Helping our children with math!

Under ***Common Core State Standards***, our students are expected to know much more than just the right answer. **What does it mean to be mathematically proficient?** Being mathematically proficient means to know **when**, why, and **how** to apply calculations to different mathematical situations.

Common Core Mathematical Practice Standard 3:
Construct Viable Arguments and Critique the Reasoning of Others

What It Means: We know students truly under a concept when they are able to give us a correct answer ***and*** explain how they got their answer. It is important that our children not only get it right, but to truly understand something they need to be able to prove why their answer is correct. Mathematical arguments require students to back up an answer or statement with facts, data, or mathematical reasoning. ***Constructing these viable arguments is not possible for students who lack an understanding of math skills and concepts.***

Students are asked to defend the following math problem: 4 X 5 = 10 + 10

Student 1: 4x5 = 20 and 10+10 =20, so they are equal. They are both 20.

Student 2: I do think they are equal because a 10 is two 5s, so two 10s would be the same as four 5s. 4x5 is four 5s, and 10 +10 is like two 5s and another two 5s… and they say the same thing.

Students do not always defend their mathematical thinking the same way. As they discuss their answers, students learn multiple ways to come to the same correct answer. As these problems show – students need to understand the mathematical concept ***and*** have language skills to construct their strong arguments.

What does it mean to critique the reasoning of others?
Students need to actively listen to their classmates' thinking, evaluate their arguments, and make decision as to whether they agree or disagree with their peers. To do this well requires kids to think at a much higher level and then APPLY their knowledge to assess someone else's argument.

How to Help Your Child Become Successful with This Standard

Begin by continually asking your child "Why?" or "How do you know?" when answering a question. You can then ask him/her, "Does your answer make sense?" and have him/her "Prove it to you."

Information taken from: *Putting the Practices into Action: Implementing the Common Core Standards for Mathematical Practice K-8* by Susan O'Connell and John SanGiovanni

Things to Do at Home:

Eliminate It:
Students are presented with 4 math concepts and asked to decide which one does not belong. They must then justify their choice, based on mathematical reasoning, explaining why it does not belong. This skill will help students construct viable arguments.

8	**2**
5	**10**

Student 1: I would get rid of 5 because it is an odd number. I know it's odd because if you used 5 counters and put them in pairs, you would have one left over.

Student 2: I would get rid of 10 because it is a two-digit number. This is different because ten has a number in the tens ***and*** the ones place.

Student 3: I would get rid of 5 because the others are a fact family. Let me explain. 8+2=10 or 10-2=8 or 10-8=2…but this won't work with the 5 – therefore I would get rid of that.

Agree or Disagree?
Give your child a math statement and have him/her explain whether he/she agrees or disagrees. Your child must include math data or reasoning to support his/her decision.

Sample statements:

Jim has 12 pencils and Annie has 8. Jim has more than Annie.

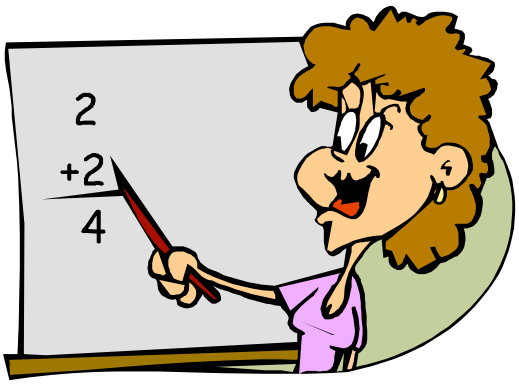
7+3 and 4+6 are the only ways to make 10.

9 is an even number.

6 tens and 3 ones is the same as 5 tens and 13 ones.

6 dimes are worth more than 11 nickels.

3.5 feet is more than 42 inches.



"The National Council of Teachers of Mathematics' Principles and Standards for School Mathematics (2000) emphasize the role that communication plays in learning mathematics. Talking and writing are critical processes through which students learn math content. When students construct mathematical arguments, they dig deep into their math understandings and, ultimately, build on those understandings" (O'Connell and SanGiovanni, 2013).

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