

## Rich Mathematical Task – Grade 1 – *Doubles Game*

### Task Overview/Description/Purpose:

- In this task, students will create their own doubles game.
- The purpose of this task is for students to use the doubles strategy for addition problems.

### Standards Alignment: Strand – *Computation and Estimation*

**Primary SOL:** 1.7b The student will demonstrate fluency with addition and subtraction within 10.

**Related SOL:** K.6, 1.6, 2.6

#### Learning Intention(s):

- **Content** - I am learning to double numbers.
- **Language** - I am learning to use mathematical language to describe doubling in addition.
- **Social** - I am learning to describe my thinking to others and listen as my classmates share their mathematical thinking.

#### Success Criteria (Evidence of Student Learning):

- I can double numbers and find the sum.
- I can use patterns to find sums.

#### Mathematics Process Goals

Mathematical Understanding	<ul style="list-style-type: none"> <li>• Students will demonstrate an understanding of the doubling strategy.</li> </ul>
Problem Solving	<ul style="list-style-type: none"> <li>• Students will apply mathematical concepts and skills and the relationships among them to find solutions to the task.</li> </ul>
Communication and Reasoning	<ul style="list-style-type: none"> <li>• Students will work with a partner to use math vocabulary to justify their thinking.</li> </ul>
Connections and Representations	<ul style="list-style-type: none"> <li>• Students will represent their thinking on paper using the spinner and game board.</li> </ul>

### 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 solutions.

This task can be given at any time to see how students are progressing with the concept of doubling. If you choose to give it before starting the unit, you can see what knowledge the students already have regarding doubles. If you give the task during your unit, you can see how students are progressing with doubles and what additional supports they may need. If given at the end of the unit, the task can be a good assessment of the student’s knowledge of doubling.

#### Materials and Technology:

- Counters
- Copy of task for each student
- [Virtual Implementation Google Slides](#)

#### Vocabulary:

- Add
- Sum
- Double

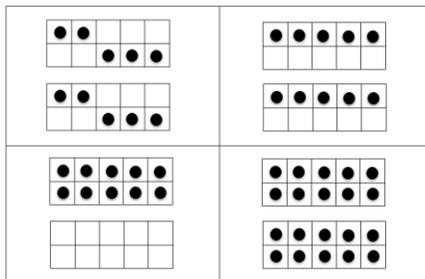
**Anticipate Responses:** See the Planning for Mathematical Discourse Chart (columns 1-3).

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### Task Implementation (Before) 10-15 minutes

#### Task Launch:

- Whole Group-Engage students in a “Which One Doesn’t Belong?” number sense routine. Display ten frames like the ones pictured below. Ask students to tell you which one doesn’t belong and why. There is no correct answer. The point of this exercise is to have students communicate and justify their reasoning.



- If the language of doubles does not come up during the discussion, lead students to see the doubles in the representations. Explain that doubles are when both addends are the same. Ask them how they would write the number sentences for the bottom two pictures? If needed, help them see that they would write  $5 + 5 = 10$ ,  $10 + 10 = 20$ , etc. Review the vocabulary of doubles, addends, and sum.
- Share the learning intentions and success criteria with the students. Clarify any vocabulary you think might be difficult for your students.
- Ask the students to briefly share their experiences playing games.
- Introduce the task by reading the problem aloud to students. Tell the students they are going to create their own game with a partner. They can choose any numbers they want for the spinner.
- Ask a few students to restate the task in their own words to promote understanding and provide an opportunity to clarify any questions.
- Explain that students will begin working collaboratively with a partner to discuss the task and possible solutions and ways to represent their solutions. Redirect them to the language and social learning intentions for this task. After discussing with their partner, each student is responsible for recording their own solution on the task sheet and need to be prepared to share their thinking with the class.
- Review the rubric with students. Let them know you are looking for their:
  - Mathematical Understanding
  - Problem Solving
  - Communication and Reasoning
  - Representations and ConnectionsYou may choose to focus on just one or two of the process goals. Make your selected focus goals clear to students before they begin working on the task.
- Implement suggestions for additional student support below as needed.

### Task Implementation (During) 25-30 minutes

#### Directions for Supporting Implementation of the Task

- Monitor – Teacher will listen and observe students as they work on the task and ask assessing or advancing questions (see the Planning for Mathematical Discourse chart on next page).
- Select – Teacher will decide which student strategies will be highlighted (after student task implementation) that will advance mathematical ideas and support student learning.

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### Task Implementation (During) 25-30 minutes

- Sequence – Teacher will decide the order in which student ideas will be highlighted (after student task implementation). The teacher should sequence from the least sophisticated strategy to the most sophisticated strategy. For instance, a student who starts with doubling basic numbers like  $1+1=2$ ,  $2+2=4$ , etc. to a more sophisticated student who noticed patterns and used larger numbers like  $10+10=20$ ,  $20+20=40$ , and finally if you have a student who doubled even larger numbers  $100+100=200$ .
- Connect – Teacher will consider ways to facilitate connections between different student responses.
  - Students work in purposefully planned groups for 25-30 minutes to explore strategies, share ideas, and transfer their ideas to paper using pictures, words, and symbols.
    - As the teacher is monitoring, s/he 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

- Have counters available for students who may need a physical model to help them create doubles facts.
- Vocabulary development could be assisted by re-reading the problem and interpreting the vocabulary terms; doubles and sum.
- When a teacher uses a think aloud where they engage in metacognition (thinking about their thinking), this can greatly support students in understanding how someone is thinking about the task. A teacher can model:
  - Questioning
  - Monitoring understanding of task or problem-solving
  - Demonstrating fix-up strategies when problem-solving breaks down
  - Visualizing what is being learned or problem-solved
  - Drawing inferences
  - Making connections between concepts and experiences
- Provide sentence frames such as:
  - I agree/disagree with \_\_\_\_\_'s strategy because \_\_\_\_\_.
  - The strategy I used to solve is \_\_\_\_\_.
  - I know that \_\_\_\_\_.
  - This is the sum because \_\_\_\_\_.
  - First I am going to \_\_\_\_\_. Next I will \_\_\_\_\_. I will know I have solved the problem because \_\_\_\_\_.
- An extension could be having students double larger numbers to see if they see the patterns in numbers.
- Another extension could be having students create near doubles or another fact strategy game.

### Task Implementation (After) 15-20 minutes

**Connecting Student Responses (From Anticipating Student Response Chart) and Closure of the Task:** Based on the actual student responses, sequence and select 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 addition-smaller facts like  $1+1$  to larger facts  $10+10$ ,  $100+100$ , etc.)
- Connections, did anyone see patterns between  $2+2$ ,  $20+20$ ,  $200+200$ , etc.?
- 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 \_\_\_\_\_

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### Task Implementation (After) 15-20 minutes

- 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. 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 participate in a Gallery Walk to view all strategies prior to coming together to discuss selected strategies.
  - Students can “Think, Pair, Share” strategies for solving.
- Close the lesson by returning to the success criteria. Have students reflect on their progress toward the criteria.

### Teacher Reflection About Student Learning

- As you reflect, think about whether the learning intentions and success criteria met. Why or why not?
- Teacher will use the chart with anticipated student solutions to monitor which students are using which strategies. This will include: 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 fact strategies?
  - Informing small groups based on misconceptions that are not addressed in sharing.
- Were students engaged in the task? If not, how could we improve the task so that it is more engaging?
- After task implementation, the teacher will use the Process Goals rubric to assess student understanding in relation to the process goals. 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.).

## Rich Mathematical Task – Grade 1 – *Doubles Game*

### Planning for Mathematical Discourse

Mathematical Task: Doubles Game

Content Standard(s): SOL 1.7b

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"> <li>● <i>Based on the actual student responses, sequence and select particular students to present their mathematical work during class discussion</i></li> <li>● <i>Consider ways to ensure that each student will have an equitable opportunity to share his/her thinking during task discussion</i></li> </ul>	
<b>Anticipated Student Response A:</b>  Students are unable to start the task.	<ul style="list-style-type: none"> <li>● Can you restate the task to me?</li> <li>● What is a double?</li> <li>● What is a sum?</li> <li>● What goes on the spinner?</li> <li>● What goes on the gameboard?</li> <li>● What numbers could you start with?</li> </ul>	<ul style="list-style-type: none"> <li>● Do you think using counters could help you?</li> <li>● Can you think of any other numbers that might work?</li> </ul>			
<b>Anticipated Student Response B:</b>  Students write facts but they are not doubles facts.	<ul style="list-style-type: none"> <li>● What is a double?</li> <li>● How did you choose the numbers for the spinner?</li> <li>● How did you get the numbers for the gameboard?</li> <li>● What numbers could you start with?</li> </ul>	<ul style="list-style-type: none"> <li>● Do you think using counters could help you?</li> <li>● Can you think of any other numbers that might work?</li> </ul>			
<b>Anticipated Student Response C:</b>  Students write the doubles 1+1, 2+2, 3+3, 4+4, 5+5, 6+6, 7+7, 8+8 but with some sums incorrect.	<ul style="list-style-type: none"> <li>● How did you choose the numbers for the spinner?</li> <li>● How did you get the numbers for the gameboard?</li> <li>● Do you see any patterns?</li> </ul>	<ul style="list-style-type: none"> <li>● How can you make sure that the sums on the gameboard are correct?</li> <li>● Can you use patterns to create more doubles?</li> </ul>			

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Teacher Completes Prior to Task Implementation			Teacher Completes During Task Implementation	
<b>Anticipated Student Response/Strategy</b> <i>Provide examples of possible correct student responses along with examples of student errors/misconceptions</i>	<b>Assessing Questions – Teacher Stays to Hear Response</b> <i>Teacher questioning that allows student to explain and clarify thinking</i>	<b>Advancing Questions – Teacher Poses Question and Walks Away</b> <i>Teacher questioning that moves thinking forward</i>	<b>List of Students Providing Response</b> <i>Who? Which students used this strategy?</i>	<b>Discussion Order - sequencing student responses</b> <ul style="list-style-type: none"> <li>● <i>Based on the actual student responses, sequence and select particular students to present their mathematical work during class discussion</i></li> <li>● <i>Consider ways to ensure that each student will have an equitable opportunity to share his/her thinking during task discussion</i></li> </ul>
<b>Anticipated Student Response D:</b>  Students write the doubles 1+1, 2+2, 3+3, 4+4, 5+5, 6+6, 7+7, 8+8 and the sums are correct.	<ul style="list-style-type: none"> <li>● How did you choose the numbers for the spinner?</li> <li>● What are you noticing about the sums you are placing on the gameboard?</li> <li>● Do you see any patterns?</li> <li>● How did you get the numbers for the gameboard?</li> </ul>	<ul style="list-style-type: none"> <li>● Is it possible to double larger numbers?</li> <li>● What patterns are you noticing as you make more doubles? How would you explain these patterns to your classmates?</li> <li>● Using patterns that you notice, what other doubles could you create?</li> </ul>		
<b>Anticipated Student Response E:</b>  Students write doubles for larger facts, 10+10, 100+100, etc. but with some sums incorrect.	<ul style="list-style-type: none"> <li>● How did you choose the numbers for the spinner?</li> <li>● How did you get the numbers for the gameboard?</li> <li>● Do you see any patterns?</li> <li>● Does this sum fit the patterns you have noticed with other numbers you have chosen? Why or why not?</li> </ul>	<ul style="list-style-type: none"> <li>● How can you make sure that the sums on the gameboard are correct?</li> <li>● Is it possible to double numbers like 22+22? Why or why not?</li> <li>● What patterns are you noticing as you make more doubles? How would you explain these patterns to your classmates?</li> <li>● Using patterns that you notice, what other doubles could you create?</li> </ul>		

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Teacher Completes Prior to Task Implementation			Teacher Completes During Task Implementation	
<b>Anticipated Student Response/Strategy</b> <i>Provide examples of possible correct student responses along with examples of student errors/misconceptions</i>	<b>Assessing Questions – Teacher Stays to Hear Response</b> <i>Teacher questioning that allows student to explain and clarify thinking</i>	<b>Advancing Questions – Teacher Poses Question and Walks Away</b> <i>Teacher questioning that moves thinking forward</i>	<b>List of Students Providing Response</b> <i>Who? Which students used this strategy?</i>	<b>Discussion Order - sequencing student responses</b> <ul style="list-style-type: none"> <li>● <i>Based on the actual student responses, sequence and select particular students to present their mathematical work during class discussion</i></li> <li>● <i>Consider ways to ensure that each student will have an equitable opportunity to share his/her thinking during task discussion</i></li> </ul>
<b>Anticipated Student Response F:</b>  Students write doubles for larger facts, 10+10, 100+100, etc. and the sums are correct.	<ul style="list-style-type: none"> <li>● How did you choose the numbers for the spinner?</li> <li>● How did you get the numbers for the gameboard?</li> <li>● Do you see any patterns?</li> <li>● What have you learned about doubling with this task?</li> </ul>	<ul style="list-style-type: none"> <li>● Is it possible to double even larger numbers?</li> <li>● Is it possible to double numbers like 22+22? Why or why not?</li> <li>● Can you use patterns to create more doubles?</li> <li>● How could you describe these patterns to your classmates?</li> <li>● Why do these patterns make sense?</li> </ul>		

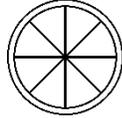
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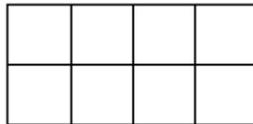
## Doubles Game

Mrs. Munson's class is making a doubles game. Students will spin a spinner, double the number it lands on, and cover that sum on the gameboard.

- What numbers could the class place on the spinner?



- If the numbers on the game board are the sums, what numbers should be placed on the game board?



Show your work and explain your thinking.

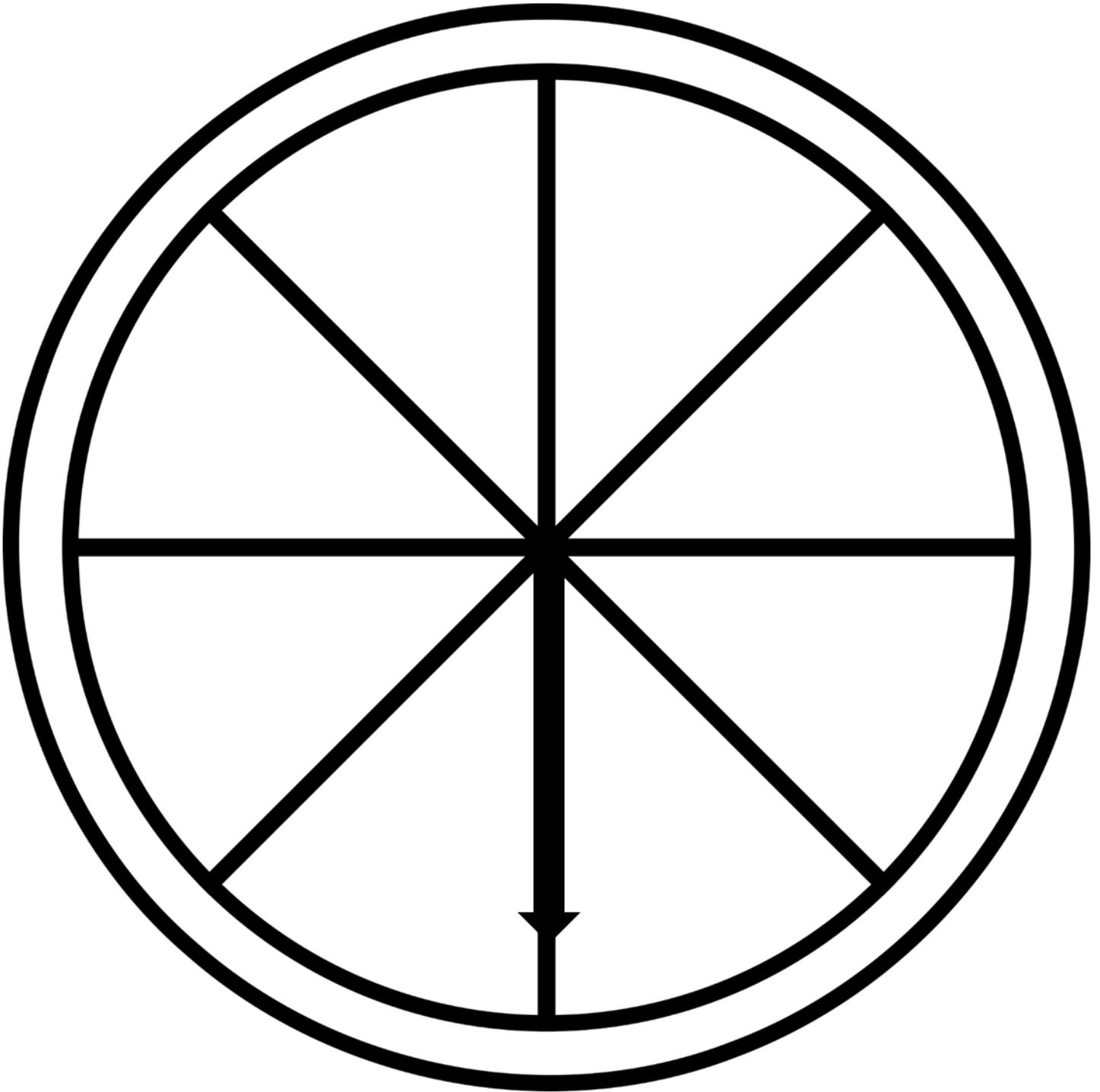
**Rich Mathematical Task – Grade 1 – *Doubles Game***

**Rich Mathematical Task Rubric**

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

**Additional Resources/Graphic Organizers/Etc.**

**Spinner**



Rich Mathematical Task – Grade 1 – *Doubles Game*

**Gameboard**


### Which One Doesn't Belong?

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