Differentiating Instruction in Math:

It's Not as Hard as You Think

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Goal

- **The goal is to meet the needs of a broad range of students, but all at one time– without creating multiple lesson plans and without making students who are often labelled as strugglers feel inferior.**

Two strategies

- **Open tasks**
- **Parallel tasks**

Some History

- **We have been using this idea for some 5 years now and it has become increasingly popular in Grades 1- 12 in all of the strands.**

Underlying principles

- **There should be a “big idea” that can be addressed at different developmental levels using these strategies.**
- **There should be choice in how a student proceeds.**

The difference

- **In open tasks, you pose a single question that evokes a broad range of responses at many levels.**
- **For parallel tasks, you pose two different questions at different levels but tied in terms of the big idea to which they relate and their context.**

Open tasks

The answer is…

- **You provide an answer, for example, the number 42 and ask students to create questions with that answer.**
- **The diversity of responses is interesting and informative.**

All about percent

Make this true as many ways as you can:

- **72 is ___ % of ____.**

Some ideas you might have

I expected:

- **10% of 720**
- **100% of 72**
- **72% of 100**

Or

- **200% of 36**
- **50% of 144…**

Alike and different

- **You can get a lot of varied responses by asking students how two items (e.g. two numbers) are alike and different.**

350 and 550

- **If I asked you how these numbers were alike and different, what would you suggest?**

For example...

- Both are multiples of 50.
- Both are multiples of 10.
- Both are even.
- Both have 3 digits.
- Both are between 100 and 1000.

For example…

- One is more than 400 and one is less.
- One is more than 500 and one is less.
- One has two 5s in it and the other doesn’t.
- One needs 10 base ten blocks to show it and the other does not.

Integers

- **You combine two integers to get -2. What integers might you have combined? How did you combine them?**

Tangram house

- **Use any four tangram pieces to build a shape that looks like a house. Use geometry words to describe your house.**

Measuring a pumpkin

- **How many different ways can you think of for measuring a pumpkin?**
- **It is delightful to see how creative students can be. This is only possible with an open question.**

Measuring a room

- **Why might it be useful to measure the length and width of a room by counting how many steps you need to get from one wall to the next?**

Trapezoids

- **What can you make if you put together 3 isosceles trapezoids?**

Many squares

- **Show how to put together squares to create shapes with 8 sides.**

Continuing a pattern

- **A pattern begins like this: 2, 5,….**
- **How could it continue?**

4 and 10

- **An expression involving the variable *k* has the value of 10 when *k* = 4. What could the expression be?**

100,000

- **Tell everything you can about the number 100 000.**

Why open questions

- **Expose student thinking to know what to do next**
- **Make students feel like their contributions actually make a difference**
- **Enrich and broaden everyone's learning**

They work best if…

- **they are focused on a big idea (so lots can happen).**

Parallel Tasks

What are they?

- **These are two or more tasks that focus on the same big idea at different developmental levels but which are quite similar.**
- **They are designed to suit the needs of different students, but so that the whole range of students can participate in a discussion about them.**

The Race

Option 1

- **Twice as many people came in ahead of David's dad in a race.**
- **There were 112 runners.**
- **What was David's dad's position?**

Option 2

- **Twice as many people came in ahead of David's dad in a race.**
- **How many people might have been in the race?**

Ordering values

- **Order the given values from least to greatest. Will your order be the same no matter what the value of *n* is?**

Ordering values

Option 1:

- $n/2$
- $3n$
- n^2
- $3n + 1$
- $10 - n$

- **Option 2:**
- $4n$
- $3n$
- $10n$
- $3n + 1$
- $5n + 2$
- $-n$

What is 10* 12?

If

- 2*3 = 12
- 2*4 = 14
- 2*5 = 16
- 3*3 = 15
- 4*3 = 18

If

- 2*3 = 7
- 2*4 = 8
- 2*5 = 9
- 3*3- 9
- 4*3 = 11

What real life situation...

- Might 10 000 describe.
- Might 1000 describe.

A Division

- **You divide two numbers and the quotient is 2.5. What two numbers might you have divided?**

- **You divide two fractions or decimals and the quotient is 2.5. What two numbers might you have divided?**

For more information and examples

- See this resource in the NCTM booth

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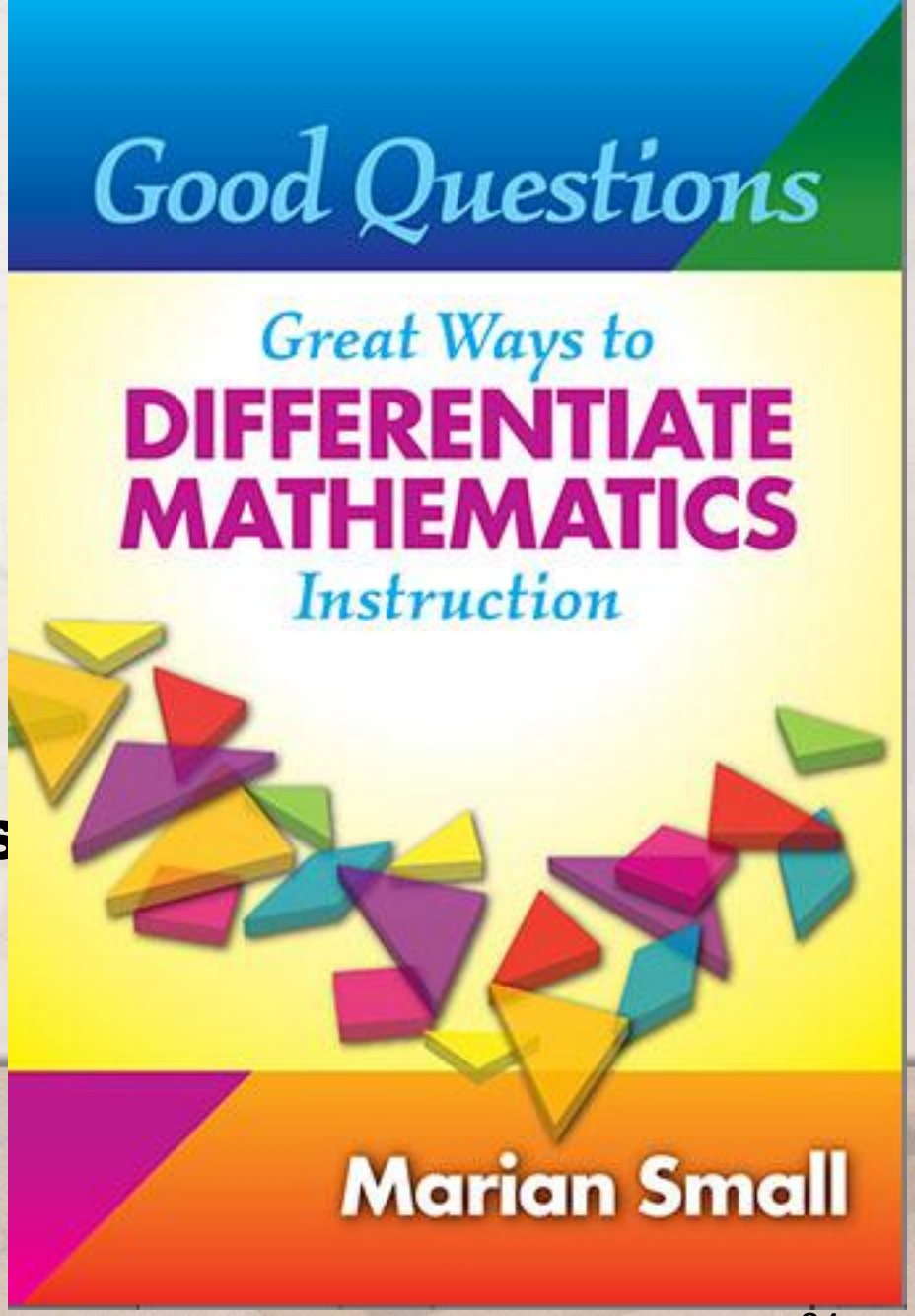

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