**4** GRADE

# Mathematics Curriculum

## Topic H
# Exploring a Fraction Pattern

## 4.OA.5

| Focus Standard: | 4.OA.5 | Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.* |
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| Instructional Days: | 1 | |
| Coherence  -Links from: | G3–M5 | Fractions as Numbers on the Number Line |
| -Links to: | G5–M3 | Addition and Subtraction of Fractions |

Topic H is an exploration lesson in which students find the sum of all like denominators from $\frac{0}{n}$ to $\frac{n}{n}$.

Students first work, in teams, with fourths, sixths, eighths, and tenths. For example, they might find the sum of all sixths from $\frac{0}{6}$ to $\frac{6}{6}$. Students discover that they can make pairs with a sum of 1 to add more efficiently, e.g., $\frac{0}{6} + \frac{6}{6}$, $\frac{1}{6} + \frac{5}{6}$, $\frac{2}{6} + \frac{4}{6}$, and there will be one fraction, $\frac{3}{6}$, without a pair. As students make this discovery, they share and compare their strategies within their teams. They then extend this to similarly find sums of thirds, fifths, sevenths, and ninths, observing patterns when finding the sum of odd and even denominators (**4.OA.5**). Through discussion of their strategies, students determine which are most efficient.

Advanced students can be challenged to find the sum of all hundredths from 0 hundredths to 100 hundredths.

| A Teaching Sequence Toward Mastery of Exploring a Fraction Pattern |
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| **Objective 1:** Find and use a pattern to calculate the sum of all fractional parts between 0 and 1. Share and critique peer strategies. <br> **(Lesson 41)** |