COMP Elementary – Summer 2015 Day 1

Revisiting Our Norms

Norm of Contribution:

- As a group of professionals we have made a commitment to helping children attain success in life and a voice in the world.
  - Many times the best part of these kinds of professional development is simply the chance to share ideas, raise questions, and work with other practitioners to improve our own understandings and practice.
  - Please bring your stories of children's learning with you.

Socio-mathematical Norms:

- Listen intently when someone else is talking avoiding distractions
- Persevere in problem solving; mathematical and pedagogical
- Solve the problem in more than one way
- Make your connections explicit - Presentation Ready
- Contribute by being active and offering ideas and making sense
- Limit cell phone and technology use to the breaks and lunch unless it's part of the task.
- Be mindful not to steal someone else's "ice cream"
- Respect others ideas and perspectives while offering nurturing challenges to ideas that do not make sense to you or create dissonance.
- Limit non-mathematical and non-pedagogical discussions

Presentation Norms

- Presenters should find a way to show mathematical thinking, not just say it
- Presenters should indicate the end of their explanation by stating something like "Are there any questions, discussion, or comments?"
- Others should listen and make sense of presenters' ideas.
- Give feedback to presenters, extend their ideas, connect with other ideas, and ask questions to clarify understandings

Children as Mathematicians

Children can explore mathematics connected to their world through the following kinds of questions:

1) How do the arithmetic operations behave?

2) What does it mean to make a general conjecture about numbers and operations?

3) How do we "prove" our claims?

In your groups reflect back and cull through the COMP tasks we have done together as a professional community. Make a list of and give a short statement connecting the task to at least one of the three questions above.

COMP Elementary – Summer 2015 Day 1

Let's look at a few examples we have already explored ourselves:
As a group look closely at the following three ideas involving operations and consider how students might go about providing "proof" of these. Fashion together at least one student based proof for each idea.

1) If you change the order of addends in an addition expression, you do not change the sum. (Grades K-2)

$$3 + 5 = 8$$
$$5 + 3 = 8$$

2) If you have an addition expression and you add 1 to one addend and subtract 1 from the other addend, the sum will stay the same. (Grades 2-4)

$$2 + 7 = 9$$
$$3 + 6 = 9$$

$$79 + 41 = 120$$
$$80 + 40 = 120$$

3) If you add 1 to a factor in a multiplication expression, the product is increased by the other factor. (Grades 4-5)

$$4 \times 5 = 20$$
$$4 \times 6 = 24$$

COMP Elementary – Summer 2015 Day 1

Read over the following statements from Dr. Reva Kasman.

"Operations are mathematical objects that have their own attributes, rather than just being directions to follow in solving problems. By understanding operations this way, students will be better able to discern when they are appropriate tools for solving problems."

- "Students have opportunities to process ideas individually or in small groups/pairs, but whole community discussion is an integral part of the process"
- "Everyone collaborates to articulate and refine class conjectures and proofs"
- "Students all engage in the same activities, but may take away different things from the work"
- "In these activities, the students function as a *community of mathematicians"*

  -- Dr. Reva Kasman, Mathematician of Salem State University

Do you agree or disagree with these statements? Why?

COMP Elementary – Summer 2015 Day 1

As a table group discuss the connections between these **7 attributes of Children as Mathematicians** and the SMP's. Write down the SMP's that can be connected with each attribute of Children as Mathematicians.

1. Exploring Examples

2. Asking Questions

3. Articulating and Testing Conjectures

4. Building Contextualized Understanding

5. Creating Representation-Based Proofs

6. Analyzing Models and Reasoning

7. Seeking Community Acceptance

Exploring Numbers

For each number below, have the student take out that many color tiles. Have the student show you how we can make pairs with that many color tiles. Looking across all the numbers, what kinds of patterns are there?

Draw two ways a child might display the possible pairings below:

1 – One

2 – Two

3 – Three

4 – Four

5 – Five

6 – Six

7 – Seven

8 – Eight

9 – Nine

10 – Ten

COMP Elementary – Summer 2015 Day 1

Exploring Sums

Ms. Colaizzi's students enjoy an activity called "Guess My Number" and they have become great number detectives! One day, after solving some "Guess My Number" problems in pairs, they were asked to write a "Guess My Number" problem of their own and share it with the class. Katy and Sam presented their problem to the class, revealing one clue at a time. Their first clue was *my number is less than 50*, their second clue was *my number is odd*, and their third clue was *when you add 17 to my number, the sum is 63*. After the third clue was revealed, another student, Nathan, quickly said that he doesn't think this will work. He said that if their number is odd and you add 17 to it, the sum cannot be odd. Katy and Sam looked back at their work and found that the sum of 63 should really be 62, but many of the students wondered how Nathan knew there was a mistake without even calculating the number.

The next day, Ms. Colaizzi gave her students the following sets and asked them to compute the sums and look for patterns in each set.

Set 1	2 + 6 = ___	4 + 2 = ___	8 + 6 = ___	12 + 4 = ___	10 + 8 = ___	22 + 14 = ___
Set 2	1 + 5 = ___	7 + 3 = ___	5 + 9 = ___	3 + 11 = ___	13 + 15 = ___	21 + 17 = ___
Set 3	6 + 1 = ___	4 + 5 = ___	2 + 9 = ___	5 + 2 = ___	11 + 6 = ___	23 + 14 = ___

What patterns related to even and odd numbers might the students see?

Are the examples in Sets 1, 2, and 3 above sufficient evidence to conclude that these patterns will always hold true?

Use manipulatives or drawings to justify the patterns found when adding two numbers that are even, adding two numbers that are odd, and adding two numbers one of which is odd and the other even.

Will these same patterns be true for subtractions involving even and odd numbers? Why or why not?

NAME:

Take a few moments to reflect on our time of thinking and learning today.

-- Jot down the meaningful and significant things you thought about.

-- Jot down the ways you thought mathematically and pedagogically.

-- Jot down how you contributed to our shared community of professionals.

(CO)² MP Elementary

Common Core for Mathematical Proficiency in Elementary Schools