

Methods and Strategies

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1 Study Process

- Preview: sort out what understand and what you don't understand. Ask questions especially "Why is it so?" and "Is there other way to reach the same result?"
- Lecture: Listen, ask questions, answer questions
- Review: Understand, memorize, and use what you learn in your HW.

2 Understand a new concept

- condition (where you use it),
- action (how to do it),
- Why (challenge its correctness),
- Relating - especially underlying connections between every concepts, number, etc.
- [Simple / specif cases] → generalized cases
- Cautions and confusions

3 Reasoning strategies

Reference: PH 1-10, p. 45-46, HW8: 11,12,13,15,16

- Draw a diagram
- Try, Test, Revise
- Write an equation
- Make an organized List
- Use Logical Reasoning
- Make a table
- Look for a pattern
- **Simplify the problem: divide and conquer** (Don't worry about complex problems, step by step)
- Work backward

4 Solving questions

- Reading questions: information (known) - 1) context (e.g. tunnel, rectangular parking lot, circle, height) ; 2) numbers and their relationships (equations); 3) actions. 4) links from known to unknown so as to solve the problem. **Note: translate words into math expressions, diagrams. Math is abstract and is God's language. You need to pull out such crucial abstract information and to leave out trivial information. Music only has 7 notes. It can make so many tunes. The essential of math and the starting point is numbers. You started understanding math by learning numbers. You are always looking for some numbers as the answer to your math problems no matter how complicated the problem and the process are.**
- Solution: Don't be wordy. Use math symbols and labels, terms, expressions (equations and solution steps), etc.

5 General Study Rules

- Let's put what you know in a circle. Outside this circle represents what you don't know. The more you know, the larger this circle becomes. At the same time, as the perimeter of the circle becomes larger, the more unknown it will touch, then you become aware of there are the more you don't know. You should not feel embarrassed of saying, "I don't know. I might be wrong. I did not do well." This indeed is the step for you to improve.
- Hardworking (learn more, practice more). There is no shortcut to reach the summit. Only those who are persistently and carefully trying can reach the summit.
- Your sister's lessons: trying different sports good. but in order to be different from others, learn snowboarding instead of skiing is not a wise choice. Both are the same indeed. What she lacks is the courage to fall.
- Work on basics. Don't try to be different in order to be different.
- Arthur C. Clark once suggested a revolutionary idea passes through three phases: 1. It's impossible – don't waste my time. 2. It's possible, but not worth doing. 3. I said it was a good idea all along. Actually, you will feel not just a revolutionary idea passes through these three phases but any new concept, new views or perspective. So don't judge in the first place. Ponder on it carefully and patiently for three times. Understand it first by figuring out . Then ponder on it again for three times, to question it by answering who, what, where, when, how, why; especially why. Last judge the idea and absorb the idea that will be useful to you. So is anything, like beauty. You won't find stranger beautiful and attractive. So is a person. Looking through the appearance to search for his or her heart by weighing more on his or her behavior while disregarding words (English teacher might be a loving person).
- Read a book into a thicker one by finding each tiny detail, deep thinking, harsh questioning, elaborated reasoning, and wild imagining and relating; who, what, where, when, how, why; of which why is the most important. Then read this book into a thinner one by pulling out absorbing its most important ideas so that it becomes best nutrient to your mind and becomes one tiny part of you.

6 Math Definitions

Math definition of a word is different from that of language dictionary.

6.1 distribute verb

dlogic : to use (a term) so as to convey information about every member of the class named The proposition "all men are mortal" distributes "man" but not "mortal."

3a: to divide or separate especially into kinds
distributing specimens into their proper classes

b: to return the units of (something, such as typeset matter) to storage

4mathematics : to use in or as an operation so as to be mathematically distributive (see DISTRIBUTIVE sense 3a)

Addition is not distributed over multiplication.

intransitive verb

mathematics : to be mathematically distributive
multiplication distributes over addition

6.2 distribute verb

3a: being an operation (such as multiplication in $a(b + c) = ab + ac$) that produces the same result when operating on the whole mathematical expression as when operating on each part and collecting the results

b: being or relating to a rule or property concerning a distributive operation the distributive property of multiplication with respect to addition

6.3 inverse

6.4 nucleus

Biology: cells

Physics: atoms

6.5 Growth, development, evolution