

Rich Mathematical Task – Grade 3 – *Baskets of Apples*

Task Overview/Description/Purpose:	
<ul style="list-style-type: none"> • In this task, students will find multiple ways to equally divide 60 apples into baskets. • The purpose of this task is to explore equal shares through division and multiplication strategies. 	
Standards Alignment: Strand – <i>Computation and Estimation</i>	
<p>Primary SOL: 3.4b The student will create and solve single-step practical problems that involve multiplication and division through 10×10</p> <p>Related SOL: 2.6c, 3.4bd, 4.4d</p>	
<p>Learning Intention(s):</p> <ul style="list-style-type: none"> • Content - I am learning to represent equal shares in various ways. • Language - I am learning to explain my thinking as it relates to equally sharing apples in baskets. • Social - I am learning to listen to and explain my peers' strategies. 	
<p>Success Criteria (Evidence of Student Learning):</p> <ul style="list-style-type: none"> • I can share apples equally among baskets in multiple ways. • I can write a number sentence for my solutions. • I can explain my reasoning and communicate my thinking for solving the problem clearly, using appropriate vocabulary. • I can give specific feedback and use suggestions to clarify thinking. 	
Mathematics Process Goals	
Problem Solving	<ul style="list-style-type: none"> • Students will use multiplication and division facts to represent the equal sharing of apples using a representation and a number sentence. • Students will accurately represent the equal sharing of apples and confirm the reasonableness of their solution.
Communication and Reasoning	<ul style="list-style-type: none"> • Students will communicate their equal shares of apples in baskets. • Students will use appropriate math language, including multiplication and division vocabulary, to express ideas with accuracy and precision.
Connections and Representations	<ul style="list-style-type: none"> • Students will create various representations as they equally share apples among baskets. • Students will describe connections between multiplication and division. • Students will make connections between the number of apples in each basket and the number of baskets needed.
Task Pre-Planning	
Approximate Length/Time Frame: 60 minutes	
<p>Grouping of Students: Students can begin the task independently. After actively monitoring student strategies and responses, the teacher should purposefully pair or group students together. Groups can consist of 2 to 4 students. Teacher should look for opportunities for students to be math leaders and choose student groups that encourage collaboration and perseverance.</p>	
<p>Materials and Technology:</p> <ul style="list-style-type: none"> • Virtual Implementation Google Slides • copy of task, supporting documents and pencil 	<p>Vocabulary:</p> <ul style="list-style-type: none"> • divide, division • multiply, multiplication

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Task Pre-Planning

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|---|--|
| <ul style="list-style-type: none"> • variety of manipulatives (cubes, chips, tiles...) • basket representations (cups, buckets...) • graph paper | <ul style="list-style-type: none"> • equal shares • equal (equally) • quotient • related facts |
|---|--|

Anticipate Responses: See the Planning for Mathematical Discourse Chart (columns 1-3).

Task Implementation (Before) 10 – 15 minutes

Task Launch:

- Anticipate prior knowledge: Engage the class in a discussion about equal shares. Use a KWL chart to deepen the discussion.
- Ensure understanding of task: The teacher will read the task aloud to students and share the “I can” statements. The teacher will ask questions to make sure the task is understood such as, “What are we trying to figure out?”
- Establish clear expectations: Review rubric with students as a tool for monitoring their proficiency. Review classroom expectations for working independently.

Task Implementation (During) 20 – 30 minutes

Directions for Supporting Implementation of the Task

- Monitor – Teacher will listen and observe students as they work on task and ask assessing or advancing questions (see the Planning for Mathematical Discourse chart on next page).
- Select –The teacher will select students to pair up based on the strategies used. The teacher may decide to pair students who used similar strategies to produce different solutions. Allow students time to work together in pairs on the task. The teacher will engage with pairs by asking assessing or advancing questions as necessary (see page 4).
- Sequence – The teacher will select 2-3 student strategies to share with the whole group. One suggestion is to look for one common misconception and two correct responses to share.
- Connect – Teacher will consider ways to facilitate connections between different student responses.
 - Students work in purposefully planned groups for 20-25 minutes to explore strategies, share ideas and transfer their ideas to paper using pictures, words, and symbols.
 - As the teacher is monitoring, teacher will look for strategies that are being used and record on Planning Chart.
 - The teacher should use questions to assess or advance student thinking.
 - Students should be encouraged to explore different strategies for solving and evaluate effectiveness.

Suggestions For Additional Student Support

- Sentence Frames:
 - I put _____ apples in _____ baskets. My number sentence is _____.
 - I made _____ ways to share apples equally in baskets.
- Vocabulary development:
 - Write related multiplication and division sentences on the board or on a chart. Label the parts of each with correct vocabulary.
- Organization:
 - Students may benefit from concrete materials over pictorial representations such as: a beaded number line, cubes, base ten blocks, apples and baskets, etc.

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Task Implementation (After) 15-20 minutes

Connecting Student Responses (From Anticipating Student Response Chart) and Closure of the Task:

- Allow students time to walk around and see the strategies of other students ([Gallery Walk](#)).
- Based on the actual student responses, sequence and select particular students to present their mathematical work during a whole class discussion. Some possible big mathematical ideas to highlight could include:
 - A common misconception
 - Trajectory of sophistication in student ideas (i.e. concrete to abstract; learning trajectories for multiplication or division of decimals)
 - Connection between multiplication and division (could both operations provide the same outcome?)
- Connect different students' responses and connect the responses to the key mathematical ideas to bring closure to the task. Possible questions and sentence frames to connect student strategies:
 - How are these strategies alike? How are they different?
 - _____'s strategy is similar to _____'s strategy because _____
 - How do these connect to our Learning Intentions?
 - Why is this important?
- Highlight student strategies to show the connections, either between different ideas for solutions or to show the connection between levels of sophistication of student ideas (connect strategy of repeated addition to strategy of multiplication – what is similar? Different?). Allow students to ask clarifying questions.
- Consider ways to ensure that each student will have an equitable opportunity to share his/her thinking during task discussion.
- Students can “Think, Pair, Share” strategies for solving.
- Close the lesson by returning to the success criteria. Have students reflect on their progress related to the criteria.
- Ask students, “How many different ways did we find to share the apples equally in baskets?” “Are there other ways?” “How do you know?”

Teacher Reflection About Student Learning

- Use the rich mathematical task rubric to determine student progress. Look for: possible misconceptions, learning trajectories and sophistication of student ideas, and multiple solution pathways. Next steps based on this information could include:
 - Informing sequence of future tasks. What will come next in instruction to further student thinking in addition computation?
 - Informing small groups based on misconceptions that are not addressed in sharing.
- Use the Process Goals rubric to assess student understanding in relation to the process goals. Did students use appropriate representations? Were they able to reason through the combinations? The teacher may decide to focus on one category. Next steps based on this information could include:
 - Informing small groups based on current student engagement with the process goal(s) (i.e. think aloud, using specific sentence frames for communication, etc.).

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Planning for Mathematical Discourse

Mathematical Task: Baskets of Apples

Content Standard(s): SOL 3.4b

Teacher Completes Prior to Task Implementation			Teacher Completes During Task Implementation	
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 <i>Who? Which students used this strategy?</i>	Discussion Order - sequencing student responses <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 Consider ways to ensure that each student will have an equitable opportunity to share his/her thinking during task discussion
Anticipated Student Response A: “I don’t know how to do this.”	<ul style="list-style-type: none"> What do you know about the problem? How can you show that? How many baskets would you like to start with? What are some things you know about the number 60? How can that help you get started? 	<ul style="list-style-type: none"> Can decomposing the number 60 help you get started? 		
Anticipated Student Response B: Student was able to put apples in baskets but not shared equally.	<ul style="list-style-type: none"> What would happen if you added another basket (or removed a basket). How would that change your solution? 	<ul style="list-style-type: none"> How can you use the number of baskets that you used here to help solve this a different way? What if you put ____ apples in each basket? How many baskets would you have? 		
Anticipated Student Response C: Student was able to equally share apples in baskets one way.	<ul style="list-style-type: none"> What strategy did you use to share apples equally in baskets? How can that strategy help you solve another way? 	<ul style="list-style-type: none"> Could you use a different strategy to find the same solution? What numbers don’t work? Why? 		

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Teacher Completes Prior to Task Implementation			Teacher Completes During Task Implementation	
<p>Anticipated Student Response/Strategy <i>Provide examples of possible correct student responses along with examples of student errors/misconceptions</i></p>	<p>Assessing Questions – Teacher Stays to Hear Response <i>Teacher questioning that allows student to explain and clarify thinking</i></p>	<p>Advancing Questions – Teacher Poses Question and Walks Away <i>Teacher questioning that moves thinking forward</i></p>	<p>List of Students Providing Response <i>Who? Which students used this strategy?</i></p>	<p>Discussion Order - sequencing student responses</p> <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>
<p>Anticipated Student Response D: Student is able to create multiple ways to equally share 60 apples in baskets.</p>	<ul style="list-style-type: none"> ● What do you notice about your solutions? ● Do you notice any patterns in your representations? ● Can you explain the patterns that you used to find your representations? 	<ul style="list-style-type: none"> ● How many ways do you think there are to pack the apples equally in baskets? ● How would your solutions change if there were 61 apples? ● How would your solutions change if there were 65 apples? 		

Name _____

Date _____

Baskets of Apples

Farmer Quinn has an apple orchard. She packs apples in baskets to sell at the market.

- She has 60 apples to pack in baskets
- She wants the same number of apples in each basket.

Show three ways she can pack the apples in baskets to sell at the market.

Explain your thinking using pictures, numbers and words. Write a number sentence for each solution.

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Rich Mathematical Task Rubric

	Advanced	Proficient	Developing	Emerging
Mathematical Understanding	<p>Proficient Plus:</p> <ul style="list-style-type: none"> • Uses relationships among mathematical concepts or makes mathematical generalizations 	<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 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	<p>Proficient Plus:</p> <ul style="list-style-type: none"> • Problem solving strategy is well developed or 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"> • Problem solving strategy displays a limited 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 • Does not produce a solution that is relevant to the problem
Communication and Reasoning	<p>Proficient Plus:</p> <ul style="list-style-type: none"> • Reasoning or justification is comprehensive • Consistently uses precise mathematical language to communicate thinking 	<ul style="list-style-type: none"> • Demonstrates reasoning and/or justifies solution steps • Supports arguments and claims with evidence • Uses mathematical language to communicate thinking 	<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 	<ul style="list-style-type: none"> • Provides no correct reasoning or justification • Does not provide evidence to support arguments and claims • Uses no mathematical language to communicate thinking
Representations and Connections	<p>Proficient Plus:</p> <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

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