Summer Math	Grade(s) Completed: 1st, 2nd	Educator Guide for Units 1-5
Suggested Paper Color Code: Blue		Math Matters Code for Grade Band: ✎

Summer Math Objectives: To review and reinforce these First Grade skills.

Major Work for First Grade: **NY-1.OA.1 –** Use addition and subtraction within 20 to solve one-step word problems involving situations of adding to, taking from, putting together, taking apart, and/or comparing, with unknowns in all positions. **Note:** Problems should be *represented* using objects, drawings, *and* equations with a symbol for the unknown number. Problems should be *solved* using objects *or* drawings, and equations.

NY Common Addition and Subtraction Situations *(slightly modified CGI CHART)* **Expectations for Grade 1:** To use the whole chart, but not expect mastery of the most difficult until Grade 2.

Math Fluency for First Grade: **NY-1.OA.6b-** Fluently add and subtract within 10. (mixture of just knowing some answers and use of strategies, such as patterns.)

NY-1.OA.8 – Determine the unknown whole number in an addition or subtraction equation with the unknown in all positions. e.g., Determine the unknown number that makes the equation true in each of the equations: $8 + ? = 11$ __ $- 3 = 5$ $6 + 6 = \square$

NY-1.OA.2- Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.

NY-1.OA.3 – Apply properties of operations as strategies to add and subtract. **Note:** Students need not use formal terms for these properties. e.g., To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$.

NY-1.G.3 – Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of.* Describe the whole as *two of,* or *four of* the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

NY Note: The First Grade materials were modified, replacing "compatible numbers" with "making 10."

Summer Math Objectives: To review and reinforce these Second Grade skills.

Major Work for Second Grade: **NY-2.OA.1 –** Use addition and subtraction within 100 to solve one-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions. Mastery of all word problems types on the "Common Addition and Subtraction Situations" Chart by end of Grade 2.

Math Fluency for Second Grade: **NY-2.OA.2a-** Fluently add and subtract within 20 using mental strategies. Strategies could include… using the relationship between addition and subtraction e.g., knowing that $8 + 4 = 12$, one knows $12 – 8 = 4$

Math Fluency for Second Grade: NY-2.OA.2b - Know from memory all sums within 20 of two one-digit numbers. *(By the end of Grade 2)*

Math Fluency for Second Grade: **NY-2.NBT–** Fluently add and subtract within 100 **using strategies** based on place value, properties of operations, and or the relationship between addition and subtraction.

NY-2.G.3 – Partition circles and rectangles into two, three, or four equal shares. Describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc. Describe the whole as *two halves*, *three thirds*, *four fourths*. Recognize that equal shares of identical wholes need not have the same shape.

NY Note: The fractions in the Math Matters materials were modified to stay within partitioning circles and rectangles in two, three and four equal shares.

Educator Packets (one per unit):
- **Target Number** directions and bull's eye with numbers to select *(need a timer)*
- **Family Fun** Game Directions and Answer Key *(helpful: base ten blocks- tens and units, or linking cubes that can simulate tens and ones)*
- **CGI** Directions and Word Problems for grade band *(English and Spanish)*
- **Snack Fraction** of the week directions *(need: paper plate, napkin, plastic knife, snack of the week or substitute)*

Student Packets with both English and Spanish (one per unit):
- **Target Number** bull's eye
- **Family Fun** cards for grade band
- **CGI** Graphic Organizer
- **Snack Fraction** Record Sheet
- **Family Fun** Game Board and "DIY" Game Pieces

Printing Note: Use a different color to print the packets for each grade level. This makes it easier for students in different grade bands to work together. Packets can be print two-sided.

Organization: Each Grade Band has the same four activities, organized in the same order, for each Unit. Students can do the same activity, but use the problems from their own packet.

In-Home Time Management: Students can work together on the Target Number and Family Fun Game. Students use the game cards from their separate Student Packets. The CGI word problems and Snack Fractions, however, often require more focused attention to the individual grade bands.

Summer School Time Management:
1. Warm up each day with Target Number.
2. Create a Daily Routine with the Family Fun game cards. Each row provides practice for different math skills. Select one card from each row. Pose the problems to students. Have the students fold paper into fourths, and then use each fourth to solve the

problem and hold up for you to check. Use three to four each day. (Differentiate for students in different grade bands, so everyone is solving problems, but different problems.)

3. Use the full Cognitive Guided Instruction protocol for the CGI word problems, two times a week.
   a. All students work on the same problem.
   b. Teacher walks between students, quietly asking individuals to explain the strategy/process they are using. This gives students a chance to self-correct.
   c. When most students are done, ask two to three volunteers to share their process. First, they draw on the board, and then they explain.
   d. As the instructor, you are looking for students who use different strategies (i.e. drawing pictures, using tallies, adding on, etc.)
   e. Eventually, use this time for a class discussion about strategies that take more time or less time.
4. Let students play the actual Family Fun game at least once a week.
5. Utilize the extra teaching lessons posted on the website for this grade to fill gaps in learning.
6. Summer School Instructors can bring in extra activities to support the student practice in their math fluency and major works.

GETTING STARTED:

Distribute Student Packets so each student receives the grade band for the grade they completed in June. The packets have a symbol instead of the grade number so Educators can differentiate the math level for students as appropriate.

WARM UP: TARGET NUMBER Directions

The Educator gives students one number. Students have one minutes to write down as many different ways to represent the number. Everyone takes turns sharing what he or she wrote.
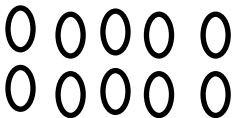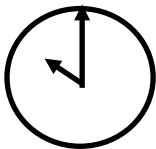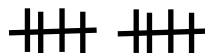
Key Points:
- Students are able to write solutions from their own math knowledge.
- Educators can work in examples related to the student's required math fluency and major works in math.
- The goal is for students to find **multiple and different (correct) responses** rather than limiting students to one correct strategy.

Process:

1. Select the Target Number for today. Students can write the number on their Bull's Eye.
   a. All target numbers are fair to use with students in grades 1 through 8. All ages can start with the numbers 12 and 15. After these, you will need to give students in grades 1 to 8 the higher numbers, and use numbers 20 and under for any Kindergarten (rising First Grade) students in the group.
2. The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
3. Set the timer for one minute.
4. Educators play along, and write examples to share related to the students' required math fluencies:
5. At the end of the minute, students give ONE example at a time, going around the group a couple of times until all DIFFERENT responses are used. Students need to give **different** ways to represent the number. Writing, "7 + 3" is different from writing, "3 + 7". Drawing 7 circles and 3 circles is different from writing, "7 + 3."

Examples of some different ways to represent the number 10:

7 + 3	10 + 0	17 – 7	2 x 5	100 / 10
3 + 7	0 + 10	ten	5 x 2	10/1

One dozen eggs minus 2   2 + 2 + 2 + 2 + 2   100 - 90

FAMILY FUN GAME

All ages of students play the game together. On their turn, students use the game cards from their own packet to solve math problems at their own level.

Key Points:
- Unit 1 introduces the game and some of the Math Matters skills.
- Units 2 through 5 provide students practice all of the core math skills, except fractions, throughout the summer.

Process:
1. Each Student Packet has its own Family Fun Game Cards, allowing each student to participate with students who have different skills to practice.
2. Do not cut the cards apart to play the game. Starting with Lesson 2, the three cards in each row will usually practice the same skill.
3. Instead of students drawing a card, students select a problem from their packets. Students can select problems in the order they choose, BUT ask students to solve one problem from each row, before repeating from the row, so they practice each skill.

a. Many students will read ahead, solving problems, to find the "easiest" ones while waiting for their next turn.
4. Game Directions are on the game board. Game boards are at the end of each Student Packet, so they are easy to pull off and use.
5. The best way to move around the board is to use dice. The Student Packets have a "Do It Yourself (DIY)" version to toss a small wad of paper onto a board of numbers.

CGI CHARTS

CGI is the **C**ognitive **G**uided **I**nstruction for primary students to solve math word problems. With a few changes, this chart is in New York State's Next Generations Learning Standards for Pre-K to Grade 2, titled, "Common Addition and Subtraction Situations." *(A copy of this chart is located at the end of this Educator Guide.)*

Key Points:
- NYS Next Generation Learning Standards include the same CGI Chart of word problems, with a few changes:
    - o In the Educator Packets, the terms on the original (English) CGI Chart have been updated to represent the Next Generation terminology changes.
    - o NYS Next Generation Learning Standards add a new category of word problems called, "Both Addends Unknown." This new category has not been added to these summer math packets.
- The CGI process allows students to solve the problem in a way they understand, instead of the "right" way.
- Provides the Educator insight about the student's math knowledge.
- Asks students to explain their solution process before asking for an answer.
- When there is a group of peers, the emphasis is on finding different solution paths, rather than one correct method.
- Eventually this can lead to a real discussion: Does a student's method work for him or her? Has the student seen another method they are ready to try?

Process:
1. *Select one word problem.* The easiest wording to understand is in the top, left corner of the CGI Chart. The wording is more difficult as you move left and down.
    a. Start students with the simplest word problems.
    b. If a student struggles, stick with these for the summer so the student becomes secure. If students are confident, move to questions to the left, or down, to increase their understanding.
    c. FYI -The word problems with a STAR on the CGI Chart are the problem-types targeted on the Grade 1 Assessment. ★ The word problems with a TRIANGLE are targeted on the Grade 2 Assessment. ▲

2. Have manipulatives and paper/pencil available for students to choose either medium for solving the problem.
3. ***Read the problem to students once***. **Note:** Each problem has three sets of numbers for you to choose from to fill in the blanks. Use the set that works best for the student(s).
4. ***Use the Graphic Organizer*** to help students organize their notes and strategies.
5. ***Read the problem again, and then teach students to take notes.*** (As students demonstrate confidence, shift to giving students a chance to take their own notes.)
   a. Prompt students with questions, and model writing notes. Use the Graphic Organizer.
   b. Sample questions: What does the problem tell us first? [*Tod has $3*] How can we write? [*T = $3 (or a drawing)*]
   c. What happens next? [*Tod needs more money to buy a toy that costs $8*] How can we write? *[toy = $8]*
   d. What question do we have to answer? [*How many more dollars does Tod need to save?*] How can we write this? *[Save ___ more dollars]*
6. Give students time to solve. *(If struggling, prompt with, "What number does the problem start with?" Do you want to draw this or use manipulatives to recreate it? Then what happens?)*
7. Ask students to explain their process before asking them for an answer. This allows students time to self-correct and gives the Educator a clue about how the student is thinking.
8. At the end, look at the final answer together, to decide if it solves the problem. How would you say the answer in a sentence? *[Tod needs to save $5 more.]*

Summer School Note: How to extend this to the full CGI process.
Walk around the group, quietly asking individuals to explain their process to you. When students seem stuck, prompt by re-asking them about their notes.

Take time to ask two to three volunteers to copy their process on a white board or large piece of construction paper. Then ask the students to explain their procedures. When selecting volunteers, it is a good idea to look for different strategies that are successful, instead of one, "best" method. The variety of examples and explanations will give all students a stronger understanding about math works.

Planning Note: In the original design, the word problems in the CGI Chart used the characters and events from one particular book, listed at the top of the chart. The class spent three days rereading and using the characters and plot from the one book.
While not as rich an experience for students who are not immersed in the particular story, the word problems still serve as good examples for the variety of one-step word problems.

Educator Note: Math Matters adds a new row of problems word problems in Grade Band 1-2 for practicing repeated addition and subtraction, otherwise known as multiplication and division.

SNACK FRACTIONS

Students separate a snack into a fractional portion. Decide if the portions are equal. Then eat.

Key Points:
- Equal portions matter when sharing real food
- All students use the same snack food
- Using the record sheet helps students transfer from the real to the symbolic

The Math Matters In-Home curriculum uses the following snacks:
- Unit 1 = String Cheese
- Unit 2 = Cup of Trail Mix
- Unit 3 = 6 pieces Beef Jerky
- Unit 4 = 100 calorie snack bags
- Unit 5 = 4 Graham Crackers and Nutella

Planning Note: Substitute snacks as needed to travel in cars and to fit the budget. If possible, have the substitute snack match the shape or number of the original, so the Fraction Record sheet still makes sense. For example, substituting something rectangular, like a breakfast bar, for the string cheese, or substituting a package with 6 cheese cracker sandwiches for the 6 pieces of beef jerky.

Summer School Note: The original Math Matters Summer School curriculum suggested the following snacks:
- Unit 1 = Apple, ice cream sandwich, string cheese
- Unit 2 = Guacamole and carrots, trail mix, cherry tomatoes and cheese
- Unit 3 = Dill pickle, beef jerky, raisin bread and banana
- Unit 4 = Fruit kabob, 100 calorie snack bag, graham cracker and peanut butter (check for allergies to peanut butter)
- Unit 5 = Laughing Cow cheese wedges, graham crackers and Nutella and strawberries (check for allergies to Nutella), bagels and cream cheese
- Unit 6 = Turkey wrap, personal pan pizza

Process:
- ***Use the Snack Fraction guidance*** in the Teacher Packet and Snack Fraction Record sheet in the Student Packet

Alternative Process:
- *Single student:* splits the food in the fractional amount practicing (half, fourth, third, etc.) and Migrant Educator discusses with student – are they fair shares? Are some portions larger/smaller? Have the student draw and write the fractional portion of a whole.
- *Partners:* each has whole food. Each splits the food in the fractional amount practicing (half, fourth, third, etc.) but the partner picks the portion (half, 2/4, 3/6) first. Have the students draw and write the fractional portion of a whole.

Recipe Note:
Trail Mix: (mix equal parts of each of the following)
- Peanuts, M&M's, Fish crackers (check for allergies to peanuts); or
- Chex Corn Cereal, Cheerios, dried fruit

(Optional) SUMMER ASSESSMENTS

Formal Summer Assessments

The formal Summer Assessments are based on the grade that a student completed. A student who completed Second Grade in June, but might be considered a (rising) Third Grader in the summer, should take the Summer Assessments for Grade 2. The questions are based on end-of-year mastery to maintain core math skills over the summer.

Note: Grades 1 and 2 receive the instruction together, but the students are assessed with different a pre-/post-tests. Each has different supplies to support the student.
- **Grade 1** uses a single crayon (✏) to code the papers students can see.
    - ***For Grade 1, the Educator has a script to read*** the full questions/problems to the student and the student has a student copy with fewer words to follow along and use to solve and write answer on.
    - ***Extra Grade 1 Supplies:*** 30 counters, a real sandwich and cutting supplies or scissors to cut the paper version attached to the assessment.
- **Grade 2** uses two crayons (✏✏) to code the papers students can see.
    - ***For Grade 2, the student has a student copy to read the questions and solve on his or her own.*** The Educator can assist the student with reading at this level, if needed.
    - No extra supplies suggested for Grade 2.

Next Generation Modifications: These assessments started as the Math Matters pre-tests and post-tests in English and Spanish. The assessments are now modified to align with the *New York State Next Generation Mathematics Learning Standards.*
- In the Grade 1 (✏) Assessments, the phrase "compatible numbers" was removed. Students just need to know "making ten."

- In the Grade 2 (✐✐) Assessments, identifying fractions in two, three, four, six or eight equal shares has been modified to identify halves, thirds, and fourths.

Informal Assessments

Educators can observe when a student is able to complete the problems or not. When gaps in knowledge are observed, Educators can re-teach to those skills, to close the gaps in learning. When a student can complete a skill on his or her own, it is important for the student to continue practicing the skill to avoid summer loss.

CLOSING THE GAPS

Use this section for ideas when a student struggles with a particular skill.

Get curious and ask yourself:
- *Is this a NYS skill for a student who just completed First or Second Grade?*
- *Does the student just need a reminder and more practice?*
- *Did the student need a full lesson to re-introduce the skill?*
- *Does the student need to have both the English and Spanish packets to work with?*

You can follow up the next lesson:
- Plan to utilize your own examples during next week's "Target Number" to support this skill. At the beginning of Family Fun, use one of the game's examples to review the skill before playing the game.
- Review the Skill Lessons posted on the website for this grade band, to teach/ reteach the Summer Math skill for individual students.

Math Matters Note: These lessons were written for a classroom, and are called "TV Lessons" because they were also scripts and videotaped during Math Matters. For example, each lesson has a part for a puppet named Azulito. You will need to preview so you can adapt the script to your students and situation.

Lessons Posted (nysmigrant.org, Resource Library, Summer Math, Grade Band 1-2, Math Lessons)

NY-1.OA.3- (Make ten) Apply properties of operations as strategies to add and subtract. (e.g., to make a ten first, when adding 2 + 6 + 4)
- Lesson references the math term, "Compatible Numbers," but NYS uses, "make ten."
- Supplies for Students
  - Two colors of linking cubes, 10 of each color (or substitute 20 counters)

NY-2.OA.2a-(Fact Families) using the relationship between addition and subtraction e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4; and

NY-1.OA.8- Determine the unknown whole number in an addition or subtraction equation

- Students use graphic of a house to make the addition/subtraction Fact Families from set of numbers.
- Supplies for Students
    - Two colors of linking cubes, 10 of each color (or substitute 20 counters)

NY-2.NBT- fluently add and subtract within 100 ***using strategies*** based on place value

- Part 1 introduces students to the basic understanding for the addition and subtraction of two-digit numbers, requiring "regrouping." Students begin by using the base ten blocks to represent quantities on place value chart, then move to using numbers on a place value chart.
- Supplies for Students
    - Base Ten Blocks: (1) Hundred flat, (13) tens, (18) units
    - (4) 6-sided dice

Internet Access Note: On-line Base Ten manipulatives can be used on the coolmath4kids website: https://www.coolmath4kids.com/manipulatives/base-ten-blocks

NYS Next Generation Expectations for Kindergarten, Grade 1 and Grade 2 Common Addition and Subtraction Situations

e.g., using objects or drawings to represent the problem

In the chart below, *the four unshaded (white) subtypes are expectations in Kindergarten.* Grade 1 and 2 students work with all subtypes. Darker shading indicates the four difficult subtypes that students should work with in Grade 1 but need not master until Grade 2.

		Result Unknown	**Change Unknown**	**Start Unknown**
Common Addition and Subtraction Situations	**Add To**	A bunnies sat on the grass. B more bunnies hopped there. How many bunnies are on the grass now? $A + B = \square$	A bunnies were on the grass. Some more bunnies hopped there. Then there were C bunnies. How many bunnies hopped over to the first A bunnies? $A + \square = C$	Some bunnies were sitting on the grass. B more bunnies hopped there. Then there were C bunnies. How many bunnies were on the grass before? $\square + B = C$
	Take From	C apples were on the table. I ate B apples. How many apples are on the table now? $C - B = \square$	C apples were on the table. I ate some apples. Then there were A apples. How many apples did I eat? $C - \square = A$	Some apples were on the table. I ate B apples. Then there were A apples. How many apples were on the table before? $\square - B = A$
		Total Unknown	**Both Addends Unknown**	**Addend Unknown**
	Put Together / Take Apart	A red apples and B green apples are on the table. How many apples are on the table? $A + B = \square$	Grandma has C flowers. How many can she put in her red vase and how many in her blue vase? $C = \square + \square$	C apples are on the table. A are red and the rest are green. How many apples are green? $A + \square = C$ $C - A = \square$
		Difference Unknown	**Bigger Unknown**	**Smaller Unknown**
	Compare	"How many more?" version: Lucy has A apples. Julie has C apples. How many more apples does Julie have than Lucy?	Version with "More": Julie has B more apples than Lucy. Lucy has A apples. How many apples does Julie have?	Version with "More": Julie has B more apples than Lucy. Julie has C apples. How many apples does Lucy have?
		"How many fewer?" version: Lucy has A apples. Julie has C apples. How many fewer apples does Lucy have than Julie? $A + \square = C$ $C - A = \square$	Version with "Fewer": Lucy has B fewer apples than Julie. Lucy has A apples. How many apples does Julie have? $A + B = \square$	Version with "Fewer": Lucy has B fewer apples than Julie. Julie has C apples. How many apples does Lucy have? $C - B = \square$ $\square + B = C$