MA.2.AR.3.1

Overarching Standard: *MA.2.AR.3 Develop an understanding of multiplication.*

Benchmark of Focus

MA.2.AR.3.1: Represent an even number using two equal groups or two equal addends. Represent an odd number using two equal groups with one left over or two equal addends plus 1.

Examples:

> The number 8 is even because it can be represented as two equal groups of 4 or as the expression 4 + 4.

> The number 9 is odd because it can be represented as two equal groups with one left over or as the expression 4 + 4 + 1.

Benchmark Clarifications

Clarification 1: Instruction focuses on the connection of recognizing even and odd numbers using skip counting, arrays and patterns in the ones place.

Clarification 2: Addends are limited to whole numbers less than or equal to 12.

Related Benchmark/Horizontal Alignment

MA.2.NSO.1.2
MA.2.NSO.2.1
MA.2.FR.1.1

Vertical Alignment

Previous Benchmarks	Next Benchmarks
MA.1.NSO.2.1	MA.3.AR.3.1

Purpose and Instructional Strategies

The purpose of this benchmark is to introduce the concept of even and odd numbers by building on students' understanding of equal groups and equal addends while continuing to build their automaticity with basic facts. This work lays the foundation for understanding multiples of 2. *(MTR.5.1)*

- Instruction includes the use of arrays to show equal groups in rows and columns.
- Instruction includes the use of manipulatives, drawings, models, or equations to show a number as even or odd.
- Instruction includes numbers no larger than 25.
- Instruction includes building the foundation for patterns in grade 3.

Common Misconceptions or Errors
- Students may think a number is odd if the doubles addition fact involves odd numbers.

Strategies to Support Tiered Instruction
- Instruction includes opportunities to draw models of double facts or use two-color counters to explore the sums produced. Focus should be on sums always being even.
  - For example, students draw a model for 4 + 4, 5 + 5, 6 + 6, 7 + 7, 8 + 8 and 9 + 9 by drawing a column of circles to represent each number. Students then pair the circle in each row to see there are no circles left without a match even when odd addends are used. Enough examples should be completed for students to see the pattern in the sums and realize the sums will always be even.

$$4 \quad + \quad 4 \quad = \quad 8$$
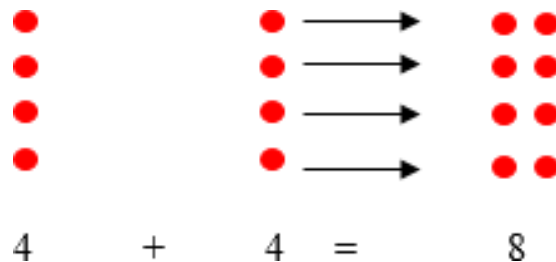
- Instruction includes opportunities to build models of numbers using two-color counters to determine if a number is even or odd.
  - For example, using 15 two-color counters, students pair the counters together to determine if each counter will have a partner or if one counter will be left without a partner. Students will determine if the number is even or odd by developing the understanding that an even number can be split into two equal groups.
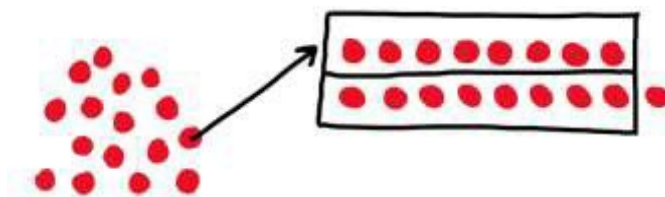
Questions to ask students:

Ask: Is 12 even or odd? How do you know?
- Sample answer that indicates understanding: *Even, because if you take 12 counters and put them in pairs, every counter will have a partner with none left over* OR *Even, because it can be split into two equal groups of 6 + 6.*
- Sample answer that indicates an incomplete understanding: *Student replies even because it ends in 2.* (Ask probing questions to see if student can provide other reasoning)

Ask: Can you tell me an even number? Can you write an equation to prove that it is even?
- Sample answer that indicates understanding: *20 is even because it can be split into two equal groups 10 + 10 = 20.*
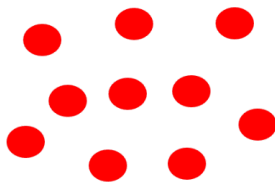
Instructional Tasks

Instructional Task 1 (MTR.5.1)

Present students with a variety of numbers between 0 and 25. Ask students to determine if the given number is even or odd by visually representing groups and creating an expression to determine if the total number of counters is even or odd. Student discussion should center around students being able to make generalizations about odd and even numbers.

Instructional Items

Instructional Item 1

The counters below represent the number 10. Use groups and an expression to justify if the number 10 is even or odd.

Instructional Item 2

Tim says 15 is odd because there is a 5 in the ones place. Use an array to show that he is correct.

Additional Resources:

CPALMS Resources

Blog Post: Not Just Evens and Odds   http://smathsmarts.com/not-just-evens-and-odds/

LearnZillion Video: Recognize even and odd numbers by forming partners and equal groups

Resources/Tasks to Support Your Child at Home:

- Give your child a number from 0-20. Have your child model that number using some type of counter (cereal, cubes, etc.). Have your child create pairs with the counters. If there are all pairs with no counters by themselves, it is an even number. If there are all pairs with one counter leftover, then it's an odd number. Continue with all numbers 0-20.

- Use a number chart to look for odd and even number patterns. Have them shade in the odd numbers blue and even numbers red to see the pattern clearly. They should notice that it is every other number that is odd/even.

- Khan Academy: Intro into Even and Odd Numbers