mastery education

WHITE PAPER

Measuring Up

Research-Based Pedagogy

of the Measuring Up to the Common Core

Research-Based Pedagogy of the *Measuring Up*® to the Common Core

INTRODUCTION

In January 2002, President George Bush signed into law the No Child Left Behind Act of 2001. Under this law, educational programs and materials paid for by federal funding must be based on sound, widely accepted educational research that supports the materials' design, thus increasing the likelihood that the materials will help students achieve the desired learning outcomes. This law, commonly known as NCLB, requires educators to be aware of the body of research that supports the design of any materials they are considering for use with their students.

Furthering efforts to stimulate an economic recovery, the American Recovery and Reinvestment Act of 2009 (ARRA), signed into law by President Barack Obama, funded Race to the Top, a competitive state education grant. Grant funds were designed to encourage and reward states that were creating education innovation and reform; achieving significant improvement in student outcomes, including making substantial gains in student achievement, closing achievement gaps, improving high school graduation rates, and ensuring student preparation for success in college and careers. As part of the grant criteria, considerable weight was given to states that adopted and participated in a consortium to develop a set of common standards and assessment. These standards are known as the Common Core State Standards.

Since its inception in 1990, Peoples Education has created student-learning products based on continual review of scientific research literature. The *Measuring Up* series, available in print and in digital format (*Measuring Up Reach*™) is founded on a set of principles derived from the soundest current theory and research on reading and language arts, mathematics, writing, science, social studies, assessment, and literacy. These principles are based specifically on the student-learning standards of the Common Core State Standards. Additionally, content experts creating this series built upon the methodology and best practices from the best-selling *Measuring Up* state-specific resources that have served more than 13 million students in the last 12 years.

This document serves both to provide information about the *Measuring Up* program and to explain the research on learning theory on which the series is based. Consequently, this document is organized to be useful to educators who are considering the soundness and the practical uses of the materials in classrooms.

First, each principle that supports the design of the materials is articulated. Second, the best known and most respected educational research substantiating the principle is given. Third, a discussion of the way the *Measuring Up* to the Common Core materials specifically embody both the principle and its research-based foundation helps prospective educators see how the materials can be used to help teachers collect information about their students' strengths and weaknesses and help students explore their own understanding of standards-based information they are likely to encounter on the state test.

THE CHALLENGE

Today's educators, schools, and districts face a daunting challenge: how to raise student achievement while incorporating the increasingly rigorous new Common Core State Standards. It is well documented that implementing change is a daunting task that brings about uncertainty. (Fullan, 2001). This dilemma is particularly critical because current legislation requires that:

- Each state educational agency implement a set of high-quality, yearly student academic assessments that include, at a minimum, academic assessments in mathematics, reading or language arts, and science that will be used as the primary means of determining the yearly performance of children and discerning whether they meet the challenging academic standards of the Common Core State Standards.

The *Measuring Up* to the Common Core series was created to help educators understand, navigate, and teach the new standards, replacing uncertainty with confidence. Available in print as *Measuring Up* to the Common Core worktexts and as a digital resource known as *Measuring Up Reach*, the series provides grade-appropriate lessons that encompass the new

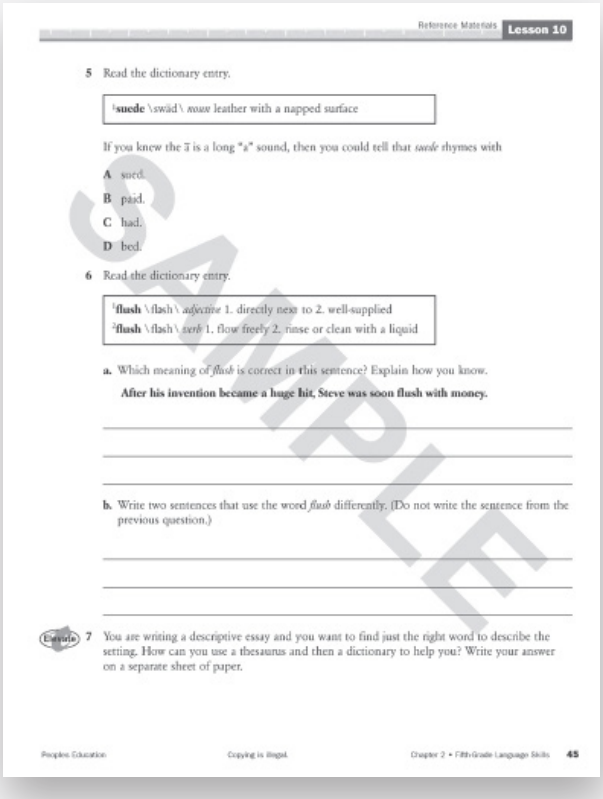
requirements for instruction in the rigorous, high-level skills incorporated in the standards. In both formats, these lessons are based on sound, research-based pedagogy to provide an easy-to-use resource to teach and assess student mastery.

RESEARCH PRINCIPLE 1:
INCORPORATES SOUND RESEARCH-BASED PEDAGOGY

The *Measuring Up* to the Common Core series has been designed to support and enhance best practices for effective teaching of the Common Core State Standards. There are some research-based unifying pedagogical principles, summarized in the following pages, that are common across Common Core State Standards and that form the foundation of the *Measuring Up* to the Common Core design.

Each lesson follows a consistent format and embodies the principles of the whole-part-whole pedagogical framework. The framework provides learners with the ability to understand the content at a variety of levels and allows for higher-order cognitive development (Swanson, 1993). The whole-part-whole model provides a comprehensive conceptual framework for instruction throughout the series that is derived directly from the standards.The systematic instruction provided in the student lessons, combined with resources in the teacher edition, is designed to help students master the challenges of the rigorous Common Core State Standards. Each component of the lesson is purposeful and explicit, providing effective strategy instruction that is clearly explained, used, and applied (Duffy, 2002). Clearly written, teacher-friendly lessons serve as a model of effective instruction, building teachers' confidence that they are meeting the rigorous requirements while navigating the changing educational environment.

Measuring Up to the Common Core ELA,
Level E Grade 5



Pedagogical Framework	Process and Purpose	*Measuring Up* to the Common Core
Whole	The first "whole" provides a foundational understanding and purpose for learning.	• **Understand the Standards** reviews and explains the skills with examples and problems from real life. • **Words to Know** lists the academic vocabulary used in the lesson for easy reference. Words are further highlighted in context.
Part	Then specific skills, or "parts," are examined in depth for mastery.	• **Guided Instruction** provides step-by-step problem-solving.
Whole	Finally, the "parts" are brought together within the context of the "whole" for deep understanding and application.	• **On Your Own** asks students to apply the skill with different types of questions and activities. Questions assess student learning of the lesson skill with a variety of formats, including multiple choice, short answer, and constructed response. • **Kick It Up** end-of-chapter project-based activities encourage students to extend and apply learning.

RESEARCH PRINCIPLE 2:

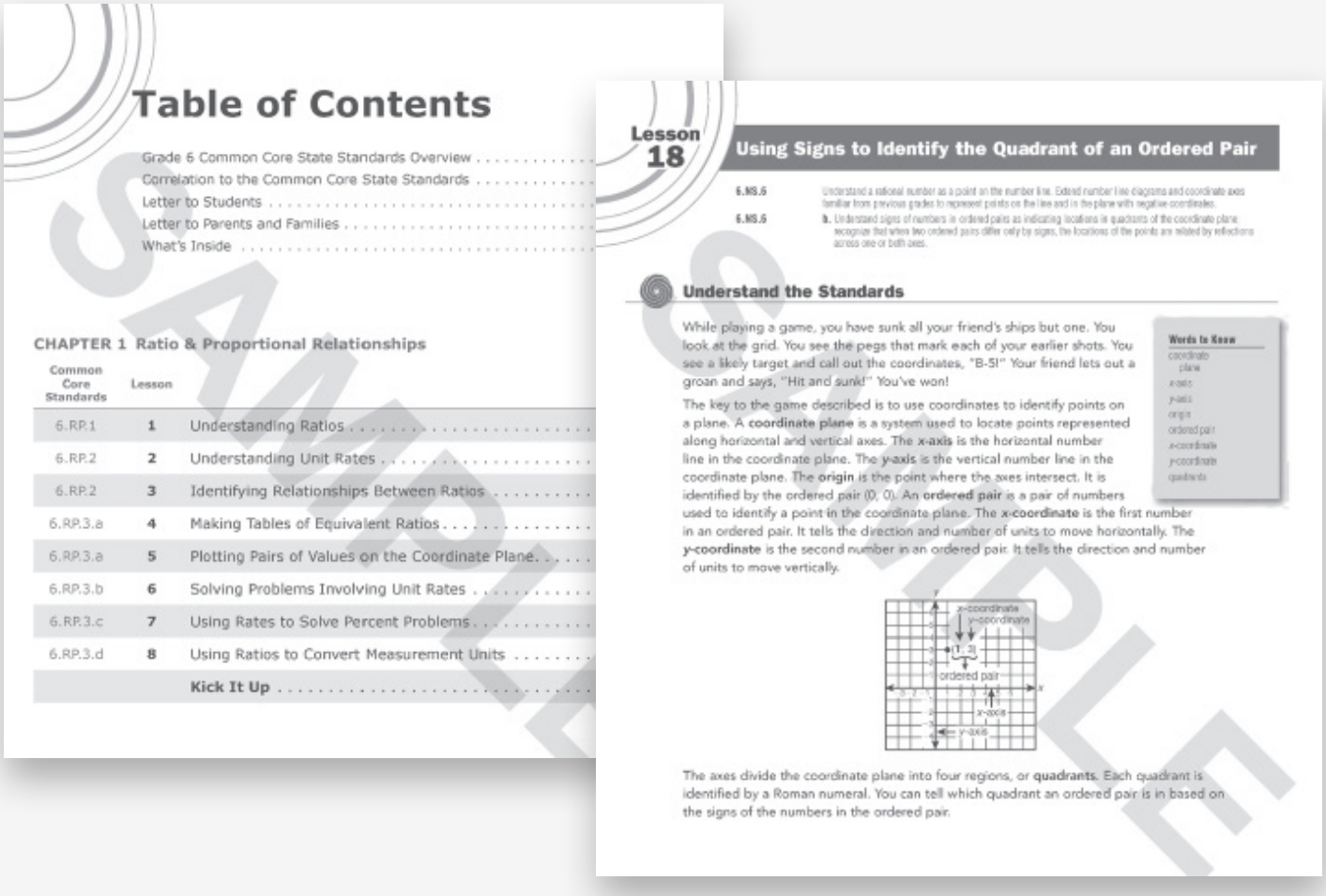
PROVIDES COMPREHENSIVE COVERAGE OF COMMON CORE STATE STANDARDS

The Common Core State Standards (CCSS) are a clear set of K–12 grade-specific expectations for English language arts and mathematics. Developed by a consortium of states and coordinated by the National Governors Association and the Council of Chief State School Officers, these standards define what it means for students to be college- and career-ready in the 21st century. These standards are fewer, clearer, higher, evidence-based, and internationally benchmarked. (PARCC, 2011)

The standards contain a hierarchy of standards. Anchor standards, those that identify college- and career-ready 21st-century skills, form the backbone; grade-specific K–12 standards translate the broad (and, for the earliest grades, seemingly distant) aims of the CCR standards into age- and attainment-appropriate terms.

Each anchor and grade-specific standard is easily identified within the *Measuring Up* to the Common Core series. CCSS and College and Career Readiness (CCR) Anchor Standards included at each grade level are described at the beginning of each student resource, in both print and digital formats, and in the teacher edition. Additionally, each lesson in both resources clearly identifies the standards of study.

Measuring Up to the Common Core ELA, Mathematics, Level F Grade 6



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6.RP.3.a	5	Plotting Pairs of Values on the Coordinate Plane
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		Kick It Up

Lesson 18

Using Signs to Identify the Quadrant of an Ordered Pair

6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative coordinates.

6.NS.6 b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

Understand the Standards

While playing a game, you have sunk all your friend's ships but one. You look at the grid. You see the pegs that mark each of your earlier shots. You see a likely target and call out the coordinates, "B-5!" Your friend lets out a groan and says, "Hit and sunk!" You've won!

Words to Know
coordinate
plane
x-axis
y-axis
origin
ordered pair
x-coordinate
y-coordinate
quadrants

The key to the game described is to use coordinates to identify points on a plane. A **coordinate plane** is a system used to locate points represented along horizontal and vertical axes. The **x-axis** is the horizontal number line in the coordinate plane. The **y-axis** is the vertical number line in the coordinate plane. The **origin** is the point where the axes intersect. It is identified by the ordered pair (0, 0). An **ordered pair** is a pair of numbers used to identify a point in the coordinate plane. The **x-coordinate** is the first number in an ordered pair. It tells the direction and number of units to move horizontally. The **y-coordinate** is the second number in an ordered pair. It tells the direction and number of units to move vertically.

The axes divide the coordinate plane into four regions, or **quadrants**. Each quadrant is identified by a Roman numeral. You can tell which quadrant an ordered pair is in based on the signs of the numbers in the ordered pair.

RESEARCH PRINCIPLE 3:

PROVIDES RIGOROUS CONTENT AND APPLICATION OF KNOWLEDGE THROUGH HIGH-ORDER SKILLS

The Common Core State Standards include rigorous content and application of knowledge through high-order skills. A study conducted by University of Pennsylvania Education School Dean Andrew Porter and three graduate students found that the Common Core State Standards emphasized different cognitive skills than those currently included in state standards. The team found a de-emphasis on memorization and performing procedures, with a greater emphasis on demonstrating understanding and analyzing written material in the Common Core State Standards (Hess, 2011).

The table below shows a snapshot of the cognitive rigor matrix being used to create high-stakes assessment of the Common Core State Standards (Smarter Balanced Assessment Consortium, 2011).

Mastery Education has created this print and digital series to help students master the new Common Core State Standards and to promote high-order thinking skills. The five chapters in each level are focused on a different set of skills, modeled on the Common Core State Standards. As students move through the high-quality instruction, activities, and review in this series, they are challenged to consider, analyze, interpret, and evaluate instead of just simply recalling facts.

A "Snapshot" of the Cognitive Rigor Matrix
(Hess, Carlock, Jones, & Walkup, 2009) Taken from Draft Specifications, p. 65

Depth of Thinking (Webb) + Type of Thinking (Revised Bloom, 2001)	DOK Level 1 Recall & Reproduction	DOK Level 2 Basic Skills & Concepts	DOK Level 3 Strategic Thinking &Reasoning	DOK Level 4 Extended Thinking
Remember	• Recall, locate basic facts, definitions, details, events			
Understand	• Select appropriate words for use when intended meaning is clearly evident	• Select appropriate words for use when intended meaning is clearly evident • Specify, explain relationships • Summarize • Identify central ideas	• Explain, generalize, or connect ideas using supporting evidence (quote, text evidence, example)	• Explain how concepts or ideas specifically relate to other content domains or concepts
Apply	• Use language structure (pre/suffix) or word relationships (synonym/ antonym) to determine meaning	• Use context to identify word meanings • Obtain and interpret information using text features	• Use concepts to solve non-routine problems	• Devise an approach among many alternatives to research a novel problem
Analyze	• Identify the kind of information contained in a graphic, table, visual, etc.	• Compare literary elements, facts, terms, events • Analyze format, organization, & text structures	• Analyze or interpret author's craft (e.g. literary devices, viewpoint, or potential bias) to critique a text	• Analyze multiple sources or texts • Analyze complex/abstract themes
Evaluate			• Cite evidence and develop a logical argument for conjectures based on one text or problem	• Evaluate relevancy, accuracy, & completeness of information across texts/sources
Create	• Brainstorm ideas, concepts, problems, or perspectives related to a topic or concept	• Generate conjectures or hypotheses based on observations or prior knowledge and experience	• Develop a complex model for a given situation • Develop an alternative solution	• Synthesize information across multiple sources or texts • Articulate a new voice, alternate theme, new knowledge or perspective

RESEARCH PRINCIPLE 4:

DIGITAL RESOURCE PROVIDES AN EFFECTIVE TECHNOLOGY TOOL FOR EDUCATORS.

"In the 21st century, students must be fully engaged. This requires the use of technology tools and resources, involvement with interesting and relevant projects, and learning environments—including online environments—that are supportive and safe.

In the 21st century, educators must be given and be prepared to use technology tools; they must be collaborators in learning—constantly seeking knowledge and acquiring new skills along with their students."

— Arne Duncan, U.S. Secretary of Education, March 3, 2010

Measuring Up Reach has been designed to support and enhance best practices for effective teaching of the Common Core State Standards via an easy-to-use digital delivery that is safe and non-threatening. Teachers who frequently use technology find their students benefit from the increased emphasis on collaboration, communication, critical thinking, and problem solving—all important 21st century skills (Dispelling Five Myths, 2010).

Using *Measuring Up Reach*, teachers are able to access all *Measuring Up* to the Common Core lessons and resources digitally. The digital format provides teachers with flexibility to project lessons, giving them the tools they need to model a process while creating an interactive learning environment for students. Moreover, the ability to print on demand provides additional opportunities to assign practice to students—whether for completion in class or at home.

The standards, their research bases, and the educational application of the standards have been presented through a collaborative effort between Publisher's Partnership and Peoples Education.

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