

**Topic:** Adding and subtracting whole numbers

**Essential Questions:**

* What are addition and subtraction and when do we use one over the other?
* Why do we need to know how to add and subtract?
* How does adding and subtracting help us in real life?

**Primary Content Objectives:**

Students will **know:**

* Students will know addition is joining two or more numbers (or quantities) to get one number (called the sum or total).
* Students will know subtraction is finding how many are left when some are taken away.
* Students will know whole number is the set of all counting numbers from zero to infinity.
* Students will know difference is the result that you get when you subtract one number from another.
* Students will know sum is the total or whole amount; the result of adding.

Students will **understand:** that addition means putting things together and that subtraction is the inverse of addition and means to separate things out.

Students will be able to **do:**

* Students will be able to combine two sets with known quantities in each set and count the combined set using up to 10 concrete objects to determine the sum, where the sum is not greater than 10.
* Students will be able to remove, take away, or separate part of the set and determine the result when given a set of 10 or fewer concrete objects.
* Students will be able to collect and record numbers (augend, addend, sum, minuend, subtrahend, and difference) on the addition and subtraction worksheet.
  + Note: Students don’t necessarily have to know the meaning of augend, addend, minuend, or subtrahend. These words are written just for teacher’s information. Students will focus on the meaning of sum, difference, and the key vocabulary words below.

**Related state or national standards:**

K.6 The student will model adding and subtracting whole numbers, using up to 10 concrete objects.

**Assessment: (**How (and when) will students be assessed? What evidence will you collect to determine whether students have met the lesson objectives? Will the assessment(s) be a pre-assessment (diagnostic), formative (ongoing feedback) or summative?)

Before the read aloud, teacher will pre-assess students by asking, “Does anybody know what addition and subtraction mean?” This will help teacher get a sense of how many students are familiar with the concepts. During the mini-lesson and the activity, teacher will formatively assess students by observing them. Ask, “If I gave one of my fish to Michelle, does that mean I have to take away 1 or add 1?” An example response may be, “Take away!” Make sure you ask why to know if they have a solid understanding of the concepts. If the student doesn’t seem to support his or her answer, say, “You are right in that we have to take away one. But, it’s also very important that we know how to explain why. We are taking away 1 because when you give 1 away, you lose 1.” During the mini-lesson, teacher will envision how to group students for the best effectiveness of the pair activity. After the activity, everyone will turn in his or her addition and subtraction worksheet for a summative assessment. Specifically, teacher will look for the number of completed equations and accuracy. This worksheet will show if they fully understood the concepts of addition and subtraction as well as their level of adding and subtracting skills (how far ahead/behind) to provide them more appropriate supports in the future lessons.

**Materials and Resources:**

Math for All Seasons by Greg Tang Illustrated by Harry Briggs, Goldfish crackers in different colors, fishbowl template (one per student), blank addition and subtraction worksheet (one per student)

**Key Vocabulary and Definitions:**

* **Addition:** joining two or more numbers (or quantities) to get one number) called the sum or total)
* **Subtraction:** finding how many are left when some are taken away
* **Whole number:** the set of all counting numbers from zero to infinity
* **Difference:** the result that you get when you subtract one number from another
* **Sum:** the total or whole amount; the result of adding

**Lesson Procedures:**

1. **Introduction and goal orientation:**

Introduce the concepts of addition and subtraction by reading aloud *Math for All Seasons* by Greg Tang to the whole class. This literature book contains lots of pictures that are visually appealing and math riddles that will stretch their minds. Before reading, make sure to discuss the meaning of addition and subtraction with class. Ask, “Does anybody know what addition and subtraction mean?” just to get an idea of how many students are familiar with the concepts. After hearing some answers from students, explain their meaning clearly as well as today’s objective. “Since many of us are not familiar with addition and subtraction, we’ll start with a very fun book called “Math for All Seasons. Are you guys ready to listen?” Start reading to students and during the reading, have students solve the riddles and explain how they came up with their answers. For struggling students, provide scaffolds by saying, “Look at the pictures on this page. It will help you solve the riddle.” After the reading, say, “Just like you’ve just seen in the book, we’ll try adding and subtracting ourselves now!” (~15 minutes)

1. **Connecting to prior knowledge and experiences: (Questions or activities that help students make links)**

Rather than jumping right into the pair activity, provide them a mini-lesson on addition and subtraction using the fishbowl template and different-colored Goldfish crackers. “My friend Michelle has 2 blue fish and I have 3 red fish and we’ve decided to share a fishbowl. How many fish do you think we’ll have in the fishbowl?” Some examples of students’ responses may be, “Four!” “Five!” “Two!” (Can be any random number) Say, “Okay, it looks like most of you said five (most repeated answer). So now, let’s see if we’ll have four fish total. I’m going to put Michelle’s 2 blue fish and my 3 red fish into this fishbowl.” Add all five fish into the fishbowl and ask, “Okay, now that I’ve added all of our fish into the fishbowl, how many fish do I have in it?” Students will say, “Five!” After repeating this step a few more times, introduce them the concept of subtraction. Say, “My friend Michelle came over and when she saw my fishbowl, she was surprised. Michelle thought my red fish were so beautiful so she asked me if she could have one of my fish. Thinking that I already have enough, I decided to give one of them away. After giving away 1, how many fish will I have left?” Repeat this step a few more times. *This mini-lesson will get students involved and excited to learn about addition and subtraction since we’re using the snack that they love (Goldfish crackers). Additionally, involving our close friends and neighbors as examples in the stories will allow them to realize that we use addition and subtraction almost every day in our lives.*  (~10 minutes)

1. **Tasks and activities: (What challenging tasks and activities will students engage in as they construct knowledge, learn new skills or behaviors and develop understandings?)**

After the mini-lesson, have them try it themselves with a partner. They will be given different-colored Goldfish crackers, a fishbowl template, and a blank addition and subtraction worksheet (one per student). Students will use the first half of the time to focus on addition. One student will briefly talk about their story and the other student will use the Goldfish crackers to solve the problem. Then, she/he will write down the numbers and their answer on their addition and subtraction worksheet. For example, if a student says, “I had 1 fish and my mom gave me 1 more for my birthday gift,” then the other student will take one red Goldfish and one blue Goldfish and put them into the fishbowl. Since she sees 2 Goldfish total in the fishbowl, she will write 1+1=2. After about 7-8 minutes, they will work on subtraction. During the activity, teacher will come around to observe them and provide formative feedback and scaffolds. Some example feedbacks and scaffolds may be “Wow, that’s a great work you’ve done here! I love the way you put the fish by their color.” and “It’s really great how you are moving these different-colored Goldfish crackers around to find the answer. Now, can you please explain how you got a 8 there? [Pointing at 4 + 3= 8]” The student may say, “Umm…because I have 4 green fish and 3 yellow fish so I have…[Counting in her head quickly using fingers] …3, 4, 5, 6, um…8!” “Okay, you need to watch out. What comes after 6? Let’s count out loud. [Counting out loud together] 1, 2, 3, 4, 5, 6, [Waiting for her to say the number]” “7!” “Good! So what do you think you should have here as your answer?” “7!” “You’re right! Counting out loud usually helps a lot when you don’t remember what number comes next.” (~15 minutes)

1. **Closure: (How will you wrap up the lesson and reinforce key ideas? Closure may include some form of assessment or exit slip)**

Teacher will gather students back on the rug and review the vocabulary words with them. Ask, “Do you guys all know what addition and subtraction is now? Show me a thumbs up only if you know what it is.” Even though every one may show thumbs up, it’s likely that there will be some students who are still not sure. For these students, it’s crucial to review when closing. To make sure if they really know the meaning, ask “Michael, can you please explain what addition is?” Some example responses may be “Putting things together...?” “I forget.,” “Finding how many are left!” To clarify any type of confusion, say “It looks like some of you are still getting addition mixed up with subtraction. You want to know a secret way of remembering which is which? In the word ‘addition,’ there’s the word ‘add’ which makes it so much easier for us to remember!” You can also repeat the meaning of addition and subtraction by saying, “Addition is joining two or more numbers and subtraction is finding how many are left after you take away some.” (~5 minutes)

**Accommodations for individual differences:** How will you modify the content (what is learned), the process (how the content is mastered) or product (how the learning is observed and evaluated) to support diverse learners? Describe additional supports that can be used for re-teaching if needed, and a challenging extension for students for demonstrate mastery quickly or show evidence of a lot of prior knowledge.

**Grouping:** Teacher will group students according to their math levels to maximize the productivity and the efficiency of this activity; teacher can still group above level students with the average level students but not above level with below level students.

**Gifted:** During the activity, gifted students will be asked to use three or even more numbers to add and subtract. To assess how far ahead they are, they will be given a different addition and subtraction worksheet (where they can add 3 or more numbers) to fill out.

**Struggling students:** Students who are still struggling with counting numbers will be put into small groups of students in similar needs and work with the teacher. Have them practice counting numbers a few times and show them how to add and then subtract (only if time allows) using the different-colored Goldfish crackers. Start with adding or subtracting 1 and then increase the quantity of addends and subtrahends as you go.

**ELLs:** Have ELLs work with a partner who speaks their native language to get assistance. Their partner will explain the instructions in their language so they would understand what exactly they are expected to do in this activity.

**Bibliography**

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Fishbowl template Blank addition worksheet

 