

Action-Packed Addition Patterns

Math Concepts

- whole numbers
- addition
- patterns

Materials

- TI-10
- manipulatives or counters
- **Action-Packed Addition Patterns** recording sheets
- pencils

Overview

Students will use manipulatives and calculators to explore what happens when they change one number at a time in an addition number sentence. They will also record and describe the pattern that develops.

Introduction

The **Action-Packed Stories** activity on page 3 should be completed before beginning this activity.

1. Have each student choose one of his or her **Action-Packed Stories** that uses addition and write the number sentence that goes with it on the recording sheet: $2 + 1 = 3$, for example. Next, ask them to model the story they chose with manipulatives.

Or, have students read *There Was an Old Lady Who Swallowed a Fly* by Pam Adams and write number sentences for the story. Then ask them to choose one of those number sentences and write it on their recording sheets. Next, ask them to model the story they chose with manipulatives.

2. Ask students to choose one number in the story to change. Have them circle the number in the number sentence on their recording sheets.

Examples:

In the number sentence $2 + 1 = 3$, change 1 to 2; the new number sentence is $2 + 2 = 4$.

In *There Was an Old Lady Who Swallowed a Fly*, 1 lady + 1 animal = 2 things, 1 lady + 2 animals = 3 things, etc.

3. Now have students model the new number sentence with manipulatives, and discuss how the story should change to work with the new number sentence.
4. Have students continue to change the same number, tell the new story it represents, and model it with manipulatives.

Action-Packed Addition Patterns *(continued)*

Introduction (continued)

5. Record all of the changes in the number sentences on the recording sheets and discuss the patterns that develop.

Example:

$$2 + 1 = 3$$

$$2 + 2 = 4$$



$$2 + 3 = 5$$

$$2 + 4 = 6$$

$$2 + 5 = 7$$

6. Have students choose a similar situation using larger numbers. Then have them use their calculators to find the number sentence patterns and write them on their recording sheets.



Use the scroll feature,  , to explore the number sentence patterns on the TI-10.

Collecting and Organizing Data

While students are exploring their patterns, ask questions such as:

- What happened to the sum each time you changed an addend? Did it get smaller or larger? Why?
- Could you show me with your manipulatives? Would your story stay the same? How might it change?
- Can you make up a different story using the same pattern of number sentences?
- What kind of pattern do you get when you change the first addend? The second addend? How are the patterns alike?





How can the pattern you recorded be represented on the calculator?



What do the numbers you are pressing on your calculator represent in your story?



How can you use the scroll feature,  , to analyze the data and look for patterns?



Did you stop using the calculator? When?

Action-Packed Addition Patterns *(continued)*


Analyzing Data and Drawing Conclusions


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




- How could you describe the pattern you recorded?
- How did your story have to change as your sentences changed?
- What do you think the patterns might be for subtraction stories? Why?

Continuing the Investigation

Have students select other stories and number sentences and then repeat the sequence.

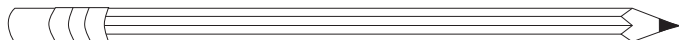
 How did you use the calculator to help you show the action in your story?

 Does the order in which you entered the numbers in your calculator matter to your story? Why or why not?

 How did you use the scroll feature,  , to explore the patterns on the calculator?



Name: _____



Action-Packed Addition Patterns

Recording Sheet

Collecting and Organizing Data

The number sentence with which I started is:

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

My new number sentence is:

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

I have circled the number I want to change.

My number sentence pattern is:

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

I have circled the number I want to change.

My new number sentence pattern is:

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

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$$\underline{\quad\quad} + \underline{\quad\quad} =$$

$$\underline{\quad\quad} + \underline{\quad\quad} =$$

The pattern I see is:

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