Game: Playing Circles and Stars

Common Core Standard:

Represent and solve problems involving multiplication and division.

3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.

Additional/Supporting Standard(s):

Understand properties of multiplication and the relationship between multiplication and division.

3.OA.5 Apply properties of operations as strategies to multiply and divide.

Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them
2. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision

Student Outcomes:

- I can see multiplication as combining equal groups.
- I can use repeated addition as a strategy to find the total number of stars.
- I can use strategies to find the total number of stars.
- I can record my answer by writing an equation.

Materials:

- One six-sided die or a spinner for each pair of children
- Game Recording Sheet per player
- Data chart for Class

Advance Preparation:

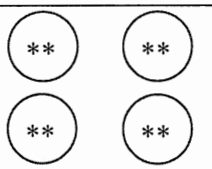
Circles and Stars is a game that gives children a visual interpretation of multiplication and repeated addition. The game also helps students see multiplication as the combining of equal-sized groups that can be represented with a multiplication equation.

Directions:

- The teacher should model this game by inviting a student to play as a partner.
- This game can be introduced to the entire class. The teacher might play a game with another student to model the game. Use modeling and questioning to ensure understanding.
  Teacher: Player One rolls the die and draws the corresponding number of circles at the top on the top row of the recording sheet. If the player rolls a 4, the player will draw 4 circles
- **Student:** Player Two rolls the die and draws the corresponding number of circles in the round one box on his/her recording sheet. If player two rolls a 1, the player will draw 1 circle.

- **Teacher:** Player One rolls the die a second time and draws the corresponding number of stars in each circle. (An option may be to draw Xs which are easier to draw.) If a player rolls a 2, the player will draw 2 stars in each circle. (See Player One's (Jack) recording sheet.) Player records both the addition and multiplication equation for each round. Many students will need to record both equations to move them from repeated addition to multiplication. Later, they might just record for multiplication.
- **Student:** Player 2 rolls a second time and draws the corresponding number of stars on his/her recording sheet. Player 2 records equations.
- **Teacher and Student:** Each player should record his/her name and partner's name in the top left corner of the player's recording sheet. At the end of the game, each player will total his/her total stars for each round and record the total in the top left box. Record partner's score and record the difference between the two scores.

Circle and Stars Recording Sheet

Jack's total ____ Partner's total ____ Difference ____	 2 + 2 + 2 + 2 =8 4 x 2 = 8			

- Both players repeat these steps until all boxes are filled.
- Each player finds the total number of stars on his/her game sheet. Players need to check each other's work.
- Each player records own score plus partner's score. Find the difference and record.
- Many students will need to record both equations to move them from repeated addition to multiplication. Later, they might just record for multiplication.

Questions to Pose:

Before:

- If your die had a zero and your first roll was a 5 and your second roll was a zero? Explain how your would record?

During:

- What numbers did you represent in different ways? Compare with your partner. Explain.
- What other observations did you make as you were playing this game? Explain.

After:

- What is the fewest number of stars you can get in one round? Explain.
- What is the greater number of stars you can get in one round? Explain.

Circles and Stars – Data Collection

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Circles and Stars Recording Sheet

Name _____ Date _____

Players Total _____ Partner's Total _____ Difference _____	**Round 1**	**Round 2**	**Round 3**
Round 4	**Round 5**	**Round 6**	**Round 7**

Total Number of Stars _____