Topic F
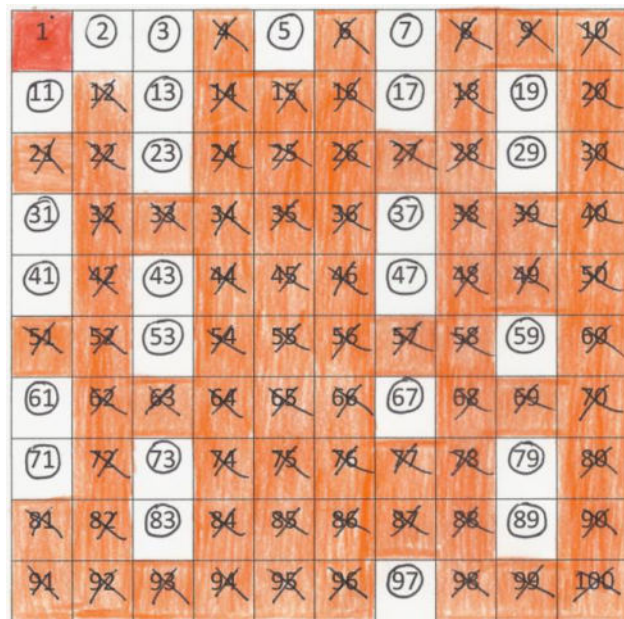# Reasoning with Divisibility

4.OA.4

Focus Standard:	4.OA.4	Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
Instructional Days:	4	
Coherence -Links from:	G3–M1	Properties of Multiplication and Division and Solving Problems with Units of 2–5 and 10
	G3–M3	Multiplication and Division with Units of 0, 1, 6–9, and Multiples of 10
-Links to:	G5–M2	Multi-Digit Whole Number and Decimal Fraction Operations
	G5–M3	Addition and Subtraction of Fractions

In Topic F, armed with an understanding of remainders, students explore factors, multiples, and prime and composite numbers within 100 (**4.OA.4**). Students gain valuable insights into patterns of divisibility as they test for primes and find factors and multiples, at times using their new skill of dividing double-digit dividends. This prepares them for Topic G's work with dividends of up to four digits.

Lesson 22 has students find factor pairs for numbers to 100 and then use their understanding of factors to determine whether numbers are prime or composite. In Lesson 23, students use division to examine numbers to 100 for factors and make observations about patterns they observe, for example, "When 2 is a factor, the numbers are even." Lesson 24 transitions the work with factors into a study of multiples, encouraging students to notice that the set of multiples of a number is infinite while the set of factors is finite.

In Lesson 25, the Sieve of Eratosthenes uses multiples to enable students to identify and explore the properties of prime and composite numbers to 100.

A Teaching Sequence Toward Mastery of Reasoning with Divisibility
Objective 1: Find factor pairs for numbers to 100, and use understanding of factors to define prime and composite. **(Lesson 22)**
Objective 2: Use division and the associative property to test for factors and observe patterns. **(Lesson 23)**
Objective 3: Determine if a whole number is a multiple of another number. **(Lesson 24)**
Objective 4: Explore properties of prime and composite numbers to 100 by using multiples. **(Lesson 25)**