GRADE 1 & 2 MATHEMATICS: Animals and Apples

Summary of Learning Opportunity

In this exciting Grade 1 and 2 class we have been working on composing and decomposing number sets, connecting to the process of addition and different ways to represent composition and decomposition of sets and addition. We started this lesson with a number talk about adding 3 numbers (Grade 1) and adding two-digit numbers (Grade 2). We discussed different ways that numbers could be composed, and using different ways to represent numbers. The students next moved onto individual tasks, to read a written problem and show on paper the multiple ways they could come to the solution.

Mathematics 1 and 2	**Learning Standards**	**Competencies**	**Understanding and solving** • Develop and use multiple strategies to engage in problem solving **Communicating and Representing** • Represent mathematical ideas in concrete, pictorial and symbolic forms
		Content	**Grade 1** • Ways to make 10 • Addition and subtraction to 20 (understanding of operation and process) **Grade 2** • Addition and subtraction to 100

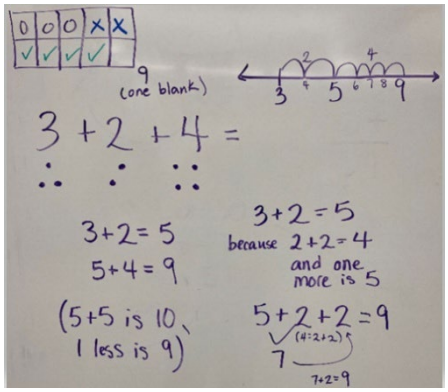
Foundational Math Connections

MATHEMATICS: Computational Fluency – *Understanding of Operations*

Instruction and Assessment

1. Students participated in two number talks as a warm-up–one geared towards Grade 1 learning standards and the other to Grade 2 learning standards. As students shared how they might solve the question, I wrote their ideas on the board.

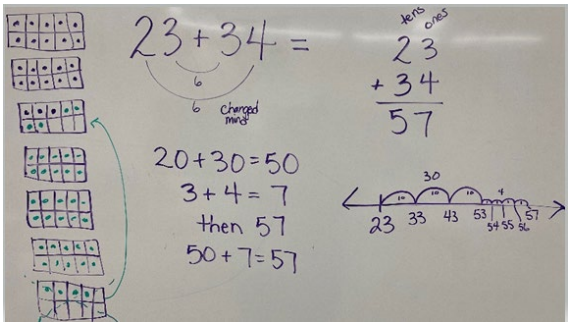
Grade 1: Expression 3 + 2 + 4 =



The students needed some prompting (the ten frame and number line), but the other strategies emerged organically such as pairing, counting, decomposing and near doubles.

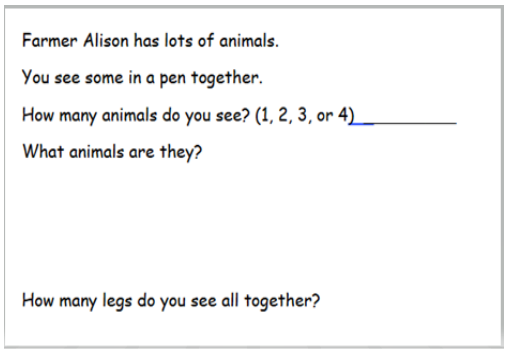
Grade 2: Expression 23 + 34 =

The students offered these strategies, including the tens frame and number line, without prompting. One student decomposed the numbers into tens and ones, then added the parts according to place value. Another student suggested moving the dots from the incomplete frame of the 34 to the incomplete frame of 23 to show that the ones added to 7.



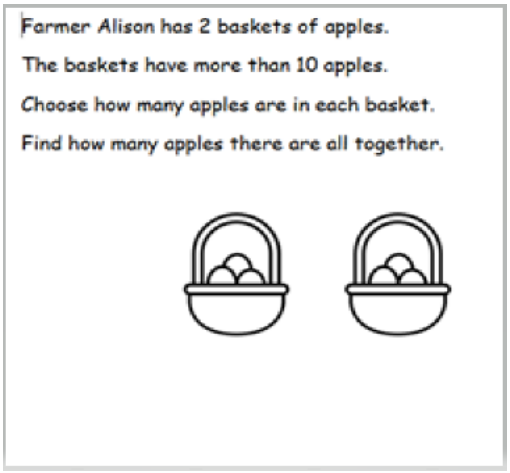
MATHEMATICS: Computational Fluency – *Understanding of Operations*

2. The two independent tasks were introduced to students. I asked the students to use more than one method to show how they got to the solution. I reminded them of some of the strategies from the warm-up and provided popsicle sticks, ten frames, and counters as tools if needed.



Grade 1 task

3. As the students worked individually, I circulated the room to provide encouragement and clarification as needed. I sat down with many students to look at their work and have a conversation to clarify and explain their thinking.



Grade 2 task

Grade 1 – Understanding of Operations

Not Yet	Proficient	Extending
	• Compose and decompose sets up to 20 using concrete, pictorial, and symbolic forms to demonstrate understanding that addition brings sets of objects together and subtraction represents taking away from a set, or the difference between two amounts • Demonstrate understanding that addition and subtraction are related/opposite operations (e.g., show fact families such as 12 + 6 = 18 and 18 – 6 = 12 by connecting and disconnecting interlocking blocks) • Use computational and mental math strategies such as doubles, making groups of 10, and counting on from a starting number, to demonstrate understanding of addition and subtraction for numbers up to 20 • Solve contextual addition and subtraction problems o Choose the appropriate operation and strategy to solve a contextual problem o Explain their thinking using mathematical language (e.g., "I added the two sets because I needed to see how many I had all together.")	

Grade 2 – Understanding of Operations

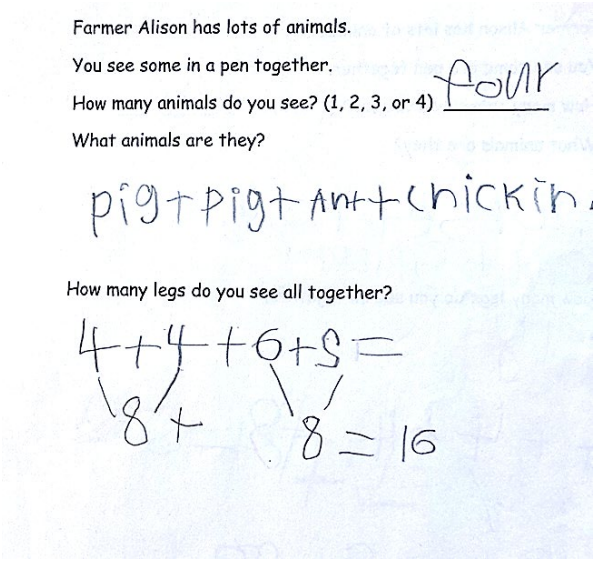
Not Yet	Proficient	Extending
	• Demonstrate understanding that addition brings sets of objects together and subtraction represents taking away from a set, or the difference between two amounts, for numbers up to 100 o Use computational and mental math strategies such as doubles, decomposing by place value, and compensating o Represent addition and subtraction using concrete, pictorial, and symbolic forms (e.g., number line, hundred chart, writing equations for ways to make 12) o Estimate sums and differences to 100 • Solve contextual addition and subtraction problems o Choose the appropriate operation and strategy to solve a contextual problem o Explain their thinking to others using mathematical language (e.g., "I subtracted because I want to see how many more they have than I have.")	

I made an assessment table for each grade using the proficiency descriptors for the sub-skill Understanding of Operations in the K-4 Mathematical Foundational Learning Progressions

Demonstrations of Student Learning and Teacher's Assessment

Teacher's Reflection

The K-4 Foundational Math Learning Progressions informed my planning, teaching and assessment. The assessment table for each grade provided me a snapshot of what I would be looking for in this task. Using the assessment tables as I circulated the class led to deeper questioning about the students' processes and strategies. It also showed me which students to target for more support and practice to meet the proficiency descriptors, and what I need to focus on for whole group instruction. I observed that the Grade 1s use more pictorial representations (pictures, tally marks) and weren't showing other strategies/tools like related doubles or number lines. Grade 2s were quite limited in the strategies they were using. I made a note to myself to focus further learning activities on developing more strategies for addition and then relating these to subtraction. I was also able to see other skills (such as subtraction) that I would need to teach and assess to get a full picture of a student's achievement level for this sub-skill.



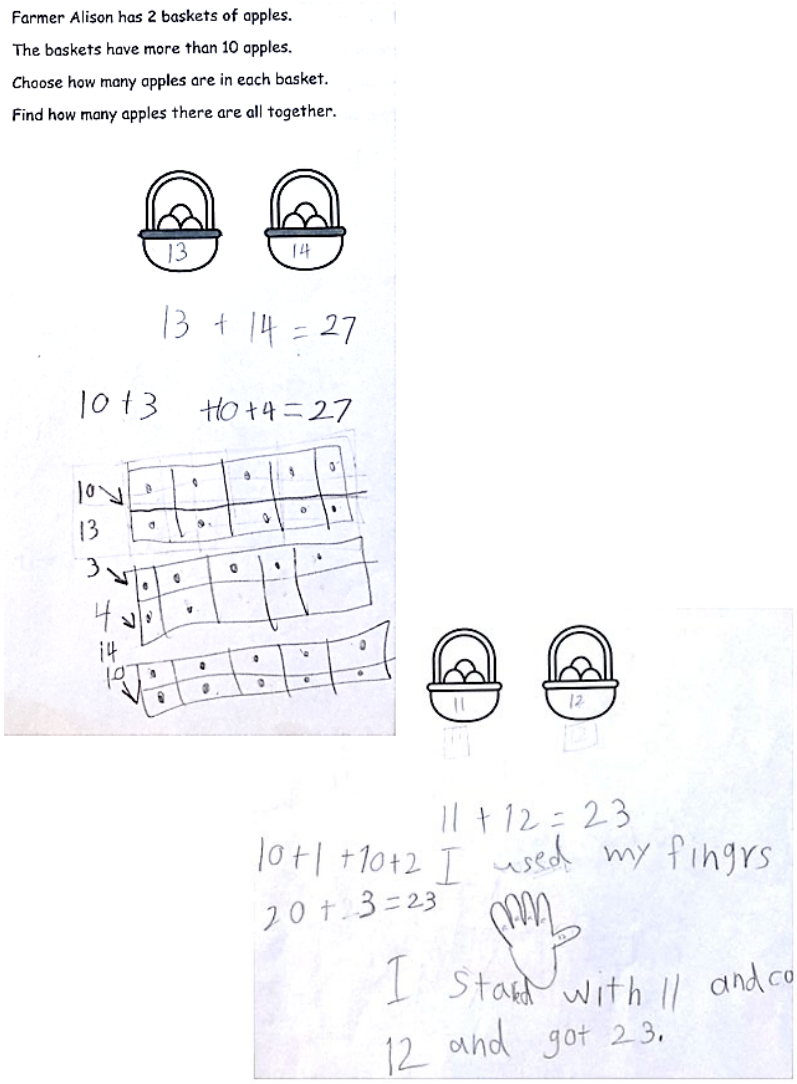
Student A (Grade 1)

Proficient

This student uses an effective computational strategy for addition (pairing numbers in a string). They paired the first two numbers to make 8 and then rewrote the equation as 8 + 8 = 16. They represented their thinking with numerals. Further conversations with the student revealed they know and understand strategies for decomposition and that they have knowledge of double facts.

Student A can accurately and consistently compose numbers to 20.

When I inquired how he knew 8+8 is 16, he explained and showed that he uses decomposition and rearranging (commutative property). He said, "5 plus 5 equals 10, and 3 plus 3 equals 6." I confirmed with him that he broke down 8 into 5+3 and used doubles facts.



Student B (Grade 2)

Developing

In the Grade 2 task, Student B accurately drew ten frames to show that 13 + 14 = 27. However, the student's explanation revealed that they counted the dots in the ten frames rather than using a computational strategy as outlined in the K-4 Foundational Learning Progressions. I explained to the student that the ten frames with the ones digits (3 and 4) could be drawn as a single ten frame, which would contain 7 dots. Together, we re-wrote their number sentence by decomposing each number into tens and ones, then adding by place value (10 + 3 + 10 + 4 = 20 + 7 = 27).

The student chose to repeat the task with different numbers. This time, Student B first used their fingers to show 11 + 12 = 23. The student then independently demonstrated the computational skill of decomposition and adding as we had practiced in the first task.

Although this is good evidence that the student is applying computational strategies to solve addition equations, I would like to observe their independent thinking process in more learning activities to ensure that they have reached Proficient.