Strands of Mathematical Proficiency
(UCARE Framework)

Strand #1 - Understanding
1. More than isolated facts & procedures.
2. Understand connections & what context the math is most useful in.
3. Able to generalize → transfer to other situations.
4. Less to learn & can see common patterns.
5. Avoid mistakes.

- Knew x, to get total # of leaves
- Knew there was more than x ÷.
- Skipped unnecessary steps
- Understood ratio of 2:5, so we got the correct answers
- Patterns of 2x+5

Understanding
- Recognizing patterns in math
- Knowing more than isolated facts
- Connecting ideas
- Solid understanding alerts children to errors

- Knowing and applying basic skills, e.g., skip counting, etc.
- Understanding that every Z caterpillars eats 5 leaves
- Understanding what each of the three different numbers mean in the problem

Computing
Key Ideas:
- Learning procedures abstractly and concretely (using manipulatives)
- Carrying out math procedures flexibly, accurately, efficiently, and appropriately in different branches of math

- Use the appropriate procedure
- Table encouraged accuracy
- Multiplying 2.5/2 was efficient

Procedures fluency
- Fluency means efficient, accurate, and flexible
- Skills vs understanding
- Through computing, students learn math is predictable

- Drawing the picture or table
- Accurate skip counting
- Multiple representations
- Understand problem to choose appropriate strategy/tool
Applying

1. Use the correct strategy to solve/attack a problem
2. Use conceptual understanding to solve non-routine problems
3. What is known and relevant from what is unknown
4. Find relationship between 5 leaves & 2 caterpillars -> or 1 caterpillar & 25 leaves
5. What numbers & how?
6. Skip counting.

Applying

1. Knowing when and where to use an appropriate strategy.
2. Use what they learn in the classroom and apply them in non-routine situations.

Reasoning

1. Reasoning is the glue that holds mathematics together.
2. Justify their procedure helps students to develop reasoning skills.
3. Using logical to solve the unknown.

Reasoning

1. Reasoning interacts strongly with the other strands of mathematical proficiency.

Engage:

- Growth mindset → effort
- Relate to real-life contexts → worthwhile
- Math identity → problem solver
- Productive struggle → frequent opportunities to engage with
- Entry point for differing levels of learners
- Real-world context
- Different ways to solve
- Adapt and extend task if needed

Engaging

- Makes sense
- Fit together logically & sensible
- Believe your capable
- Frequent opportunities

- Reread
- Talk about what they were asking
- Draw a picture