

JOIN THE MATH REBELLION

CREATIVE
PROBLEM-SOLVING
TIPS FOR
ADVENTUROUS
STUDENTS



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AUTHOR OF LET'S PLAY MATH: HOW FAMILIES CAN LEARN MATH TOGETHER AND ENJOY IT

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CREDITS: “[Strong woman](#)” photo on cover by Miguel Bruna via Unsplash. “[Fist with pencil](#)” image from OpenClipart-Vectors on Pixabay, which appears to be adapted from this [public domain fist](#) by Keith Tyler. My “Tips for Creative Math Rebels” are based roughly on the [Standards for Mathematical Practice](#), which are part of the Common Core State Standards.

W. W. Sawyer quote from *Vision in Elementary Mathematics*, Dover Publications, 2003 (pages 50, 52).

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How to be a Math Rebel

Understand Math Concepts

When you get a math worksheet or homework page,
don't start working straight away.

Examine the page to see if the problems look familiar.

Do you know what the teacher or textbook wants you to do with each problem?

If you're not sure about a problem, then you have some learning to do.

Math rebels always care about the Truth.

So first, learn what the problem means and how to solve it.

After you understand the problem, then you can work on your rebellious answer.

Choose Your Battleground

Fighting for intellectual freedom takes energy,
so decide how rebellious you want to be.

Are you going to mess with just a few of the problems?

Or turn the whole page into a protest statement?

Live by the Two Rules

**“A pupil is allowed to write
anything that is true,
and not allowed to write
anything untrue!
These are the only rules
of mathematics.”**

—W. W. SAWYER

PERSEVERE

Fight to make sense of a problem.

Think about the things you know.

Ponder what a solution might look like.

Compare this problem

to those you solved in the past.

If it seems too hard, make up a simpler version.

Can you solve that one?

If one approach doesn't work,

try something else.

When you get an answer, ask yourself,

“Did I miss anything?”



Don't Panic

Don't let abstraction scare you.

Don't freeze up when you see complex numbers or symbols.

Break them down into simpler parts.

Take each problem one step at a time.

Know the meaning of the math, how it relates to the “real world.”

But if it gets in your way, ignore the “real world” situation.

Revel in the abstract fantasy.

KNOW HOW TO ARGUE



- Argue respectfully.
- Analyze situations.
- Recognize your own assumptions.
- Be careful with definitions.
- Make a guess, then test to see if it's true.
- Explain your thoughts.
- Give evidence for your conclusions.
- Listen to other people.
- Ask questions.
- Celebrate when someone points out your mistakes.
- That's when you learn!

LOOK UNDER the SURFACE

Notice the math behind everyday life.

Examine a complex situation.

Ignore the parts that aren't relevant.

Pay attention to the big picture,
but don't lose track of the details.

Make assumptions that simplify the problem.

Express your thoughts using numbers, shapes, or equations.

Test how well your model reflects the real world.

Draw conclusions.

Explain how your solution relates to the original situation.