Number System

6.NS.B.2 & 6.NS.B.3 Procedural Skill and Fluency Mini-Assessment by Student Achievement Partners

OVERVIEW

This mini-assessment is designed to illustrate aspects of standards 6.NS.B.2 and 6.NS.B.3, specifically the expectation that students perform computations with multi-digit numbers fluently. This mini-assessment is designed for teachers to use either in the classroom, for self-learning, or in professional development settings to:

- Evaluate students' progress toward some of the skills required by 6.NS.B.2 and 6.NS.B.3 to ensure that students have mastered the expected computation skills;
- Gain knowledge about assessing computation at the depth expected at grade 6; and
- Illustrate CCSS-aligned assessment problems.

MAKING THE SHIFTS

This mini-assessment attends to **focus** and **coherence,** as it addresses culminating content that spans several grades building toward computational fluency. While these standards are from an additional cluster of grade 6, the work with operations is a consolidation of learning from earlier grades and provides the opportunity for students to demonstrate fluency with whole numbers and decimals for all four operations. These are all key components of the major work of grade 6.[1] It addresses content from across grades as the questions require students to add, subtract, multiply, or divide multi-digit whole numbers and decimals. This mini-assessment primarily targets *procedural skill and fluency,* one of the three elements of **rigor**, although there are also some questions with carefully chosen numbers that allow students to also use some conceptual understanding. Problems 3 and 6 would be interesting to discuss with students post-assessment as they target conceptual understanding. Teachers could say, "Let's look at what is interesting about problem #3 and the answer to #3. Why does that happen?"

A CLOSER LOOK

As shown by this mini-assessment, students can and should continue to draw on their conceptual understanding both to evaluate reasonableness of computations and to use opportunistic strategies instead of procedures for problems that lend themselves to such approaches. This is true for 6.NS.B.2 and 6.NS.B.3 which are the capstone of work with operations in earlier grades. This consolidation of learning provides an opportunity for Grade 6 students to demonstrate fluency with whole numbers and decimals for all four operations. This mini-assessment centers on the required fluencies in the grade 6 standards. The problems highlight the four operations with whole numbers, decimals and fractions.

> **6.NS.B.2:** Fluently divide multi-digit numbers using the standard algorithm.
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> **6.NS.B.3:** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

The standards call for the fluency using the standard algorithm for each operation. In earlier grades, the standards built students' understanding of the mathematics leading to the standard algorithms. In grade 6, students should be using them to perform fast and accurate calculations. Students who leave grade 6 without meeting the expectations of 6.NS.B.2 and 6.NS.B.3 may have difficulty with operations on all rational numbers called for in the grade 7 standards and may struggle to evaluate the reasonableness of their answers to computation problems.

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[1] For more on the Major Work of the grade, see achievethecore.org/focus.

Name:_____ Date:_____

1) 2,073 x 56	2) $4{,}872 \div 24 =$ _____
3) $148{,}148{,}148 \div 37 =$ _____	4) 7,816 + 5,436
5) $201.134 - 41.0272 =$ _____	6) $462.8 + \frac{1}{5} =$
7) $1.6\overline{)15.76}$	8) $28.7 \ x \ 0.15 =$
9) $\dfrac{5}{0.2} =$	10) $\dfrac{391}{17} =$

Number System Procedural Skill and Fluency Mini-Assessment Answer Key

Name:_____Date:_____

1) $\qquad$ 2,073 $\qquad$ x 56 116,088	2) $4872 \div 24 = \underline{203}$
3) $148,148,148 \div 37 = \underline{4,004,004}$ Some students may use the quotient 148/37 and place value understanding to generate the answer. Student work may appear partially completed.	4) $\qquad$ 7,816 $\qquad$ + 5,436 13,252
5) $201.134 - 41.0272 = \underline{160.1068}$ This item illustrates how place value and rounding can be helpful in identifying when answers are unreasonable. Students should be able to explain that their answer will be close to 160.	6) $462.8 + \frac{1}{5} = \underline{463}$ Some students may arrive at the correct answer without showing calculations, knowing that 1/5 is .2 and finding the sum mentally.
7) $\qquad$ 9.85 $1.6\overline{)15.76}$	8) $28.7 \times 0.15 = \underline{4.305}$

9) $\dfrac{5}{0.2} = 25$

Students may not solve this item using long division and may only show partial work. Students know that .2 x 5 = 1 and find an equivalent fraction with a denominator of 1.

10) $\dfrac{391}{17} = 23$