



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.

Grade Levels: 1–2




Concepts

- Whole numbers
- Addition
- Patterns



Materials

-  TI-10 calculators
Note: the TI-15 Explorer™ calculator can be used in place of the TI-10 for this activity.
- *There Was an Old Lady Who Swallowed a Fly*
Adams, Pam (New York, NY: Child's Play (International), [1990], 1973)
- Manipulatives or counters
- Student activity sheet
- Pencils



Assessment

Throughout the activity, questions are included for formative assessment. Student work should be used as a check for understanding. Have the students use the chart and counters along with the TI-10 to complete the activity.



Introduction

1. If students completed the *Action-Packed Stories* activity, you may choose to have each student choose one of his or her *Action-Packed Stories* that used addition and write the number sentence that goes with it on their activity 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* and write number sentences for this story. Then ask them to choose one of those number sentences and write it on their activity 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.
5. Record all of the changes in the number sentences on the activity sheets and discuss the patterns that develop.

Example:

$$2 + 1 = 3$$

$$2 + 2 = 4$$

$$2 + 3 = 5$$

$$2 + 4 = 6$$

$$2 + 5 = 7$$



Using the Calculator

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

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



Collecting and Organizing Data



While students explore their patterns, ask questions like the following:

Questions for Students:

- ❖ *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?*



Using the Calculator

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



Analyzing Data and Drawing Conclusions


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

Questions for Students:

- ❖ *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?*



Using the Calculator

- *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 can you use the scroll feature, , to explore the patterns on the calculator?*

Continuing the Investigation

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



SOLUTIONS



Name _____

Date _____



Focus: Create addition number patterns.

Action-Packed Patterns

Collecting and Organizing Data

The number sentence with which I started is: **Sample answers:**

___ 3 ___ + ___ (2) ___ = 5

I have circled the number I want to change.

My number sentence pattern is:

___ 3 ___ + ___ 3 ___ = 6

___ 3 ___ + ___ 4 ___ = 7

___ 3 ___ + ___ 5 ___ = 8

___ 3 ___ + ___ 6 ___ = 9

___ 3 ___ + ___ 7 ___ = 10

___ + ___ =

___ + ___ =

The pattern I see is:

Answers will vary. Students should note that the pattern in the sums reflects the pattern in the changing addends.

My new number sentence is:

___ (20) ___ + ___ 5 ___ = 25

I have circled the number I want to change.

My new number sentence pattern is:

___ 22 ___ + ___ 5 ___ = 27

___ 24 ___ + ___ 5 ___ = 29

___ 26 ___ + ___ 5 ___ = 31

___ 28 ___ + ___ 5 ___ = 33

___ 30 ___ + ___ 5 ___ = 35

___ + ___ =

___ + ___ =

The pattern I see is: