

# Predictable Patterns with Addition

## Math Concepts

- whole numbers
- addition
- comparing numbers

## Materials

- TI-10
- **Predictable Patterns with Addition** recording sheets
- pencils, crayons, and markers

## Overview

Students will generate patterns using repeated addends and different starting points. Then they will analyze and compare the patterns.

## Introduction

1. Read *What Comes In 2's, 3's, & 4's?* by Suzanne Aker or *Each Orange Had 8 Slices: A Counting Book* by Paul Giganti, Jr.
2. Ask questions such as: If each person has two legs, how many legs are there at your table? How many legs are there in the classroom?
3. Discuss with students how they would find the answer to that question (by counting, adding 2 over and over, etc.).
4. Demonstrate how the calculator can help you keep track of adding 2 over and over again by entering  $\boxed{\text{Op}} \boxed{+} \boxed{2} \boxed{\text{Op}}$  to store the constant. Press  $\boxed{0}$  to start counting at 0. Then press  $\boxed{\text{Op}}$  each time you want to add 2.

On a transparency of the hundred chart on the recording sheet, color in the number that is displayed after each press of  $\boxed{\text{Op}}$ . Have students discuss the pattern that is formed.

5. Ask students what kind of pattern they think would be made with  $\boxed{\text{Op}} \boxed{+} \boxed{3} \boxed{\text{Op}} \boxed{0} \boxed{\text{Op}} \boxed{\text{Op}} \boxed{\text{Op}} \dots?$   
 With  $\boxed{\text{Op}} \boxed{+} \boxed{4} \boxed{\text{Op}} \boxed{0} \boxed{\text{Op}} \boxed{\text{Op}} \boxed{\text{Op}} \dots?$   
 With  $\boxed{\text{Op}} \boxed{+} \boxed{5} \boxed{\text{Op}} \boxed{0} \boxed{\text{Op}} \boxed{\text{Op}} \boxed{\text{Op}} \dots?$   
 With  $\boxed{\text{Op}} \boxed{+} \boxed{2} \boxed{\text{Op}} \boxed{1} \boxed{\text{Op}} \boxed{\text{Op}} \boxed{\text{Op}} \dots?$   
 With  $\boxed{\text{Op}} \boxed{+} \boxed{5} \boxed{\text{Op}} \boxed{1} \boxed{\text{Op}} \boxed{\text{Op}} \boxed{\text{Op}} \dots?$

**Note:** Press  $\boxed{\text{Mode}}$     $\boxed{\text{Enter}}$  to clear the constant stored in  $\boxed{\text{Op}}$ . Then press  $\boxed{\text{Clear}}$  to clear the display. Repeat step 4 to store a new constant.

6. Have students work in pairs or groups. Have them use calculators to generate sequences with repeated addends, recording the numbers in the sequence by coloring them on the hundred chart.
7. Ask students to analyze the patterns they make with different repeated addends and different starting points.

# Predictable Patterns with Addition *(continued)*

## Collecting and Organizing Data

While students are generating data for the different patterns, ask questions such as:

- What addend are you repeating?
- What kinds of objects might you count with that repeated addend?
- What starting point are you using? Why?
- Choose two patterns you made. How are they alike? How are they different?
- Choose a pattern you made that you like. What different repeated addend or starting point could you use to make a pattern similar to it? Try your prediction and see what happens.
- Can you make a pattern with all even numbers? All odd numbers?

## Analyzing Data and Drawing Conclusions

After students have made and compared several patterns, have them work as a whole group to analyze their patterns. Ask questions such as:

- Pick two patterns that are alike. How are they alike? Why do you think they turned out alike?
- Pick two patterns that are very different. How are they different? Why do you think they turned out so different?
- What happened when you used the same repeated addend, but started at 1 instead of 0? In what kind of situation might you want to start with 1 instead of 0?
- What happened when you started with other numbers? How did it change your pattern?

 What do you do on the calculator to change the starting point for your pattern?

 What do you do on the calculator to change the repeated addend?

 What happens each time you press  $\boxed{001}$ ?

 How did you use the calculator in making your patterns?

 Could you predict what the next number on the calculator should be each time?

 How were your patterns related to what you were doing on the calculator?

 Did the scroll feature, , , help you explore the patterns on the calculator?

# Predictable Patterns with Addition *(continued)*

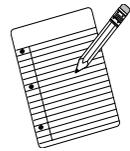
## Analyzing Data and Drawing Conclusions *(continued)*

- What is alike about the patterns for adding 2 starting with 0 and adding 5 starting with 0? How are they different from other patterns starting with 0? Why do you think they turn out that way?
- How do you make a pattern with only even numbers? Only odd numbers?

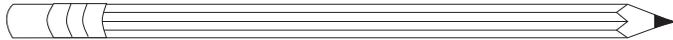
## Continuing the Investigation

Have students:

- Generate patterns with repeated subtraction starting from 100 and then compare their subtraction patterns to their addition patterns.
- Generate subtraction patterns starting from numbers other than 100 and compare their results to patterns starting from 100.
- Investigate what happens with subtraction patterns when they go “beyond 0” into the negative numbers.



Name: \_\_\_\_\_



# Predictable Patterns with Addition

## Recording Sheet

### Collecting and Organizing Data

Starting Number  
\_\_\_\_\_Number (Addend)  
\_\_\_\_\_

Hundred Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Questions we thought of while we were doing this activity: