Brainstorming

Instructional Design Document

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Instructional Design Team:
Candice Bowes
Lynne Kohler
Dina Saffouri
Jenny Whiteman

Table of Contents

Problem Definition

Background

Second grade teachers of regular education classes in Fairfax County, and Manassas City, Virginia report that their students are often unable to generate more than one related idea associated with an age-and culturally appropriate teacher-given topic without three or more teacher prompts.

Evidence

In their study of second graders, Hough (2012), found evidence for an increase in brainstorming capabilities after receiving explicit instruction in brainstorming. Additionally, Troia, Graham (2002), found that students receiving multiple strategies for planning increase the quality of their story writing. Demir (2005) discovered that brainstorming practices increase student idea generation. This research supports the need for explicit brainstorming instruction in a school setting.

Proposed Solution

Our solution is to develop a unit for practicing second grade teachers, specific to teaching the brainstorming technique to their students using an advanced organizer. Marcy P. Driscoll, author of *Psychology of Learning for Instruction* (2005), referenced R.E. Mayer (1979) in stating that **"**Advance [or graphic] organizers are relevant and inclusive introductory materials that serve to bridge the gap between what the learner already knows and what he needs to know before he can meaningfully learn the task at hand.". The three levels of the Six Question Organizers contained in this unit will facilitate the use of six questioning areas: *who, what, when, where, why,* and *how* and will reflect a gradual decrease in the number of prompts given to the students on each successive level of the organizers. This is consistent with the concept of scaffolding as

discussed by Driscoll as she references Greenfield (1984). "As learners become more proficient, able to complete tasks on their own that they could not initially do without assistance, the guidance can be withdrawn." To measure student growth, this unit will include a pre- and post- assessment for students.

Desired Outcome

Second grade students in a regular education classroom will be able to generate approximately three ideas in each questioning area (who, what, when, where, why, and how) and choose one from each area to develop into a project associated with an age-and culturally appropriate teacher-given topic.

Learner Analysis

The intended audience for this instruction is second grade students in the United States public education system. According to *Curriculum Guides and General Characteristics (2002),* as referenced by the Glendale River Hills School District in Glendale, Wisconsin (http://www.glendale.k12.wi.us/2_char.aspx) and the Riverview School District in Kent, Washington (http://www.riverview.wednet.edu) a second grade student could be characterized by the following.

General Characteristics

- Students' reading abilities range from 18-28 on the Developmental Reading Assessment or an equivalent reading score on similar assessment.
- Typical age range of students is 7-8 years old.
- Students will be from a variety of cultural and ethnic backgrounds.
- Students will be a heterogeneous mix of boys and girls.
- Students may need visual or pictorial support.
- Students realize that there are many things that need to be learned, sometimes leading to less confidence than in first grade.
- Students are beginning to reason logically and organize thoughts coherently.
- Most students thinking concerns actual physical objects; there is difficulty handling abstract reasoning.
- Students often make decisions based on influence of others instead of by reasoning.
- Students develop more skill in reading while speaking and listening vocabularies are expanding rapidly
- Students want to assume more responsibility.

- Students enjoy collecting, organizing, and classifying objects and information.
- Student listen well, but they are so full of ideas that they cannot always recall what has been said.
- Students like to explain ideas,-but-may exaggerate.

Specific Entry Characteristics

- Students have solid knowledge of letter and sound associations
- Students have the ability to spell emergent level sight words, such as *the, we, to, go,* etc.
- Students have the ability to read and understand the meaning of the words *who, what, when, where, why, and how.*
- Students have prior knowledge of topics to be discussed.

Attitudinal Characteristics

- Students have different levels of creativity and confidence in their ability to problem solve.
- Students have a sincere desire to learn.
- Students are learning to plan ahead and evaluate what they do.

Contextual Analysis

Orienting Context

Students need brainstorming skills to be effective learners within multiple areas of a school setting. The Writing Center at the University of North Carolina at Chapel Hill (http://writingcenter.unc.edu/handouts/brainstorming/) explains that "Brainstorming can help [one] choose a topic, develop an approach to a topic, or deepen [one's] understanding of the topic's potential." Additionally, the e-Learning department at the Penn State School of Art and Architecture (https://elearning.psu.edu/demos/art010/brainstorming) states that "Brainstorming and planning are important to every art work." The public school environment provides a context for delivering instruction in brainstorming. The importance of this instruction will be understood by students as they come to view themselves as creative thinkers.

Instructional Context

Context will vary based on school and teacher characteristics. Although the behavior management system will reflect school policy, personal teacher style will impact and support learning. Teachers who teach brainstorming should cultivate a positive atmosphere that will encourage students to participate. Necessary supplies will be provided.

Transfer Context

Teacher will provide future opportunities for brainstorming to help the students generalize and internalize the brainstorming strategy.

Task Analysis

Facts

- Students will recall that *who* refers to people or characters, *what* refers to objects, *when* refers to times, including days, dates, months, years, seasons, etc., *where* refers to places, *why* refers to reasons for doing something, and *how* refers to actions or ways of doing something.
- Students will recall prior knowledge of assigned topics.
- Students will create new ideas regarding assigned topics.
- The student will assign topic knowledge to appropriate categories.

Concepts

- Students will describe creativity as "using your imagination to think of something new".
- Students will describe brainstorming as "a time to think creatively".

Principles and Rules

- Using a graphic organizer can help the student to generate and organize their ideas.
- Generating multiple ideas creates a better end product.

Procedures

- The student will enter a thinking mode.
- The student will answer the questions *who, what, when, where, why,* and *how.*
- The student will complete each level of the Six Question graphic organizer with an increasing level of independence.

Interpersonal Skills

- The student will be able to work within the class structure to participate in discussions.
- The student will be able to reflect on individual work and provide feedback to teacher.

Attitudes

- The student will have a positive attitude about their ability to generate ideas.

Topic Analysis

- Brainstorming through the use of a graphic organizer which incorporates the questions of *who, what, when, where, why,* and *how.*

Procedural Analysis

- Students must explore the concept of creativity.
- Students must recall examples of the six question words.
- Students must complete a Level 1 Six Question graphic organizer
- Students must illustrate their ideas.
- Students must complete a Level 2 Six Question graphic organizer.
- Students must write a story using their ideas.
- Students must generate titles for their illustrations and stories.
- Students must complete a Level 3 Six Question graphic organizer.
- Students must write and illustrate a story using their ideas.

Instructional Objectives

Terminal Objective

After completing this unit, students will use the Six Questions graphic organizer strategy to generate as many as 18 ideas associated with an age-and culturally appropriate teacher-given topic and use them to create a project of their own.

Enabling Objectives

- Students will generate original ideas stemming from the Six Questions and related to a given topic.
- Students will complete each level of the Six Questions graphic organizer.
- Students will write and/or illustrate their own ideas from the graphic organizer.

Instructional Approach

The instructional approach will be in the format of a whole class discussion with both small group and individual activities. Concrete examples will be used that match the learners' background knowledge and understanding. Pacing will be dependent upon student understanding and will use graduating levels of the graphic organizer, but should generally take five instructional periods of approximately 40 minutes each. Materials needed include the following:

- *Green Eggs and Ham* by Dr. Seuss
- Sufficient copies of each level of the Six Questions graphic organizer
- The scoring rubric for the pre- and post- assessments
- The SmartBoard presentation included with the unit
- A Smartboard, a projector, and a computer
- Sufficient paper, pencils, crayons, paints, etc. for student projects

Sequencing

The sequencing for this unit would be learner-related and would address the identifiable prerequisites such as learner knowledge of what is meant by the six question words as well as their reading and writing ability, the familiarity of the learner with the topics, the difficulty of each level of the graphic organizer, the interests of the learners, and the development of the learner with respect to having mastered each level of the graphic organizer before moving on to the next one. Skills and concepts would be sequenced as follows:

1. Introduction to the concept of creativity
2. Administration of pre-assessment
3. Introduction to the concept of brainstorming

4. Introduction of and practice with Level 1 Six Questions graphic organizer
5. Introduction of and practice with Level 2 Six Questions graphic organizer
6. Introduction of and practice with Level 3 Six Questions graphic organizer
7. Administration of post-assessment

Evaluation Plan

Formative Evaluation

The formative evaluation will be connoisseur-based and will rely on the feedback of classroom teachers as subject matter experts (Morrison, 2013) and will progress as follows.

Stage 1: This unit will be administered and evaluated by three regular education second grade teachers. These teachers will pilot the unit and provide feedback on it, including their observations regarding student difficulty/engagement with the lessons, the effectiveness of the rubric levels, and suggestions for improvement using the feedback template found in Appendix 5.

Stage 2: The unit will be modified as needed based on the results of the Stage 1 trial. The unit will then be field tested with a randomly selected group of 15 second grade regular education classrooms following the same (or modified) procedure and template.

Summative Evaluation

Assessment methods and standards vary significantly by region in public education. In order to standardize the assessment data to be used to measure student growth, teachers will give a pre- and post-assessment using the brainstorming rubric (see Appendix 4). The assessments will measure student ability to generate ideas, use the graphic organizer, and implement their ideas in a project. The data from the pre- and post- assessments will be analyzed using a single sample t-test to measure student growth. For both assessments, students will be given a Level 3 Six Questions graphic organizer and instructed to use the graphic organizer to brainstorm ideas for a story. Students will then use the information to create a project. Graphic organizer and project will be assessed by the classroom teachers using the brainstorming rubric.

Additionally, school administrators would be asked to evaluate the academic effectiveness of adopting and implementing the unit, the overall reactions to the unit, and the anticipated long-term benefits of adopting and implementing the unit. (See Appendix 6).

References

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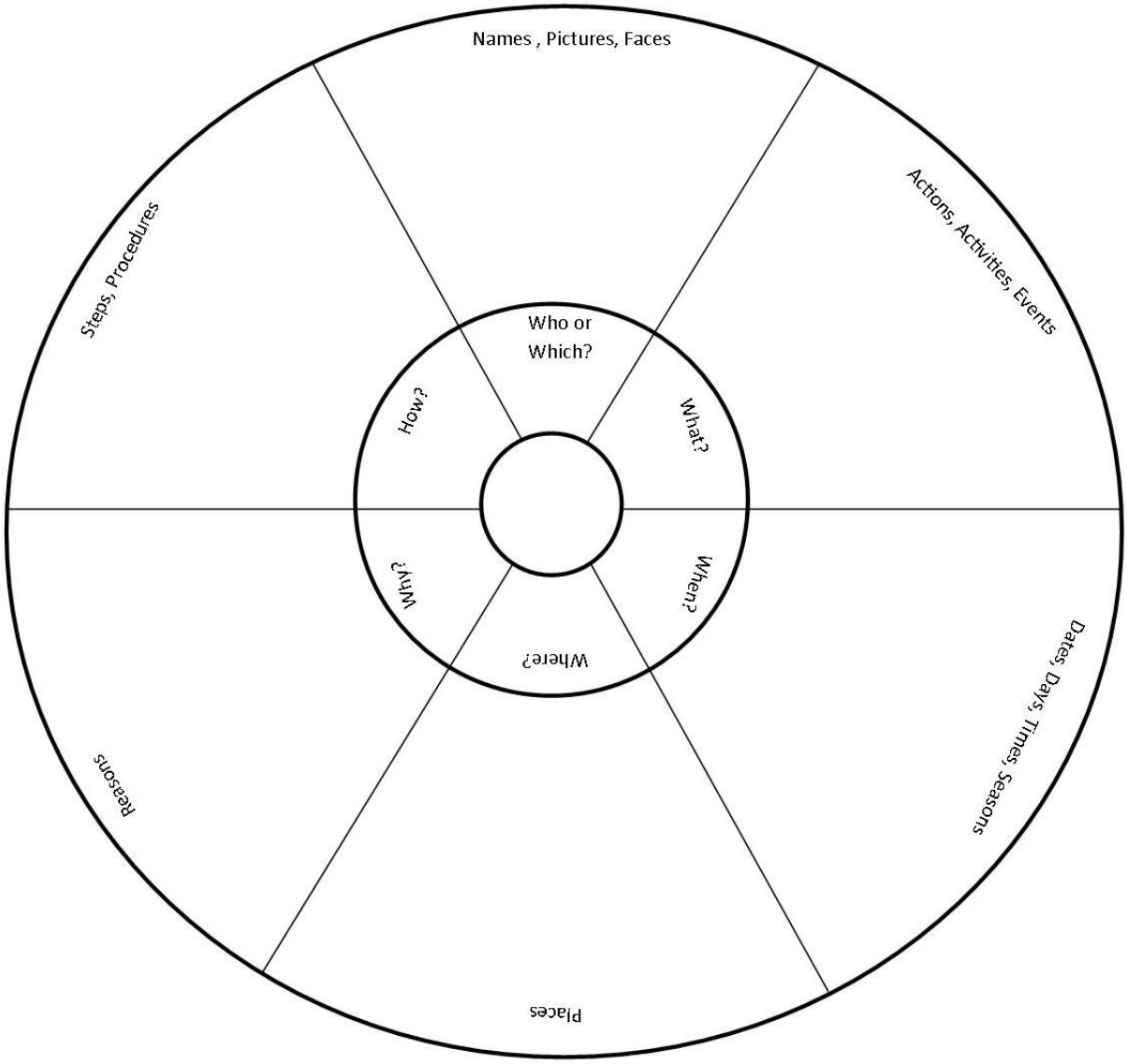
Mayer, R.E. (1979). Can advance organizers influence meaningful learning? *Review of Educational Research*, 49, 371-383 as referenced in Driscoll, M. (2005). *Psychology of Learning for Instruction.* Boston, MA. Pearson.

Morrison, G.R., Ross, S. M., Kahlman H. K., Kemp, J. E., (2013) *Designing Effective Instruction,* Hoboken, NJ. John Wiley & sons, Inc.

Troia and Graham (2002) The effectiveness of a highly explicit, teacher-directed strategy instruction routine. *Journal of Learning Disabilities*, 35(4), 290-305.

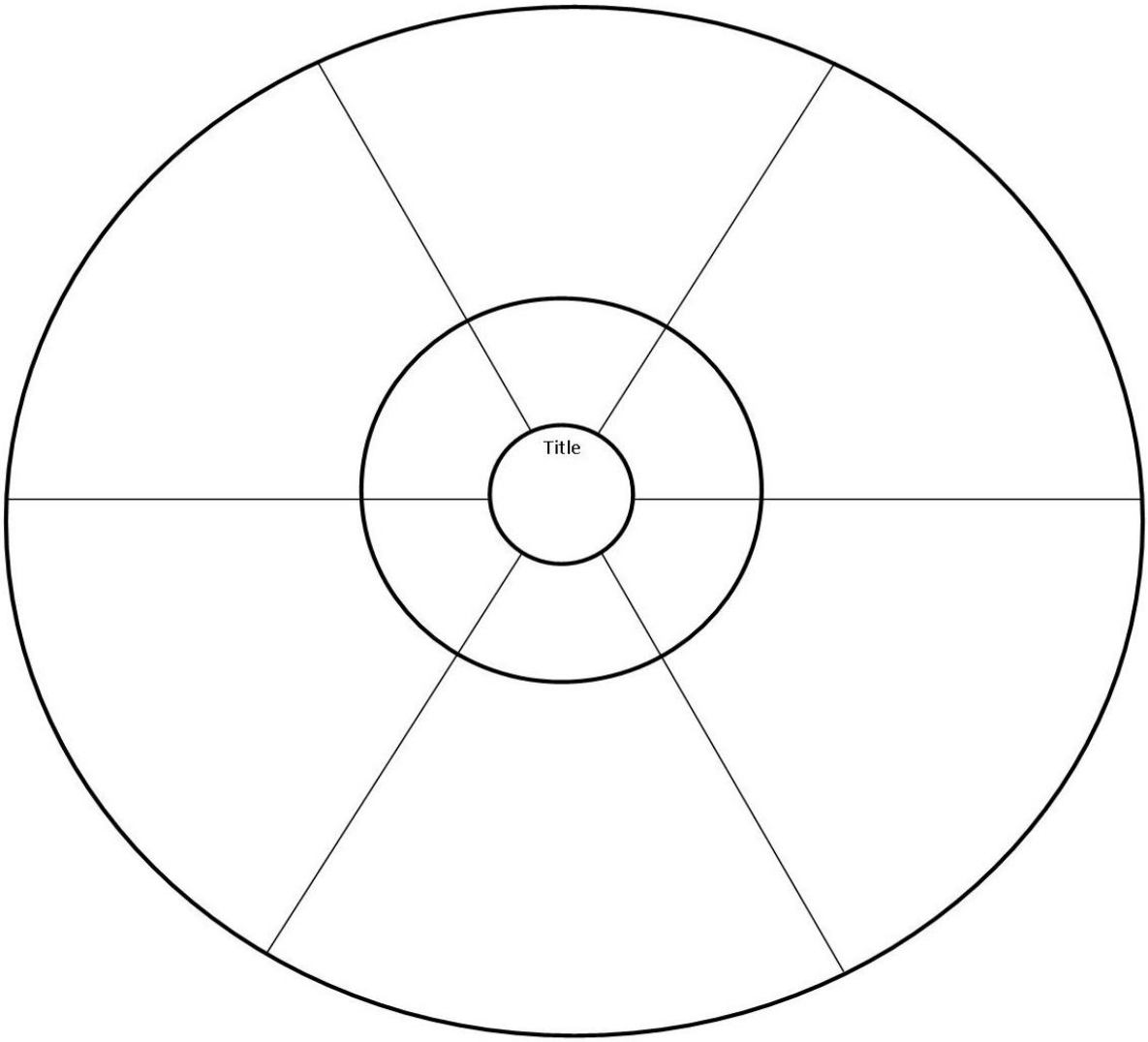
Appendix 1

Level 1 Six Questions Graphic Organizer



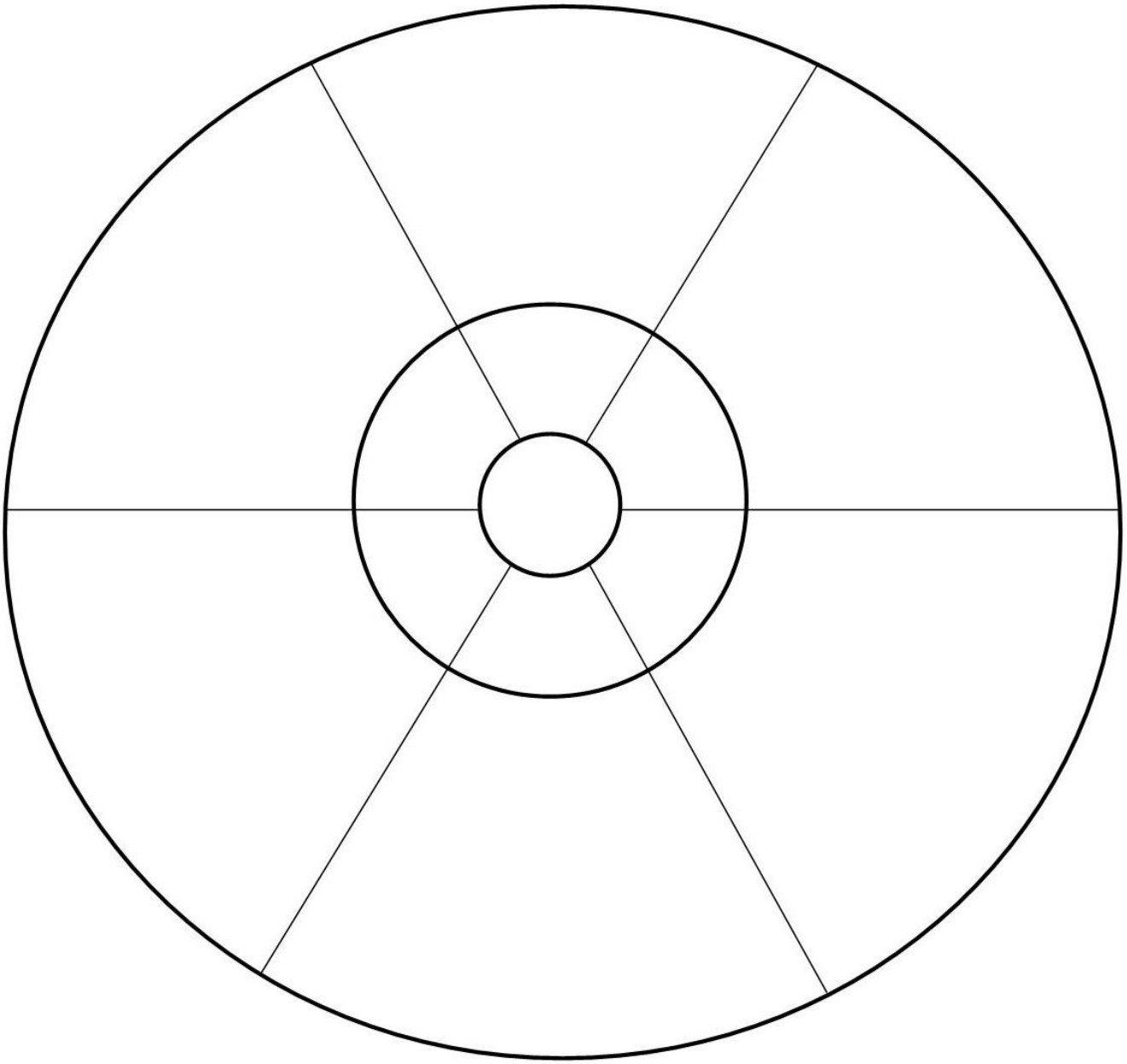
Appendix 2

Level 2 Six Questions Graphic Organizer



Appendix 3

Level 3 Six Questions Graphic Organizer



Appendix 4

Brainstorming Rubric

	4	3	2	1
Brainstorming				
Uses Brainstorming Strategy to Generate Multiple Ideas	Generates at least three ideas in each questioning area for a total of 18 or more ideas.	Generates at least two ideas per questioning area and three ideas in at least 1-2 areas for a total of 13-17 ideas.	Generates at least one idea per questioning area and multiple ideas in 1-2 areas for a total of 7-12 ideas.	Generates one or fewer ideas per questioning area for a total of six or less ideas.
Graphic Organizer				
Demonstrates Use of Graphic Organizer	Independently labels all seven areas of the graphic organizer correctly.	Independently labels 5-6 areas of the graphic organizer correctly.	Independently labels 2-4 areas of the graphic organizer correctly.	Is unable to label areas of the graphic organizer correctly.
Project				
Implementation of Brainstorming Ideas in Project Creation	Uses at least one idea from each questioning area and multiple ideas from at least one area.	Uses at least one idea from each questioning area.	Does not use at least one idea from each questioning area.	Does not use ideas from questioning areas.

Appendix 5

Teacher Feedback Template

Teacher instructions: Please complete the chart below indicating your evaluation of this brainstorming unit. Please circle the number that best indicates your assessment of each item listed and include any suggestions for improvement you may have in the space at the bottom of the form. Thank you for your participation!

1= Not Effective 2= Somewhat Effective 3= Effective 4= Very Effective

Effectiveness of the Pre- / Post- Assessments	1	2	3	4
Effectiveness of the suggested text	1	2	3	4
Effectiveness of the Level 1 Graphic Organizer	1	2	3	4
Effectiveness of the Level 2 Graphic Organizer	1	2	3	4
Effectiveness of the Level 3 Graphic Organizer	1	2	3	4
Effectiveness of the SmartBoard slides	1	2	3	4
Effectiveness of the scoring rubric	1	2	3	4
Effectiveness of the overall unit	1	2	3	4

Please use this space to provide any suggestions you may have for improving this unit.

Appendix 6

Administrator Feedback Template

Administrator instructions: Please complete the chart below indicating your evaluation of this brainstorming unit. Please circle the number that best indicates your assessment of each item listed. Thank you for your participation!

1= Poor 2= Fair 3= Good 4= Excellent

Academic Effectiveness of the Unit	1	2	3	4
Overall Reaction to the Unit	1	2	3	4
Anticipated Benefit of Adopting and Implementing the Unit	1	2	3	4