

## Understanding Math Clusters and Standards

**Purpose:** Develop content knowledge and internalize the demands of a cluster and standards in order to support math planning.

### Objectives:

- Study a standard and make connections to the related cluster and domain
- Solve math tasks and items in order to understand the demands of the standards and anticipate student misconceptions
- Identify the aspect(s) of rigor for each standard and make connections to the Standards for Math Practice

### Materials:

- [Coherence Map from Achieve the Core](#), which includes grade-level Common Core Math Standards and sample math items
- [Standards for Math Practice](#)

### Actions:

- 1. Identify connections across a cluster of standards.** Start by choosing a high-leverage, major cluster that is part of upcoming instruction to study in depth. Read the full language of the cluster, and consider what students need to know and be able to do. (Math is a web of interconnected concepts and ideas, so don't be afraid to look to other standards, clusters, or domains in order to make connections back to the cluster you've prioritized.)
  - What are the main concepts and ideas within this cluster? Share in your own words with your team.
  - Based on the cluster, what should I teach? What should students learn in this unit?
  - How is the language of this cluster similar to or different than the way I've thought about it in the past? Do I have preconceived notions about what this cluster involves? If so, are they correct or do they need to change based on what I've learned?
- 2. Reflect on the parts *and* the whole.** Read through each of the standards within the cluster, and consider what students need to know and be able to do. But remember, we're not just unpacking standards into individual objectives that we'll teach and check off a list—we're looking to make connections across standards so students understand concepts and ideas as a unified whole, instead of as discrete, isolated parts of a whole.
  - What will students know and be able to do if they've successfully mastered the standards within this cluster?
  - How does each standard connect to the cluster? To other standards within the cluster? To the domain?
- 3. Determine the aspect(s) of rigor at play.** Study the language of each standard within the cluster to identify whether it requires conceptual understanding, procedural fluency, and/or that a mathematical concept is applied.
  - Does this standard require conceptual understanding, procedural fluency, and/or application?

- What implications does this have on my planning and instruction, especially when it comes to the student experiences I want to create?
- The following practices are especially effective for each of these aspects of rigor:
  - **Conceptual understanding:** discussion and reflection, use of concrete or visual models, multiple representations, error analysis
  - **Procedural skill and fluency:** connecting procedures to conceptual understanding, explicit instruction, opportunity to practice with teacher feedback
  - **Application:** problem-solving opportunities, multiple solution methods, Intentionally integrating content from related standards

4. **Solve tasks and items to further understand the demands of the standards.** Select a handful of sample items aligned to the standards within the cluster. As a team, work to uncover multiple solution paths and internalize what the skills and knowledge students will need to demonstrate mastery of these standards.

- What do students need to know and be able to do in order to meet the requirements for these standards?
- What strategies are students likely to use to solve the tasks? Which of the strategies show mastery of the demands standard? Which do not?

5. **Consider prerequisite skills and knowledge, and make connections to other standards.** Additionally, look at other standards within your grade and related standards from previous grade(s) to understand how they work together to build student understanding of this topic.

- What foundational skills and knowledge should students have before engaging with these standards?
- What can I do to close gaps in knowledge while working toward mastery of grade level standards?

6. **Think ahead to where students will struggle.** Use your knowledge of the standard, cluster, and domain, and the expectations of the standard to anticipate where your students will have misconceptions and make wrong turns.

- What common misconceptions and missteps should I anticipate?
- What implications does this have on my planning and instruction?

7. **Identify related Standards for Mathematical Practice.** The Standards for Mathematical Practice (SMPs) are a set of eight practice standards that describe habits of mind that we should seek to develop in our students as we teach content standards. Incorporating these practice standards into planning and instruction help ensure that we're building a mathematical mindset in our students.

- Which SMP(s) are embedded in, or lend themselves to these content standards?
- What implications does this have on my planning and instruction, especially when it comes to the student experiences I want to create?

8. **Synthesize takeaways and make revisions to an upcoming unit.** With your new learnings about the cluster and standards, look at your upcoming unit and analyze the lessons, tasks, and activities. Consider supplementing your plan with instructional strategies and student experiences that reflect your new understanding of the rigor, skills and knowledge, and possible misconceptions that are part of these standards.