# Creating Story Problems

## Unit 2: Understanding Operations

### Grade Level
Grade 1

### Overview

This activity focuses on reading/ listening comprehension skills as they apply to mathematics story problems, as well as on written and verbal mathematics communication skills. Using classic literature as inspiration children will apply their understanding of addition and subtraction situations and operations to create, describe, and solve story problems. Students will write and solve story problems involving a variety of situations, choosing strategies including- part-part- whole, comparing, grouping, doubling, counting on and counting back situations. Students will use drawings, equations, and written responses to solve single story problems.

### Key Standards
**M1N3. Students will add and subtract numbers less than 100 as well as understand and use the inverse relationship between addition and subtraction.**
   c. Compose/decompose numbers up to 10 --"break numbers apart", e.g., 8 is represented as 4 + 4, 3 + 5, 5 + 2 + 1, and 10-2).
   d. Understand a variety of situations to which subtraction may apply: taking away from a set, comparing two sets, and determining how many more or how many less.
   e. Understand addition and subtraction number combinations using strategies such as counting on, counting back, doubles, and making tens.
   f. Know the single-digit addition facts to 18 and corresponding subtraction facts with understanding and fluency. (Use strategies such as relating to facts already known, applying the commutative property, and grouping facts into families.)
   h. Solve and create word problems involving addition and subtraction to 100 without regrouping. Use words, pictures, and concrete models to interpret story problems and reflect the combining of sets as addition and taking away or comparing elements of sets as subtraction.


### Related Standards

**ELA1R6. The student uses a variety of strategies to understand and gain meaning from grade-level text. The student**
   a. Reads and listens to a variety of texts for information and pleasure.
   b. Makes predictions using prior knowledge.
   c. Asks and answers questions about essential narrative elements (e.g., beginning middle- end, setting, characters, problems, events, resolution) of a read-aloud or independently read text.
   e. Distinguishes fact from fiction in a text.
   f. Makes connections between texts and/or personal experiences.
   g. Identifies the main idea and supporting details of informational text read or heard.
   i. Recognizes cause-and-effect relationships in text.
   l. Recognizes plot, setting, and character within texts, and compares and contrasts

these elements among texts.

**ELA1W1. The student begins to demonstrate competency in the writing process. The student**
    a. Writes texts of a length appropriate to address a topic and tell a story.
    b. Describes an experience in writing.
    c. Rereads writing to self and others, revises to add details, and edits to make corrections.
    d. Prints with appropriate spacing between words and sentences.
    e. Writes in complete sentences with correct subject-verb agreement.
    f. Uses nouns (singular and plural) correctly.
    g. Begins to use personal pronouns (e.g., I, me, we, us) in place of nouns.
    h. Uses singular possessive pronouns.
    i. Begins to write different types of sentences (e.g., simple/compound and declarative/interrogative).
    j. Begins to use common rules of spelling.
    k. Begins to use a variety of resources (picture dictionaries, the Internet, books) and strategies to gather information to write about a topic.
    l. Uses appropriate end punctuation (period and question mark) and correct capitalization of initial words and common proper nouns (e.g., personal names, months).
    m. Uses commas in a series of items.

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**Possible Materials**

- Children's Book <u>When the Relatives Came</u> *by Cynthia Rylant and Stephen Gammell's -  The book tells of an old-fashioned family reunion where relatives came from far across the mountains. They pile into and around the house with love and exuberance.*

- Math Word Wall
  Vocabulary:  number line, related facts, doubles, doubles +1, count on, count back, compare, part, whole

- Unfix cubes or other manipulative

- Whole/ Part Mats

| WHOLE | |
|---|---|
| PART | PART |

- Promethean Board if available or chart paper- Prior to the lesson create some sample problems that illustrate the book.
Example: *When the relatives came everyone was excited.  We had six beds for sleeping. There were ten relatives.  How many more relatives are there ten beds?*

*There are eight freshly baked pies. If we eat 6, how many will be left?*
*Uncle Chuck brought five suitcases. Grammy bought four suitcases. How many suitcases are there all together?*

**Task**

Read and discuss the book **When the Relatives Came.**
Look at the illustrations and think about the events in the story. Discuss the 'Math' problems presented when family comes to visit.

1. Tell stories related to the book: Ask for students to identify the most important information in the story. To do this, ask the following questions:

   ► What is this story problem about?
   ► How many [subjects/objects] are there to begin with?
   ► What is happening to these [subjects/objects]?

2. As students identify the information, highlight or underline the information that will be needed to solve the problem. Ask students to find the actual question in the story problem that needs to be answered: "What does this story want to know?" Read it aloud. Ask for a complete sentence that answers the question. When a sentence has been agreed upon that includes specific information (e.g., the subject's name, the numbers involved, the items' names, etc.), have a student write the sentence under the equation, using conventional capitalization and punctuation, and writing all numbers as words (i.e., instead of writing "20" a student would write "twenty") to facilitate correct spelling of number words.

   ➢ Continue telling stories and asking questions until students can explain and represent what is happening with words and or manipulatives.
   ➢ Students should then begin to create, illustrate, and solve their own story problems.
   ➢ Share with the class.

**Sample Questions**

- Is your story problem asking you to add or subtract?
- What problem solving strategy should you use?
- What two parts are you joining in your problem?
- When one part is separated from the whole, what part is left?
- How can you compare these sets?
- Can you change the order of numbers when you add (or subtract)? Why or why not?
- Explain your thinking when you got this answer?
- Would there be another way to solve this problem?
- What questions do you need to ask your readers?
- What number sentence will match your story?
- Does your picture show what is happening in your story?

**Sample Question Solutions**

- Students should be actively engaged by developing their own understandings.
- Students should be given opportunities to revise their work based on teacher feedback, self-assessment and reflection.
- In supporting the writing of story problems, encourage the inclusion of each strategy learned.
- Give students ample opportunity to discuss problems with peers. Story problems depend on reading comprehension skills for the development of successful problem-solving strategies. Having students collaborate on story problems gives them the opportunity to learn by talking, collaborating, and sharing ideas as they compare pictures, words, and numeric symbols for consistency.

## Assessment Ideas

► Teacher observation of whole group participation.
► Teacher observation of small group participation.
► Student explanations of their strategies.
► Quality of student work, including clarity of ideas and details in written work.

Sample Rubric

| Competent | Progressing | Inadequate |
|---|---|---|
| **Clear** and evident representation of mathematical ideas by use of pictures, math language and manipulative - All elements (story, illustration and number sentence) match | **Somewhat clear** and evident representation of mathematical ideas by use of pictures, math language and manipulative- Some elements (story, illustration and number sentence) match | **Not clear** and evident representation of mathematical ideas by use of pictures, math language and manipulative - Story, illustration and number sentence do not match |
| Selects and uses appropriate strategies for solving problems | Somewhat selects and uses appropriate strategies for solving problems | Does not select and use appropriate strategies for solving problems |
| <ul><li>Writing is clear with a majority of correct sentences</li><li>Generally correct spelling, grammar, mechanics, and usage. Mistakes do not detract from clarity and meaning.</li></ul> | <ul><li>Frequent incorrect and unclear sentences</li><li>Some mistakes in spelling, grammar, mechanics, and usage. Somewhat detracts from clarity and meaning.</li></ul> | <ul><li>Severe mistakes in sentence structure</li><li>Severe mistakes in spelling, grammar, mechanics, and usage. Completely detracts from clarity and meaning.</li></ul> |

Follow up and reinforce with Math Tub Activites



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