiz lens;" this means they were to annotate the script in a

way that highlights the important information that could be assessed on a quiz. By starting on the first page and reading aloud page by page, students reviewed important content. This step ended when students successfully identified all embedded content. The students then acted out the script a second time using props from around the room and the classroom as their stage. The lesson concluded with the following exit ticket: name one thing you learned about space that you did not know previous to today's lesson.

Day two through four were conducted in a similar manner to day one. The days began with the students and teacher reading the day's script chorally one time completely. Students were assigned roles to act during the play. The students and teacher acted out the play role by role. The teacher checked for understanding and clarified content as needed before allotting the students three minutes to annotate their scripts. During those three minutes, students highlighted important content material and wrote notes in order to record new information. The students were advised to use their "quiz lens" when annotating, thinking about how the information could be turned into a quiz question. Together the class reviewed all highlighted and annotated information to ensure that each student was correctly identifying and important content material. On these days, class time did not allow for a second reading of the scripts. At the end of each lesson, the students were given an exit ticket question to answer; the students were not allowed to look back in their notes for the answer, but had to answer the question based upon what they remembered from the lesson.

On the final day, the students used the 45 minute class period to complete a ten question quiz (See Appendix E). The quiz contained short answers, multiple choice, and true or false questions, each worth ten points, and two bonus questions, totaling an

additional five points. Once the students were finished with the quiz, they completed a post-Curriculum Based Reader's Theater survey anonymously (See Appendix F). This survey gathered information about how the students felt about learning through Curriculum Based Reader's Theater, and students' advice to the teacher and researcher to make learning through Curriculum Based Reader's Theater easier and more fun. The teacher also received a post-Curriculum Based Reader's Theater survey to complete to gather information about the planning, implementation, and overall method of Curriculum Based Reader's Theater (See Appendix G).

Analysis

Various assessment techniques were used throughout each method of teaching to measure student acquisition of new knowledge. During the week of traditional methods of teaching the teacher engaged the students in clarification discussions as a way of formative assessment. The clarification discussions monitored the students' learning and comprehension of the content material before moving forward and engaging in the application portion of the lessons. The clarification discussions allowed the teacher to answer any questions the students may have had in regards to the content information and how it was taught, improving student comprehension. At the end of week a ten question quiz was given as a form of summative assessment. The quizzes evaluated the students' overall learnings and comprehension of the content material. The quiz answers suggested that the students fully mastered, partially mastered, or did not master the content material.

Four assessment techniques were used during the week of Curriculum Based Reader's Theater. Clarification discussions and the end of the week quiz were used in the same manner as in Week One. Two additional formative assessment techniques were used

during Week Two. Exit tickets were used at the end of lessons one through four to assess the content information learned and the level at which the students comprehended: fully, partially, or minimally. Review discussions were held at the beginning of lessons two through four to assess if the students comprehended the key concepts of the previous day's lesson.

Chapter 4: Findings and Results

This study focused on three questions: How does Curriculum Based Reader's Theater impact science students' acquisition of new knowledge, per in-class formative and summative assessments; How does Curriculum Based Reader's Theater impact in-class assessment scores; and In what ways does Curriculum Based Reader's Theater impact student motivation towards learning science content? To address these questions, the researcher compared instructional methods and components, students' formative and summative scores, and students' participation and motivation for traditional instruction and instruction through Curriculum Based Reader's Theater.

Acquisition of Knowledge

The first purpose of this study was to measure whether students comprehended and acquired new knowledge through the use of Curriculum Based Reader's Theater scripts. Four sources of data were used to determine this. Comprehension and acquisition of new knowledge of each day's content was assessed and measured through three formative assessments: end of the lesson exit tickets, clarification discussion, and review discussion. The summative assessment, a quiz at the end of lesson five, checked for overall comprehension and acquisition of the content from each of the four lessons.

Formative Assessments in Curriculum Based Reader's Theater

The first type of formative assessment, exit tickets, was given to the students at the end of lessons one through four. The students were required to answer the question using the knowledge they had acquired during the lesson and could recall without looking back the script. Exit tickets were handed in at the end of the lesson to assess each student's level of mastery. Students' answers were rated as showing full, partial, or minimal to no mastery.

The teacher and researcher used students' levels of mastery to determine the direction of the following day's review discussion.

The second type of formative assessment, clarification discussions, was implemented in lessons one through four to check for student understanding of the script's content. The discussion was led by the students based upon the questions they had about the script's content. The teacher would often respond by stating the content information in a clearer manner. The discussions allowed the teacher to monitor student learning on the spot, in addition to providing the students with explanations that would support their comprehension and acquisition. Clarification discussions helped students answer exit ticket questions and provided additional information for them to contribute to the review discussion at the beginning of the following lesson.

The third type of formative assessment, review discussions, was held at the beginning of lessons two through four. The purpose of review discussions was for students to recall the information they had learned from the previous day's script. The discussions were led mostly by the students with minimal teacher support; the teacher provided minimal prompting to keep the pace lively and the focus of the discussion on task. When recalling content information from the previous day, students' answers were rated by the teacher and researcher as indicative of full mastery, partial mastery, or minimal to no mastery.

Summative Assessment in Traditional Instruction and Curriculum Based Reader's Theater

For both traditional instruction and Curriculum Based Reader's Theater, an end of the week quiz was used as a summative assessment to evaluate the student learning and

acquisition of new knowledge of the content material across the four lessons. The following data show the results of a comparison of quiz scores. The class average of the traditional instruction quiz was 78%. The class average of the Curriculum Based Reader's Theater quiz was 53%. The two averages show a difference of 25 points. The quiz scores from Week One ranged from the lowest score of 50 points to the highest score of 100 points showing a range of 50 points. The quiz scores from Week Two ranged from the lowest score of 34 points to the highest score of 76 points showing a range of 42 points. The median score from Week One was 80 and the median score from Week Two was 50. The median scores showed a difference of 30 points.

	Number of Students Assessed	Class Average (in percent)	Range of Scores (in points)	Median Score
Traditional Method	13	78	50-100	80
CBRT Method	12	53	34-76	50

Figure 1: Comparison of Quiz Scores without Extra Credit

An analysis of the summative assessments for traditional (Week One) and Curriculum Based Reader's Theater (Week Two) instruction pointed to important differences in two key areas: the quizzes themselves and the learning experiences involved.

Analysis of the quizzes includes a focus on the construction of the quizzes in terms of the type of questions asked and the levels of thinking required to answer the questions, and the content knowledge assessed by the quizzes. An analysis of both quizzes suggested that the questions emphasized different levels of thinking. Even though both quizzes required the students to answer through application students needed to recall different amounts of content information in order to answer the questions correctly. The traditional

style quiz supplied the students with the content knowledge needed in order to answer the questions. For example, the formulas needed to calculate velocity and speed were given at the top of the quiz. Since the students received the formulas for the velocity and speed questions, they did not need to recall this content. Instead, students needed to understand how to plug the information from the question into the given formulas and solve. In addition, Newton's laws of motion were stated within two questions that asked the students to provide examples that supported the laws. Although most of the quiz questions required the students to apply the information, they were not required to recall the necessary content information prior to answering the question. Only one or two questions required the students to recall the definition of a mathematical concept used during the experiment. In contrast, the questions on the Curriculum Based Reader's Theater quiz required the students to recall content information with little to no support from the words of the questions. In order to answer the Curriculum Based Reader's Theater quiz questions successfully, students needed to recall the terms, definitions, and concepts learned throughout the week. In addition, one of the questions required the students to first recall the information learned and then apply the content. If the students could not recall the information there was a very limited chance that they could answer the question completely and gain full credit.

Next, the teacher's use of different modalities and intelligences in the traditional lessons may have helped students to comprehend more deeply and make more meaningful connections with the content. By varying the types of activities during the lessons, the teacher differentiated the lessons to support visual, auditory, verbal, and kinesthetic learners. In contrast, the Curriculum Based Reader's Theater lessons did not address the

varied learning styles of diverse learners. The only activities to take place during the Curriculum Based Reader's Theater lessons were repeated readings of the scripts, limited content discussions, and the annotation of the scripts. Including additional activities may have supported the learning styles of the students, enabling further comprehension of the content. Additionally, the lack of discussion within the Curriculum Based Reader's Theater lessons may have impeded students' abilities to further comprehend the content and acquire new knowledge. Whole class discussion and partner discussion may have increased the acquisition of new knowledge thereby improving the students' ability to recall information and answer quiz questions correctly. Lastly, collaboration through partner discussion was observed in the traditional method lessons, but not in the Curriculum Based Reader's Theater lessons. Collaboration enables students to increase their knowledge by building upon the knowledge of their peers, working with one another to expand their content knowledge and comprehension. As observed in the traditional method lessons, students who worked together were able to generate answers and explanations that targeted the questions more clearly and accurately. By working together, students were able to combine their knowledge of the content to correctly answer questions and create a deeper meaning of the content.
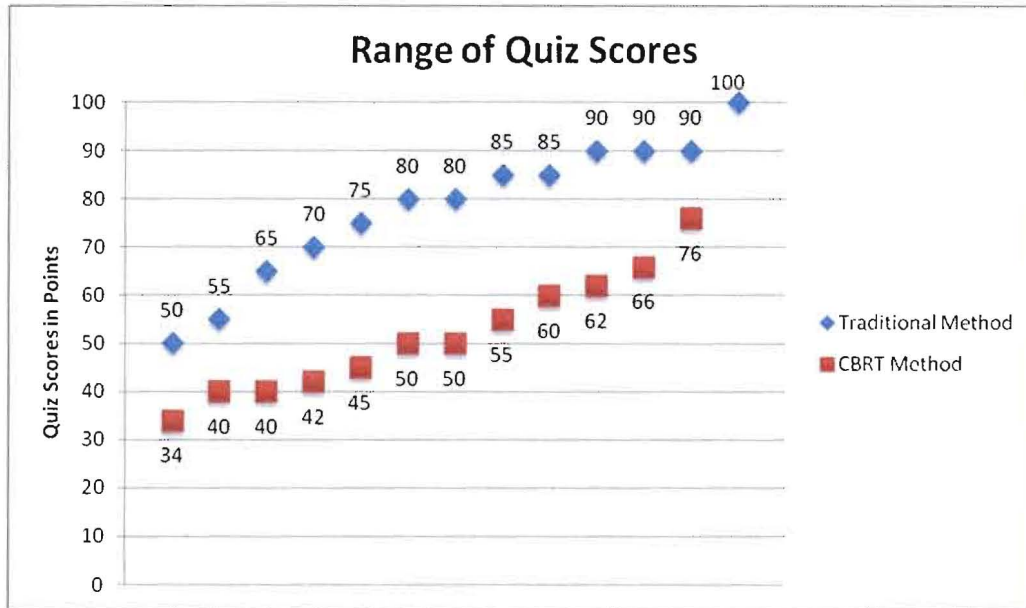
Figure 2: Comparison of Quiz Scores to Show Range

The amount of the content taught and assessed in each the unit may have contributed to the difference in students' scores. The traditionally-taught unit about velocity and speed required the students to comprehend and acquire the following knowledge: the definitions for speed and velocity, the mathematical formulas for speed and velocity, the difference between speed and velocity, the meaning of Newton's three laws of motion, and examples of Newton's three laws of motion. In contrast, the CBRT unit about astronomy required the students to comprehend and understand the models of the solar system and who created them, what objects make up the solar system and how it operates, the roles each object in the solar system plays, the phases of the moon, the various types of telescopes and how they operate. Clearly, the amount of content taught in the astronomy unit exceeded the amount of content taught in velocity and speed unit.

Differences in overall instruction may have influenced students' scores. First, differences in the amount of content included in each unit impacted the amount of instructional time allocated to each topic within the unit. In turn, the amount of time

available for instruction for each topic impacted the extent of application and/or review/clarification activities.

During traditional instruction, the students spent more time covering fewer topics in the velocity and speed unit. This allowed for more instructional time to be spent on discussing the meanings of each topic and how the topics play a role in our daily lives. The more instructional time spent on a smaller amount of topics allows the content information to become more comprehensible to the students, resulting in larger possibilities of acquisition. The unit of astronomy provided the students with a large amount of new information. However, the Curriculum Based Reader's Theater lessons did not provide the students with opportunities for application. The students covered a large amount of material in a given time with little to no discussion of the content. Even if the students did not comprehend the material through two or three readings, future lessons did not include a return to the script's content for further explanation. Students were only given the instructional time of one lesson to gain comprehension of the material.

Another instructional factor that may have impacted students' scores is the variation in instructional modalities used in the two units. The lessons taught through the teacher's traditional method of teaching contained activities that supported visual, auditory, or kinesthetic learners. Students were given the opportunity to listen to the teacher rely the content information while simultaneously copying notes and explanations from the board. Within the notes, students were given pictures, charts, and diagrams to support the verbiage. After the lecture portions were completed the students participated in a form of application, whether it was participating in an experiment or a kinesthetic demonstration of the content. For example, students participated in calculating speed of a given distance

of the mousetrap cars. Students also participated in demonstrations of Newton's three laws of motion, in addition to coming up with their own examples to prove Newton's three laws of motion. On the contrary, Curriculum Based Reader's Theater lessons only supported verbal and auditory learners. The Curriculum Based Reader's Theater lessons were carried out strictly by reading the scripts and annotating the scripts for content. Verbal and auditory learners received limited, additional support due to the lack of conversation and discussion surrounding the content information. There was only a small portion of time, within in each lesson, where the students could ask questions in order to clarify the concepts within the scripts. Students were required to comprehend independently without further explanations of the content, besides what was written in the scripts. If the students were unable to do so, minimal comprehension was most likely obtained.

In particular, the use of discussion in the Curriculum Based Reader's Theater lessons did not allow for extensive discussions to further explain of the content information of the scripts. During Curriculum Based Reader's Theater whole class discussion was minimal and took place only if the students requested clarification on a topic within the scripts. The whole class discussion was either initiated by the teacher while students examined the pictures at the end of the scripts or by the students to ask clarification questions. If the students did not ask any questions after the second reading then there was no discussion during the lesson. For the most part, students learned the content of the chapter indirectly through the lines of the script. While this may have been an acceptable form of learning for some students, others may have needed more extensive discussions to make clear connections with the content material. For students who are verbal and auditory learners, the discussion portions of lessons are often where they make meaningful

connections with the content and gain an understanding. Lack of discussion interfered with this. Any length of discussion time may have increased the student's ability to comprehend the content within the scripts and increase their acquisition of new content knowledge.

On the other hand, the traditional method included both whole class and partner discussion. Whole class discussion, led by the teacher, took place during most of each lesson where he asked a variety of questions and built upon the students' answers to explain content information further. The students participated in partner discussion in segments of lesson in which they worked together closely to conduct their experiments and calculate their results. During these times students discussed how their cars performed and why, how to calculate their results, and what their results meant. The teacher provided minimal support during partner discussions, but would offer a prompting thought or question when needed.

Participation and Motivation

In addition to measuring students' comprehension and acquisition of new knowledge, this study explored students' participation, and motivation when learning through Curriculum Based Reader's Theater in contrast to learning through traditional instruction. Through informal researcher observations, students' motivation and participation in class were noted based upon the following criteria: on-topic engagement in discussions, raising hands to ask or answer questions, eyes focused on the speaker, on task, appropriate individual or partner work, body placement in seat, type of conversation, and attention to distractions. Students were considered being on task if they sat in their seats with their feet on the floor and facing forward; raised their hands to ask or answer a question; asked relevant questions and gave topic-related answers; tracked the speaker

when listening; focused on the task requirements and content when working independently and in a group; and avoided off topic conversations or distractions.

Participation fluctuated during traditional lessons and Curriculum Based Reader's Theater lessons. On Monday of Week One, students' participation levels were high at the beginning of the lesson: partially related to being introduced to the researcher and learning about the plans for the upcoming weeks. Despite the fact that less than half of the class was prepared for the journal portion of the lesson, the students were highly engaged in the journal question; many of the students volunteered to read their answers to the journal. During the lecture portion of the lesson, students were active in answering topic-related questions and copying the notes from the board.

In particular, this class is known for calling out, speaking over one another, and off topic comments or stories. As the lesson content activated prior knowledge, students began calling out and raising their hands to tell stories that were slightly related to the content of the lesson, but mostly off topic. At this moment the teacher reminded the students of the rules of the classroom and reinforced their good behavior with a previously established rewards system. For the remainder of the lesson 75% of the students were on task, while occasionally a student would busy him or herself with an off-topic task or conversation during lag time. Off task behavior was almost immediately recognized by the teacher who reinforced the rules of the classroom and rewards system.

For the second half of the lesson, the students participated in an experiment involving speed of previously built mouse trap cars. All students showed 100% participation and were involved in the timing and trials of their cars. Within the groups, each student was given a role to complete in order to achieve success in the experiment.

Students actively participated in their role, often switching on and off with their partners, taking turns at each role. The students were fully focused on the task, and their behavior was rewarded at the end of the lesson.

The students' behavior and motivation continued in the same manner during the second lesson in Week One. The students continued with additional trial runs of their mouse trap cars in order to calculate the speed. Students actively participated in their role within their groups in order to accomplish the goal of the experiment. Student motivation and participation remained high as they returned to their seats to calculate the average speed of their cars per number of trial runs. Due to the excitement of an in-class contest, the students began to call out and speak over one another, dismissing the teacher's instruction. Immediately the students were reminded of the classroom rules and the rewards system was strictly reinforced. Students remained on task for the completion of the lesson.

The pattern of behavior and participation observed during lessons one and two continued during lessons three and four. Particularly with this class, as a characteristic of their behavior, the students often remained motivated and actively participated in the lessons, questions, discussions, and experiments. Occasionally one or two students would be distracted by side conversations or personal disturbances. Unacceptable behavior, according to the teacher's standards, was almost immediately addressed on the individual or class level. With the rules of the classroom frequently reinforced, student behavior was easily redirected to the appropriate location. While observing during Week One there were no instances of behavior or participation that would be labeled as "extreme", "uncalled for", or "out of hand." Overall the class behaved in a respectful manner, participated, and remained motivated.

Student behavior and participation varied considerably during Week Two in comparison to Week One, throughout each lesson, each day. At the beginning of Week Two, the students were reintroduced to the idea of learning through Curriculum Based Reader's Theater during the upcoming week. Due to being on school break for 10 days, the students were excited to be back in the classroom and to participate in Curriculum Based Reader's Theater. Students met the journal question with high levels of participation and motivation as they raced the clock to create a list of words and phrases they knew relating to space. The students were very eager to share their journal answers.

During the first half of the initial read aloud of the script the students were very enthusiastic and read with much expression. Students began the script reading in near perfect unison, sharing the same levels of prosody. Towards the end of page two the students began to read at different rates and volume levels, lessening the unison between one another. From this point forward, students were paused and redirected at the script in order to regain focus and unison when reading aloud. The students never quite reached the level they began at and finished the initial read with lower levels of motivation and participation. Of the twelve students present for the lesson, two students stopped reading aloud with the class altogether, while an additional two to three students began to read in a monotone voice without any pausing, causing them to reach lines within the script before the other students. Despite the pause in the read aloud and redirection, those who were further along in the script would follow directions for four to five lines before returning to their previous levels of motivation and participation.

The above motivation and participation patterns repeated for each of the four lesson plans. In order to increase the levels of motivation and decrease the fade of motivation

during the initial reading, the researcher divided the students into groups for each of the remaining three lessons. Students were broken up into groups based upon their seating arrangements, counting by fours, and boys versus girls for the following three lessons. Despite the arrangement in which students were to participate in the initial script reading, the patterns of motivation and participation exhibited in lesson one continued for lessons two through four.

The same pattern of motivation and participation was seen during the second reading, after the students were assigned their roles. During the first page to page and a half, students' levels of participation and motivation were high. Over 75% of the students read their roles with great levels of prosody. The remaining percentage of students began reading their roles with little to no motivation and expression. These students continued reading the remainder of the script at the same levels of prosody. The students' lack of motivation and expression was addressed by the teacher and resulted in pausing the reading of the script to have the students retry their lines with higher levels of prosody. Often the students reread the specific line with a higher level of prosody, but continued with their previous motivation and expression for the remainder of their lines. In attempt to increase the levels of prosody, the students were given larger roles in upcoming scripts in order to vary the size of a student's role and allow all students to have participated in equally sized roles.

Students ended each lesson with high levels of motivation and participation as they annotated the scripts for content information. The high levels of motivation are believed to be related to the timer that was set, giving the students three minutes to complete the assignment. Students were eager to beat the clock and complete the assignment before the

buzzer rang aloud. Once the timer was completed, students were eager to share the content information they discovered within the scripts.

Overall the pattern of motivation, participation, and prosody can be explained by the high increase at the beginning of a new activity. The cause of the increase at the beginning of each activity can be explained by the students' curiosity of what was to happen next in each lesson. Students were eager to participate in new scripts resulting in their wonder of what the day's script was going to be about and the adventure they were going to take with the twists and turns of the script's plot. Students were also enthusiastic to receive their role for the script and preview their speaking lines. Lastly, students were motivated by the timer to complete the annotation of the notes before the buzzer rang.

Several factors may have played a role in decreasing the students' levels of motivation, participation, and prosody. First, the students participated in the Math Statewide Exam during the morning of days three, four, and five. This may have impacted students' motivation to continue with school work in the afternoon. Another contributing factor may be the students' inability to sustain attention on an ongoing task, such as reading the Curriculum Based Reader's Theater scripts. Alternate tasks, such as conducting science experiments, would have broken the routine of each Curriculum Based Reader's Theater lesson. Also, as they expressed in the pre-Curriculum Based Reader's Theater survey, many of the students enjoyed conducting experiments during class. The experiments provided the students with hands on activities for applying learned lesson content to real life situations; this also enabled students to get out of their seats and move about the classroom. Lastly, the students were often motivated by the rewards system typically used

on a daily basis. During the week of Curriculum Based Reader's Theater students did not participate in the rewards system to address their good behavior.

Chapter 5: Discussion and Implications

Discussion and Conclusions

This study was conducted to understand better the impacts of using Curriculum Based Reader's Theater when introducing new science content. This study explored science students' levels of participation during multiple lessons, their levels of motivation to participate, their acquisition of new knowledge, and their ability to complete an in-class assessment. Even though the results of the study are limited, there were several unanticipated findings.

When determining which curriculum topic should be taught though the use of Curriculum Based Reader's Theater the researcher and teacher chose a topic that was similarly weighted to the topic of week one, in terms of the amount of content contained in the topic; how much information there was to be taught. Comparing the quiz scores required looking back at both quiz assessments to examine the types of questions written and what the students needed to recall in order to answer the questions. The quiz given during the week of traditional instruction required the students to apply the content learned throughout the week with limited use of memory or recalling information. Many of the questions gave the students the necessary content information needed in order to answer the question. In contrast, the quiz given during the week of Curriculum Based Reader's Theater required the students to use a high level of memory in order to recall the content learned throughout the week. The quiz questions required the students to use very little application. If application was required to answer the question, students needed to recall the necessary information first and then proceed to answer the question through application.

Although the class averages for each quiz were very different in number, the scores reflect upon the methods of teaching and the types of questions asked on each quiz. This does not reflect on the study as a whole, or the method of teaching, but only indicates areas of adaptation for future study. Curriculum Based Reader's Theater is still an effective method of teaching when introducing new content material. The students' scores reflect the knowledge they acquired throughout the four lessons and their ability to perform on an assessment. The quiz was not the only form of assessment, as both summative and formative assessments were given throughout the five lessons. Aside from the quiz, students were able to answer end of the lesson exit ticket questions based upon the content of the day's script. In order to complete this activity, students were expected to recall the information they had learned without looking back in the scripts for the answers. Lastly, students were able to recall the content discussed and learned from the previous day's lesson when they reviewed it at the beginning of the lesson. This reinforced the material that had been highlighted at the end of the previous day's lesson.

The way the lessons for the week of Curriculum Based Reader's Theater were designed did not provide students with a variety of activities to participate in that would touch upon the many learning styles of the students. Although the method of Curriculum Based Reader's Theater required the students to do lots of talking with the scripts and the content of the scripts, there was very limited discussion about the content of the scripts and what the content meant. This hindered students' learning, particularly that of verbal students who would learn best through conversations. The addition of a discussion component would provide the teacher and students with the opportunity to clarify and expand content as well as to synthesize understandings across the entire unit.

The style of the lessons also hindered those students who learn best through visuals. With the scripts being the only source of information for four lessons, the students were not given many visuals to support the content of the scripts. Students were given visuals for the more complex topics within the scripts that may be harder to visualize. For those students who learn best with the support of visuals, they had to rely on the words of the scripts to create mental images. If the students were unable to comprehend the words, the mental images created would not have matched the content of the script, resulting in further confusion of the content. Students received visuals only when asked for, during the clarification portion of the lessons. These visuals were from the textbook and supported the content of the script and provided input to answer their questions.

Lastly, the lessons did not plan for experiments which often support those students who are kinesthetic learners. The lessons required very little application of the content hindering the students from using the information they have learned. Although the content of this particular unit would most likely not allow for various experiments, conducting any type of an experiment may have supported the students' learning.

As Reader's Theater often supports the performance of the script, the design of the lessons, and time constraints, did not allow for the students to act out the scripts. Acting out the scripts to conclude the lesson would have supported all styles of learners. At this point in the lesson the students would have read the script two times aloud, in addition to a third reading for content information. In addition, the content information would have been highlighted in the script, pinpointing exact locations of important information. For those students who are verbal learners, this portion of the lesson would have given the students and the teacher the opportunity to ask questions and further explain the content of

the script at any given point. Acting out the script would have provided visual learners with the ability both to watch their peers and create their own demonstrations of the meaning of the content. In order to create demonstrations and visuals, students must first understand the content. If students are unable to comprehend the text and create understanding, watching their peers act out a portion of the text would support the process of comprehension. Lastly, the students who learn best through kinesthetic would be given the opportunity to move about the classroom and act out their lines. This is a form of application as students determine the moves they want to make related to their lines in order to relay the content to their peers. When acting out the script, students are to create actions that match the words within their lines in order to support the comprehension of their audience. In order to create appropriate actions, students themselves must first comprehend their lines. The actions in turn would aid in the acquisition of new knowledge as they recall the actions of their peers and their own actions during the various scenes in the script.

In order to support all learners when implementing Curriculum Based Reader's Theater, educators should consider designing only one or two lessons within a unit. This will allow for more time to explore the content of the script and provide the students with the types of activities they need in order to gain full comprehension of the content and acquire new knowledge.

Limitations

This study assessed the impact of Curriculum Based Reader's Theater on student performance when used to introduce and acquire new science content material. However, there were several limitations that held the study back. Limited time for the study was one

factor inhibiting the gathering of more data. This study was conducted over a four week period, two of which were lost to the school's spring recess. Of the ten sessions conducted, three sessions were held in the afternoon after the state wide math exam. This time frame only allowed one week for observing the teacher and one week to deliver Curriculum Based Reader's Theater, which was not enough time to gather an appropriate amount of data for a true comparison of instructional practices. In order to assess if an instructional practice has an impact and is beneficial to student learning, a comparison of more than week would need to be implemented. The students have been exposed to the teacher's style of teaching for over eight months, whereas the one week of Curriculum Based Reader's Theater was the students' first exposure and participation in the method of teaching. One week is not enough time to show any sort of progression of learning through a new method of teaching.

In addition to limited time allotment, class size was another limitation of this study. There was only one fifth grade class in the school and only 13 students in that class; they were the participants in this study. This did not allow for a true comparison of instructional methods on the same science content topic. With only one fifth grade class available for participation, the same students participated in two different instructional methods on two different science content topics. Additional fifth grade classes would have allowed for a true comparison of instructional methods on the same science content topic.

Difficulty in matching the science content taught was another limitation. Working with only one fifth grade class meant the content taught through the teacher's regular methods and the content taught through Curriculum Based Reader's Theater needed to be different in order to meet the purpose of the study. The content chosen to be taught was decided upon by the weight of the content material; the two science topics needed to have

a similar amount of content, in addition to presenting the students with a similar challenge. Moreover, the content had to be chosen from topics remaining in the curriculum. Since the study took place towards the end of the school year, the teacher and researcher tried to match two topic areas based upon the amount of content that could be presented to the students and the complexity of the topic.

There were also several unexpected difficulties encountered with the study. One challenge was the timing of the study. It was initially planned to be conducted earlier in the second half of the school year. Due to scheduling conflicts, the study began at the beginning of April followed by a two week spring recess. Upon returning to school, the students took the state wide math portion of the exam the final three days of the study. After testing for the morning hours, the students' levels of motivation were often low, reducing their interest in and enthusiasm for participating in science class. Low student interest and motivation directly impacted one of the factors assessed in the study. In addition to measuring students' acquisition of new knowledge, the study also observed the students' interest and motivation to learn and acquire new science content knowledge. Students' attitudes were often depleted in the afternoon sessions of the final three days after returning from testing in the morning sessions. Through facial expressions and level of participation, it was clear to see that the students were exhausted from testing for three consecutive hours.

Implications for Future Practice

Based on the research presented and this study, implementing Curriculum Based Reader's Theater in a science setting may impact the way students are introduced and acquire new content knowledge. Implementing Curriculum Based Reader's Theater in a

science setting may also impact student performance on in-class assessments. Educators can implement Curriculum Based Reader's Theater at various times throughout the curriculum with content material that can easily be manipulated and transformed into a fiction or non-fiction plot. Curriculum Based Reader's Theater can be implemented for one lesson or a unit.

By implementing Curriculum Based Reader's Theater, educators are providing their students with an alternative method for learning. Using Curriculum Based Reader's Theater to introduce new content is a way to break from the teacher's traditional methods of teaching and put a twist on the content. Curriculum Based Reader's Theater is used to engage students in their learning because of the high levels of participation needed in order to deliver the script. When using Curriculum Based Reader's Theater to introduce new content knowledge, students are required to separate the different elements of the script to uncover the content material. This action requires the students to utilize critical and higher order thinking skills.

Suggestions for implementing Curriculum Based Reader's Theater differently in the classroom include: the variation of resources, how the content is developed, the format of developed content, how Curriculum Based Reader's Theater is implemented, and the variation of content areas. Curriculum Based Reader's Theater can utilize a variety of non-fiction resources when gathering content material. Although this study used the grade level class textbook, additional non-fiction resources can be used as the sole source of information or as supplemental materials. Educators and students can gather content material from articles, journals, websites, non-fiction books, and a variety of other sources.

Educators must ensure the content information and material gathered is grade level appropriate and, more importantly, accurate.

Content can be developed by almost anyone involved in the implementation of Curriculum Based Reader's Theater. For the purpose of this study, and the knowledge of the researcher, the content for the Curriculum Based Reader's Theater unit was developed by the researcher. The development of the content should relate to the amount of time spent implementing Curriculum Based Reader's Theater and the purpose behind the implementation. A teacher can develop the content by his or her self or with the assistance of the students. If the students are to participate in the development of the content it is important that the educator previously checks for content understanding and comprehension. Students can develop the content individually or in groups depending on the purpose for implementing Curriculum Based Reader's Theater.

Curriculum Based Reader's Theater can be created in many different formats. As mentioned in the research, Curriculum Based Reader's Theater does not have to take the form of a script in order to be considered Curriculum Based Reader's Theater. It is most commonly created in the form of a play in order to engage and involve as many students in the lesson at a given time. Educators and students can utilize as much information as desired to develop a form of Curriculum Based Reader's Theater; all of the content cannot always be incorporated at a given time. If desired, Curriculum Based Reader's Theater can take the form of a song, poem, riddle, story, or any other format that requires the students to present the material through a performance.

Curriculum Based Reader's Theater can be implemented for any amount of time deemed necessary for the implementation purpose. For the purpose of this study,

Curriculum Based Reader's Theater was implemented for the length of a unit in order to meet the purpose of using Curriculum Based Reader's Theater to introduce new science content. Educators can implement Curriculum Based Reader's Theater as a portion of their lesson for one day or various whole lessons throughout the curriculum. Since not all content can easily be manipulated into the form of a script, some lessons may not be beneficial to the comprehension of the students.

Lastly, Curriculum Based Reader's Theater can be used within any content area. Ideally Curriculum Based Reader's Theater is to be used with content areas that contain dense information, such as Social Studies or Science. Curriculum Based Reader's Theater can also be used with Math to act out equations and word problems. English Language Arts and Literature commonly uses the traditional method of Reader's Theater to act out fictional stories and practice literacy skills.

Implications for Future Research

Implications for future research include adapting Curriculum Based Reader's Theater and extending the implementation to further develop findings. Most importantly, future researchers should extend the duration of the study to make a wider comparison of teaching methods and influences on students' acquisition of new knowledge and performance on in-class assessments.

If the study were to be replicated, it is suggested that more than one class on the same grade level be asked to participate. With the addition of a second class of fifth grade students, the researcher will be able to compare two classes learning the same content material. Week one of the study should be replicated, as the teacher uses traditional methods of teaching to introduce new content material to both classes. Minor changes

should be made during week two when the implementation of Curriculum Based Reader's Theater begins. During week two, class "A" will continue to acquire new knowledge through the teacher's traditional instruction methods and strategies. Class "B" will be introduced to Curriculum Based Reader's Theater as their instructional method. Since class "B" is being exposed to Curriculum Based Reader's Theater for the first time, week two should be proceeded by multiple weeks of traditional instruction methods of the teacher and instruction in Curriculum Based Reader's Theater. Multiple weeks of both instructional methods will provide more reliable data to either support or refute the use of Curriculum Based Reader's Theater as an instructional method to introduce new content material.

Additional studies can be designed and conducted using the same procedure, but varying the content area being taught. Future researchers should consider the implementation of Curriculum Based Reader's Theater in Social Studies and Math classrooms. Based on the research presented, traditional Reader's Theater is an instructional tool that is successfully used in English Language Arts and Literature. Research, however, does not provide much an explanation for the implementation of Curriculum Based Reader's Theater in Social Studies and Math classrooms.

Although there were several limitations and suggestions for improvement, this study offered a valuable perspective on using Curriculum Based Reader's Theater to introduce and acquire new science content knowledge. This study is one of the few observing the influence of Curriculum Based Reader's Theater in a science classroom on the introduction and acquisition of new content material. In addition, it offered the teacher an additional teaching method to be used with any science content throughout the

curriculum. Curriculum Based Reader's Theater provided the students opportunities to utilize and strengthen their higher order thinking skills when acquiring new content material. Content is often embedded in Curriculum Based Reader's Theater scripts requiring students to unwrap new material. Curriculum Based Reader's Theater is an instructional method that can bring excitement into the classroom for both the students and teacher while creating a very unique learning experience. For future research, the suggestions discussed previously should be addressed in order to conduct a meaningful study and gather significant data. Replications of the study could be made with the recommendation as previously outlined above. However, further studies are also needed with different populations of students, as well as studies using larger ample sizes. Hence reliability of these results would increase. For future research, it would be interesting to see how a longer duration and variety of content topics influence students' ability to acquire new content knowledge and their performance on in-class assessments. This study has shown that Curriculum Based Reader's Theater is an instructional method that can be used to introduce new content knowledge, in addition to students acquiring new content knowledge and successfully performing on in-class assessments.

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Appendix A: Consent Forms

Dear Parent(s) and/or Guardian(s):

As part of my master's degree requirements at Wagner College, I am conducting research in your child's school on the use of Readers Theater to teach Science content. My hope is that by conducting this study, we will be able to improve our understanding of the methods and strategies that teachers can use to introduce new content information in subject areas that often contain dense material, such as Science.

I am requesting your permission for your child to participate in the research. This document will provide you with information that will help you decide whether or not you wish to provide your permission. If you decide not to give permission, or if you or your child decides at any point to discontinue participation in the study, there will be no penalties for you or your child.

During the course of the project, I will work with the Science teacher to develop lessons using the teaching method Readers Theater. The teacher and I will be delivering upcoming Science lessons using the teaching method Readers Theater. First, I will be observing how the Science teacher teaches Science content for the current unit. Next, I will work with the Science teacher to conduct Reader's Theater lessons for the following unit. I will be observing the effects of using Readers Theater to teach Science versus the traditional method of lecture. Additional support will be given to the students for comprehension purposes, as it is my ultimate goal that the students learn and comprehend the content. If you were to grant permission for your child to participate, I would ask your child to regularly attend class, participate in traditional class activities, read and perform Reader's Theater Science scripts, participate in written surveys regarding their interests in Science and Reader's Theater, and take quizzes to assess their knowledge using the Science teacher's traditional quiz format. This study will take place over the next two weeks and I ask that your student(s) comes prepared for class with all required books and materials. The study will not interfere with your child's access to his or her regular educational program.

All information gathered during the project will remain confidential and will not be associated with your child's name. My analyses will also be cleared of any possible identifying information in order to ensure your child's confidentiality.

The project does not carry any foreseeable risks for your child. However, if for any reason you or your child felt uncomfortable, he or she could be removed from the study at any time with no penalty, and any information gathered from your child during the study would be destroyed.

If you have any questions concerning this study please feel free to contact me at gina.giglia@wagner.edu or Dr. Advisor at rhoda.frumkin@wagner.edu. Thank you for considering being part of a study related to my research for a master's degree in Education at Wagner College.

Please sign below to indicate your understanding of the project and your consent to for your child to participate. I have provided two copies so that you may keep a duplicate for your records.

_____   _____

Signature of Parent/Guardian   Date   Child(ren)'s Name

Appendix B: Curriculum Based Reader's Theater Week Breakdown

5th Grade – Science   Chapter 4- Astronomy

Day 1:
- Students will complete a pre-Reader's Theater Science survey about their interest in science and science class
- Journal Prompt: (A) In 30 seconds, list as many things you know about space. After 30 seconds are up: (B) Pick one or more items from your list and compare/contrast what we know about them today to what scientists from the past knew or studied.
- Distribute the play.
- Explain Reader's Theater briefly.
- Introduce play.
- Students and teacher read through play as a whole one time.
- Assign roles.
- Students read through play one time.
- Annotate play to find pieces of content information that students should be learning.
- Review information highlighted.
- Students act out play.
- Exit ticket: name one thing you learned about space today that you did not include in your journal entry.

Day 2:
- Review content learned from Day 1.
- Introduce play #2.
- Students and teacher read through play as a whole one time.
- Assign roles.
- Students read through play one time.
- Annotate play to find pieces of content information that students should be learning.
- Review information highlighted.
- Exit ticket: name one way the Sun is like a star. Name one way the Sun is different from a star.

Day 3:
- Review content learned from Day 2.
- Introduce play #3.
- Students and teacher read through play as a whole one time.
- Assign roles.
- Students read through play one time.
- Annotate play to find pieces of content information that students should be learning.
- Review information highlighted.

- Exit ticket: describe the difference between reflection and refraction.

Day 4:
- Review content learned from Day 3.
- Introduce play #4.
- Students and teacher read through play as a whole one time.
- Assign roles.
- Students read through play one time.
- Annotate play to find pieces of content information that students should be learning.
- Review information highlighted.
- Exit ticket: name 5 or more phases of the moon.

Day 5:
- Students will use the class period to complete a ten question quiz about the content learned during this week's Reader's Theater performances.
- After the students complete the quiz they will complete a post-Reader's Theater Science survey about learning science through Reader's Theater.

Appendix C: Pre-Curriculum Based Reader's Theater Survey

Not at all   A little bit   Most of the time

A lot

1. I like science

2. I understand science lessons

3. I earn good grades in science class

4. I participate in science class

5. I am motivated to learn science

6. I can read science texts/textbooks

7. Pictures/graphs help me to understand

8. Experiments help me to understand

9. My favorite thing about science class is

_____

10. My least favorite thing about science class is

_____

11. If I could change one thing about science class I would change

_____

12. If I could add one thing to science class to help me be a better science student I would

add_____

Appendix D: Lesson 1: What Makes Up the Solar System?

Jeopardy: Scientists Week, Final Episode

Characters

Game Show Host #1	Game Show Host #2	Game Show Host #3
Ptolemy	Audience Group A	
Copernicus	Audience Group B	
Johannes Kepler	Audience Group C	

Game Show Hosts #1, 2, 3: Welcome to tonight's episode of…

Everyone: JEOPARDY!

Game Show Host #1: This week we have had some very special scientists joining us. Let's bring out and meet tonight's scientists. First we have Ptolemy. Tell us a little bit about yourself and what you have been working on lately.

Ptolemy: I lived in Greece during the A.D. 100s. I have been working on a model of the solar system for some time now. This means I have created a drawing to show how the solar system works. My model shows the Sun and other space objects revolving around Earth.

Game Show Host #2: Very interesting! Thank you for joining us. Up next is Copernicus.

Copernicus: I am Polish and published my most recent work in 1543. Unlike Ptolemy's model, I have placed the Sun at the center of the solar system. All other planets and space objects revolve in circles around the Sun.

Game Show Host #3: Thank you very much! Last but not least, our returning champion Johannes Kepler.

Johannes Kepler: I am a German Astronomer. In the 1600s I created a model of the solar system that used Copernicus' idea of the Sun in the center of the solar system. The only difference with my model is that planets and all other space objects revolve around the Sun in elliptical motions. This means everything revolves in oval paths.

Game Show Host #1: Three scientists with three brilliant ideas! The winner of the final episode of scientists week will have their model of the solar system published and used by future scientists all over the world!

Game Show Host #2: Let's play…

Everyone: JEOPARDY!

Game Show Host #3: What makes up the solar system?

Ptolemy: The sun, planets and their moons, and other objects.

Audience Group A: CORRECT!

Game Show Host #1: Because distances between objects are too large to measure in kilometers or miles, astronomers measure in?

Copernicus: Astronomical units, or AUs.

Audience Group B: CORRECT!

Game Show Host #2: For extra points Copernicus, how large is one AU on average?

Copernicus: One AU on average is the distance from the sun to Earth, or about 150 million kilometers.

Audience Group B: CORRECT!

Game Show Host #3: What keeps the planets in their orbits as they revolve around the Sun?

Johannes Kepler: Gravity! This was reasoned by Sir Isaac Newton in the 1600s.

Audience Group C: CORRECT!

Game Show Host #1: How do planets shine?

Ptolemy: They reflect light from the Sun.

Audience Group A: CORRECT! End of Round 1!

Game Show Host #2: So far we have a tie between Johannes Kepler and Ptolemy, with Copernicus in the lead. Let's move on to round two. What revolves nearest to Earth than any other object and is about a quarter of the size of Earth in diameter?

Copernicus: The moon.

Audience Group B: CORRECT!

Game Show Host #3: The moon seems to change shape depending on?

Johannes Kepler: How much of the lighted side is facing Earth.

Audience Group C: CORRECT!

Game Show Host #1: What is like a small planet and orbits the Sun?

Ptolemy: An asteroid.

Game Show Host #2: For a two part bonus question, what area do they orbit in and where is this area located?

Ptolemy: They orbit in an asteroid belt located between the orbits of Mars and Jupiter.

Audience Group A: CORRECT!

Game Show Host #3: What is a small piece of rock or metal that revolves around the Sun and when do they form?

Johannes Kepler: Meteoroids and they form when asteroids collide or comets break up.

Audience Group C: CORRECT!

Game Show Host #1: Describe a meteor.

Copernicus: When a meteoroid passes through Earth's atmosphere, friction from air particles rub against the meteoroid's surface making it extremely hot. The rock begins to burn. The streak of light given off by the burning surface is a meteor. Sometimes they are called shooting stars.

Audience Group B: CORRECT!

Game Show Host #2: What is a ball of ice, dust, and gas that revolves around the sun in a long, narrow path?

Ptolemy: A comet.

Audience Group A: CORRECT! End of Round2!

Game Show Host #3: We now have a tie between Ptolemy and Copernicus, with Johannes Kepler trailing behind. Let's move on to our last round, the Lightening Round. All points are worth triple in this round. What does energy from the sun provide?

Johannes Kepler: Heat and light. Without it Earth would be a frozen ball of ice.

Audience Group C: CORRECT!

Game Show Host #1: The sun is a glowing ball of hot gas. How is it different from other stars and why?

Copernicus: The sun is much brighter, bigger, and hotter than other stars because it is so much closer to Earth.

Audience Group B: CORRECT!

Game Show Host #2: Many objects that enter Earth's atmosphere burn up completely. What does not burn up completely and can land on Earth's surface? For bonus points define this object.

Johannes Kepler: Meteorites can pass through the Earth's atmosphere without burning up. A meteorite is a piece of rock and metal that lands on Earth's surface.

Audience Group C: CORRECT!

Game Show Host #3: Where do meteorites come from and how do they affect Earth?

Ptolemy: Meteorites come from the asteroid belt or rocks from the moon or Mars. They affect Earth's surface by creating large craters when they hit the ground.

Audience Group A: CORRECT!

Game Show Host #1: Explain how the sun and the moon affect Earth.
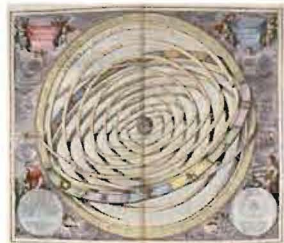
Johannes Kepler: The sun and the moon cause the rising and falling of the tides. Moon's gravity pulls ocean water toward the moon. The water piles up in a bulge on the side of the Earth that is facing the moon. The water also bulges out on the opposite side of the Earth. Low tides are formed in the area between the two bulges. When the sun and moon are lined up with Earth, their pulls combine together and make very high tides.

Audience Group C: CORRECT! End of Round 3!

Game Show Host #1, 2, 3: Our winner tonight is…

Audience Group A, B, C: Johannes Kepler!

Figure 3: Ptolemy's Model   **Figure 4: Copernicus' Model**

Figure 5: Kepler's Model

Appendix E: Astronomy Quiz
5th Grade Science Quiz   Date: _____
Astronomy Chapter

1. Describe the three models of the solar system and name the scientist that created each model.

_____

_____

_____

_____

2.   True or False: A meteoroid passes through the Earth's atmosphere and lands on Earth's surface.

3.   **List the three things that make up a comet.**

      a. _____

      b. _____

      c. _____

4.   The moon's orbit
    a. Rotates
    b. Rotates and revolves
    c. Revolves
    d. None of the above

5.   A spectroscope is a tool that analyzes

    a. Color
    b. Stars
    c. Light
    d. Heat

6.   True or False: The sun is an average star in size, hotness, and brightness.

7.   You are a scientist who just discovered a new star. Describe how you would classify the star. What do these properties tell you about the star?

_____

_____

8.   Name and describe the three parts of the sun.

_____

_____

_____

9.   Explain how telescopes work.

_____

_____

10. List 5 of the phases of the moon. For (+3) Bonus points, what is the difference between Waxing and Waning?

_____

_____

Extra Credit: Explain how the saying "Once in a blue moon" is related to science. (+2)

_____

_____

Appendix F: Post-Curriculum Based Reader's Theater Survey for Students

Did you enjoy learning Science through Readers Theater? Were you motivated to learn Science? Why or why not?

_____

What was your favorite part about learning Science through Readers Theater?

_____

What was your least favorite part about learning Science through Readers Theater?

_____

What was the easiest part of learning Science through Readers Theater?

_____

What was the most difficult part of learning Science through Readers Theater?

_____

What did you learn from doing Science through Readers Theater?

_____

Would you like to learn Science through Readers Theater again? Why or Why not?

_____

Compared to using a textbook, was it easier or more difficult to read a script and learn new science information? Why?

_____

If you could give the teacher any suggestion about doing Readers Theater in Science what would it be?

_____

If you could change one thing about how we did Readers Theater in Science what would it be? Why?

_____

Do you think you well on this quiz and will get a good grade? _____

Appendix G: Post-Curriculum Based Reader's Theater Survey for Teacher

Did you enjoy the experience of teaching through Readers Theater? Why or why not?

_____

_____

What was the easiest part about planning for the Readers Theater lessons?

_____

_____

What was the most challenging part about planning for the Readers Theater lessons?

_____

_____

If you could change anything about the way you planned for the Readers Theater lessons what would you change and why? How would you change it?

_____

_____

What was the easiest part about delivering the Readers Theater lessons?

_____

_____

What was the most challenging part about delivering the Readers Theater lessons?

_____

_____

If you could change anything about the way the Readers Theater lessons were delivered what would you change and why? How would you change it?

_____

_____

Do you think this experience was beneficial for your students? Why or Why not?

_____

_____

Were there any noticeable changes in the students' behavior or performance?

_____

_____

Would you do Readers Theater again to teach another unit with the same class? Why or why not? What would you keep the same? What would you change?

_____

_____

Wagner College

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Department: **Education**

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