We are all "math brains"

All City Tutor Training
Middle School Math

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Audrey Roach
Math Assessment Specialist
amroach@seattleschools.org
206-252-0153

Thank you for all you do for our students and schools! ☺

Goals:

By the end of today's session, you should be able to:

Demonstrate an understanding of focus standards in grades 6-8.

Ask probing questions to develop student's mathematical thinking.

Give feedback and comments that promote a growth mindset.

Apply the strategies you've learned to support students with their learning.

Norms:

- 7 Norms to guide our work with each other
  - Pursue a spirit of inquiry
  - Put ideas on and off the table
  - Paraphrase
  - Presume positive intentions
  - Pause
  - Probe
  - Pay attention to self and others

What do you know, think you know and want to know about supporting middle school students in learning math content?

Know - Think I Know - Want to Know

On your own:

Complete each column on your recording sheet

Task Group:

Compare and share in a round-robin pattern

TOPIC: _____

Know	Think I know	Want to know

Guidance on what math to learn:

- The state of Washington adopted Common Core State Standards a few years ago.
- Our adopted text for middle school is CMP2 (Connected Mathematics 2).
- The SPS math program and 50+ teachers developed a scope and sequence to support both.

To help SPS teachers incorporate all of this, SPS teachers developed a scope and sequence

- So students could master the content emphases
- Have access to the key learning of each course as early as possible in the year

Key: Major Clusters; Supporting Clusters; Additional Clusters

Operations and Algebraic Thinking

- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and divisio
- Multiply and divide within 100.
- Solve problems involving the four operations, and identify and explain patterns in arithmetic.

Number and Operations in Base Ten

- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations — Fractions

- Develop understanding of fractions as numbers.

Measurement and Data

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
- Represent and interpret data.
- Geometric measurement: understand concepts of area and relate area to multiplication and to
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Geometry

- Reason with shapes and their attributes.

Fun facts:

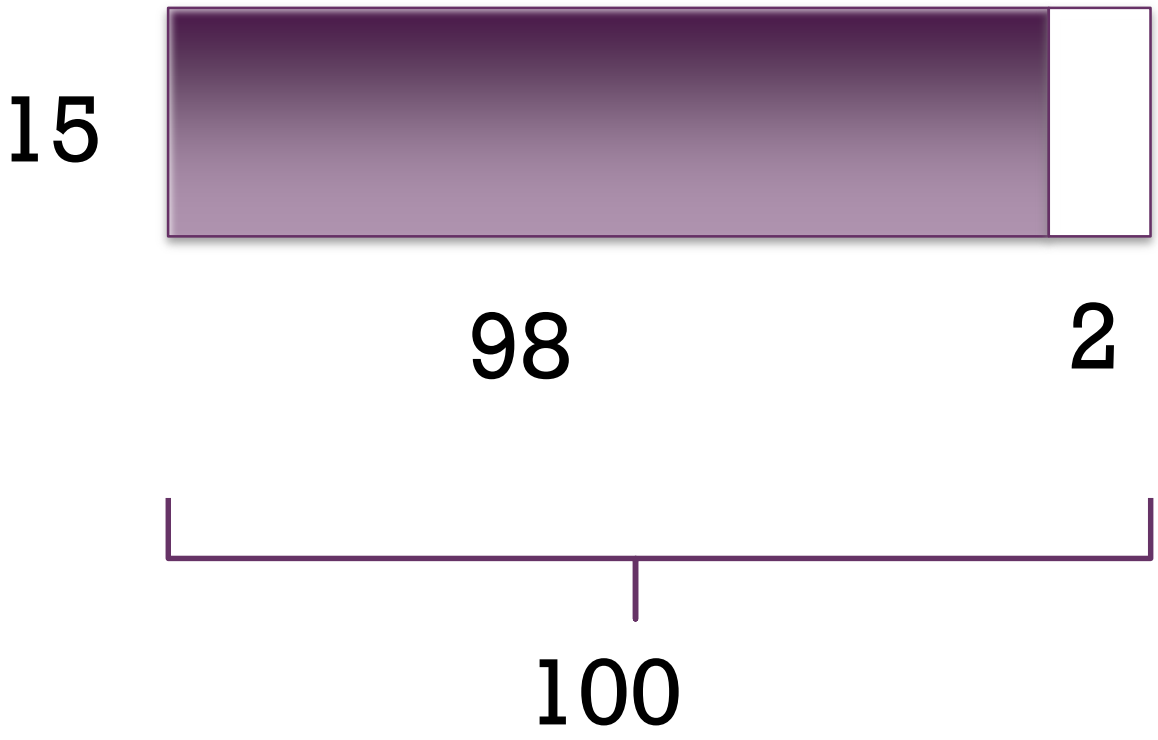
- There are many ways to approach and solve math problems.
- The way you learned math still works but it's not necessarily the best way to solve problems.

15 x 98 = ?

The product is still the same. How students arrive at this product may be different than the way you learned.

15 x 98 = ?

Student 1 may draw an area model



15 x 98 = ?

Student 2 may correctly use the standard algorithm

$$\begin{array}{r} 98 \\ \times\ 15 \\ \hline 490 \\ +\ 980 \\ \hline 1470 \end{array}$$

15 x 98 = ?

Student 3 may think of 15 as 10 + 5 and say:

10 x 98 is 980.

5 x 98 has to be 490.

So 15 x 98 is 980 + 490 or 1470.

Fun facts II:

- It is good for students to struggle.
- Students learn best when they are asked to express their thoughts and processes.
- Developing questioning strategies enhances student learning and helps students make sense of the math.

Learning to Question-Questioning to Learn

- Read over the ten habits to success in school.
- Star the habit(s) that you as a tutor could support students to develop in order to have the most potential impact.

Video on questioning strategies

- https://www.teachingchannel.org/videos/questioning-in-the-classroom

- While watching the video, pay attention to what you see the teacher doing and not doing.

Questioning Strategies

- Get into pairs.
- Look over questioning strategies.
- You and your partner will work on a grade 6, grade 7 and grade 8 math problem. One of you will take turns playing the student, and the other will play the teacher.
- If you are the teacher, use your questioning strategies to help your student.

As the teacher….

- Keep the answer hidden.
- Ask your student if he/she is sure his/her answer is correct. Ask him/her to explain it to you. Ask if he/she can explain it another way.
- In the explanation listen for "you just do" or "I just know." Keep pressing on these. The math should make sense.
- Resist the temptation to insist that your process is the best way to get to the right answer.

How can I help?

- Growth Mindset
- Hint: Please don't say "I was never good at math either."

Exit Ticket

What question(s) do you still have about supporting middle school students in learning math content?

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