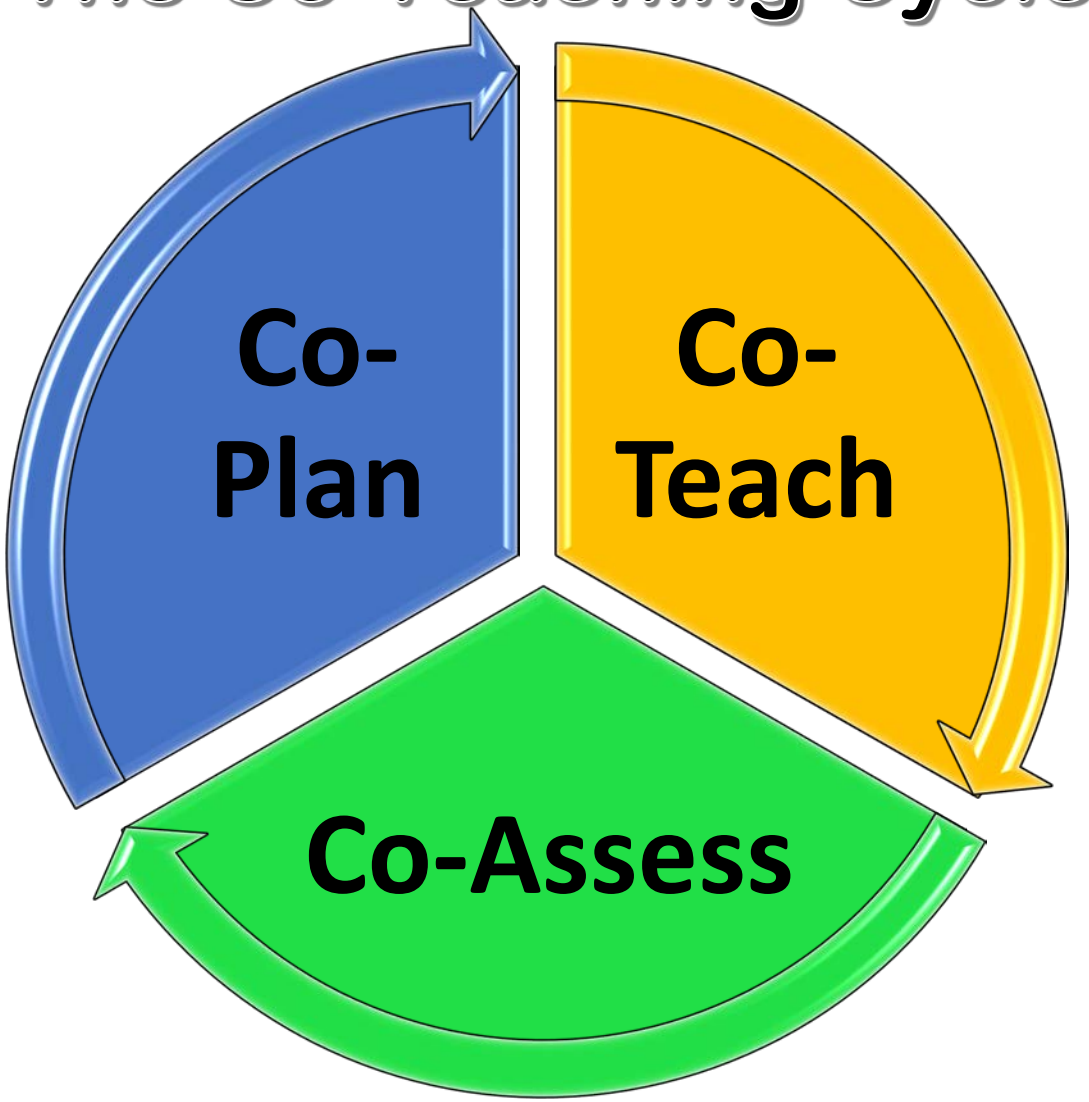
The Co-Teaching Cycle



Sample Unit Planning Agenda

Dates of Instruction: March 10-24, 2017

Teachers/Subject: Laura Beller, Tamara Smith-Moyler/Math

Upcoming curriculum topics/units/lessons
(12 minutes)

SOL 5.4: Creating and solving single-step and multistep practical problems involving addition, subtraction, multiplication and division of whole numbers.

Student data summary/discussion
(10 minutes)

Pre-assessment data shows that the students are fairly comfortable with single-step addition and subtraction problems. The students had difficulties with multistep problems; the data showed that student answers did not match the question given. It appeared that this was caused by not completing all of the steps in the multistep problems. The data also showed that multi-digit multiplication and division problems were a challenge.

Likely instructional challenges/specially designed instructional needs
(15 minutes)

-Interpreting and understanding multi-step problems: Polya's problem solving process will be used to address this challenge.
-Solving problems that involve multiplication and division: The Concrete-Representational-Abstract (CRA) approach will be used to help students conceptualize the concepts.

Co-Teaching arrangements and assignments
(15 minutes)

We will use various co-teaching models throughout the unit: team teaching, alternative teaching, parallel teaching, station teaching, and one teach/one observe (to collect formative data).

Relationship/Communication/Housekeeping/Logistics
(8 minutes)

We will meet twice per week to plan lessons for the unit and to create formative assessments.

Sample Co-Teaching Lesson Plan Template

Teacher 1: Laura **Teacher 2:** Tamara

Co-Teaching Approach:
☒ One Teach-One Observe ☐ One Teach-One Assist ☐ Station Teach
☐ Alternative Teach ☒ Team Teach ☒ Parallel Teach

Subject: Math	**Topic/Lesson:** Solving single and multi-step word problems	**Date:** March 10, 2017

Standard(s):
SOL 5.4a The student will create and solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of whole numbers.
5.19b: write an equation to represent a given mathematical relationship, using a variable

Lesson Outcomes: Using Cuisenaire rods and model drawings, the students will solve single and multi-step story problems.

Materials Needed: Cuisenaire Rods, grid paper, colored pencils, pencils, magnetic Cuisenaire rods, dry erase markers

Vocabulary: Equation, variable, model drawing

Lesson Component	Teacher 1 Role	Teacher 2 Role
Anticipatory Set: Co-Teaching Model: Parallel & Alternative Teaching	Each student will be given a set of Cuisenaire rods to explore. Questions to ask: What do you notice? What is the relationship between the rods?	TTW work with a small group that needs more intensive instruction. TTW ask specific questions regarding the relationship between the rods' colors, sizes and numerical value.
Lesson Activities/ procedures Co-Teaching Model: Team Teaching & 1 Teach/1 Observe Note: Students have previous experience using the model drawing strategy.	1. Teacher 1 will pose the following story problem to the students: "Bryce has some apples. He buys 6 more at the store. He now has 20 apples. How many apples did Bryce have before he went to the store? Write an equation to represent the problem." 2. Teacher 2 will model how to set up the problem using magnetic Cuisenaire rods and the students will model at their desks using Cuisenaire rods. 3. Teachers 1 & 2 will model representing the problem on grid paper as the students color the representation on grid paper using colored pencils. 4. Teacher 1 will model creating an equation to represent the story problem while Teacher observes the students, gathering data to group students into guided and independent practice groups.	
Guided/Independent Practice Co-Teaching Model: Alternative Teaching	1. TTW pose another problem to the students: "Sean has half as much money as Andrew. Stacy has 2 times as much money as Andrew. If Andrew has $24, how much money do they have altogether?"	Using the same problem as Teacher 1, Teacher 2 will use more intense, explicit, systematic instruction to chunk the problem. The teacher will guide the students though modeling each part of the problem. The

Question: *At summer camp, there are half as many children hiking as there are canoeing. There are 3 times as many students swimming as canoeing. If there are 12 children canoeing, how many children altogether are participating in these three activities?*

A. Abstract level of understanding

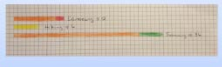
Canoeing = c
Hiking = 1/2c
Swimming = 3c

If, Canoeing (c) = 12
Then, Hiking = 6
Swimming = 36

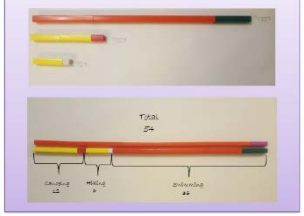
12 + 6 + 36 = 54 children participating

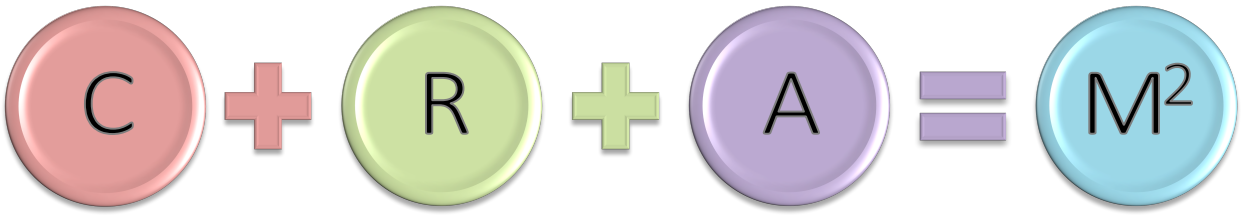
Total Participating		
c	1/2c	3c

B. Representational level of understanding



C. Concrete level of understanding





Creating Meaning in Math for All Learners

The Concrete-Representational-Abstract sequence of mathematics instruction involves ongoing assessment, explicit teacher modeling and scaffolding as an instructional framework that allows students to move meaningfully through less complex math concepts and procedures to more abstract, complex ones. Research indicates that the CRA sequence has been effective for students with and without disabilities.

Concrete

The **"Concrete"** level is the most basic and crucial. Using concrete objects students can have a sensory experience of mathematical concepts. They can see, touch, and feel math! Teachers can facilitate learning at this level by getting students to think about and verbalize how the objects reflect the mathematics.

Use chips, straws, interlocking cubes, base-10 blocks, beans and bean sticks, pattern blocks, geometric prisms, paper plates, fraction bars.

Mastery to move to Representational Level: Performs skill correctly 3/3 times, 3 consecutive days.

Representational

When students are able to "see" concepts and are proficient with the concrete, the concept can be modeled at the **"Representational"** level using drawings that represent the concrete items. When students begin to draw, their understanding of the concept can become apparent. Teachers can facilitate learning by explicitly relating the drawings to the concrete materials that were used earlier. Replicating the movements used while using the concrete items can assist struggling learners.

Use tallies, dots, circles, stamps, number lines, graphs, pictograms, etc.

Mastery to move to Abstract Level: Performs skill correctly 5/5 times, 3 consecutive days.

Abstract

When students are proficient at drawing representations of math solutions, they are ready for the "**Abstract**" level. By connecting what students did at the earlier "representational" and "concrete" levels of learning, teachers can promote conceptual understanding and allow students to internalize their learning. Linking the abstract symbols to the concrete items and drawings, as students progress through earlier stages, can assist in this process.

Use number sentences and algorithms.

Mastery of Skill at Abstract Level: Performs skill correctly 10/10 times, 3 consecutive days.

Allsopp, D., Kyger, M., Lovin, L., (2007). Teaching Mathematics Meaningfully: Solutions for Reaching Struggling Learners. Baltimore: Brookes.

Finding Time for Collaborative Planning

STRATEGY	DESCRIPTION	CONSIDERATIONS
1. BACK TO BACK	Stack two blocks of planning time together.	• May mean teachers do not have a planning block one day a week • Schools must ensure teachers have a duty-free lunch or other non-instructional time every day
2. BANKING TIME	Reduce planning time on a few days to increase time on another day.	• Useful when teachers have at least 40 minutes of planning time per day, to ensure shortened blocks are still useful
3. BEGINNING AND END OF DAY	Reorganize time that teachers have at the beginning and end of the day into more team planning time.	• Useful when teachers are mandated to arrive before and depart after students • Staff may need to arrive earlier or stay later on certain days under this model
4. RECESS AND LUNCH	Schedule non-instructional blocks like recess and lunch next to planning time, and cover those activities with other adults.	• Schools must have staff to cover recess/lunch
5. LARGER SPECIALS	Create larger specials classes so that fewer specials classes can cover more core teachers' time.	• Works best when specials are not already at or near class-limit size
6. ENRICHMENT PERIODS	Create enrichment or intervention periods, covered by other adults, to allow teachers to plan.	• Useful when schools have staff or community partners to cover enrichment periods effectively—i.e., as an academic benefit, not a time filler

(Rosenberg, Daigneau & Galvez, 2018)

Referenced Resources

WWW.MENTIMETER.COM

Tool for creating interactive presentations

HTTP://TTAC.ODU.EDU/ARCHIVES/CURRICULUM-AND-INSTRUCTION/MATH/

Blog with resources for virtual manipulatives

WWW.UMU.COM

Tool for creating micro-learning and interactive learning

WWW.LETTERTOMYFUTURESELF.NET

Website to write letters to be delivered at a future date

WWW.TTAC.ODU.EDU

The VA Dept. of Education's TTAC at ODU

HTTPS://WWW.FACEBOOK.COM/TTACODU/

TTAC ODU's Facebook Page

HTTP://WWW.COTEACHSOLUTIONS.COM/

Resource for core co-teaching competencies and co-teaching checklists

HTTPS://WWW.ERSTRATEGIES.ORG

Connected professional learning case study

WORKING WITH STRUGGLING STUDENTS: SELF-ASSESSMENT INVENTORY

Considerations for teachers that are working with students struggling in mathematics

making learning visible

in the Co-Taught Classroom

SELF-ASSESSMENT INVENTORY: WORKING WITH STRUGGLING STUDENTS

(TEACHER SELF-EFFICACY SECTION)

This checklist is designed for Pre-K-8 teachers of mathematics to use to reflect on how they are currently supporting students who are struggling with learning mathematics and identify opportunities for providing additional support. If several teachers complete the inventory, it can also be used as a basis for a discussion and sharing about current practices.

Teacher Efficacy	
1. I exhibit confidence in teaching math based upon my conceptual understanding of math concepts. I use multiple representations in demonstrations.	Help students acquire number sense Providing concrete-representational-abstract learning Understanding of importance of math connections in developing algebra awareness Have the ability to help students make real world connections Provide alternate explanations or example when students are confused Explain to students the conceptual understanding behind a math procedure Concrete materials Representational materials Story contexts Visual diagrams Virtual demonstrations (via computer) Number lines
2. I allow students to discover math understanding in a manner that works for them individually.	Accepting of various ways students may solve problems Promote conceptual understanding of math Allow students to problem solve in math using relevant information and data
3. I challenge students to think deeply and to make personal connections.	Providing students opportunities to verbally express their learning process Crafting questions that take students to a deeper level of understanding beyond a problem being just right or wrong Allowing students to illustrate representational understanding of math concepts
4. As an individual, I sometimes experience math anxiety.	It would be helpful for me personally to have a god review of some basic math skills An enriched personal understanding of fractions, decimals and percents would make me a better math teacher Help students to address math anxiety
5. In a co-teaching environment, I am confident in my ability to create a classroom utilizing roles and responsibilities of both teachers	Collaboration-roles and responsibilities Co-Planning Co-Teaching Classroom management Co-Assessment Accommodations Student engagement
6. I am confident in my ability to evaluate student errors in math. I am confident in my re-teaching to address specific errors.	Error analysis

7. I am able to stay abreast of current math technology and utilize in my teaching.	Websites Interactive white boards Virtual manipulatives

Teacher Efficacy: What areas of professional development would help you address teacher efficacy as you reflect upon your skills and confidence as a math teacher (individual or professional learning committee)?

List resources to be used in professional learning activities: