

KINDERGARTEN MATHEMATICS: My Mathy Martian

Summary of Learning Opportunity

The My Mathy Martian activity was a playful way to continue practicing number concepts. Kindergarten students use subitizing or counting skills to determine the number of dots on a die, practice writing numerals 1-6 and demonstrate the ability to represent quantities with pictures.

Students roll a six-sided die to determine the number of specific body parts their Mathy Martian will have. Then they draw their Mathy Martian, representing the correct number of each body part in their picture. The teacher observes students' foundational math skills through conversations with the students, checking students' ability to count forward and backward.

Mathematics
Kindergarten

Learning Standards

- Develop, demonstrate and apply mathematical understanding through play, inquiry and problem solving
- Represent mathematical ideas in concrete, pictorial and symbolic forms
- Number concepts to 10

Foundational Math Connections

Instruction and Assessment

Prior Learning: Kindergarten students have been working throughout the year on counting to 10, counting objects in a group (up to 10 items), representing numbers in concrete, pictorial and symbolic (numerals) ways and developing subitizing skills up to 5. They have had many experiences including with concrete materials through inside and outdoor play, choral counting, dice games, centres and printing practice (for numerals). Some math tasks they have done encourage drawing pictures.

Lesson: Students started at the carpet where I explained they would be drawing a picture using numbers and counting. The picture would be their imaginary "Mathy Martian". The term Martian was new to the students, so we had a discussion on aliens and Martians before proceeding. I showed students a giant die and we counted the number of dots on each side. We also brainstormed the body parts that our Martians would need. I demonstrated the procedure of rolling the die and recording the numeral in a chart next to the body part.

Body Part	Number Rolled
Heads	
Eyes	
Noses	
Arms	
Legs	

MATHEMATICS:
Number Sense– Whole
Number Concepts

Independent Student Work: Students were provided with their own recording sheets. At their desks, they each rolled a die and recorded the numeral on their chart. Once their data tables were filled out, students were given a sheet of paper to draw their Mathy Martians.

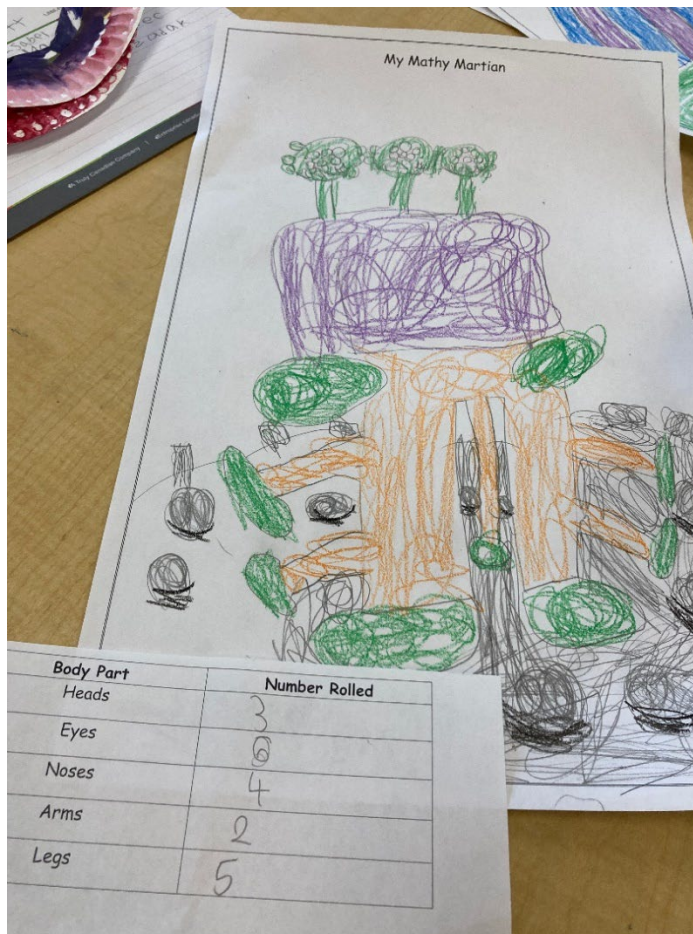
Assessment: I circulated as students drew and talked with them one on one about their processes for drawing their Martians. I typically asked, "What did you roll for [body part]?" and then "Can you show me that many [body part/s]?" Students pointed and counted (showing one-to-one correspondence). I also asked, "When you rolled [number], how did you know what the number on the die was?" I used these conversations to assess students' one-to-one correspondence, subitizing and counting skills and writing numerals. I also encouraged fast finishers to repeat the activity with a 10-sided die.

Demonstrations of Student Learning, Teacher Assessment and Reflection

Student A: Proficient

- accurately determined the number represented on the die and recorded the numeral on their chart
- when asked how they determined the number rolled –did they count or just know – student confirmed they “just knew”. This demonstrates the skill of subitizing
- accurately represented 3, 6, and 2 in the picture with the heads, eyes, and arms respectively (each head has 6 eyes, but the student accurately counted each eye)
- the student read the 5 legs in their chart and then started counting, “1, 2, 3, 4, 5, 6...what? I put too many legs.” This demonstrates the ability to reflect and find their own mistakes.

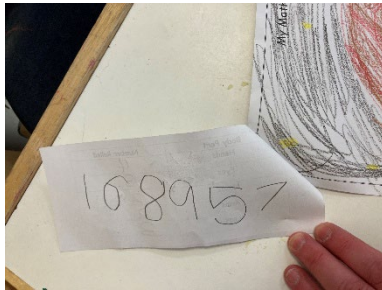
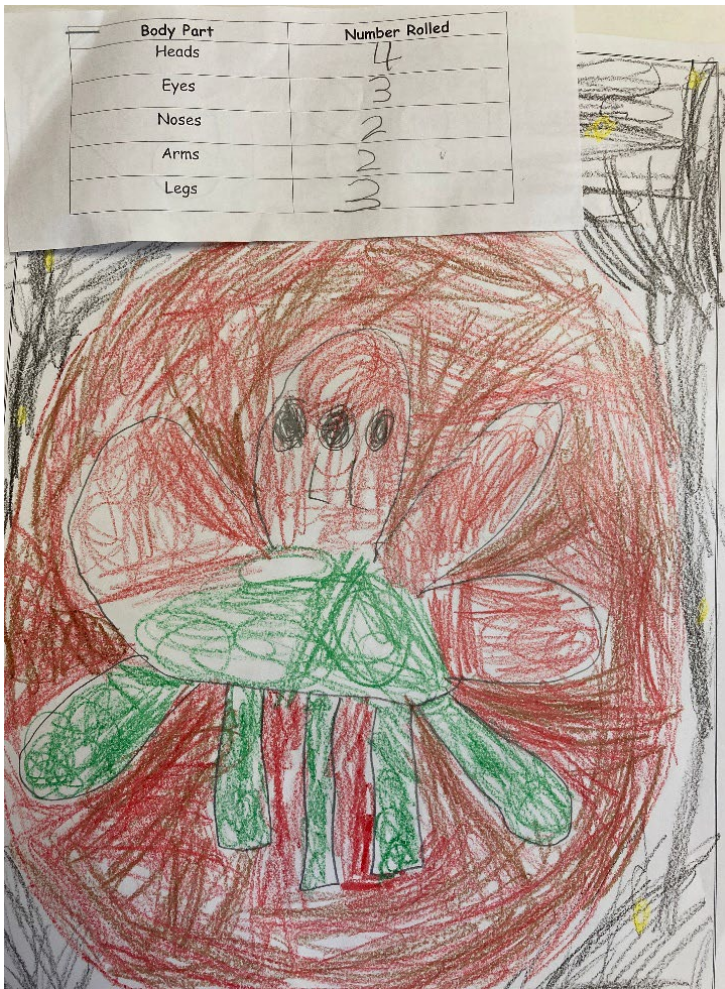
In future observations, I need to gather evidence for proficiency descriptors that weren't reflected in this task and interview. However, the student demonstrated proficiency in several number sense skills. The student's performance was confident and accurate.



Teacher's Reflection

When doing this task in the future, I will have students share their work either in partners, groups or as a class given that not all students rolled a wide range of numbers. This could provide them with more opportunity to count and more opportunity to write different numerals. In future lessons, students could also use loose parts or tangrams to create concrete representations of their Mathy Martian. All these variations would provide me further opportunities for assessing proficiency.

Using the Foundational Math Learning Progressions helped to focus me when assessing students. I asked the students to demonstrate learning and understanding in more ways than I have when previously using this assignment. This lesson was done in May, and using the tracking sheet and proficiency descriptors allowed me to have a focused path forward for the remainder of the year to ensure students had the opportunity to achieve and demonstrate proficiency in all areas. I can see that just a few learning tasks with formative assessment will be needed to feel confident about students' proficiency levels for a final summative judgement. For reporting to parents, both informally and for the Summative Written Report, I will have specific examples of what the student does and knows related to the “number concepts to 10” content learning standard. It will also give me specific things to suggest as supports for areas for growth and ways to practice at home.



Student B: Proficient

- accurately determined the number presented on the die. When asked how they determined the number rolled – did they count or just know – student confirmed they “just knew.” They likened 4 to four corners. They demonstrated the skill of subitizing

I asked how many of each body part they needed and to count on them on their picture. The student used their finger to count, demonstrating one-to-one correspondence. The number of body parts in the picture corresponded with what they had recorded from their die rolls.

In a further check in, the student was able to demonstrate ability to count from 1-10 and backwards from 10-1, from different starting points.

I also asked the student to write numerals not recorded from the die rolls (below).

More evidence is needed for pictorial representation of higher numbers and concrete representation of all numbers to 10. This is one set of evidence for several but not all of the proficiency descriptors for this sub-aspect. I will need to continue using the tracking sheet across

other tasks to collect sufficient evidence over time for the descriptors captured in this task and to address the other descriptors. The student is proficient in this task, and I will confirm this student’s proficiency level when I have evidence of all descriptors.

I made an assessment table using the Sub Skill “Whole Number Concepts” in the [K-4 Mathematical Foundational Learning Progressions](#). I intend to use this tracking sheet over several activities as a snapshot of students’ learning and whether or not they are fully demonstrating proficiency.

Whole Number Concepts Tracking Sheet - Kindergarten

Student	Counting					Conservation	Represent			Write numerals -0-9	Subitizing to 5
	Forward 1-10	Backward 1-10	Forward to 10 -d Part 11 start	Backward to 1 -d Part 11 stop	Counting a group up to 10 objects		Concrete	Pictorially	Symbolically		
Student A	✓	✓	✓	✓	✓ 1-7			✓ 3, 6, 2 4, 5 - mistakes	✓	✓ 1-9	✓ (die)
Student B	✓	✓	✓	✓	✓ 1-4			✓ +4	✓	✓ 1-9	✓ 4 or 6 - subitized 3 twice