

is a measure of learning trajectory-oriented formative assessment that can be used for program evaluation, professional development, and more. cpre.org/task

TASKs have been developed for the following mathematics content areas:

- » Grades K-1: Addition
- » Grades 2-3: Subtraction
- » Grades 3-5: Fractions
- » Grades 6-8: Proportional Thinking
- » Grades 9-10: Algebraic Reasoning
- » Grades 10-11: Geometric Reasoning

About the Consortium for Policy Research in Education (CPRE)

Since 1985, the Consortium for Policy Research in Education (CPRE) has brought together renowned experts from major research universities to improve elementary and secondary education by bridging the gap between educational policy and student learning. CPRE researchers employ a range of rigorous and innovative research methods to investigate pressing problems in education today. Having earned an international reputation for quality research and evaluation, CPRE researchers have extensive experience conducting experimental studies, large-scale quasi-experimental research, qualitative studies, and multistate policy research. CPRE's member institutions are the University of Pennsylvania; Teachers College Columbia University; Harvard University; Stanford University; University of Michigan; University of Wisconsin-Madison; and Northwestern University.



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A Measure of Learning Trajectory-Oriented Formative Assessment

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The TASK Instrument

A Teacher Analysis of Student Knowledge, or TASK, is a gradespecific, online assessment for mathematics teachers, which measures important components of the instructional knowledge necessary to teach to the high expectations of the Common Core State Standards (CCSS).

TASKs are carefully designed to measure teachers' emphases on procedural and conceptual understanding and their recognition of the learning trajectories underlying many mathematics content areas. TASKs can be used for program evaluation, professional development, and other research purposes, in addition to providing schools and districts with an understanding of teachers' preparation to teach to the CCSS in mathematics.

TASKs focus on the application of pedagogical content knowledge to specific student situations. They require teachers to recognize different levels of student understanding represented in the students' work, and to explain the student response strategies in relation to research-based learning trajectories. TASKs are authentic because they ask teachers to respond in their own words, not select from multiple-choice options.

The TASK instrument measures five domains in relation to the specific concept that is being assessed.

- 1. Teachers' knowledge of the concept within the domain of mathematics for instruction
- 2. Teachers' analysis of student understanding
- 3. Teachers' knowledge of mathematical learning trajectories
- 4. Teachers' instructional decision-making
- 5. Teachers' content knowledge (for upper grades)

TASK Item (Grades 3-5: Fractions)

TASKs present

Problem: "Each carton holds 24 oranges. Kate's carton is 1/3 full. Paul's carton is 2/4 full. If they put all their oranges together, would Kate and Paul fill 1 whole carton? Solve the problem. Show your work."



Each guestion on the TASK is I FARNING scored on a validated rubric by experienced mathematics RAJECTORY educators trained as reliable scorers. TASK scoring culminates in categorizing NCEPTUAL teacher responses into one of four levels: general, procedural, PROCEDURAL conceptual, or learning trajectory. This **GENERAL** response ontains no specifics. DCEDURAL response focuses on bby about a specific procedure, not based on her understanding. This CONCEPTUAL response focuses on strengthening Abby's understanding of the concepts of part/whole and magnitude. This LEARNING TRAJECTORY response works from the students' understanding to develop a more sophisticated

Teacher instructional recommendations for Abby

	CON
Abby should practice to enrich her understanding.	This PDC
Abby would be directed into writing fractions, determining a common denominator and then making equivalent fractions and solving the problem.	teaching A n
I would first ask Abby to look at her representation of 1/3 and ask her to explain how it is indeed 1/3. Abby needs to understand that the circle must be divided into 3 EQUAL parts. Next, I would ask how can she prove it does not make one whole when it is added to one half? I would guide her in seeing that 1/3 (a whole divided into 3 equal parts) is less than one whole divided into 2 equal parts and therefore, when added to 1/2 it could not equal one whole.	
First, I would encourage Abby to draw a picture and group things according to the fraction $1/2 = 12/24$, $1/3 = 8/24$. I would explore the relationship among those equivalences to help her understand the interrelatedness. My rationale would be that drawing a picture is a basic understanding or step to equal - sharing/division - fractions but easy for children to do at an early age. Equivalent fractions are more sophisticated, but can be explored to understand how these numbers make sense.	

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TASK Scoring Rubric

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strategy aligned with a learning trajectory.