

Mathematical Habits of Mind

I collect data and results and use them to determine what to do next.

I find evidence of claims via experimentation.

I provide concrete examples when faced with abstract problems.

I look at my results and ask myself, "Does this make sense?" If it does not, I check my results for errors.

EXPERIMENTER

I make an estimate of an answer and am within an order of magnitude.

I create a reasonable range for my final solution.

I use guess and check when confronted with a problem I don't know how to do.

I can make estimations of broad problems using no additional facts (aka Fermi estimation).

GUESSER

I make statements based on data and test them to see if they are accurate.

I test others' statements to see if they are true or not.

I create a rule for a situation that describes it accurately and generally.

I can generalize most situations I come across.

CONJECTURER

I can, given a problem, draw a picture that accurately represents what is going on in the problem.

I can create a visual of a process that is understandable by others.

I can interpret the pictures of others to understand what is happening in a problem.

I can accurately make changes to diagrams when the parameters of a problem change.

VISUALIZER

I wonder what happens when I change something.

I investigate situations by asking "What if I do this?" and then doing it.

I choose appropriate tools to best discover new data about a problem.

I encourage other students to wonder and be playful to help them understand a situation.

Tinkerer

I can explain my mathematical ideas clearly (both verbally and in writing) so that they are understandable by others.

I choose my words carefully so that they are precisely what I mean and no ambiguity exists about my statements.

I choose the best level of precision in a problem given that problem's constraints.

I can explain processes to help other students understand what is going on.

Describer

I detect patterns by noticing repeated changes.

I can describe the rules for generating a pattern in words, pictures, and mathematical notation.

I use patterns to predict future results.

I ignore irrelevant information that distracts from the patterns.

I can extend complex visual patterns far into the future.

**PATTERN
HUNTER**

I create shortcuts to work more efficiently.

I generalize patterns and create models to represent situations.

I create new methods for solving problems and share those methods with others.

I notice the inherent structures of problems and can use those structures to solve future problems.

I share my inventions with other students to make it easier for everyone to learn.

inventor