GRADE 2/3 MATHEMATICS: Planning the School Garden

Summary of Learning Opportunity

The students engaged in a multi-day investigation to determine what should be planted in the 18 garden beds in the school garden. During this investigation, students conducted research using tablets to learn about compatible plants, referred to planting guides on the internet, learned about the importance of pollinators using books and videos and considered ratings of past garden plant successes from the teachers' garden committee. The students practiced foundational mathematics learning by collecting data from their classmates and plotting their findings using tally marks and bar graphs. They used their data to decide the best plants and arrangement for the school garden, explaining their reasoning in writing.

Mathematics 2 and 3	**Learning Standards**	**Competencies**	**Reasoning and analyzing:** • Use reasoning to explore and make connections • Model mathematics in contextualized experiences **Communicating and representing** • Explain and justify mathematical ideas and decisions
		Content	**Grade 2:** • Pictorial representation of concrete graphs, using one-to-one correspondence **Grade 3:** • One-to-one correspondence with bar graphs, pictographs, charts and tables

Foundational Math Connections

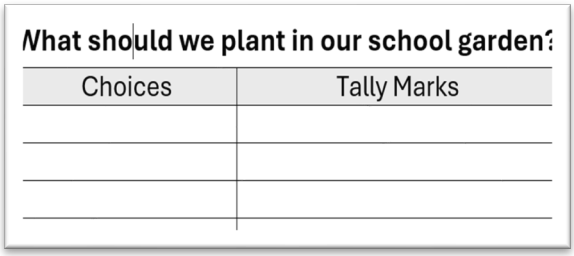
Instruction and Assessment

MATHEMATICS: Data and Probability (Data Literacy) – Understanding, Analyzing, and Communicating Data

1. Students researched and planned a proposed spatial layout of the garden using various resources. I included sources which presented information using tables or graphs, such as this regional seed guide with tips for water, fertilizer and sunlight needs. As a class, we discussed how to interpret these sources, e.g. arranging plants with similar water and sunlight needs in the same garden bed.

MATHEMATICS: Data and Probability (Data Literacy) – Understanding, Analyzing, and Communicating Data

2. Students then created and conducted a survey on other students about their plant preferences. They recorded data using tallies.



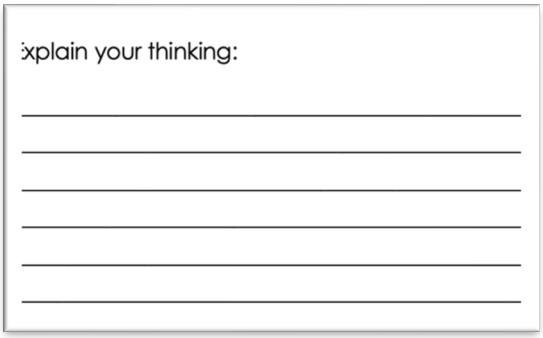
What should we plant in our school garden?

Choices	Tally Marks

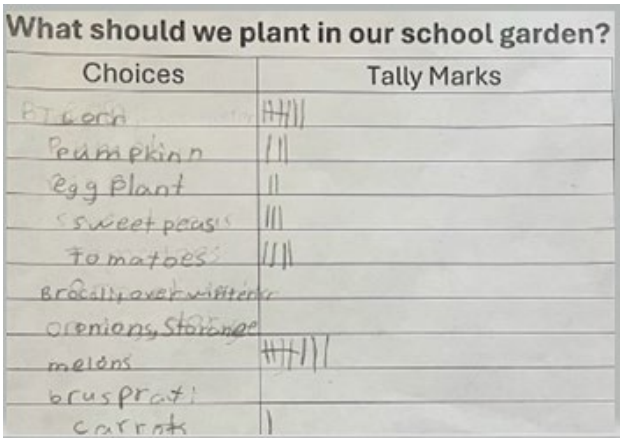
MATHEMATICS: Data and Probability (Data Literacy) – Understanding, Analyzing, and Communicating Data

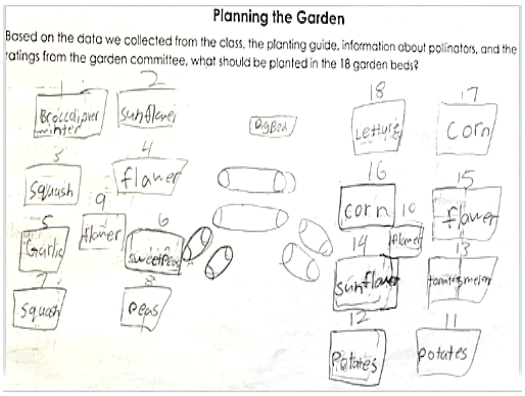
3. Based on all the information gathered, students were given the task of planning the types and numbers of plants and mapping the arrangement of plants in the garden beds. Students were asked to justify and explain their thinking.

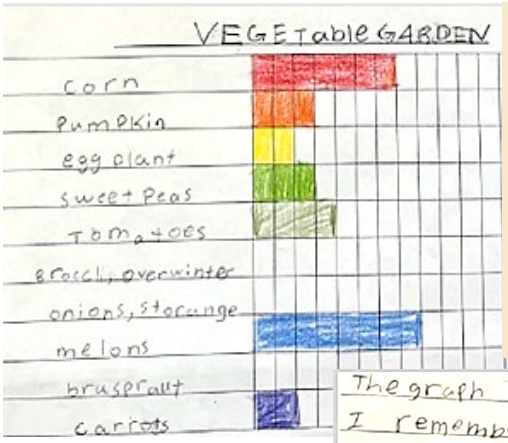
Assessment was done through one-on-one conversations and my evaluation of their thinking papers. I based my assessment of the students' work on the learning standards and the proficiency descriptors in the K-4 Mathematical Foundational Learning Progressions skill "Understanding, Analyzing and Communicating Data."



Demonstrations of Student Learning, Teacher Assessment, and Reflection

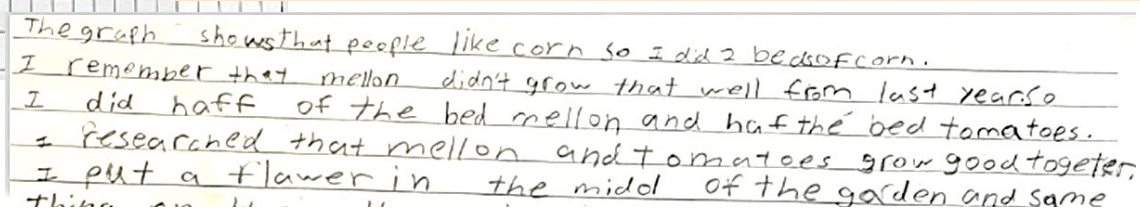






Student A: Proficient

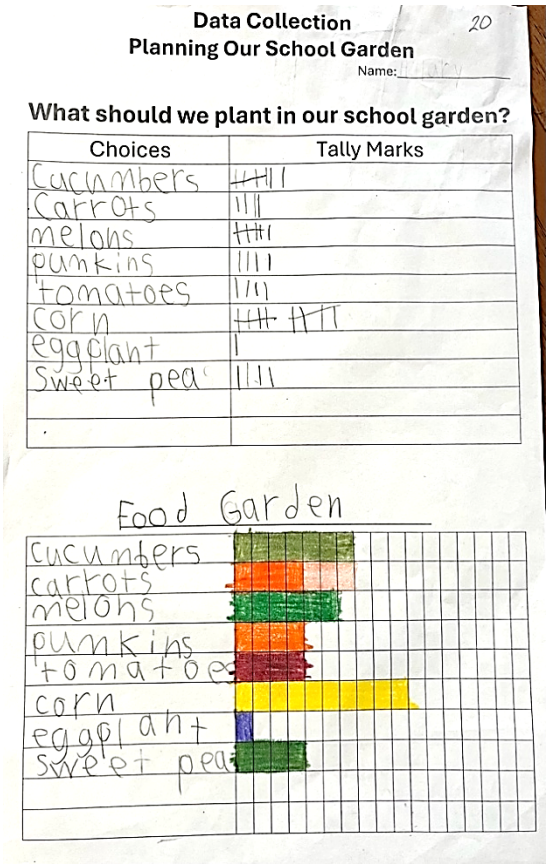
Student A is proficient in their ability to collect and record data using tally marks and then use the tally marks to create a bar graph. Each square on the graph represents one person's choice in plant (one-to-one correspondence). The student is developing their ability to interpret the quantitative information from the graph to make decisions to solve the problem of what should be planted in the garden. The student said, "The graph shows that people like corn, so I did two beds of corn" and modeled this in their drawing. They did not compare this to the number of people who like melons. However, the student further explained that melons did not grow well in previous years. This is evidence that the student is proficient in explaining and justifying mathematical ideas and decisions.



Student B: Proficient

Student B is also proficient based on their ability to collect and record data using tally marks and then use the tally marks to create a bar graph. Each square on the graph represents one person's choice in plant (one-to-one correspondence). They are able to interpret the information from the graph and use it to make decisions to solve the problem of what should be planted in the garden (i.e. "I think we should grow more corn because the kids like it and it has the most votes").

The student modeled in their garden map their interpretation of all the data and research collected. They were also able to use the rating scale provided by the teachers' garden committee to determine which vegetables should be planted (i.e.. "Carrots are a no because they don't grow" and "We can grow melons but only a little because it was not a success"). Their justification for pumpkins was also thoughtfully done because they know that pumpkins are big so they need more room to grow. The student included this quantitative and qualitative information on their garden map, which aided in their explanation and justification.



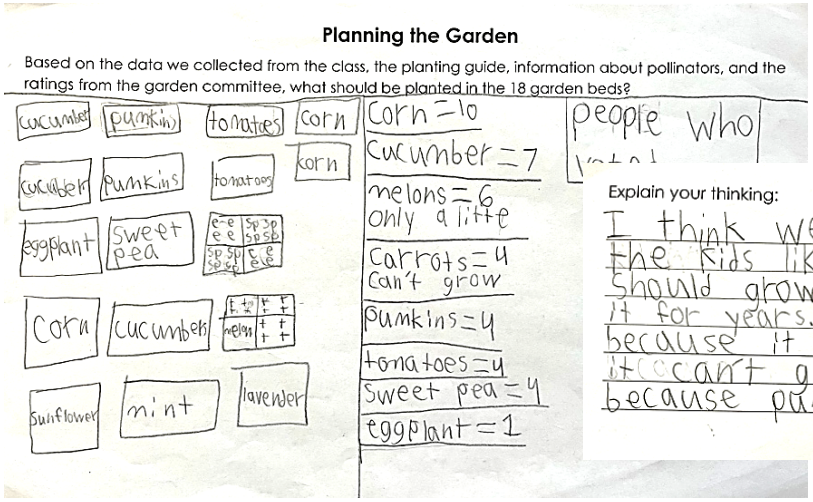
Data Collection 20
Planning Our School Garden
Name:

What should we plant in our school garden?

Choices	Tally Marks
Cucumbers	++++ |
Carrots	|||
melons	++++
pumkins	||||
tomatoes	|||
corn	++++ ++++ |||
eggplant	|
Sweet pea	|||

Food Garden

cucumbers
carrots
melons
pumkins
tomatoes
corn
eggplant
sweet pea



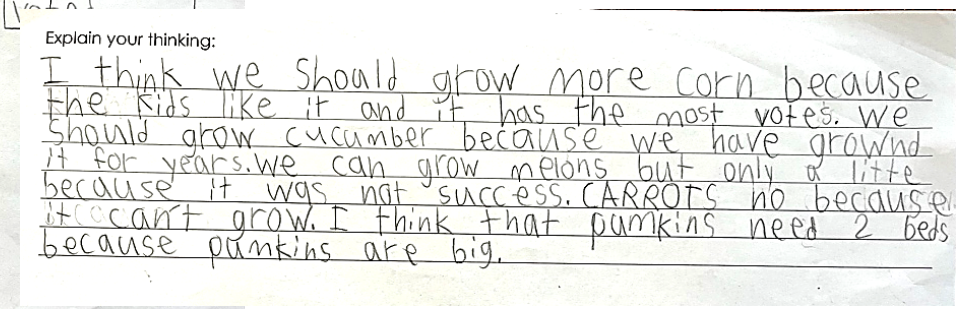
Planning the Garden

Based on the data we collected from the class, the planting guide, information about pollinators, and the ratings from the garden committee, what should be planted in the 18 garden beds?

cucumber | pumkin | tomatoes | corn
cucumber | Pumkins | tomatoes | corn
eggplant | Sweet pea
Corn | cucumber | melons
Sunflower | mint | lavender

Corn = 10
Cucumber = 7
melons = 6 only a litte
Carrots = 4 Can't grow
Pumkins = 4
tomatoes = 4
Sweet pea = 4
eggplant = 1

people who



Explain your thinking:

I think we Should grow more corn because the kids like it and it has the most votes. we Should grow cucumber because we have grownd it for years. we can grow melons but only a litte because it was not success. CARROTS no because it can't grow. I think that pumkins need 2 beds because pumkins are big.

Teacher's Reflection

Using the proficiency descriptors in the K-4 Foundational Math Learning Progressions allowed me to start with a clear understanding of what proficient looked like for the Learning Standards being taught and assessed in this lesson. Once I assessed the students, I could use the information to guide further lessons. Do I need to spend more time on building on their understanding of how to justify and explain their math thinking (i.e. by using the numbers as evidence for their thinking) or should I choose a different competency for the next task? How can I support those that were not yet proficient?

The proficiency descriptors were also used to help conference with parents and write report card comments. I was able to use the wording provide descriptive feedback on what their child is able to do. For example:

"Student A is able to collect and record data using tally marks. They were able to use the information from the tally marks to create bar graphs and interpret information from the graphs and use it to make decisions to solve different problems."

Or "Student B is able to thoughtfully explain and justify their mathematical thinking and provide examples and evidence to support their problem-solving decisions."