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Research-Practice Brief

#58

How can I help my child with homework?

NC Collaborative for Mathematics Learning

PARENTS SUPPORTING STUDENTS: WHY DOESN'T THE MATH LOOK THE SAME?

Parents can have a positive impact on children's mathematical growth in middle grades. Talking about mathematics at home and helping with homework can help students achieve success and confidence in mathematics class. However, many parents have noticed that the type of homework that is sent home may look different than what they saw when they were growing up. The reason students' homework probably looks different is because research shows that students who understand the meaning behind the rules are more successful at mathematics than those who merely memorize procedures. Additionally, to be prepared for college and the workplace, individuals need to be able to think critically rather than reproduce memorized procedures. This brief explains how parents can help their students with homework.

A BALANCED APPROACH

The NC Standards emphasize a balanced approach to knowing and doing mathematics. This means there is still a need to know basic facts and be able to perform calculations. Yet, there is a growing demand for students to possess communication and expert thinking skills. The NC Standards emphasize a balanced approach to mathematics with equal weight placed upon mathematical facts and meaning. Homework will emphasize basic computation problems as well as challenging problems that require critical thinking. A traditional homework problem is to evaluate the equation $y = 4x + 2$ when $x = 5$, yet homework today should emphasize realistic problems that call for students to interpret the situation and make calculations (see inset above).

A TYPICAL HOMEWORK PROBLEM

Evaluate the equation $y = 4x + 2$ when $x = 5$.

CRITICAL THINKING HOMEWORK PROBLEM

Shirts4Less.com sells t-shirts for a small fee. It charges $2 for the design and then $4 per t-shirt. Write an equation for the total price for n t-shirts. How much does it cost if someone orders 5 t-shirts?

MATHEMATICAL PRACTICES

The NC Standards Has a set of Math Practices that can help your child be successful on homework.

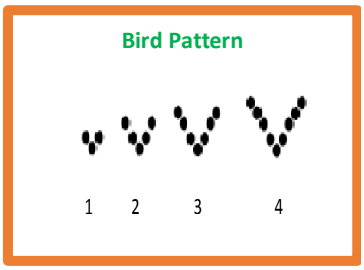
- *Persevere in problem solving- develop a mindset with your child to try a problem even if she doesn't have a way to solve it immediately*
- *Model mathematics- have your child sketch a picture or make a table*
- *Explain her thinking, even if it is wrong so the teacher can help*

IF I CAN'T SOLVE IT, HOW CAN I HELP MY CHILD?

Luckily, there are many strategies you can use to help your child, even when you do not know how to solve the problem. First, it is important to communicate with your teacher to know whether homework grades are based upon accuracy or completion. If homework is based upon completion, then your child should make their best attempt and show their work so that the teacher can determine where they are struggling. If the grade is based upon accuracy, it may be necessary to schedule an appointment with the teacher. Communication with the teacher is essential for the success of your child. However, there are many strategies that you and your child can use to increase your chance of creating a solution and being accurate. Many of the strategies below suggest the modeling practice (i.e., drawing pictures, diagrams or tables to represent the problem).

PROBLEM SOLVING STRATEGIES

- MAKE AN ORGANIZED LIST OR TABLE
  Sometimes a problem can be easier if you make a list or place the numbers in a table. When trying to find how many birds are in the 100th pattern (see insets below), it is useful for some students to keep track of the number of birds using a table and then use another strategy to make sense of the data.



Pattern Number	Number of Birds
1	3
2	5
3	7
4	9

- STRATEGIC GUESS AND CHECK
  One of the most fundamental and easiest strategies to start with is to guess an answer and check to see if it works. If it doesn't, adjust your answer and try again. This is not the quickest method, but it might help you find an easier solution. Also, talk with your child about answers or numbers that you can rule out, because they wouldn't make sense for that problem.

- LOOK FOR A PATTERN
  Sometimes there is a pattern, especially when the problem involves a lot of numbers. Inspect the numbers to see if they are increasing or decreasing in any organized way.

- DRAW PICTURES
  Certain problems lend themselves to making mathematical drawings. Those drawings can be helpful for solving the problem. For example, if the problem asks a student to share three pizzas fairly among eight people, try drawing three circles or three rectangles and drawing "cuts" in the picture to show what each person would get. Number lines and other mathematical tools are also useful for understanding a mathematical problem.

- WORK BACKWARDS
  Problems that seem to have a forward calculation can be reversed to find the original number: Guess my number…my number times 2 and adding three is 33. This type of problem seems to have steps to it that lead to an answer, so reversing the calculations (33-3 then divide that answer by 2) can return you to the starting number.

- SOLVE A SIMPLER PROBLEM
  For problems that use large numbers, one strategy is to solve the same problem but use smaller numbers and see if your strategy can be applied to the larger number.

WHAT ELSE CAN I DO TO SUPPORT MY CHILD

There are several ways you can engage your child in doing mathematics outside of school.

- *When riding in the car, pose **mental arithmetic problems** such as, "If I have 39 pennies and take away 23, how much money do I have now?"*

- *Do not simply show your child how to do a problem your way. Instead, **start with questions** such as: What is the problem asking? How are you thinking about this?, Can you draw a picture? If you solve the problem for your child, you are stealing their chance to be creative and feel successful.*

- *Be your child's **mathematics advocate**. Acknowledge that it is sometimes hard but she can be successful. Follow up with your child's teacher with other ways you can help ensure her success.*

CONSIDER THIS PROBLEM

Fifteen people are at a party. If each person shakes hands with everyone else (just once), how many handshakes are there in all? This problem can be explored by trying to find out how many handshakes with just 5 people (see left inset); whatever strategy is used here might be helpful for figuring out the solution for 15 people.

Person 1: 4 shakes
Person 2: 3 shakes
Person 3: 2 shakes
Person 4: 1 shake
Person 5: 0 shakes

You might even consider **Acting Out** this problem by actually lining up family members, shaking hands, and recording the shakes.

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