MA.3.AR.3.1

Overarching Standard: MA.3.AR.3 *Identify numerical patterns, including multiplicative patterns*

Benchmark of Focus

MA.3.AR.3.1: Determine and explain whether a whole number from 1 to 1,000 is even orodd.

Benchmark Clarifications:

Clarification 1: Instruction includes determining and explaining using place value and recognizing patterns.

Related Benchmark/Horizontal Alignment
- MA.3.NSO.2.2/2.4

Vertical Alignment

Previous Benchmarks	Next Benchmarks
MA.2.AR.3.1	MA.4.AR.3.1

Purpose and Instructional Strategies

The purpose of this benchmark is for students to relate odd and even numbers to factors and multiples. In Grade 2, students learn to represent an even number using two equal groups or twoequal addends and as odd number as two equal groups or two equal addends with one left over (2.AR.3.1). In Grade 3, instruction extends to use patterns to generalize whether any number is odd or even (MTR.2.1, MTR.5.1).
- Instruction should connect multiples of 2 to the patterns that the ones digit in any even number is 0, 2, 4, 6, or 8. By teaching this benchmark with MA.3.AR.3.2, students can see that multiple of 2 can form any even number. If a number is not a multiple of 2, thenthe number is odd (MTR.5.1).
- These beginning understandings about multiples will help students explore factors and divisibility with prime and composite numbers in Grade 4.

Common Misconceptions or Errors
- Students may confuse that in an even number, the ones digit indicates whether it is a multiple of 2. For example, students may look at the number 883 is even because thedigit 8 in the hundreds and tens places are even.

Strategies to Support Tiered Instruction
- Instruction includes opportunities to practice identifying if multi-digit numbers are even or odd by using a place-value chart. The teacher explains that even numbers can be represented by two equal groups or two equal addends and that odd numbers can be represented by two equal groups or two equal addends with one left over while modeling using visual representations with several examples (e.g., drawings, tally marks).

○ For example, the teacher uses visual representations to identify numbers are even or odd by sorting into two equal groups using drawings or tally marks and enters numbers into a place value chart while asking "What do you notice about the digits in the ones place?" Students should explain that even numbers all have digits in the ones place that are multiples of 2 (0, 2, 4, 6, or 8). Additional examples are used in the place-value chart to practice identifying if numbers are even or odd by looking at the digits in the ones place.

Hundreds	Tens	Ones	Tallies/Drawings		Even or Odd?
	1	3	‖‖ ‖	‖‖	Odd
	2	8	‖‖ ‖‖ ‖‖‖	‖‖ ‖‖ ‖‖‖	Even
		7	‖‖‖	‖‖	Odd
	3	0	‖‖ ‖‖ ‖‖	‖‖ ‖‖ ‖‖	Even
	1	6	‖‖ ‖‖	‖‖ ‖‖	Even
2	3	2	▢ ⁞	▢ ⁞	Even
8	8	1	▢▢▢ ‖‖‖˙	▢▢▢ ‖‖‖	Odd
4	9	4	▢▢▢ ‖‖‖⁚	▢▢▢ ‖‖‖⁚	Even

○ For example, students use counters to identify if numbers are even or odd by sorting into two equal groups and enter numbers into a place value chart.

Hundreds	Tens	Ones	Multiples of 2: 0, 2, 4, 6, 8	
	1	3		
	2			
		7		
	3			
	1			

o   As in the previous example, the students use counters by sorting into two equal groups. The teacher asks, "How many total counters are there, and what is the digit in the ones place?" Students should explain that even numbers all have digits in the ones place that are multiples of 2 (0, 2, 4, 6, or 8). Additional examples are used in the place-value chart to practice identifying if numbers are even or odd by looking at the digits in the ones place.

Questions to ask students:
- Ask: Is 140 even or odd? How do you know?
    - Sample answer that indicates understanding: "Even because I know that ten is even, and when I count by ten those numbers are also even. There isn't anything in the ones place that could make it odd."
- *Ask: Can you tell me an even number? Can you write an equation to prove that it is even?*
    - Sample answer that indicates understanding: "354 is even because the digit in the ones place is a multiple of 2."
- Ask: How does the ones place help you determine if a number is odd or even?
    - Sample answer that indicates understanding: "Every time you get to a ten or a hundred those are always even numbers, so the ones place it going to tell you if you have equal pairs or not. If it is 2, 4, 6, or 8 then they will always be even because they will always have a pair."

Instructional Tasks
Instructional Task 1

Is the number 461 even or odd? Explain how you know.

Instructional Items
Instructional Item 1

Determine whether the numbers are even or odd in the table below.

	Even	Odd
883	☐	☐
19	☐	☐
538	☐	☐
1,000	☐	☐
727	☐	☐

Achievement Level Descriptors

Benchmark	Context	Assessment Limits
MA.3.AR.3.1 Determine and explain whether a whole number from 1 to 1,000 is even or odd. Clarification 1: Instruction includes determining and explaining using place value and recognizing patterns.	Mathematical	Items must include numbers from 101 to 1000. Items with explanations may include models.

ALD 2	ALD 3	ALD 4	ALD 5
determines whether a whole number from 1 to 20 is even or odd.	determines whether a whole number from 1 to 100 is even or odd.	determines and explains whether a whole number from 1 to 1,000 is even or odd.	identifies an error and determines and explains whether a whole number from 1 to 1,000 is even or odd.

Additional Resources:
CPALMS Resources
Blog Post: Not Just Evens and Odds
Video: Recognize even and odd numbers by forming partners and equal groups

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Resources/Tasks to Support Your Child at Home:

- Give your child a number from 0-100. 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 some counters left by themselves then it's an odd number. Continue with various numbers 0-100.

- Khan Academy: Intro into Even and Odd Numbers
- Shopping Spree: Together with your child, go shopping at a grocery store, drug store, or a 99¢ store. Look at different items and their prices. Have your child identify if the number is odd or even. Remind your child to look at the ones place to see if a number is even or odd. Then ask your child to look for an item with a price that is even or odd. As an extension, you can add a dollar or subtract a dollar from a price and have your child identify if the new price is even or odd.

- Odd and Even Cubes: Roll two number cubes to make a two-digit number. Have your child identify if the number is even or odd. If he or she has difficulties, have your child use beans, coins, or other small objects to divide the number into two groups. If the counters can be divided into two equal groups, the number is even. If the counters cannot be divided into two equal groups, the number is odd. Have him or her record all the numbers in a notebook and use the page as a reference in the future. Continue this with 3 number cubes to build three-digit numbers to identify ass odd or even.