Module 3
Participant Guide

Focus on Teaching and Learning

Section 3

Connecticut Core Standards for Mathematics

Grades K–5

Systems of Professional Learning

Connecticut Core Standards Systems of Professional Learning

The material in this guide was developed by Public Consulting Group in collaboration with staff from the Connecticut State Department of Education and the RESC Alliance. The development team would like to specifically thank Ellen Cohn, Charlene Tate Nichols, and Jennifer Webb from the Connecticut State Department of Education; Leslie Abbatiello from ACES; and Robb Geier, Elizabeth O'Toole, and Cheryl Liebling from Public Consulting Group.

The Systems of Professional Learning project includes a series of professional learning experiences for Connecticut Core Standards District Coaches in English Language Arts, Mathematics, Humanities, Science, Technology, Engineering, Mathematics (STEM), and Student/Educator Support Staff (SESS).

Participants will have continued support for the implementation of the new standards through virtual networking opportunities and online resources to support the training of educators throughout the state of Connecticut.

Instrumental in the design and development of the Systems of Professional Learning materials from PCG were: Sharon DeCarlo, Debra Berlin, Jennifer McGregor, Judy Buck, Michelle Wade, Nora Kelley, Diane Stump, and Melissa Pierce.

Published 2014. Available online at http://ctcorestandards.org/

PCG Education
Public Focus. Proven Results.™

CONNECTICUT STATE DEPARTMENT OF EDUCATION

the RESC Alliance
CONNECTICUT ALLIANCE OF REGIONAL EDUCATION SERVICE CENTERS

Section 3

Section 3: Teaching and Learning with the UDL Principles

Identifying UDL Strategies–Video Observation

Instructions: *As you watch the video, Multiplying Whole Numbers and Fractions, look for the instructional strategies being used to address the UDL Principles. Record the teacher actions and student actions you observed.*

Note: The video can be found here: https://www.teachingchannel.org/videos/multiplying-fractions-by-whole-numbers-lesson.

Did you see evidence of the following and if so, what was the teacher doing and what were the students doing?

Principle	Strategy Used
Principle 1: Provide Multiple Means of Representation	
Principle 2: Provide Multiple Means of Action and Expression	
Principle 3: Provide Multiple Means of Engagement	

5th Grade Lesson Outline

Instructions: *Use the following information as you discuss the 5th grade lesson.*

Standards being addressed:

- 5.NF.1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
- 5.NF.2: Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
- SMP 1: Make sense of problems and persevere in solving them.
- SMP 3: Construct viable arguments and critique the reasoning of others.
- SMP 6: Attend to precision.

1. Provide students with different versions of the task as needed.

The task version 1:

Stuffed with Pizza

From NYC Department of Education

Tito and Luis are stuffed with pizza! Tito ate one-fourth of a cheese pizza. Tito ate three-eighths of a pepperoni pizza. Tito ate one-half of a mushroom. Luis ate five-eighths of a cheese pizza. Luis ate the other half of the mushroom pizza. All the pizzas were the same size. Tito says that he ate more pizza than Luis because Luis did not eat any pepperoni pizza. Luis says they each ate the same amount of pizza. Who is correct? Show all of your mathematical thinking.

The task version 2:

Stuffed with Pizza

From NYC Department of Education

Tito and **Luis** are stuffed with pizza! Tito ate one-fourth of a cheese pizza. **Tito** ate three-eighths of a pepperoni pizza. **Tito** ate one-half of a mushroom. ***Luis*** *ate five-eighths of a cheese pizza.* ***Luis*** *ate the other half of the mushroom pizza.* All the pizzas were the same size. **Tito** says that he ate more pizza than **Luis** because **Luis** did not eat any pepperoni pizza. **Luis** says they each ate the same amount of pizza. Who is correct? Show all of your mathematical thinking.

The task version 3:

Stuffed with Pizza

From NYC Department of Education

Tito and **Luis** are stuffed with pizza!

Tito ate one-fourth of a cheese pizza. **Tito** ate three-eighths of a pepperoni pizza. **Tito** ate one-half of a mushroom.

Luis ate five-eighths of a cheese pizza. **Luis** ate the other half of the mushroom pizza. All the pizzas were the same size.

Tito says that he ate more pizza than **Luis** because **Luis** did not eat any pepperoni pizza.
Luis says they each ate the same amount of pizza.

Who is correct? Show all of your mathematical thinking.

2. **Read the problem.**
3. **Clarify language:** *stuffed, cheese pizza, pepperoni pizza, mushroom pizza*
4. **Clarify the mathematics:** How can we represent one-fourth, three-eighths, one-half, five-eighths?
5. **Clarify facts:**
   a. How many pizzas are there in this situation?
   b. Who is eating the pizza?
   c. How much pizza did Tito eat?
   d. How much pizza did Luis eat?
   e. How big was each pizza?
6. **Check for understanding of the problem situation:** What is the problem asking you to determine?
7. **Activate prior knowledge and address possible misconceptions:** What strategies and/or tools have you used in the past to solve problems involving fractions (i.e., draw a picture, used fraction strips)? What do we know about working with fractions that might help us with this problem (i.e., when adding, make like denominators, when comparing fractions we cannot only look at the denominator

we also have to look at the numerator because the denominator tells us the size of the unit fraction but the numerator tells us how many of the unit fractions we have so while 1/9 may be smaller than 1/8, 5/9 is larger than 2/8)?

8. **Activate problem solving using strategies/tools from #7:** How might drawing a picture help me determine who ate more pizza? How might fraction strips help me determine who ate more pizza?
9. **Clarify expectations:** What does it mean to 'show all of your mathematical thinking'?
10. **Provide a process:** You will have 5 minutes of individual think time. Then in your groups each person will have 1 minute to discuss their personal thoughts on a strategy. Then the group will have 20 minutes to work together to solve the problem. Then we will end with each group having 5 minutes to present their work and discuss their solution or partial solution to the class. Provide time chart to each group.

Time	Step
5 minutes	Individual think time.
1 minute per person	Each person presents.
20 minutes	Group works together to solve the problem.
5 minutes per group	Group presentation time.

11. **Provide graphic organizer and checklist for students/groups to use while they work.** (Can be provided as a poster and/or as a separate handout as needed.)

Stuffed with Pizza		
What questions am I being asked to answer? Write them down.	What strategy or strategies can I use to solve the math word problem and answer all the questions? Write them all down.	How can I show all of my mathematical thinking and proof? Write it down.

Checklist		
After reading each question, check Yes or No	**Yes**	**No**
Did I read the math problem several times?		
Did I know what the problem was asking me to solve?		
Did I label my work correctly?		
Did I check all my computations?		
Did I show how I solved the problem?		
Did I show all of my mathematical thinking?		
Did I justify and defend my answers?		
Did I answer all the questions?		

Additional Notes:

Outlining a Lesson

Instructions: *Use the questions below to guide your thinking as you plan a lesson outline around an identified set of CCS-Math Standards.*

Questions to Guide Your Thinking
Adapted from NYC Department of Education

Concepts and Skills to Consider

- What ***CCS-Math Standard(s)*** for this grade is/are being addressed?

- What task is being used in the lesson?

- What concepts does the student need to know—*so that they will be able to complete the task successfully?*

- How will I prepare students who have not yet mastered these concepts—*so that they will be able to complete the task successfully*?

- What concepts will the student learn after the completion of task?

- What prerequisite skills does the student need to have mastered—*so that they will be able to complete the task successfully*?

- How will I prepare students who have not yet mastered these skills—*so that they will be able to complete the task successfully*?

- What new skills will the students have mastered upon completion of the task?

Provide Multiple Means of Representation

- How am I going to ensure that key information is equally perceptible by ***all*** students—*so that they will be able to complete the task/unit successfully?*

- How am I going to ensure accessibility, clarity, and comprehensibility for ***all*** students—*so that they will be able to complete the task/unit successfully?*

- How am I going to provide the necessary scaffolds to ensure that ***all*** students have access to knowledge and can assimilate new information—*so that they will be able to complete the task/unit successfully?*

Provide Multiple Means of Action and Expression

- Have materials been provided with which all students can interact, navigate, and express what they know—*so that they will be able to complete the task/unit successfully?*

- Have I provided alternative modalities for expression, to level the playing field and to allow all students the opportunity to express knowledge, ideas, and concepts in the learning environment—*so that they will be able to complete the task/unit successfully?*

- How have I provided necessary strategies and scaffolds for students to be more plan-full and strategic—*so that they will be able to complete the task/unit successfully?*

Provide Multiple Means of Engagement

- Have I provided alternative ways to recruit student interest, ways that reflect inter- and intra-individual differences among students—*so that they will be able to complete the task/unit successfully?*

- Have I provided options for students who differ in motivation and self-regulation skills—*so that they will be able to complete the task/unit successfully?*

- Have I provided alternatives to support students with different aptitudes and prior experience to effectively manage their own engagement and affect—*so that they will be able to complete the task/unit successfully?*