

Presentation #370, Anderson, Huh? What Does that mean?

HUH? WHAT DOES THAT MEAN?

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Why do we need good questions?

The power of questioning is in the answering. We not only need to ask good questions to get good answers but we need to ask good questions to promote the **THINKING** required to give good answers.

What is a good question?

- Help make sense of math
- Open-ended
- Unravel misconceptions
- Require application of facts and procedures
- Make connections and generalizations
- Accessible to all students
- Lead students to wonder and ask more

How are good questions created?

- What is the question asking?
- Solve the problem
- Explain your strategy
- Does your answer make sense?

What questions should teachers ask?

- Who?
- What or what if?
- When?
- Where?
- Why or why not?
- How?

Who? Who has another solution?
Who has another method?
Who can put that in different words?
Who agrees or disagrees?

What or what if?

What patterns do you see in the data?
What generalizations can you make?
What proof do you have?
What are the chances?
What is the best answer, method, or strategy to begin with?
What if I change part of the problem?
What new problems can you create?

When? When does this work?

When does this not work?
Is there a counterexample?
When would there be a better way?
When will it lead to a new idea?

Where? Where did that come from?

Where should I start?
Where could I go next?
Where could I find additional information?

Why or why not?

Why does that work?
Why doesn't that work?
Why would you choose that method?
Why do you think that?
Why would it work sometimes and not others?

How? How is it like other problems?

How is it different from what we have done?
How does this relate to real-life problems?
How many solutions are possible?
How many representations can you make?
How can you organize that information?
How did you know to try another strategy?
How do you know you have an answer?
How do you know it will always work?

What about student's questions?

- Avoid answering directly
- Repeat by paraphrasing
- Redirect the question
- Ask a probing question
- Promote a discussion among students
- Postpone answering the question

- Discourage inappropriate questions
- Admit when you don't know the answer

What about vocabulary?

Sound alike words:

Sum and Some

Mean, means

Median and medium

Odd and odds

Outlier and outline

Percent and percentile

Discriminant and discriminate

J and L found some coins in the couch cushions after Uncle Fred's visit. The sum of the coins was enough to buy two ice cream cones. Ice cream cones cost \$.89. How much money did J and L find?

More than one math meaning

Square, square root, shape, x squared

Round, estimate, shape

Power of a power

English language definition that is common

Depression, altitude, Composite, Complementary, Data, degree, domain, range, extremes, factors, function, intersection, irrational, legs, terms, mean, means, mapping, mode, odd, prime, product, radical, rational, real, roots, set, regular, standard, union, variable, whiskers, intercept, outcomes, identity

Unique language

Tree diagram, stem and leaf plot, real numbers, imaginary numbers, open sentence, sin, family of graphs, box and whiskers

Confusing small words

A, any, all, each, it, of, off, and , or

"We should think of question asking as the goal of an educational activity, rather than a happy by-product." Susan Engel