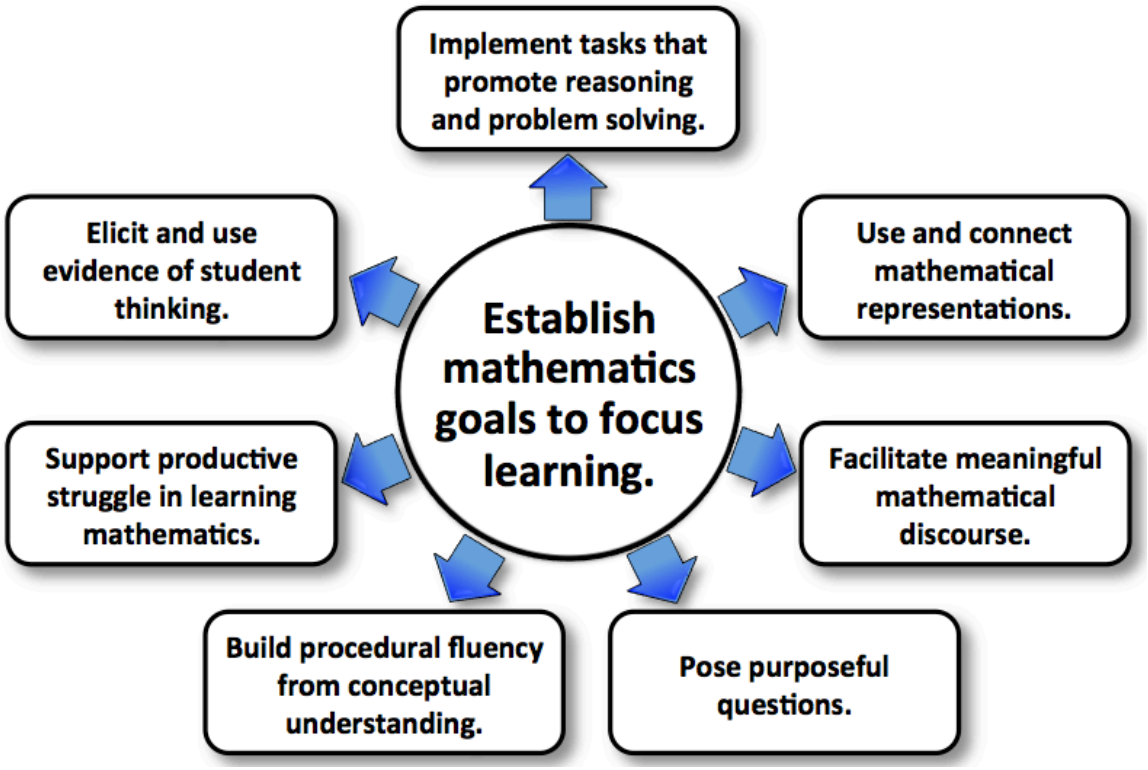
A Core Teaching Practice
Establishing and Using Goals Effectively



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- How do you decide on the math learning goals for your lessons?
- How do you communicate the purpose of a lesson to your students?
- How do you use the learning goals during instruction?
- How do you determine if your students are making progress toward the learning goals?

Most of the time, I use the pacing guides created by the district math specialists; these show the alignment of our curriculum materials to the state standards. Then I look at my textbook, and think about what it is that I want my students to walk away with from a lesson and write this in student friendly language. [Second grade teacher]	I use my curriculum materials as a starting point to determine my learning goals, and then depending on the lesson, I go back to the state standards to determine the main emphasis for the lesson. Then I write my learning targets and post them on the board for my students. [Fifth grade teacher]
I put the goals on a sheet of paper and post them on our learning goals board. I also put them at the beginning of my smart-board slides. We discuss the learning goals at the beginning of a lesson, and we talk about any new vocabulary. I use the learning goals myself during the lesson as I interact with students to see if they are on the right path. Then I revisit the goals at the end of the lesson with the students. I also give students an exit slip to help me determine if the goals and success criteria have been met. [Fourth grade teacher]	I always post my math learning goals on the board in the classroom and also on the slides for the day. We talk through the goals at the start of class, usually connecting them to the previous day's work. We then bring them back at the end to discuss how our work that day connected to the goals. At the end of the lesson I usually give students an exit slip that has a problem to apply the learning goals. Students know they can also put questions on the exit slip for me, and then I use these to shape my plans for the next day. [Fifth grade teacher]
I post the goals every day on the board and also have them at the beginning of all of my smart-board slides. We go over the goals at the beginning of the hour right after warm-ups. At the end of the period, I usually ask students, "What stuck with you today?" Students answer on a post-it note and stick it on the classroom door before they leave. [Sixth grade teacher]	We are required to post our learning goals. I often read them out loud, verbatim, at the beginning of the lesson and then I refer to pieces of it throughout the lesson. I try very hard to debrief the lesson and goals every day, but it doesn't always happen because of time. I do usually give my students exit tickets related to the goal to check for understanding. [Seventh grade teacher]
Last year, I only had the learning goal on my slides for the day, now I also post them in the room on the board. This has really helped my students stay more focused; they even refer to them during the lesson. Having them posted has also been a good reminder to myself. [Second grade teacher]	I project the learning goals at the beginning of a lesson and we discuss them to clarify any vocabulary. However, I hardly ever make reference to them during a lesson. I do use them to focus myself so I don't get sidetracked, and I keep them in mind as I check in on student work during the lesson. [Sixth grade teacher]
At the end of a lesson, I often ask students to talk with each other and tell what they have learned and whether they have met the target. Students then fill out exit tickets to show their progress in meeting the goals. [Second grade teacher]	New this year, I post both the learning goal and the assignment online so parents can see it. It takes extra time and I wondered if it was worthy my time, but I've been surprised and impressed by how many parents check it every night. [Sixth grade teacher]
I post the learning target at the beginning of our session slides and tell my students what we're going to be working on that day. I try to refer back to them, but can't say I always manage to do so. This is something I need to get better at doing. I do frequently include the targets on exit slips along with a problem for students to demonstrate their learning. [Fourth grade teacher]	I have my students complete self-assessments for each unit. I list the learning targets for the unit and then the students identify which are areas of strength in their learning and which are areas for growth. Then they list next steps they can take to advance their learning. [Fourth grade teacher]

Effective Mathematics Teaching Practices

Establish mathematics goals to focus learning. Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.
Implement tasks that promote reasoning and problem solving. Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.
Use and connect mathematical representations. Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.
Facilitate meaningful mathematical discourse. Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.
Pose purposeful questions. Effective teaching of mathematics uses purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.
Build procedural fluency from conceptual understanding. Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.
Support productive struggle in learning mathematics. Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.
Elicit and use evidence of student thinking. Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all*. Reston, VA: Author.

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Grade 4 Student Pre-Assessment

1. Check all the expressions that are true for $\frac{5}{6}$ is equal to:

   _____ a. $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$

   _____ b. $1 - \frac{1}{6}$

   _____ c. $\frac{3}{6} - \frac{1}{6} - \frac{2}{6}$

   _____ d. $1 - \frac{5}{6}$

   _____ e. $\frac{3}{6} + \frac{1}{6} + \frac{1}{6}$

2. Decompose (break apart) $\frac{7}{8}$ in two different ways using an equation and a visual model.

3. Emily, Kim, and McKenzie made a pan of brownies. Emily ate $\frac{1}{8}$ and Kim and McKenzie each ate $\frac{2}{8}$ of the pan of the brownies. Draw a visual model to show each person's share.

4. Five friends ordered 3 large sandwiches. James ate $\frac{3}{4}$ of a sandwich. Katie ate $\frac{1}{4}$ of a sandwich. Ramon ate $\frac{3}{4}$ of a sandwich. Sienna ate $\frac{2}{4}$ of a sandwich. How much sandwich is left for Oscar?

Student Mathematics Work Analysis Summary Form

Teacher: Ms. Terry **Grade: 4th**	**School: Kozy** **District: Cudahy**	**Name and Brief Description of Task** Pre-Assessment for Math Standard 4.NF.3 Students find equivalent expressions for 5/6; decompose 7/8 using equations and visual representations; draw a visual model for a real world situation; and solve a multi-step fraction word problem.
Wisconsin Standard Assessed **4.NF.3: Understand a fraction *a/b* with *a*> 1 as a sum of fractions 1/*b*.** Learning Targets to share and discuss with students: ▪ I can understand addition and subtraction of fractions as joining and separating parts referring to the same whole. ▪ I can decompose fractions into a sum of fractions with the same denominator to show that I understand different ways to break apart fractions. ▪ I can add and subtract mixed numbers with like denominators to show that I understand how to compose and decompose whole numbers and fractions.		**Identify and Articulate Mathematics Expectations for Meeting Standard** Student should be able to show their understanding of combining or decomposing fractions with like denominators with support of a visual model when they are given problems of either bare numbers or word problems. If a student is using physical models to be successful, they would be marked as approaching the standard since the standard states with a visual fraction model.

Students' Names Beginning	Students' Names Developing Standard	Students' Names Approaching Standard	Students' Names Meeting Standard
_____% of class	**_____% of class**	**_____% of class**	**_____% of class**
Description of Student Performance Beginning	**Description of Student Performance Developing Standard**	**Description of Student Performance Approaching Standard**	**Description of Student Performance Meeting Standard**
Problem 1: Student could only see repeated addition statement as ⅚. Problem 2: Student could not decompose ⅞, even with a physical model. Student might have only been able to decompose ⅛. Problems 3/4: Student was unable to make sense of the problem and create a visual model and solve (problem 4 only).	Student is using physical models, but is unsuccessful with part or all task. Problem 1: Selects at least two correct combination to ⅚. Problem 2: Student can decompose ⅞ with a physical model but is unable to compose an equation. Problem 3: Uses visual models with physical models or incorrectly interprets the problem (only shows one of each of the given eighths).	Student is still using physical models, but is successful with all tasks or: Problem 1: Selects all combinations for ⅚ with physical models or selects only the addition combinations. Problem 2: Decomposes ⅞ successfully with a visual and matching equation with support of physical model or can create a visual without support of a physical model, but cannot create an equation.	Student is successful with all tasks without using their physical models. Problem 1: Students selects all combinations equal to ⅚. Problem 2: Decomposes ⅞ successfully two ways with visual models and matching equations. Problem 3: ONE visual representing ⅛, $^{2}/_{8}$, and $^{2}/_{8}$ with each part labeled with the given name.

	Problem 4: Uses only one visual model to solve the problem with or without physical models.	Problem 3: ONE visual representing ⅛, $^2/_8$, and $^2/_8$ with each part labeled with the given name with support of the physical model or uses individual visual models to show the given eighths. Problem 4: Three wholes should be shown and partitioned into fourths. There should be the correct amounts identified that corresponds with the story, and a clear answer is given with the support of physical models.	Problem 4: Three wholes should be shown and partitioned into fourths. There should be the correct amounts identified that corresponds with the story, and a clear answer is given.
Learning Needs of Students with Suggested Instructional Supports or Strategies: Beginning	**Learning Needs of Students with Suggested Instructional Supports or Strategies: Developing**	**Learning Needs of Students with Suggested Instructional Supports or Strategies: Approaching Standard**	**Learning Needs of Students with Suggested Instructional Supports or Strategies: Meeting Standard**
▪ Every problem should have physical models to represent a fraction. ▪ Opportunities to physically decompose/rip fraction bars. ▪ Opportunities to group physically unit fractions together, ⅛ + ⅛ +⅛+ ⅛ +⅛ = ⅝, could be made into ⅜ + $^2/_8$ = ⅝. ▪ Representing physical fraction model on paper as a visual.	▪ Continued work with physical fraction strips. ▪ Representing physical fraction model on paper as a visual. ▪ Writing equations for the combinations created with physical/visual models. ▪ work with physical tools to create and decompose fractions larger than 1.	▪ Work with a physical model, but more focus on creating a visual model at the same time. ▪ Writing equations for combinations created from the visual model. ▪ Working with visual and physical models to decompose fractions that are greater than one.	▪ Continued work with visual models for fractions greater than one. ▪ Push towards just creating decompositions and removing the visual tool.
Reflective Notes			

Learning Goals	Performance Goals
Students will learn that fluent addition strategies are based on use of number relationships for decomposing and recomposing numbers.	Students will learn to solve addition problems within 20 by using ten frames and counters.
Students will learn how comparing two fractions involves reasoning about their size and that two fractions can be compared only if they refer to the same whole.	Students will learn how to compare fractions by finding common denominators.

Students will learn how angles are measured with reference to a circle, with the center of the circle as the common endpoint of the rays.	Students will learn how to use a protractor to measure angles in whole-number degrees.
Students will learn to explain that a ratio is a relationship between two quantities and be able to provide real-world examples of ratios.	Students will learn to plot pairs of values from a ratio table on the coordinate plane.
Students will learn to interpret solutions from solving pairs of simultaneous linear equations in terms of the point of intersection and in terms of a real-world context.	Students will learn to find the ordered pairs that solve pairs of simultaneous linear equations.