

@ Home Math Ideas¹

Asking Questions (continued)

- Is there someone you can call to get help? Can you discuss the problem with a classmate?
- Would using a calculator help you solve the problem?
- Would it help to go on to another problem and come back to this one later?
- Is there a homework hotline at your school? What is the phone number for it?
- Why don't we look for some help on the Internet?
- If you do only part of a problem, will the teacher give you some credit?
- Can you go in before or after school for help from the teacher?

Homework Reminder

Remember, *support homework—don't do it!*

Besides supporting your child on homework, show the importance of learning math by helping your child connect math with daily life. Point out your own activities that involve mathematics, such as deciding if you have enough money to buy items on a shopping list, estimating how long it will take to make a trip, determining how much carpet or wallpaper to buy for a room, or developing a schedule to complete a series of tasks. Talking about these everyday situations will give you a chance to increase your child's appreciation for the usefulness of math!

¹ National Council of Teachers of Mathematics (NCTM), "Tips for Families - Homework Help", online article @ nctm.org/resources/families.aspx

www.aMathsDictionaryforKids.com

An animated, interactive dictionary for students which explains over 600 common mathematical terms in simple language.



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Updated October 5, 2013

Source Documents:

Based on Common Core State Standards for Mathematics, June 25, 2010

Adapted from North Dakota Content Standards: "I Can" Statements

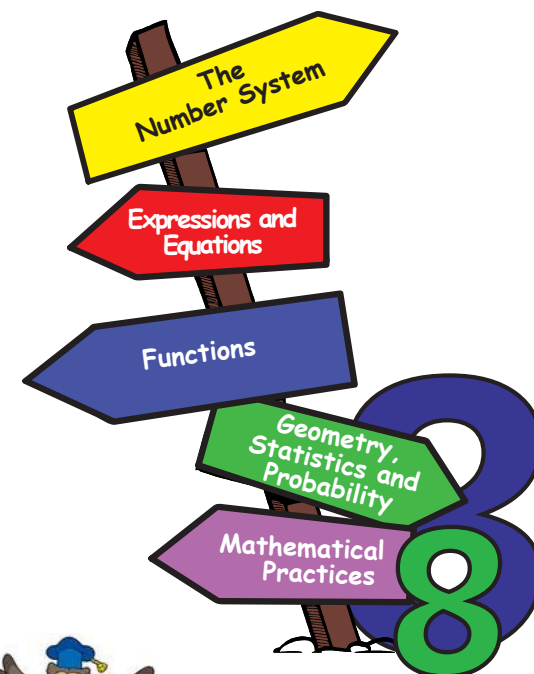
Adapted from Arizona Department of Education Mathematics Standards, 2010

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Grade 8

CCSS Math Expectations Checklist



Middle School

Homework Tips

Homework causes trouble in many households. Relax—remember whose homework it is! Think of yourself as more of a guide than a teacher. Don't take over for your child. Doing that only encourages him or her to give up easily or to ask for help when a problem becomes difficult.

The best thing you can do is ask questions. Then listen to what your child says. Often, simply explaining something out loud can help your child figure out the problem. Encourage your child to show all work, complete with written descriptions of all thinking processes. This record will give your child something to look back on, either to review or to fix a mistake, and can also help the teacher understand how the problem was solved.

Asking Questions

Asking the following kinds of questions can help you and your child tackle the challenges of math homework:

- What is the problem that you're working on?
- Are there instructions or directions? What do they say?
- Are there words in the directions or the problem that you do not understand?
- Where do you think you should begin?
- Is there anything that you already know that can help you work through the problem?
- What have you done so far?
- Can you find help in your textbook or notes?
- Do you have other problems like this one? Can we look at one of those together?
- Can you draw a picture or make a diagram to show how you solved a problem like this one?
- What is your teacher asking you to do? Can you explain it to me?
- Can you tell me where you are stuck?



My checklist of what I can do in 8th grade math

I understand that it is important to apply the mathematical practices (identified on the inside cover) on a regular basis.

The Number System

Know that there are numbers that are not rational, and approximate them by rational numbers: (8.NS.1, 8.NS.2)

- I can explain the difference between a rational and an irrational number.
- I can convert either repeating or terminating decimals into a fraction.
- I can write a decimal approximation for an irrational number to a given decimal place.
- I can place rational and irrational numbers on a number line.
- I can estimate the value of an expression that includes an irrational number and justify my estimation.

Statistics and Probability

Investigate patterns of association in bivariate data: (8.SP.1, 8.SP.2, 8.SP.3, 8.SP.4)

- I can construct and interpret scatter-plots and describe the relationships shown in a scatter-plot. (identifying patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association) ___ construct ___ interpret ___ describe relationships
- I can sketch a line of best fit on a scatter plot, justify the location of the line, and explain why or why not a given line is a good fit. ___ sketch ___ justify ___ explain
- I can write the equation of a line of best fit and use it to make predictions.
- I can explain what the slope and y-intercept mean in terms of the situation.
- I can construct two-way frequency and relative frequency tables to summarize bivariate categorical data (two variables collected from the same subjects).
- From two-way frequency and relative tables, I can describe, interpret, and justify inferences in patterns of association between the two variables. ___ describe ___ interpret ___ describe ___ justify

How to use checklist:

- Show the date of when you were able to do the math expectation.
- Show an example of what you did in a journal.

Expressions and Equations

Work with radicals and integer exponents: (8.EE.1, 8.EE.2, 8.EE.3, 8.EE.4)

- I can use properties of integer exponents, including zero and negative exponents to evaluate and simplify numerical expressions containing exponents.
- I can derive and explain the properties of exponents. ___ derive ___ explain
- I can solve equations of the form $x^2 = p$ and $x^3 = p$ using square or cube roots.
- I can find square roots and cube roots of perfect squares and perfect cubes.
- I can estimate very large and very small quantities using a single digit times a power of 10.
- I can compare two quantities written as a single digit times a power of 10.
- I can perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.
- I can use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g. use millimeters per year for seafloor spreading).
- I can interpret scientific notation that has been generated by technology.

Understand the connections between proportional relationships, lines, and linear equations: (8.EE.5, 8.EE.6)

- I can graph proportional relationships and interpret the unit rate as the slope. ___ graph ___ interpret
- I can compare two different proportional relationships given different representations.
- I can calculate slope on a graph using similar triangles.
- I can explain why slope is the same between any two distinct points on a non-vertical line using similar triangles.
- I can derive the equation $y = mx$ and $y = mx + b$

Analyze and solve linear equations and pairs of simultaneous linear equations: (8.EE.7, 8.EE.8)

- I can solve equations using distributive property, combining like terms, and equations with variables on both sides.
- I can write/solve/explain linear equations in one variable that give one solution, infinitely many solutions or no solutions. ___ write ___ solve ___ explain
- I can solve for a given variable in terms of another variable.
- I can solve and explain (in terms of the situation) a system of linear equations graphically or algebraically, including those that have no solution or infinitely many solutions. ___ solve ___ explain ___ graphically ___ algebraically
- I can solve real-world problems involving a system of linear equations.

Functions

Define, evaluate, and compare functions: (8.F.1, 8.F.2, 8.F.3)

- I can explain what a function is.
- I can determine if a table, graph, or set of ordered pairs is or is not a function and justify my conclusion.
- I can distinguish between linear and nonlinear functions given a table, graph, or equation and justify my conclusion.
- Given two functions (represented algebraically, graphically, numerically in tables, or by verbal descriptions), I can determine which function has a greater rate of change.

Use functions to model relationships between quantities: (8.F.4, 8.F.5)

- I can write the equation of a line (in the form $y = mx + b$) given a point and a slope, 2 points, a table, or the graph of the line. ___ point/slope ___ 2 points ___ table ___ graph
- I can explain a real world situation from an equation, table, or graph (explain the rate of change/slope and the y intercept in the context).(linear only)
- I can create the equation, table or graph for a real-life situation. (linear only)
- I can describe a relationship as increasing or decreasing, linear or nonlinear, from an equation, table or graph.

Geometry

Understand congruence and similarity using physical models, transparencies, or geometry software: (8.G.1, 8.G.2, 8.G.3, 8.G.4, 8.G.5)

- I can use the properties of translations, rotations, and reflections on line segments, angles, parallel lines or geometric figures.
- I can show and explain two figures are congruent using transformations. (explaining the series of transformations used)
- I can determine the new coordinate of a figure given a dilation, translation, rotation, or reflection.
- I can describe transformations and/or dilations that produce similar figures and explain similarity of figures in terms of dilation and/or transformation..
- I can show triangles are similar by AA and explain why AA is enough to show similarity.
- I can show and/or explain how the angle-sum and exterior-angle theorems of a triangle are true.
- I can identify angle pairs created by parallel lines cut by a transversal and explain which angle pairs are congruent or supplementary and why.

Understand and apply the Pythagorean Theorem: (8.G.6, 8.G.7, 8.G.8)

- I can give or explain a proof of the Pythagorean Theorem and its converse (prove perpendicular sides or right triangle).
- I can apply the Pythagorean Theorem in real-world situations or drawings to find unknown side lengths in right triangles in two and three dimensions.
- I can use the Pythagorean Theorem to find the distance between two points on a coordinate system.
- I can describe patterns in special right triangles. (Honors)

Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres: (8.G.9)

- I know and use the formulas for volumes to solve real world and mathematical problems involving cones, cylinders, and spheres