<u>Know 2 Show ⇔ Show 2 Grow</u>
A Student to Student Teaching Partnership to Promote Collaborative Learning
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<u>Introduction</u>

Throughout my summer internship it became evident how collaborative teamwork, communication, and effective teaching methods are essential skills to achieve goals and meet the expectations in today's workforce. Many people are trained and develop skill sets from other employees, making the "teacher-learner" relationship an important facet in the professional world and one that extends beyond any classroom.

This project will focus on the development of a student-to-student instructional program to foster collaboration and promote active learning in the school environment. Students will acquire peer teaching and learning strategies to be applied in any subject area. A majority of lessons and content in this project will focus mainly on, but is not limited to, 2nd grade elementary mathematics and science standards.

Teaching and learning partnerships will develop and take place in phases throughout the 2018-19 school year. Throughout each phase, students in my 2nd grade classroom will continually use and improve his/her skills as a peer learner or teacher to gain knowledge, deepen understanding of content, and build relationships.

PHASES OF PROJECT

I. 4th grade and 2nd grade partnerships	7 consecutive days (30 min per day) mid-September
II. 2nd grade and kindergarten partnerships	7 consecutive days (20 min per day) mid-October
III. Peer to peer 2nd grade within classroom partnerships (The goal is for students to teach and learn from one another all year long. However, 10 minutes of peer guided teaching/learning will be built into the class schedule each day to develop proficiency).	Duration of school year
IV. Show to Grow: Be A Mentor Program **Select 4th and 2nd grade students**	Once per week (30 min) October 29th- through December 19th
V. "Girls Doing Math" After School Math Club	12 consecutive weeks (1 day per week) February 5th - April 30th.

PHASE I: 4th GRADE AND 2nd GRADE PARTNERSHIPS

LESSON 1: UNDERSTANDING THE PEER TEACHER AND PEER LEARNER ROLES AND RELATIONSHIP

Second Grade Curriculum Alignment
SL: Speaking and Listening Standards
SL.2.1: Participate in collaborative conversations with diverse partners about grade 2 topics with peers and adults in small and larger groups.

SL.2.2: Recount or describe key ideas or details from a text read aloud, information presented orally, or through other media.

SL.2.3: Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

Objective: Students will establish relationships and learn to use effective peer teaching and learning methods.
Note: The skill in this first lesson is purposefully made simple so students can focus on learning the *process* of an effective teaching and learning partnership through the "I DO -YOU DO" format.

- Older students will apply a 4-step peer teaching model to demonstrate how to effectively teach a skill to a younger student. The skill will be drawing a number line from 0 to 10.
- Younger students will apply a 4-step peer listening/learning model to demonstrate how to effectively learn a skill from an older student. The skill will be drawing a number line from 0 to 10.

Time and Location
The lesson and activities will take place in a second grade classroom during a 30-minute period of time.

Teacher Materials
- Large Chart Paper (blank), and with clearly written teaching and learning methods.
- Resource handouts for each 4th grade student including:
  - ➢ Peer Teacher Objectives
  - ➢ Peer Teacher Instructional Steps

➢ Peer Teacher Role - Positive Student to Student Communication Stems

- Resource handouts for each 2nd grade student including:
  - ➢ Peer Learner Objectives
  - ➢ Peer Learner Instructional Steps
  - ➢ Peer Learner Role - Positive Student to Student Communication Stems

Student Materials
Every student partnership will have two 8 x 11 blank white sheets of paper, a ruler, and a pencil. Students will receive handouts at the beginning of the lesson (see Teacher Materials).

Student Prior Knowledge
Students have an understanding of the importance of collaboration, mutual respect, and learning from one another as it pertains to their own education and real-world applications.

Second grade students will have previewed and practiced the Peer Learner Steps with the teacher in a full group for a few days prior to the start of Lesson 1.

Teacher Preparation
The teacher will:
- Collaborate ahead of time with the 4th grade teacher to pair or group students to ensure a positive partnership.
- Pre-write on large chart paper the objectives, instructional steps, and communication stems to discuss and refer to with students.
- Create and laminate 24 sets of all the student resources needed for the lesson.

Activities
Introduction: The teacher will:
- Invite the 4th grade students to sit next to second grade students based on the pairings formed through collaborative talks with the 4th grade teacher.
- Ask each 2nd grade student to introduce themself to their older partner by stating their name, what they like most about school, and what they like to do outside of school.
- Ask each 4th grade student to introduce themself to their younger partner by stating their name, what they like most about school, and what they like to do outside of school.

- Explain the objective of the lesson and the value of the teacher-learner partnership to students. <mark>Examples of this partnership will be discussed using real-world scenarios.</mark>
- Pass out resource handouts to students.
- Review the peer-teacher and peer-learner objectives, instructional steps, and communication stems with students (referring to the corresponding written text on chart paper and student handouts).
- Teach the skill using the "I Do, You Do" teaching format (show how to draw a number line from 1-10) for students to teach their partners while applying the peer instructional methods.
- Facilitate learning partnerships and participation through active observations, answering questions, guiding the process with student pairs, additional modeling, and asking questions to drive collaboration.

Steps in How to Draw a Number Line from 1 to 10.
"I DO" PHASE - The teacher will say:
 (1) Today I will be teaching you how to draw a number line from 1-10 [This is Peer Teacher Instructional Step #1].
 (2) First, use a ruler to draw a straight line across your paper [This begins Peer Teacher Instructional Step #2].
 (3) On the right end of your line (where you usually begin your writing), draw a short vertical mark and label it underneath with a 0.
 (4) Next, place your index (pointer) finger next to (and touching) the number 0 and to the right.
 (5) On the other side of your index finger draw a second vertical mark and label it underneath with a #1.
 (6) Then, place your index (pointer) finger next to (and touching) the #1 and to the right.
 (7) On the other side of your index finger draw a third vertical mark and label it underneath with a #2.
 (8) Continue adding vertical marks and numbers in the same way until you get to #10 [This ends Peer Instructional Step #2].
 (9) Ask the older students if they have any questions or if they want to see the process again from start to finish [This is Peer Instructional Step #3]
(10) Ask if one 4th grade student will volunteer to come up to the front of the class and show and explain how to do the skill on chart paper. The teacher will model how to listen and watch carefully for accuracy, and encourage student questions [This is Peer Instructional Step #4].

"YOU DO" PHASE - The teacher will say:

1.) Now fourth grade students will model the same steps as the Peer Teacher to a second grade Peer Learner.
2.) You will want to refer to your Peer Teacher Instructional Steps 1-4, as well as the directions on how to make a number line (on the resource card at your seat, or the large chart paper in the front of the class).
3.) Second grade students will follow the Peer Learner Instructional Steps 1-4 (on the resource card at your seat, or the large chart paper in front of the class).
4.) I will be walking around the room listening to the great teamwork going on in the classroom. I will help and encourage everyone to use the appropriate talking points, effective participation behaviors, and the steps you will want to use in each role.

Assessment
The purpose of the assessment is to determine the initial adaptability, user-friendliness, and effectiveness of the designed peer teacher-learner method.

- Informal: The teacher will have a premade checklist with student groups/pairs clustered together. A check mark will be placed next to names of students who were seen using their resources and engaging in the partnerships.

Lesson 1 Assessment Checklist

Students	Students	Students
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
Students	Students	Students
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
Students	Students	Students
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Students	Students	Students
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

- Exit ticket (4th grade student assessment of the process): Students will have 4 yes or no questions to complete on an Exit Ticket before leaving the session.

Peer Teacher Exit Ticket	Circle One	
1.) Did you enjoy being a Peer Teacher today?	Yes	No
2.) Were the Peer Teaching Steps explained clearly to you?	Yes	No
3.) Did you find the Peer Teacher Steps easy to follow?	Yes	No
4.) Do you think you could use the Peer Teacher Steps to teach other skills (once you've practiced the steps)?	Yes	No

- Exit ticket (2nd grade students only): Students will have 3 yes or no questions to complete on an Exit Ticket before leaving the session. The teacher will facilitate a discussion with classroom students after the 4th graders depart. The questions will be similar to those on the Exit Ticket.

Peer Learner Exit Ticket	Circle One	
1.) Did you enjoy being a Peer Learner today?	Yes	No
2.) Did you find the Peer Learner Steps easy to follow?	Yes	No
3.) Did you like learning with students from another class?	Yes	No

Critical Vocabulary
Communication stem, peer, feedback, positive, resource, receptive.

Peer Teacher Objectives

- Clearly model and explain how to do the skill.
- Encourage and answer questions from the learner.
- Help the learner feel safe and comfortable.
- Provide positive and corrective feedback.
- Allow the learner to practice and show you what he/she has learned

Student Resource Card

Peer Teacher Instructional Steps

1. Explain what you will be teaching.
  Say, "I am going to show and explain how to…"

2. Slowly show and explain the process step by step (write large and neatly).
  ❏   *Explain in <u>words</u> what you are doing as you do it.*
  ❏   *Make eye contact with the learner as you <u>model</u> each step.*

3. Ask the student if they have any questions or if they want you to show the process again from start to finish.
  ❏ *If they say "Yes", then repeat step #2.*
  ❏ *If they say "No", then go to step #4.*

4. Ask the student to now explain and show you how to do the skill.
  ❏ *Listen and watch carefully.*
  ❏ *Say, "It is okay to make mistakes, we are just practicing ."*

Peer Teacher Feedback: POSITIVE	Peer Teacher: CORRECTIVE	Peer Teacher: QUESTIONS
You seem to really understand...	One suggestion would be...	What is...
I like the way you...	Don't forget to...	How do you feel about...
I can tell you know how to do this part...	One area to practice...	Can you think of another way to...
You worked hard on...	Something that helps me ...	Can you tell me why you...
Continue to...	You may want to try...	Explain this part again...

Peer Learner Objectives

- Listen and watch carefully.
- Ask questions if you do not understand something.
- Use resources (examples, checklists, models, etc.) to help you.
- Show and explain "step-by-step" what you learned back to the student.
- Be open to feedback to improve your skills.
- Understand what is being said or taught so you can do it yourself.

Student Resource Card

Peer Learner Instructional Steps
1. Watch and show you are listening ❏   Make eye contact with the peer teacher. ❏   Nod or smile. **2. Ask a question if you do not understand something or want to see it again.** ❏   Do not argue. ❏   Be open to learning something new. **3. Now show and explain "step by step" what you learned back to the peer teacher.** ❏   Use words like, "first", "then", "next"... ❏   Ask for help if needed. **4. Ask, "What did I do well?" or "What can I improve?"** ❏   Take notes on feedback ❏   Repeat back to the peer teacher what you heard so you understand what to practice.

PEER LEARNER ROLE : Positive Student to Student Communication Stems

Peer Learner Feedback: POSITIVE	Peer Learner: RECEPTIVE	Peer Learner: QUESTIONS
Thank you for showing me...	What did I do well?	Can you show me another way next time?
I am glad you saw my mistake about...	How can I improve or practice?	How can you make it more challenging?
I like how you explained...	I do not understand the part about...	How can you make it easier?
Your idea about _____ is very helpful.	What is the most important skill I need to work on?	Can I use the same resources next time?
You made me feel...	Did I seem like I was listening the whole time?	Can I write down your suggestions?

LESSON 2: APPLYING THE ROLES OF THE PEER TEACHER AND LEARNER TO SECOND GRADE MATH STANDARDS.

Second Grade Curriculum Alignment
Operations and Algebraic Thinking
NC.2.OA.2: Demonstrate fluency with addition and subtraction, within 20, using mental strategies.
Number and Operations in Base Ten
NC.2.NBT.5: Demonstrate fluency with addition and subtraction, within 100 by:
- Flexibly using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- Comparing addition and subtraction strategies, and explaining why they work.
- Selecting an appropriate strategy in order to efficiently compute sums and differences.

SL: Speaking and Listening Standards
SL.2.1, SL.2.2, and SL.2.3 (Refer to Lesson 1)

Day 1 Objectives
- Students will apply the roles of Peer Teacher (4th grade student) and Peer Learner (2nd grade student) to practice the skill of adding to a multiple of ten, within 100.
- By repeating this fluency activity for 5 days, second grade students grow confidence and build proficiency prior to computing sums and differences with more challenging numbers.

Time and Location
The lesson and activities will take place in a second grade classroom during a 30-minute period of time.

Teacher Materials
Extra Large Hide Zero Place Value cards, 100 chart, chart paper with Place Value chart showing the "tens place" and the "ones place" (to model paper assignment for 2nd grade students).
*An example of the Hide Zero Place Value Cards can be seen on the next page after "Student Materials".

Student Materials
- A set of Hide Zero Place Value cards (cut by place value on dotted lines)
- Desk top 100 chart

- 8 x 11 paper with a pre-made Place Value chart showing the "tens place" and "ones place".
- Instructional steps for the Peer Learner (on laminated card)
- Instructional steps for the Peer Teacher (on laminated card)
- Positive student to student communication stems for the peer teacher (on laminated card)
- Positive student to student communication stems for the peer learner (on laminated card)

1	0	0	1	0	1
2	0	0	2	0	2
3	0	0	3	0	3
4	0	0	4	0	4
5	0	0	5	0	5
6	0	0	6	0	6
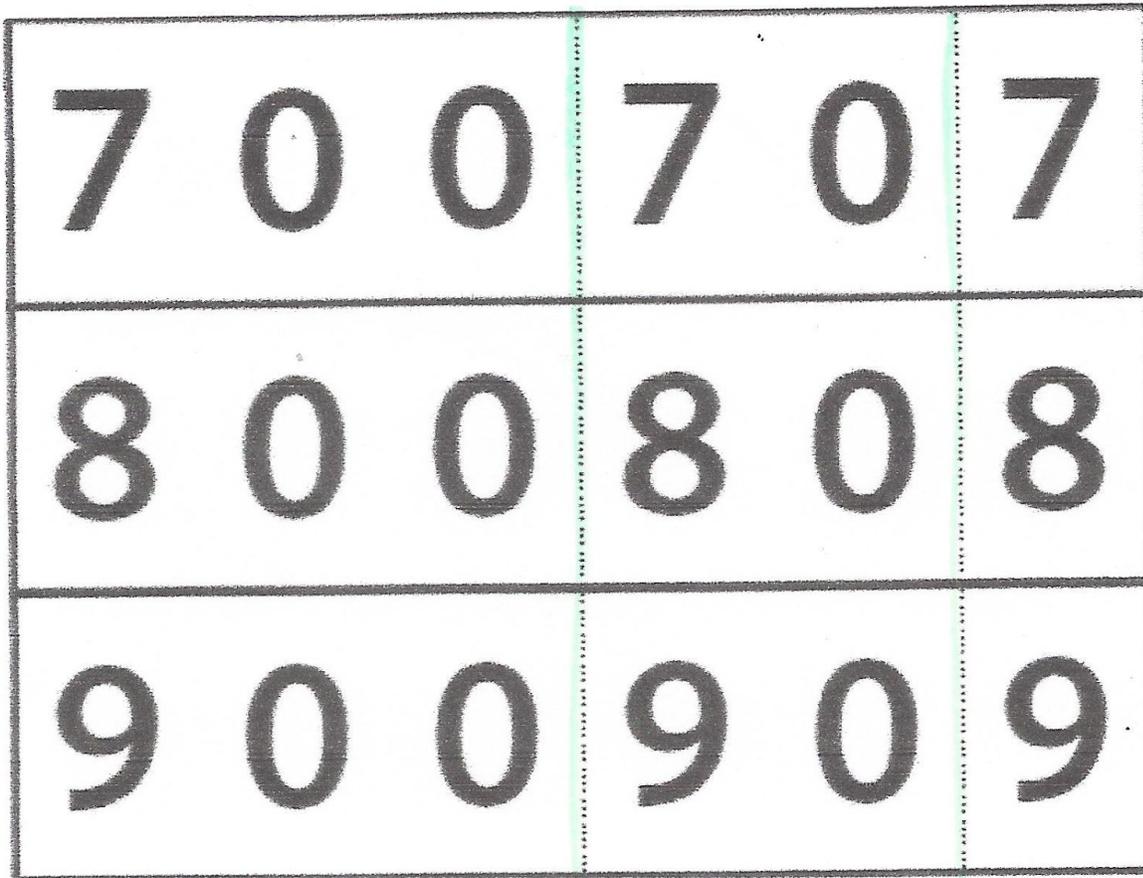
7	0	0	7	0	7
8	0	0	8	0	8
9	0	0	9	0	9

Student Prior Knowledge

Students have an understanding of the roles of a peer teacher and learner. Students demonstrate fluency for addition and subtraction within 10 (1.OA.6), and they understand the multiples of ten from 10 to 100 as bundles of groups of 10 (1.NBT.2).

After each 30 minute peer session, the second grade students will build on their knowledge with additional classroom activities and small group instruction. They will practice how to make the next multiple of ten from a number (e.g., If 3 + 7 = 10, then 13 + ___ = 20, 23 + ___ = 30, 53 + ___ = 60?). This balanced approach will help students connect different skills to strengthen number sense in the Base 10 Number System.

Teacher Preparation

The teacher will:
- Collaborate ahead of time with the 4th grade teacher to confirm positive peer partnerships/groups.
- Have large 100 chart visible

- Have tape available to tape *Hide Zero Cards* to chart paper with Place Values.
- Make sure all student materials are accessible and at student desk/tables.

Activities

Introduction: When the fourth grade students enter the classroom, they will sit next to an assigned second grade learner. Student materials will be ready at each learner's table. The teacher will welcome the fourth graders.

Lesson Steps:

1. The teacher will remind students of their roles during the lesson, making reference to the instructional steps and communication stems provided on resource cards to follow when they begin the activity.

2. The teacher will model the activity using the *Hide Zero Cards,* large hundred chart, and chart paper.

3. The teacher shows the number 10 card. The teacher places the number 1 card directly below the 10 card. The teacher asks a student to identify each number card (There is a 10 and a 1). The number 10 has 1 ten in the tens place and 0 ones in the ones place.

4. The teacher slowly slides the number 1 card on top of the 0 in the number 10 saying, "10 plus one more is 11."
"The number 11 is showing, which has 1 ten in the tens place and 1 one in the ones place."

1 0	1 0	1 1	1 0 + 1 = 1 1
1	↑ 1		

5. The teacher writes, "10 + 1 = 11" on chart paper. The teacher asks all students to read the equation aloud. Students put a finger on "10" on the hundreds chart and say, "10 + 1 = 11" as they move one space to the number 11.

6. The teacher begins again by showing the number 10 card. She places the number 2 card directly below the 10 card. The teacher asks a student to identify each number card (There is one 10 and a 2). The number 10 has 1 ten in the tens place and 0 ones in the ones place.

7. The teacher slowly slides the number 2 card on top of the 0 in the number 10 saying, "10 plus 2 more is 12."
"The number 12 is showing, which has 1 ten in the tens place and 2 ones in the ones place."

$$1\ 0 \qquad\qquad 1\ 0 \qquad\qquad 1\ 2 \qquad\qquad 1\ 0\ +\ 1\ =\ 1\ 1$$
$$\uparrow \qquad\qquad\qquad\qquad\qquad 1\ 0\ +\ 2\ =\ 1\ 2$$
$$2 \qquad\qquad\quad 2$$

8. The teacher writes, "10 + 2 = 12" on chart paper under the first equation to begin a cumulative list of equations. The teacher asks students to read the equation aloud. Students put a finger on "10" on the hundreds chart and say, "10 + 2 = 12" as they move two spaces to the number 12.

9. The teacher explains to the 4th grade students (Peer Teachers) how they will model the exact same thing to a 2nd grade friend starting by adding +1 to 10 and continuing until they add +9 to 10. The 4th grade student will write the equation on lined paper, and the 2nd grade student will read the equation out loud after it is written.

10. The teacher explains to the 2nd grade students (Peer Learners) they will follow the steps as a Peer Learner and then repeat and teach back the same activity to the 4th grade student. They will model with the *Hide Zero Cards* and write the equation in their paper.

Teacher Facilitation Role: (during student activity steps 10 - 12). As students are working together, the teacher will walk around the classroom and...
- Encourage students to use the Peer Learner and Peer Teacher Instructional Steps Resources.
- Remind students to work through the activity slowly and to write equations neatly.
- Remind students to verbally explain what they are showing.
- Ask questions to informally assess process and/or content understanding.
- Make suggestions for additional or extended practice (if time allows)
- Assist students who may need extra guidance.
- Informally assess student performance and comprehension (checklist from Lesson 1)

11. The teacher explains to all students that they will now use their Communication Stems to give and receive feedback from the learning partnership. The teacher will model two scenarios using both the Peer Learner stems and the Peer Teacher stems.

The students will then choose prompts from their resource to engage in conversation. The teacher will provide 5 minutes for this part of the lesson.

- The 4th grade student gives feedback to the 2nd grade student using the *Positive Student to Student Communication Stems* for the peer teacher.

- The 2nd grade student gives feedback/asks questions to the 4th grade student using the *Positive Student to Student Communication Stems* for the peer learner.

Teacher Facilitation Role: (during student activity step 11). As students are communicating about the lesson, the teacher will walk around the classroom and…
- Encourage the use of the communication stems to deepen and strengthen the learning process and collaborative efforts between students.
- Remind students to write down feedback to improve performance and build on the learning of content the next day.

12. The teacher and 2nd grade students will thank the 4th graders for their teamwork, organize and put materials away, and end the session.

 Assessment: Exit Ticket
*The same exit ticket from Lesson #1 will be given to students at the end of the session.

Critical Vocabulary
Multiple of 10, ones place, tens place, value, equation.

Day 2-5 Objectives:
- Students will continue to apply the roles of peer teacher (4th grade student) and peer learner (2nd grade student) to practice the skill of adding a multiple of 10 to a multiple of 100 and building up to 990.
  For example:
  Day 2: 40 + 3 = 43, 40 + 7 = 47, 70 + 5 = 75, 80 + 3 = 83
  Day 3: 100 + 20 = 120, 100 + 30 = 130, 200 + 50 = 250
  Day 3: 300 + 30 = 330, 300 + 90 = 390, 400 + 70 = 470
  Day 4: 500 + 60 = 560, 600 + 60 = 660, 600 + 80 = 680
  Day 5: 700 + 10 = 710, 700 + 40 = 740, 800 + 50 = 850, 900 + 20 = 920

- All sections of the lesson plan will remain the same.

- Differentiation will occur based on teacher observations and student performance. Students will use *Hide the Zero* cards, write and read aloud each equation and progress slowly.

    <u>Differentiation</u>
    - ❖ Students will add to 10 with single digit numbers in non-numerical order. (Refer to steps 3-8 - e.g., 10 plus 4 more is 14, then 10 plus 6 more is 16, etc.)
    - ❖ Students will add to the next multiple of 10 with single digit numbers in order. (e.g., 20 plus 1 more is 21, 20 plus 2 more is 22, 20 plus 3 more is 23, etc.)
    - ❖ Students will add a single digit number to various multiples of 10 less than 100. (e.g., 30 plus 3 more is 33, 40 plus 7 more is 47, 80 plus 2 more is 82, etc.)
    - ❖ Students will subtract the value in the ones place from a 2-digit number. (e.g., 58 take away 8 is 50, 64 take away 4 is 60, 39 take away 9 is 30).
    - ❖ Ask how does 10 + 5 help you solve 60 + 5?
    - ❖ Ask how does 6 + 4 = 10 help you solve 16 + ___ = 20
    - ❖ Students will add a single digit number to multiples of ten equal to, or greater than, 100.

Day 6-7 Objectives: Students will apply the skills practiced in days 1-5 to a real world story problem.

Day 6 Activities:
- The teacher will explain how students will apply the skill of adding to a multiple of ten, to solve story problems during the next two sessions. The teacher will model the thinking and solution process for all students.

- The teacher will read aloud the problem below from large chart paper for the class to see. A photo will also be shown of the Coastal Currents waterway at Carowinds Amusement Park.

Story: *The Coastal Currents relaxation waterway at Carowinds is a fun place to cool off at the waterpark. Ben, a new lifeguard on duty, has 30 inner tubes in the water and 7 more inner tubes on the pool deck. The waterpark manager just called and told Ben he needs to have 40 inner tubes at the location ready for guests. How many total inner tubes does Ben have at the Coastal Currents location? Does Ben have enough inner tubes for 40 guests?*

- The teacher will model the activity using the *Hide Zero Cards,* large hundred chart, and chart paper.

- The teacher re-reads the first two sentences. The teacher circles the numbers 30 and 7 and writes them separately on the large chart paper. Next to the number 30 she writes (IN) and next to the number 7 she writes (OUT).

- The teacher explains that 30 inner tubes are *IN* the water and 7 inner tubes are *OUT* of the water at the Coastal Currents .

Ben has:		**Ben needs**:
IN	30	40
OUT	7	

- The teacher re-reads the third sentence and circles the number 40. The teacher writes the number 40 on her chart paper (see example above).

- The teacher re-reads aloud the fourth sentence, "*How many total inner tubes does Ben have at the Coastal Currents location?*"

- The teacher says, *"To find the total I need to put together (or add) the amount Ben has in the water with the amount he has out of the water because all of the inner tubes are at the Coastal Currents location."*

- *"30, or 3 tens, plus 7 is the same as 37. I know this because in the number 30 there is a zero in the ones place and I am adding a one-digit number to 3 tens."*

- The teacher re-reads aloud the last sentence, "*Does Ben have enough inner tubes for 40 guests?*"

- The teacher says*, "He has 37 and he needs 40. So, NO! He does not have enough because 40 has 4 tens and 37 has 3 tens and some ones."*

- *The teacher writes on the chart paper:*
  No. Ben does not have enough   37 < 40

- The teacher explains how the 4th grade students will model the exact same process to a 2nd grade friend using a provided copy of **Story A** at their desk.

- The teacher explains to the 2nd grade students they will then reteach the same copy of **Story A** to a 4th grade student.

- Each 2nd grade student will then teach **Story B** to a 4th grade friend (without any pre-teaching by the the older student).

- The 4th grade student gives feedback to the 2nd grade student using the *Positive Student to Student Communication Stems* for the peer teacher.

- The 2nd grade student gives feedback/asks questions to the 4th grade student using the *Positive Student to Student Communication Stems* for the peer learner.

- The teacher and 2nd grade students will thank the 4th graders for their teamwork, organize and put materials away, and end the session.

Story Problems

A.) **Dave wants to buy a sweatshirt at the Carowinds gift shop. It costs $46 dollars. Dave has $40 dollars. How much more money does he need to buy the t-shirt?**

B.) **Mr. Jones has $9 in his wallet. Mrs. Jones has $50 in her purse. Do they have enough money to get a Chicken Tenders Family Meal that costs $69?**

C.) Extension: **Manny has $74. He spends $4 on a pair of sunglasses. How much money does he have left?**

Day 7 Activities:
- Students will use the solved problem from Day 6 on the large paper as a resource.

- Students will match up with their peer teacher or learner.

- Peer groups will read-aloud **Story A** together.

- Second grade students will model and explain how to solve the problem in **Story A** and apply the skill of adding to any multiple of 10.

- The 4th grade student gives feedback to the 2nd grade student using the *Positive Student to Student Communication Stems* for the peer teacher.

- Second grade students will model and explain how to solve the problem in **Story B** and apply the skill of adding to any multiple of 10.

- The 4th grade student gives feedback to the 2nd grade student using the *Positive Student to Student Communication Stems* for the peer teacher.

- Second grade students will model and explain how to solve the problem in **Story C** and apply the skill of adding to any multiple of 10.

- The 4th grade student gives feedback to the 2nd grade student using the *Positive Student to Student Communication Stems* for the peer teacher.

Story Problems

A.) Jack has $4 in his pocket and $90 in his bank account. He owes his older brother $92. Does Jack have enough money to pay back his brother? How do you know?

B.) There are 44 broken computers and 40 working computers at the amusement park. How many more computers are broken than working? If the operations manager buys 8 new computers, than how many computers in all will be working?

C.) Extension: Kim has 160 game tickets and Bill has 130 game tickets. If Kim gets 3 more tickets and Bill gets 9 more tickets, than how many tickets will each person have? Who has more tickets, Kim or Bill?

Day 6 and 7 Assessment

The assessments for Day 6 and 7 are partly embedded in the student activity. The peer teacher will assess the 2nd grader's understanding using a short checklist.

<mark>Peer Teacher Checklist to be used on Day 6 and Day 7</mark>

Peer Teacher Checklist	Names_____	Circle One

1.) The Peer Learner follows all the Peer Learner Steps.	Yes	No
2.) The Peer Learner can model the math story.	Yes	No
3.) The Peer Learner can explain, write, and show how to solve the math story.	Yes	No
4.) The Peer Learner can correctly add and subtract.	Yes	No

Peer Learner Exit Ticket	Circle One	
1.) Did your partnership with another student over the last 5 days help you solve the story problem?	Yes	No
2.) Did you enjoy learning with a student from another class?	Yes	No
3.) Would you prefer to solve the math story on your own or with a partner?	Alone	Partner

PHASE II: 2nd GRADE AND KINDERGARTEN PARTNERSHIPS

The lesson plans for this phase will resemble the same process as in Phase I. The changes in this phase are listed below:

- Second grade students will be peer teachers, and kindergarten students will be peer learners.
- The curriculum will align with North Carolina kindergarten math standards.
- The lessons will take place in the kindergarten classroom (second grade students will travel) during a 20-minute peer session.
- Peer Learner and Teacher Step Cards will be altered to be developmentally appropriate for kindergarten students.

Peer Learner Steps

1. **Look and Listen**

2. Ask **?**

3. I do

Student Resource Card K and 1st Grade

Peer Teacher Steps

1. Tell what you will teach.

2. Show how YOU do it.
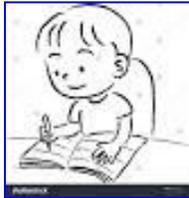
3. Look and Listen as your PARTNER shows you.
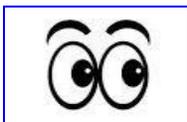
LESSON 1: APPLYING THE ROLES OF THE PEER TEACHER AND LEARNER TO KINDERGARTEN MATH STANDARDS.

Kindergarten Curriculum Alignment
CC: Counting and Cardinality
NC.K.CC: Know number names and the counting sequence.
OA: Operations and Algebraic Thinking
NC.K.OA: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

SL: Speaking and Listening Standards
NC.SL.K.1: Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small groups.
NC.SL.K.3: Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
NC.SL.K.6: Speak audibly and express thoughts and ideas clearly.

Day 1 Objectives
- Students will apply the roles of Peer Teacher (2nd grade student) and Peer Learner (kindergarten student) to practice the skill of making sums up to 10 by adding two sets of different colored unifix cubes.
- By repeating this fluency activity for 5 days, kindergarten students understand the relationship between numbers and quantities, and connect counting to cardinality.

Time and Location
The lesson and activities will take place in a kindergarten classroom during a 20-minute period of time.

Teacher Materials
- Notepad for observational notes regarding student peer teaching skills, peer learning skills, partnership collaboration, and kindergarten student understanding of math concept.
- Anchor chart with Peer Teacher Steps (brought over from 2nd grade classroom to kindergarten classroom as a resource for 2nd grade students).

Student Materials (per each Kindergarten and 2nd grade partnership)
- 2 sets of 10 Unifix cubes (10 cubes all in one color; another 10 cubes all in one color, but not the same color as the first set).
- Box of Crayons
- Kindergarten math journal to record addition equations.
- Instructional steps for the Peer Kindergarten Learner (on laminated card)

- Instructional steps for the Peer 2nd Grade Teacher (on laminated card)

Student Prior Knowledge

Students have an understanding of the roles of a peer teacher and learner. The kindergarten teacher reviewed the Peer Learner Steps with her students for two days prior to Lesson #1. Kindergarten students were exposed to one-to-one correspondence, counting, the addition symbol and equal sign, and the meaning of addition in combining two groups of objects.

Second grade students were shown the skill they would teach prior to Lesson #1. They practiced the skill with another second grade student using the Peer Teaching Steps.

Teacher Preparation

The teacher will:
- Collaborate ahead of time with the kindergarten teacher to confirm positive peer partnerships/groups.
- Prepare and bring all the sets of colored Unifix cubes in Ziploc bags (1 set of 10 in one color, another set of 10 in one color) to be easily distributed in the kindergarten classroom.
- Bring the anchor chart with the Peer Teaching Steps outlined to the kindergarten classroom.

Activities

Introduction: When the second grade students enter the classroom, they will sit next to an assigned kindergarten learner. Student materials will be ready at each learner's table. The teacher and second graders will greet the kindergarten students.

Lesson Steps:

1. The teacher will remind students of their roles during the lesson, making reference to the instructional steps and resource cards (or anchor chart) to follow when they begin the activity.

2. The teacher will model the activity on the board by drawing two orange squares, then three green squares (in a horizontal line). To find the total amount, the teacher will count the orange set of squares saying, "1, 2" and write the numeral 2. The teacher will count the green set of squares saying, "1, 2, 3" and write the numeral 3.

3. The teacher will say, "To find the total amount of squares I can write a math sentence called an equation that says 2 + 3 = 5. The + sign means to put together. The = symbol means the "same as". So let's see… If I count all the squares I would have, 1,2,3,4,5. So 2 + 3 is the same as (=) 5.

*Note: The number 2 is written in an orange marker and the number 3 is written in a green marker to match the corresponding number of squares.

4. The teacher will say, "Today you and your peer teacher from second grade will practice adding (or putting together) two groups of colored cubes to find and write the total. Make sure you have two crayons to match each color of the cubes you will be using today."

5. The teacher explains to the 2nd grade students (Peer Teachers) how they will model the exact same thing to a kindergarten friend starting with 1 + 1 and continuing with different combinations until they add 5 + 5. The 2nd grade student will model with cubes (a different color for each addend) and write the equation (using a colored crayon to match each addend) in the kindergartner's math journal, and the kindergarten student will read the equation out loud after it is written.

6. The teacher explains to the kindergarten students (Peer Learners) they will follow the steps as a Peer Learner and then repeat and teach back the same activity to the 2nd grade student. They will model with the cubes (a different color for each addend) and write the equation (using a colored crayon to match each addend) in their paper.

Teacher Facilitation Role: (during student activity steps 5 - 6). As students are working together, the teacher will walk around the classroom and...
* Encourage students to use the Peer Learner and Peer Teacher Instructional Steps Resources.
* Remind students to work through the activity slowly and to write equations neatly.
* Remind students to verbally explain what they are showing.
* Ask questions to informally assess process and/or content understanding.
* Make suggestions for additional or extended practice (if time allows)
* Assist students who may need extra guidance.
* Informally assess student performance and comprehension (checklist from Phase 1, Lesson #1)

7. The 2nd grade student gives feedback to the kindergarten student using the *Positive Student to Student Communication Stems* for the peer teacher.

Teacher Facilitation Role: (during student activity step 7). As students are communicating about the lesson, the teacher will walk around the classroom and encourage the use of the communication stems to deepen and strengthen the learning process and collaborative efforts between students.

8. The teacher and 2nd grade students will thank the kindergarteners for their teamwork. They will help organize and put away materials. The session ends.

 Assessment: Exit Ticket
*Kindergarten students will be given a sticky note. If they liked learning from a peer teacher they will be asked to put their sticky note on the Whiteboard. If they did not enjoy learning from a peer teacher they will be asked to put their sticky note on their table/desk. The kindergarten teacher will use the Exit Ticket information to have a class discussion after the 2nd graders leave, or during morning meeting time.

Critical Vocabulary
Add, addition, count, plus, equal, same as, how many, equation, number sentence, total.

Day 2-6 Objectives:
- Students will continue to apply the roles of peer teacher (2nd grade student) and peer learner (kindergarten student) to practice the skill of making sums up to 10 or 12 (based on student progress and kindergarten teacher's recommendation) by adding two sets of different colored unifix cubes.

    For example:
    Day 2: 4 + 3 = 7, 5 + 3 = 8, 6 + 3 = 9, 7 + 3 = 10 (change one addend)
    Day 3: 5 + 5 = 10, 5 + 6 = 11, 5 + 7 = 12, 7 + 5 = 12 (commutative property)
    Day 4: 6 + 5 = 11, 7 + 4 = 11, 8 + 3 = 11, 9 + 2 = 11 (pattern +1/-1)
    Day 5: 3 + 2 = 5, 5 + 2 = 7, 7 + 2 = 9, 9 + 2 = 11 (pattern +2)
    Day 6: 2 + 2 = 4, 3 + 3 = 6, 4 + 4 = 8, 5 + 5 = 10 (doubles)

- All sections of the lesson plan will remain the same.
- Differentiation will occur based on teacher observations and student performance.

    Differentiation
- ❖ Students will analyze patterns in more depth.
- ❖ Students will extend and make sums up to 15 or 20.
- ❖ Students will subtract cubes from the total.

- ❖ Students will break apart one addend into two smaller parts to create an equation with three addends (example: 6 + 4 = 10 could be broken down to 3 + 3 + 4 = 10).

Day 7 Objectives: Students will apply the skills practiced in days 1- 6 to math story problems. Story Problem #1 will be read aloud and modeled by the 2nd Grade Peer Teacher. Colored cubes will represent the objects in each math story.

Story Problems 2-5 will be read aloud by the 2nd Grade Peer Teacher and solved by the kindergarten Peer Learner using the same process and materials in Days 1-6.

Story Problem 1

Jack has 4 cubes and Sam has 4 cubes. How many total cubes do they have?

Story Problem 2

Mary has 5 cubes and Jim has 3 cubes. How many total cubes do they have?

Story Problem 3

A dog has 6 treats and a cat has 2 treats. How many total treats are there?

Story Problem 4

There are 7 dogs outside and 4 dogs inside. How many total dogs are there?

Story Problem 5

A man has 3 apples and 8 oranges. How many total pieces of fruit does he have?

End of Phase II: Exit Ticket

Peer Teacher Checklist to be used on Day 7

Peer Teacher Checklist Names_____	Circle One	
1.) The Peer Learner can use cubes to show how to solve the math story.	Yes	No

2.) The Peer Learner can correctly count to find the total.	Yes	No
3.) The Peer Learner can write an equation to find the total.	Yes	No

Peer Learner Exit Ticket	Circle One	
1.) Did your partner help you learn during the last 7 days?	Yes	No
2.) Did you enjoy learning with your partner?	Yes	No
3.) Would you like to learn again from an older friend?	Yes	No

*Note: The Peer Learner Exit Ticket can be also be done as a whole group where the teacher reads aloud each question and students raise their hand to express "Yes" or "No". A chart can be made on the Whiteboard with tally marks representing "Yes" or "No". A class discussion about the results can follow to talk about the peer partnership experience.

PHASE III: PEER TO PEER 2nd GRADE WITHIN CLASSROOM PARTNERSHIPS

This phase will take place continuously throughout the 2018-19 school year within my 2nd grade classroom. Students will be given a minimum of 10 minutes, 3-days per week, to engage with one another using the peer objectives, instructional steps, and communication stems outlined in Phase I. Each student will have a copy of these three resources to keep in a personal folder.

This minimum 10-minute time period will be integrated into our daily schedule as "Peer to Peer Partnerships". It will be used primarily in mathematics to review and practice specific skills. These skills may at times be teacher-selected or student-selected. This process may also be adopted to use in other subject areas as needed. The teacher will follow the description outlined in the Teacher Facilitation Role in Phase I.

Note: The scheduled "Peer to Peer Partnerships" time will not be the only opportunity students have to engage in the peer teacher-learner process. As in most flexible and engaging classroom environments, there will be many optimal times for students to collaborate and work together. However, in order for students to become proficient in any skill, they need to be consistently provided with sufficient time and resources. Embedding this process into our daily schedule will ensure students have adequate practice throughout the school week.

Phase III Implementation

After a math skill has been taught for a period of 3 days based on teacher prepared lessons, and students have practiced the skill in both teacher-led small groups and through class activities, then a peer-to-peer teaching and learning opportunity of the skill should occur between students.

Time and Location

The lesson and activities will take place in a second grade classroom during a 10-minute period of time.

Teacher Materials

- Either large chart paper, a Whiteboard, or premade worksheet with math problems for each student to solve.
- Two large pieces of chart paper displaying the:
  - ➢ Peer Learner Instructional Steps
  - ➢ Peer Teacher Instructional Steps
- Extra resource handouts for each 2nd grade student including:
  - ➢ Peer Learner and Teacher Objectives
  - ➢ Peer Learner and Teacher Instructional Steps

Student Materials
- Every student partnership will have two large dry erase lap boards, two dry erase markers and erasers.
- Students will have access to the Peer Learner and Teacher Instructional Steps by means of a Student Resource Card, or with the steps clearly outlined on a large visible anchor chart.

Student Prior Knowledge
- Second grade students will have a basic understanding of the math skill they are going to teach and learn about from a peer.
- Second grade students will have an understanding of, and will have practiced, the Peer Learner and Teacher Steps from their experiences in Phase I and II.

Teacher Preparation
The teacher will:
- Create two math problems (one for the peer teacher, and one for the peer learner to demonstrate their understanding of the concept back to the peer teacher). Each problem will be labeled "Peer Teacher" and "Peer Learner". This can be done on the Whiteboard or on a student worksheet.
- Create two additional math problems on the same math skill (one for the peer teacher, and one for the peer learner to demonstrate their understanding of the concept back to the peer teacher), when the two students switch roles. Each problem will be labeled "Peer Teacher" and "Peer Learner". This can be done on the Whiteboard or on a student worksheet.
- Have paired students sitting next to each other with all materials ready and accessible (Student pairs can be changed weekly).
- Review the Peer Teacher and Learner Steps by having students read them from the anchor charts.

- Ask students to think about the post-lesson questions (1) What was challenging as a peer learner or teacher today? (2) What did you learn today as a peer learner or teacher?

ANCHOR CHARTS

Peer Teacher Steps

1. Explain what you will be teaching.

2. Slowly Show and Explain the process step by step.

3. Ask the student if they have any questions.

4. Ask the student to show and explain how to do the skill.

Peer Learner Steps

1. Show you are listening

2. Ask if you do not understand something.

3. Show and Explain what you just learned.

4. Ask, "What did I do well? What can I improve?"

Lesson and Activities

The teacher will:

- 1. Explain how students will be teaching a math skill learned in class (for example, how to use an open number line to find a missing addend in an equation such as 18 + ___ = 63).
- 2. Show two problems: #1 for the Peer Teacher and #2 for the Peer Learner. (on a Whiteboard, chart paper, or student worksheet).

#1 Peer Teacher	#2 Peer Learner
26 + ____ = 74	13 + ____ = 88

- 3. Ask student #1 to use the Peer Teacher Steps (and math strategies learned in class) to model how to solve 26 + ___ = 74 to student #2 using the dry erase board.
- 4. Ask student #2 to use the Peer Learner Steps as student #1 explains and models the math skill.

  (During this time the teacher will be walking around the room and observing how students implement the peer partnership steps and how well students can explain the math concept that has been taught for several days).

- 5. Ask student #2 to explain and model their understanding of the math skill (Peer Learner Step #3) to student #1 using the problem: 13 + ___ = 88 on the dry erase board.
- 6. Explain that student pairs will change roles as teacher and learner.
- 7. Display the second set of math problems.

#1 Peer Teacher	#2 Peer Learner
33 + ____ = 92	8 + ____ = 65

- 8. Repeat Steps 2 - 5 as students change roles with new math problems to solve.
  (During this time the teacher will be walking around the room and observing how students implement the peer partnership steps and how well students can explain the math concept that has been taught for several days).

Lesson Reflection/Informal Assessment

Ask students to verbally respond to two questions and record their responses on chart paper.

➢ What was challenging as a peer learner or teacher today?
➢ What did you learn today as a peer learner or teacher?

(The teacher will have an open discussion about student responses and refer to the chart paper before starting the next peer partnership lesson. The purpose is to improve the process for each student throughout the school year).

The teacher will use notes and observations from the lesson to determine (1) which students need reteaching or additional support in learning the math concept, and (2) which students need direct modeling to better implement the peer partnership process.

PHASE IV: SHOW TO GROW - BE A MENTOR PROGRAM
Select 4th and 2nd grade students

This phase will be somewhat of an extension to a program already established at our school. Currently, students in grades 3, 4 or 5 can volunteer to mentor once a week during their recess time. Students generally volunteer in an enrichment class (art, music, media, or PE) to help with younger students in kindergarten or first grade.

The Show to Grow: Be a Mentor Program will focus on 4th grade selected students (from various classrooms) mentoring during a second grade instructional block occuring at the same time as their scheduled recess. It will be set up between the classroom teachers, with an older student paired with a second grade student based on personality, academic needs, and social skills. The peer objectives, instructional steps, and communication stems outlined in Phase I will be explained and utilized during the mentorship period between both students. The math skills can vary depending on the needs of the second grade students.

SAMPLE EMAIL LETTER SENT TO 4th GRADE TEACHERS REGARDING PEER TEACHING OPPORTUNITY:

October 7, 2018

Hello 4th Grade Teachers,

I am working on a peer partnership project as part of a Kenan Fellowship. I wanted to see if some of your students (who I had last year in 3rd grade) could be a math mentor in my room one time per week during your recess? I believe your recess is sometime around 11:50 - 12:30?

I have a list of some girls who I wanted to ask from each of your rooms. I also spoke to Mr. Jarrett *(our principal)* and he suggested I contact you all and either (1) meet with you after school one day for maybe 10 min, or (2) email the names and days for each student in your class if you choose to participate. If we meet in person I could also explain the project.

The students are all girls. They gained so much confidence in math last year and I think this opportunity would continue to positively boost their attitude in this subject area. I would also send a letter home to their parents to let them know they would be helping in my room (if it is alright with you)?

I will make sure they are back in your classroom when they need to be for instruction. Let me know if you can share some of your students once a week during recess, and how you want me to communicate specifics with you. If you do not want any of your students to participate, I completely understand.

I am thinking of starting the mentoring program the week of October 28th. Since there are five of you, I would designate a day of the week for your students to help.

Thank you.

SAMPLE EMAIL LETTER SENT TO THE PARENTS of the 4th GRADERS INVITED TO PARTICIPATE IN THE PEER TEACHING PROGRAM DURING RECESS:

October 17, 2018

To the Parents of _____,

This past summer I took part in a Kenan Fellowship teacher-internship program. Through this program I became very aware of how the teacher-learner relationship extends well beyond the classroom and into the workplace. Many people I spoke with said they learned important skills from other colleagues or mentors. Without this teacher-learner partnership they would not have been able to be in their current position or be as successful at their job. I believe it is important that our students know how to teach their strengths and help one another become successful learners, while also deepening their own understanding through modeling and explaining strategies to others.

I am writing to you about a peer mentorship program I am organizing at school. I have received permission from our principal and Mrs. Henley to invite Samantha to be a math mentor in my second grade classroom one day per week. This would take place during your child's scheduled recess every Tuesday.

I observed the growth and confidence Samantha made last year in 3rd grade and would like for her to share her math abilities, collaborative skills, and modeling strategies with second grade students. I have no doubt she will have a positive impact on the learning of younger children.

The mentor program will begin the week of October 29th. If you give permission, and Samantha would like to participate, then please email me back with a response no later than Wednesday, October 24th. I will then inform Mrs. Henley of which students will be helping in my room.

If you have any questions please email me at: mm.hershey-mason@cms.k12.nc.us.

Thank you

PHASE IV Implementation

2nd and 3rd Grade Curriculum Alignment
NC.2.OA.4: Use addition to find the total number of objects in rectangular arrays; write an equation to express the total as a sum of equal addends.
NC.3.OA.1: Interpret products of whole numbers; e.g., interpret 5 x 7 as the total number of objects in 5 groups with 7 objects in each group.

Time and Location
The lesson and activities will take place in a second grade classroom during a 30 minute peer to peer instructional period of time.

Teacher Materials
- Two large pieces of chart paper displaying the:
    - ➤ Peer Learner Instructional Steps
    - ➤ Peer Teacher Instructional Steps
- Materials and resources ready based on the skill being taught in the session.

Student Materials
- Every student partnership will have two large dry erase lap boards (or one large dry erase table), two dry erase markers and erasers, and one 8 x 11 laminated 100 chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- Students will have access to the Peer Learner and Teacher Instructional Steps by means of a Student Resource Card, or with the steps clearly outlined on a large visible anchor chart (refer to Phases I, II, and III).

Student Prior Knowledge
- Second grade students will have a basic understanding of the math skill they are going to learn about from an older peer.
- Second grade students will have an understanding of, and will have practiced, the Peer Learner and Teacher Steps from their experiences in Phase I, II, and III.

Teacher Preparation
The teacher will:
- Set-up dry erase boards, resource cards, and all materials in the back of the classroom (near the Peer Teacher and Peer Learner Anchor Charts).
- Create a list of the pairings for each day of the 4th grade peer teachers and the 2nd grade peer learners prior to the beginning of Phase IV.

- Plan a weekly lesson for the 4th graders to teach to the 2nd graders.

Lesson and Activities
*Note: This peer to peer partnership is meant to differentiate, build, and expand the knowledge of 2nd graders to higher levels and above grade level content. However, the sessions can be used to reinforce and teach any math skill.

Four days a week (Tuesday-Friday), 3 to 5 students in 4th grade come to the second grade classroom at approximately 11:50 a.m. to 12:30 p.m. The 4th grade students wait in the back of the room while the teacher assigns a few warm-up math problems to the 2nd grade students.

As 2nd graders are working on the grade-level warm-up problems the teacher will:

- 1. Meet with the 4th graders in a group and explain the math skill students will be teaching (in this case, students will explain and model how repeated addition can be shown as multiplication, and how to write and solve mathematical equations using either operation).
- 2. Explain how to teach the skill using the 4 steps on the Peer Teacher anchor chart (this is in close proximity) and modeling the math strategy and computation on a large dry erase board.
- 3. Explain the 2nd graders role as the Peer Learner (quickly review steps).
- 4. Give each 4th grade peer teacher a set of index cards with varied repeated addition equations to use with a 2nd grader.

  Examples:

2 + 2 + 2 + 2 + 2	3 + 3 + 3 + 3 + 3 + 3	6 + 6 + 6

- 5. Students will wait with their materials and the teacher will call the selected 2nd graders to go to the back of the room and work with their partner.
- 6. Peer teachers will use the Peer Teacher Steps to teach the skill.

6 + 6 + 6

This is 3 groups of 6.

3   x   6

# of groups	Amount in each group

You can skip count by 6 - three times on a 100 chart: 6, 12, 18

You can add a doubles fact: 6 + 6 = 12. Then add 12 + 6 = 18.

Multiplication is really adding the same amount (equal groups)
to get the total value (all the groups combined).

- 7. Second grade students will follow the Peer Learner Steps to learn the skill.
- 8. The teacher-learner partnership will continue for 20 minutes using the repeated addition cards.
- 9. The students will then choose prompts from their resource to engage in conversation. The teacher will provide 2-3 minutes for this part of the lesson.
- 10. The 4th grade student gives feedback to the 2nd grade student using the *Positive Student to Student Communication Stems* for the peer teacher.
- 11. The 2nd grade student gives feedback/asks questions to the 4th grade student using the *Positive Student to Student Communication Stems* for the peer learner.
- 12. The session ends and the 4th graders return to their classroom, and the second graders join the rest of the class in working at math stations or on independent math assignments.

Teacher Facilitation Role:
- After the 4th grade peer teacher and 2nd grade peer learner are partnered and begin the lesson, the teacher returns to the front of the room and reviews how to solve the warm-up problems with the rest of the second graders. Next, the teacher gives a mini lesson on a specific math concept, and then students work in a small group, in math stations, or at their seat based on teacher directions.
- The students will have the same peer partners for three consecutive weeks. At the end of the three weeks, the teacher will re-assign a different group of second graders to work with each mentor for another three consecutive weeks.
- The same math skill will be reviewed and practiced for three consecutive weeks.
- The teacher will meet with the peer teachers at the end of each three week session and get feedback about (1) how the 2nd grader is implementing the Peer Learner Steps, and (2) how well the 2nd grader is understanding the math concept.
- The second graders will then teach the same math skill to their classmates.

Assessment (given at the end of Phase IV)

Second grade students will be given five repeated addition equations to (1) write as multiplication equations, (2) find the total amount by using skip counting on a 100 chart or addition strategies.

Name: _____

Directions:
Write the multiplication equation for each addition number sentence. Find the total amount.

   1.)   4 + 4 + 4 + 4 + 4

   2.)   3 + 3 + 3 + 3

   3.)   6 + 6 + 6 + 6 + 6

   4.)   5 + 5 + 5 + 5 + 5 + 5 + 5

   5.)   7 + 7 + 7

PHASE V: "GIRLS DOING MATH" AFTER SCHOOL MATH CLUB

The purpose of the math club will be to develop students' math skills and knowledge using kinesthetic and visual materials, adaptations of real-world activities/problem solving, and peer collaboration. Students will engage in lessons to build on classroom learning, develop higher order thinking, and promote math talk using the peer teaching strategies outlined in Phase 1. Students who participate in the club will be encouraged to take the peer to peer partnership process back to their homerooms to teach other students.

Specifics about the club are listed below:

- When: One-day per week, after school from 3:30 p.m. - 4:45 p.m.
- Where: Teacher's second grade classroom.
- Who: 14-18 female participants, 1 mentor, 1 teacher facilitator
- Grade level: Participants (2nd grade only), Mentors (4th or 5th grade)
- How: Students will apply for the club. An application will be available for students/parents to jointly fill out about (1) why the student would like to join the club, and (2) what math skills the student would like to learn or practice.
  Selection: Students will be selected based on application information (desire to learn, passion for topic, etc.), her homeroom teacher's recommendation, and timeliness of application submission. Mentors will be invited based on teacher recommendation and desire to participate.
- Communication: A formal application will be sent home. Each 2nd grade homeroom teacher will send the information home with the girls in their classroom who would like to apply. Parents will also be notified about the application process and math club through Parent Square, a platform our school uses for school-to-home communication.
- Lessons and activities: These will be created by the teacher facilitator.

INFORMATION TO BE SENT HOME JANUARY 11th TO STUDENTS WHO ARE INTERESTED IN PARTICIPATING.(see below)

AFTER SCHOOL 2nd GRADE GIRLS MATH CLUB

Facilitated by Maggie Mason, 2nd grade DES teacher

Purpose: To explore and practice math concepts through a combination of direct teacher instruction and collaborative peer work. Students will use a variety of hands-on and kinesthetic materials, while integrating mathematical strategies and computational skills, to support their understanding of variety of elementary math standards and real-world application scenarios.

When: Every Tuesday beginning on Tuesday February 5th and ending on Tuesday, March 12th.

Time: 3:30 p.m. - 4:45 p.m.

Location: Room 201 (Mrs. Mason's classroom)

Meeting dates: Feb. 5, Feb. 12, Feb. 29, Feb. 26, March 5, and March 12th

Student Criteria:
- Must be a second grade female student at Davidson Elementary School.
- Committed to meet every Tuesday for 6 weeks.
- Submit the application and letter of intent by **Friday, January 18th** to your homeroom teacher.
- Essay must be written in student's handwriting
- A teacher recommendation must be submitted with the application.

Parent Support:
- Must be able to pick up your child on time at 4:45 pm. each Tuesday.
- Sign the Parent Permission form (to be submitted with student application and forms.
- Provide an extra healthy (quick & easy) snack for your child to have after school if needed.
- Encourage your child to be focused on learning additional math skills and collaborate with others.

IMPORTANT:

*Spots are limited. Please review the dates to be sure your child can attend (illness is an understandable excuse to miss a session).

*Students of all levels, who are passionate about learning math, are encouraged to apply.

*Applications will be reviewed by several staff members.

*Students will be notified on Friday, January 25, 2018.

Email Mrs. Mason if you have any questions about the application process or about the Girls Math Club at: *mm.hershey-mason@cms.k12.nc.us.*

STUDENT APPLICATION

Student's Name: _____

Student's Classroom Teacher: _____

Student's written response to each of the following (on separate lined paper)

1. Why do you think math is important to learn?

2. What are some math skills you want to improve or learn more about?

3. Why do you want to participate in the Girls Math Club?

Teacher Recommendation (to be filled out by your teacher prior to the due date of January 18th):

_____
_____
_____
_____
_____
_____
_____
_____

Teacher signature: _____

Parent Permission Form
(Please print neatly)

Student's name: _____

Parent's name: _____

Parent's phone number: _____

Parent's email address: _____

I give my child, _____ permission to attend the Girl's After School Math Club each Tuesday on **Feb. 5, Feb. 12, Feb. 29, Feb. 26, March 5, and March 12th.**

Parent Signature: _____

I will pick up my child at 4:45 p.m. each Tuesday at the end of the math club.

Parent Signature: _____

Student Intent and Signature:

I _____ will try my best and work with the teacher
         (student's name)
and other students in a responsible and respectable manner during the math club sessions.

Student Signature: _____

Example Acceptance Email Sent to Parents

To the parents of ▮▮▮▮▮▮▮▮▮▮,

I wanted to inform you that our six week session of the Girls Math Club will begin on Tuesday, February 5th. I look forward to working with ▮▮▮▮▮▮▮▮ after school to explore new math concepts and to facilitate her collaborative learning with other girls in second grade.

I'll send out more details next week, but wanted you to know that ▮▮▮▮▮▮▮▮ will be part of a group of 18 girls to begin the club the first week in February! If you have any questions please feel free to email me. Thank you.

**Note, due to the high interest in the club, I added a second six-week session with another group of 14 second grade girls. This session ran every Tuesday from March 19th- April 30th.

Sample Lessons and Activities from the Girls Math Club
Note: During each session the students will practice the concept with hands-on materials (square tiles, cubes, Base 10 blocks, place value charts, dry erase boards and markers, and skip counting floor mats. They will then apply the peer teaching and peer learning models to explain the concept to a partner. Next, they will collaboratively work with their partner to solve a real-life problem together.

(1) Linking Repeated Addition and Arrays to Multiplication, Doubling, and Equal Groups
Understanding Multiplication by 2's, 4's, and 8's and 3's, 6's and 12's as not only equal groups, but as doubling products (by doubling groups) to get other products *(for example, if you know 2 x 6=12, then 4 x 6 is "12 doubled" = 24, and 8 x 6 is "24 doubled" = 48).*

Examples:
How can I find out the product of 8 x 7?
2 x 7 (two groups of 7) = 14,   so 4 x 7 (four groups of 7) = 28,   therefore 8 x 7 (eight groups of 7) = 56
If you double the groups, you double the product because the amount in each group stays the same.

The relationship of multiplying by 2, 4, and 8 is all about doubling!

(double)	(double, double)	(double, double, double)
2 groups	**4 groups**	**8 groups**
2 x 1 = 2	4 x 1 = 4	8 x 1 = 8
2 x 2 = 4	4 x 2 = 8	8 x 2 = 16
2 x 3 = 6	4 x 3 = 12	8 x 3 = 24
2 x 4 = 8	4 x 4 = 16	8 x 4 = 32 …

Real-life Problem: You work at a water park and have to manage a ride called *Water Rapids*. There are 14 total water rafts for the ride. Each raft can hold 8 people. Each raft must have 8 people on it before it leaves the start station and drops into the water. Only half of the rafts can be moving in the water at one time, while the other half of the rafts are getting refilled with new passengers at the start station.

Questions:
1. If the 14 rafts are full at the same time, then how many people are on the rafts in all?
2. If the rafts in the water are all full, but only 5 of the rafts at the start station are full, then how many more people can you let get on the ride?
3. If each raft could only hold 6 people, then how many people could get on the rafts in all?

4. If you have to wait for all the rafts to be filled with passengers before you can let them leave the start station, and you are usually waiting 5 or 10 minutes to get them filled, do you think the park should still require that 8 people be on each raft or 6 people be on each raft? Why? Explain your reasoning.

(2) The Relationship of Multiplication to Division

Understanding the relationship of multiplication and division, breaking apart a whole amount into equal groups and/or rewriting a division equation as multiplication with an unknown factor (24 ÷ 6 = ___ can be written as 6 x ___ = 24. Students make the connection between the whole amount, making equal groups, and having an amount in each group, using both division and multiplication operations.

Examples:
What is 48 ÷ 8 ?   (A whole, divided into 8 groups, equals how many in each group?)
Change to multiplication with an understanding of the whole, the amount in each group, and the number of groups.
8 x ___ = 48   (Students know 8 x 5 is 40, so it is more than 5). They plug in the number 6 and model out the problem.   Therefore, 48 ÷ 8 = 6.

Real-life Problem: You design and make stuffed animals to sell at amusement parks, carnivals, and fairs around the country. You can ship your products in a large box that holds 48 large stuffed animals, or a small box that holds 24 small stuffed animals.

Questions:
1. If you ship 2 large boxes and 1 small box on Monday, then how many stuffed animals will you ship in all?
2. If you have 72 small stuffed animals, then how many small boxes will you need to ship them?

3. A small box holds 24 small stuffed animals. If the stuffed animals are placed in the box in rows with 4 stuffed animals in each row, then how many rows are there in a small box?
4. A large box holds 48 large stuffed animals. If the stuffed animals are placed in the box in rows with 8 stuffed animals in each row, then how many rows are there in a large box?
5. If you have a total of 120 small stuffed animals, then how many small boxes will you need to ship them to an amusement park in North Carolina?

(3) Doubles and Halves
Students will double, and divide in half, large numbers with up to 5 digits. Students use place value, number patterns, skip counting (to support multiplication), and their understanding of fractions to calculate answers.
Examples:
What is half of 392?
What is half of 393?

Double a number and then double the new sum 3 more times. How can this help you multiply and divide?   (8 + 8 = 16, 16 + 16 = 32, 32 + 32 = 64, 64 + 64 = 128)

Real-life Problem: You are a chef at a restaurant. You have two big events coming up, one on Saturday and one on Sunday. You will need to make several strawberry desserts for each event. In order to feed everyone at both events you have to purchase a box of 1,750 strawberries.

Questions:
1. How many strawberries will you have for each event if you divide the box in half?
2. If 35 of the strawberries you ordered are rotten, then how many will you have? Will you be able to divide them into two equal amounts for each event?
3. You also need small disposable bowls to serve the strawberry desserts to your guests. Right now you have 48 disposable bowls. You need 112 bowls for the event on Saturday and 120 bowls for the event on Sunday. How many more bowls do you need? If you double 48 and continue to double the sum two more times, will you have enough bowls for both events? Will you have any extra bowls?

   48 + 48 = X   X + X = K   K + K = _____ (will this sum equal enough for the events?)

(4) The Relationship of Skip Counting to Multiplication and Division
Understanding the relationship of skip counting to multiplication and division, and "seeing" the patterns in the skip counting sequence.
Examples:
3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 41, 44, etc..
The pattern alternates odd/even, odd/even, etc... Why ?
If you know 3 x 2 = 6, then 3 x 4 will be the double of 6.

If you count to the 5th multiple of 3 in the sequence you will know 3 x 5 =15, 15 ÷ 3 = 5.

If you count to the 13th multiple in the sequence you will know 3 x 13 = 39, 39 ÷ 3 = 13.

Real-life Problem: You work an animal hospital. Right now there are 16 dogs, 3 cats, and 1 rabbit staying at the hospital overnight. There are 9 large dogs and 7 small dogs. Your job is to feed the dogs and give them water.

Questions:
1. If each dog needs 4 cups of water during a 24 hour period, then how many total cups of water will you need to provide?
2. If each small dog needs 2 cups of food during a 24 hour time period, and each large dog needs 3 cups of food, then how many total cups of food will you need to provide?

FINAL PHASE: STAFF PRESENTATION
This phase will happen in the Fall (August or September) of 2019.

I will give a presentation to the staff about the entire project and the observed outcomes.

AUTHOR INFORMATION

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