

Rich Mathematical Task – Grade 2 – *Sticker Sets*

Task Overview/Description/Purpose:

- The purpose of this task is for students to explore and deepen their understanding of the concept of place value.
- Students will investigate a contextual situation to identify numbers that are ten more and ten less than a number of their choice.

Standards Alignment: Strand – Measurement and Geometry

Primary SOL: 2.1 The student will

- b) identify the number that is 10 more, 10 less, 100 more, and 100 less than a given number up to 999

Related SOL: 1.2, 3.1

Learning Intentions:

- **Content** – I am learning to identify numbers that are ten more and ten less than a number.
- **Language** – I am learning to explain my thinking using math vocabulary.
- **Social** – I am learning to work with a partner and share my mathematical thinking.

Success Criteria (Evidence of Student Learning):

- I can find 10 more and 10 less than a number using models.
- I can find 10 more and 10 less than a number using place value.
- I can explain my thinking using the math vocabulary of ten more and ten less.
- I can work with a partner and share my mathematical thinking.

Mathematics Process Goals

| | |
|---------------------------------|---|
| Problem Solving | Students will apply their understanding of the relationship between place value concepts and number sense skills to find solutions to the task. |
| Communication and Reasoning | Students will work with a partner and use math vocabulary to justify their thinking. |
| Connections and Representations | Students will make connections to the base ten place value system and represent their thinking orally and on paper. |

Task Pre-Planning

Approximate Length/Time Frame: 60 minutes

Grouping of Students: After the whole group launch, students will be partnered for this task. Partners work through possible answers, and then individually record their chosen solution.

Materials and Technology:

- base ten pieces
- hundreds charts
- counters
- task for each student

Vocabulary:

- place, value
- digit, numeral
- group
- one, ten, ones, tens
- more, less

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| Task Pre-Planning | |
|--|--|
| | <ul style="list-style-type: none"> • estimate, compare • greater than, less than, equal to |
| Anticipate Responses: See Planning for Mathematical Discourse Chart (Columns 1-3) | |
| Task Implementation (Before) | |
| Task Launch: | |
| <ul style="list-style-type: none"> • In a whole group setting, invite students to connect with the context of the problem by asking, “How many of you have received or earned stickers?” To activate prior knowledge, consider showing students a sheet of stickers, then ask “What do you notice? What do you wonder?” • Introduce the task by reading the problem aloud to students. Ask a few students to restate the task in their own words to promote understanding and clarify questions. • Pass out the task to each student to solve with a partner. Make manipulatives and drawing tools available, as needed. | |
| Task Implementation (During) | |
| Directions for Supporting Implementation of the Task | |
| <ul style="list-style-type: none"> • Monitor – Teacher will listen and observe students as they work on task and ask assessing or advancing questions (see potential ideas on the Planning for Mathematical Discourse Chart). • Select – Teacher will decide which strategies or thinking that will be highlighted (after student task implementation) in order to advance mathematical ideas and support student learning. • Sequence – Teacher will decide the order in which student ideas will be highlighted (following the student task implementation). • Connect – Teacher will consider ways to facilitate connections between different student responses. | |
| Suggestions For Additional Student Support | |
| <i>May include, among others:</i> | |
| <ul style="list-style-type: none"> • Encourage the use of counters or base ten manipulatives. (You may choose to provide stickers cut in strips of ten and singles.) • Encourage the use of the hundreds chart. • Give a start number of stickers for Madison. • To extend the task, ask students to find a number 10 more or 10 less than a three digit number. • To extend the task, add constraints such as Madison’s number is a number between 50 and 99 and is an even number. | |
| Task Implementation (After) | |
| Connecting Student Responses (From Anticipating Student Response Chart) and Closure of the Task: | |
| <ul style="list-style-type: none"> • Based on the actual student responses, sequence and select particular students to present their mathematical work during class discussion. • Connect different students’ responses and connect the responses to the key mathematical ideas to bring closure to the task. • Consider ways to ensure that each student will have an equitable opportunity to share his/her thinking during task discussion. • As students share their work ask questions like: <ul style="list-style-type: none"> ○ How can you prove (convince us) this answer makes sense? ○ Do you agree or disagree? Why? ○ Did anyone think about it in a different way? ○ What patterns are you noticing? ○ That was a big math idea, who can restate it? ○ Who can add on to this idea? | |

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Task Implementation (After)

- Is there just one solution to this problem or more than one? How do you know?
- Close the lesson by returning to the success criteria. Have students reflect on their progress toward the criteria.

Teacher Reflection About Student Learning:

- Use the rich mathematical task rubric to evaluate students' progress toward the process goals.
- Look at the students' work. Who employed what strategies?
 - Who was able to think of the 10 more and 10 less than a number without using base ten pieces or a hundreds chart?
 - Who needed base ten pieces and/or a hundreds chart to be successful?
 - Who was unable to complete the task even with support?
 - Who selected small numbers to start with?
 - Who selected larger numbers to start with?
 - Who found a pattern that helped them to find multiple solutions?

Planning for Mathematical Discourse

Mathematical Task: Sticker Sets Task

Content Standard(s): SOL 2.1b

| Teacher Completes Prior to Task Implementation | | | Teacher Completes During Task Implementation | |
|--|---|--|--|--|
| Anticipated Student Response/Strategy | Assessing Questions – Teacher Stays to Hear Response | Advancing Questions – Teacher Poses Question and Walks Away | List of Students Providing Response Who? | Discussion Order - sequencing student responses |
| <i>Provide examples of possible correct student responses along with examples of student errors/misconceptions</i> | <i>Teacher questioning that allows student to explain and clarify thinking</i> | <i>Teacher questioning that moves thinking forward</i> | <i>Which students used this strategy?</i> | <ul style="list-style-type: none"> ● <i>Based on the actual student responses, sequence and select particular students to present their mathematical work during class discussion</i> ● <i>Consider ways to ensure that each student will have an equitable opportunity to share his/her thinking during task discussion</i> |
| Anticipated Student Response A: Student has solution a that does not work within the parameters given(Ex. Students add 1 and subtract 1 instead of 10) | <ul style="list-style-type: none"> ● Can you restate the task? ● Can you tell me about your work? How much more does Christian have than Madison? Can you build what that looks like? | <ul style="list-style-type: none"> ● Would using manipulatives help you to solve this task? ● How could you use this building strategy to show the number of stickers for Abbey? | Student C Student D | |
| Anticipated Student Response B: Students pick a single digit start number | <ul style="list-style-type: none"> ● How did you decide what number to start with? Will you be able to show 10 less than that number? | <ul style="list-style-type: none"> ● Would using manipulatives help you to solve this task? ● Can you use a two digit number for a start number? ● How could you change your number so that you can show 10 less? | | |
| Anticipated Student Response C: Student has trouble picking a start number | <ul style="list-style-type: none"> ● Would using manipulatives help you to solve this task? ● If Madison had 22, how many would Christian and Abby have? | <ul style="list-style-type: none"> ● How can you show what Christian’s stickers look like? ● How can you show what Abby’s stickers look like? | | |
| Anticipated Student Response D: Student picks 10 as a start number | <ul style="list-style-type: none"> ● How did you decide what number to start with? What is 10 less than 10? ● How did you determine the | <ul style="list-style-type: none"> ● If you were Abby would you want 0 stickers? ● Can you think of other amounts of stickers Madison, | | |

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|--|--|--|--|---|
| Anticipated Student Response/Strategy <i>Provide examples of possible correct student responses along with examples of student errors/misconceptions</i> | Assessing Questions – Teacher Stays to Hear Response <i>Teacher questioning that allows student to explain and clarify thinking</i> | Advancing Questions – Teacher Poses Question and Walks Away <i>Teacher questioning that moves thinking forward</i> | List of Students Providing Response Who? <i>Which students used this strategy?</i> | Discussion Order - sequencing student responses <ul style="list-style-type: none"> ● <i>Based on the actual student responses, sequence and select particular students to present their mathematical work during class discussion</i> ● <i>Consider ways to ensure that each student will have an equitable opportunity to share his/her thinking during task discussion</i> |
| | number of stickers Christian, Madison, and Abby had? | Christian, and Abby might have? | | |
| Anticipated Student Response E: Student has solution(s) that work within the parameters | <ul style="list-style-type: none"> ● What student did you choose to start with? Why? ● How did you choose their number of stickers? ● How do you know those numbers work? | <ul style="list-style-type: none"> ● What patterns do you notice? ● Will this work with larger numbers? | Student A Student B Student F | |
| Anticipated Student Response G: Student picks a number with three or more digits to find 10 more and 10 less than | <ul style="list-style-type: none"> ● Tell me about Madison, Christian, and Abby stickers. ● Why did you choose those amounts? | <ul style="list-style-type: none"> ● How do you know that Christian has 10 more and Abby has 10 less than Madison? ● How does place value relate to what you are doing? ● Can you think of other amounts of stickers Madison, Christian, and Abby might have? | Student E | |
| Anticipated Student Response H: Student picks a number that crosses from two digit to three digit. (Madison has 104 stickers, 10 less will be a two digit number 94) | <ul style="list-style-type: none"> ● How did you decide on these number of stickers for each friend? ● How did you think about subtracting 10 from this 3 digit number? | <ul style="list-style-type: none"> ● What kind of patterns are you noticing as you move between two digit and three digit numbers? | Student A | |

Name _____

Date _____

Sticker Sets

Christian, Madison, and Abby each have a different set of stickers. Christian has 10 more stickers than Madison. Abby has 10 less stickers than Madison. How many stickers could each person have? How do you know your numbers makes sense? Explain your thinking and show your work.

Rich Mathematical Task Rubric

| | Advanced | Proficient | Developing | Emerging |
|--|--|--|---|--|
| Mathematical Understanding | Proficient Plus: <ul style="list-style-type: none"> • Uses relationships among mathematical concepts | <ul style="list-style-type: none"> • Demonstrates an understanding of concepts and skills associated with task • Applies mathematical concepts and skills which lead to a valid and correct solution | <ul style="list-style-type: none"> • Demonstrates a partial understanding of concepts and skills associated with task • Applies mathematical concepts and skills which lead to an incomplete or incorrect solution | <ul style="list-style-type: none"> • Demonstrates little or no understanding of concepts and skills associated with task • Applies limited mathematical concepts and skills in an attempt to find a solution or provides no solution |
| Problem Solving | Proficient Plus: <ul style="list-style-type: none"> • Problem solving strategy is efficient | <ul style="list-style-type: none"> • Problem solving strategy displays an understanding of the underlying mathematical concept • Produces a solution relevant to the problem and confirms the reasonableness of the solution | <ul style="list-style-type: none"> • Chooses a problem solving strategy that does not display an understanding of the underlying mathematical concept • Produces a solution relevant to the problem but does not confirm the reasonableness of the solution | <ul style="list-style-type: none"> • A problem solving strategy is not evident or is not complete • Does not produce a solution that is relevant to the problem |
| Communication and Reasoning | Proficient Plus: <ul style="list-style-type: none"> • Reasoning is organized and coherent • Consistent use of precise mathematical language and accurate use of symbolic notation | <ul style="list-style-type: none"> • Communicates thinking process • Demonstrates reasoning and/or justifies solution steps • Supports arguments and claims with evidence • Uses mathematical language to express ideas with precision | <ul style="list-style-type: none"> • Reasoning or justification of solution steps is limited or contains misconceptions • Provides limited or inconsistent evidence to support arguments and claims • Uses limited mathematical language to partially communicate thinking with some imprecision | <ul style="list-style-type: none"> • Provides little to no correct reasoning or justification • Does not provide evidence to support arguments and claims • Uses little or no mathematical language to communicate thinking |
| Representations and Connections | Proficient Plus: <ul style="list-style-type: none"> • Uses representations to analyze relationships and extend thinking • Uses mathematical connections to extend the solution to other mathematics or to deepen understanding | <ul style="list-style-type: none"> • Uses a representation or multiple representations, with accurate labels, to explore and model the problem • Makes a mathematical connection that is relevant to the context of the problem | <ul style="list-style-type: none"> • Uses an incomplete or limited representation to model the problem • Makes a partial mathematical connection or the connection is not relevant to the context of the problem | <ul style="list-style-type: none"> • Uses no representation or uses a representation that does not model the problem • Makes no mathematical connections |

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|-----|
| 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 |