

Unit 5: Number Patterns

TEAMBPCS
Office of
Mathematics PreK-12

The PreK-12 Mathematics curriculum focuses on problem solving, communication, and critical thinking in order to provide a foundation where every student reaches their potential to become a globally competitive, mathematically literate citizen.

About this Unit

The focus of this unit is number patterns. Students construct, describe, and extend number patterns by understanding relationships and skip counting patterns. They are able to extend repeating patterns and determine the position of particular elements in the pattern. Students create tables and charts to represent and extend patterns. Second graders begin to understand the concepts of ratios and equal groups through a series of activities involving counting the number of rooms on each floor of a building. Students also discover ratio relationships using pattern blocks.

Describing and Representing Ratios

Second grade students are familiar with the concept of equal groups. In first grade, students began skip counting and counting by groups such as number of fingers in a group of people, cans in a pack, etc. In this unit, students further explore these relationships by thinking about the underlying relationship and patterns that remain constant. For example, if there are six cans of soda in one pack, then there are twelve cans in two packs (6:1 and 12:2). Students explore this concept through activities involving a building with an equal number of rooms on each floor. Students follow floor plans that provide a concrete example of skip counting equal groups using connecting cubes and pattern blocks. Students begin to express their findings in writing before learning how to display data in a table.



Students might say:

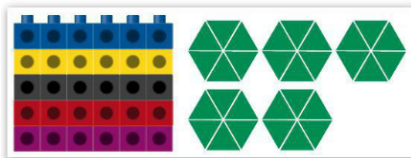


"The first floor is 3, the second is 4, 5, 6, the third is 7, 8, 9."



"I pointed to each floor and I said 3, 6, 9, 12, 15. Then I pointed to each one again because I needed 10 floors, and I kept going."

Total Number of Floors	Total Number of Rooms	Total Number of Hexagons	Total Number of Triangles
1	6	1	6
2	12	2	12
3	18	3	18
4	24	4	24
5	30	5	30



This representation shows how a building with 6 rooms on each floor follows the same ratio as a hexagon covered by 6 triangles.

Using Tables and Graphs

In this unit, tables are used to represent how one quantity changes in relation to another. Students describe how numbers in rows and columns of tables are connected. Once students determine the rule associated with a given table, they can predict future outcomes by extending the pattern. It is important for students to make connections between the information in the table and the situation it represents.

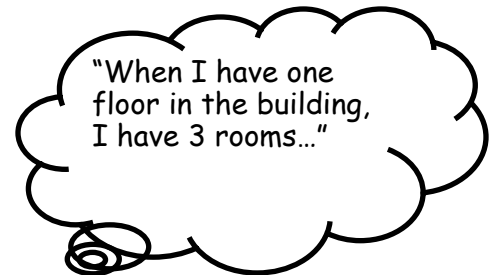
In this table, students represent the number of rooms in their cube buildings based on the number of floors and rooms on each floor.

Building A



Total Number of Floors	Total Number of Rooms
1	3
2	6
3	9
4	12
5	15
10	

A student might say:



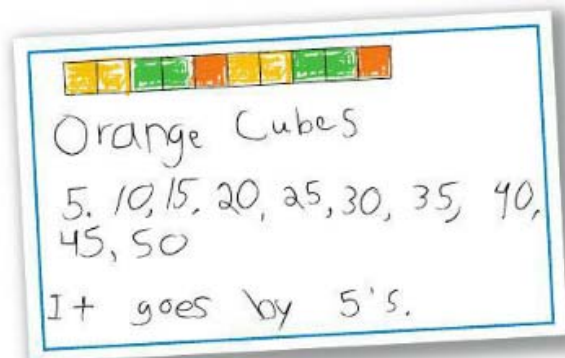
Number Sequences and Repeating Patterns

Students have been working with patterns since Kindergarten. In second grade, students associate numbers with the elements in a repeating pattern. Students begin by writing counting numbers below each element in a repeating pattern. Students are then able to use skip counting and the counting sequence to extend the pattern and determine which element of a repeating pattern will occur in a particular position.



Using this build a foundation multiples of 2, 3,

strategy, students of skills for using 4, and 5.



Sample Student Work



Helping Your Child at Home

- Practice skip counting by equal groups (2s, 5s, 10s, etc.).
- Use household items (coins, buttons, toys) to create and extend patterns.
- Create patterns using body movement patterns (i.e., clapping or snapping fingers).
- Discuss and extend ratios using common items (1 table = 4 legs, 2 tables = 8 legs, etc.)



Visit These Websites for Interactive Math Activities

- [Number Bubble](http://www.abcya.com/number_bubble_skip_counting.htm) (http://www.abcya.com/number_bubble_skip_counting.htm)
Students practice skip counting by filling in missing numbers in a sequence.
- [Number Cracker](http://www.funbrain.com/cracker) (http://www.funbrain.com/cracker)
Students continue number patterns of varying levels of difficulty.
- [Investigations](http://investigations.terc.edu/library/Games_23.cfm) (http://investigations.terc.edu/library/Games_23.cfm)
Students can explore a variety of games leveled for 2-3 students focusing on numbers, addition and subtraction, place value, money, and other mathematical topics.
- [Reading a Table](http://www.kidsmathgamesonline.com/numbers/mathdata.html) (http://www.kidsmathgamesonline.com/numbers/mathdata.html)
Students practice reading data from a table.
- [Patterns](http://www.mathsisfun.com/algebra/patterns.html) (http://www.mathsisfun.com/algebra/patterns.html)
Students play a variety of games to practice patterns using shapes, colors, and numbers.
- [Money Bingo](http://www.abcya.com/money_bingo.htm) (http://www.abcya.com/money_bingo.htm)
Students add money amounts with coins.

