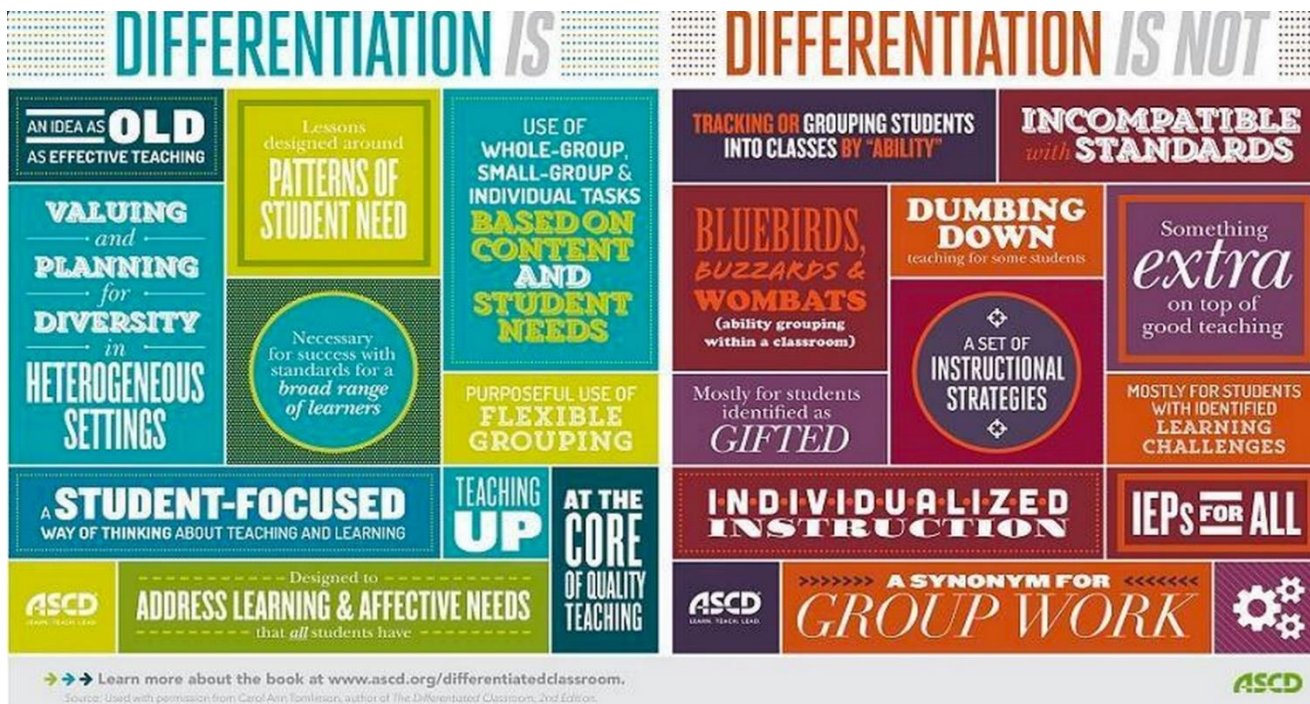


Differentiation

Every class has students at a variety of levels and abilities. While we can't feasibly provide individualized instruction, we also can't just use the "bowling ball down the middle" approach.



Screeners given at the beginning of the year will help teachers know their students, and be able to place them in groups depending on their needs in various outcomes.

Pre-assessing prerequisite skills *before* teaching the outcome is important.

1. Teachers can identify gaps that exist for most of the class, and reteach those skills before starting grade-level instruction. Using this method has been found to increase confidence in all students, help the teacher make more timely progress through curriculum, and allow students to engage more meaningfully in discussions and provide more insightful answers to questions.
2. Students may be grouped according to how much support and scaffolding they may need. The teacher can change the tasks that each group has. There may be:
 - Students on IEP's that have an individualized program
 - Students working below grade level, on more basic skills.

Effect Size student centred teaching: 1.07

- Students working at a scaffolded version of grade – level math, such as fewer questions, less complex tasks, more scaffolding, and EA support.
- Students working at grade level. These students still need our support, and to have their thinking and reasoning expanded.
- Students capable of work beyond grade level. These students need enrichment.
- Interventions may be done in class during small group instruction.

The goal is to provide students material that is appropriately **challenging but not overwhelming** (zone of proximal development).

Effect Size for Response to Intervention: 1.07

As much as possible, grade-level outcomes are the goal.

All students may listen to full group lesson, but then be grouped according to skill level or in stratified groups, and have small group tasks adjusted accordingly. Working in small groups allows teachers to respond to assessment data, work on gaps in understanding, provide alternative assignments or parallel tasks, observe students working on whiteboards and provide feedback, engage students in discussion and provide opportunities for them to construct meaning and express reasoning, and challenge all learners at appropriate levels. In stratified groups, there may be peer tutoring, behaviour leadership, or guidance through tasks by some students. Teachers may want to switch groups frequently to avoid labeling of students.

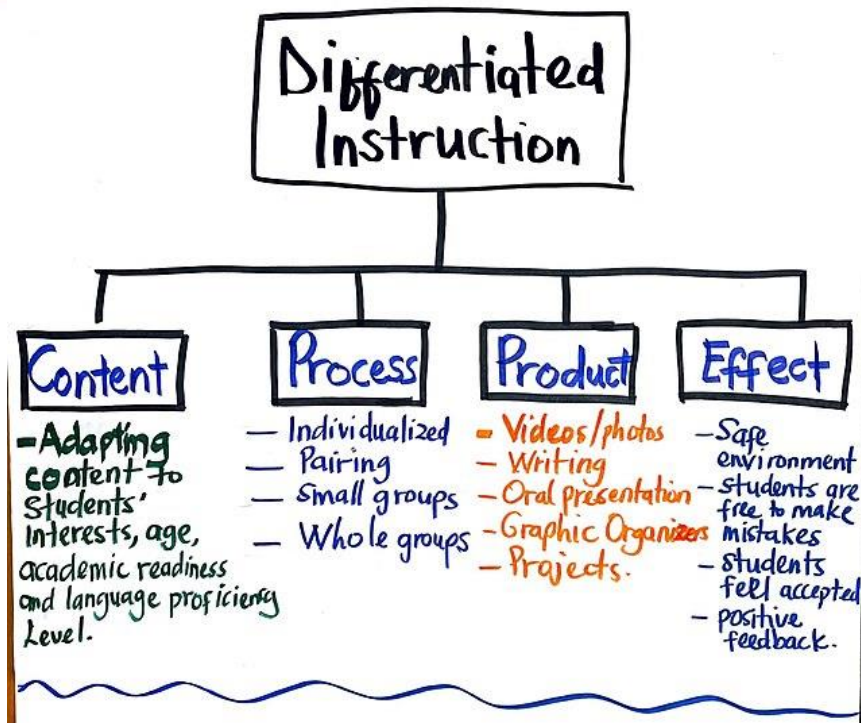
Differentiation: "The consistent use of a variety of instructional approaches to modify content, process, and/or products in response to the learning readiness and interest of academically diverse students"

-Tomlinson

There are many models of a differentiated classroom. Teachers do what fits their style and serves their students best.

<https://saskmath.ca/differentiation-in-instruction/>

https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/rti_math_pg_042109.pdf



https://en.wikipedia.org/wiki/Differentiated_instruction#/media/File:Four_areas_of_differentiation.jpg

Differentiating Content: Using adapted resources, working on simplified problems, less-complex tasks, reduced number of questions, using parallel tasks, using tasks with multiple entry points (low floor-high ceiling tasks), working on prerequisite skills or lower grade-level content, alternating some outcomes for more work on basics.

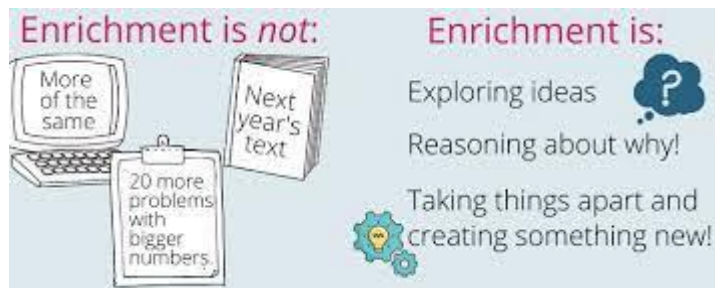
Differentiating Process: More time, EA support, alternative environment, more repetition, less independence, using adaptations such as calculator, charts and anchor sheets and reminder cards, scaffolded steps, chunking information, providing worked examples, more access to manipulatives and technology

Differentiating product: Adjusting assessment tasks, using parallel tasks, providing choice, allowing oral explanations and modeled demonstrations, reduced length of assessment, alternative assignments.

Enrichment

Enrichment is part of differentiation, but is sometimes overlooked because so much teacher energy goes to supporting struggling learners. Students that excel in math need to be challenged or we risk boredom and a lack of learning.

Enriching does not mean teaching “up” to higher grade content. It means increasing complexity, allowing extension and exploration of interesting math topics, providing more choice and exchanging some grade level work for something more interesting and challenging.



<https://themathviking.com/math-enrichment-in-the-elementary-classroom/>

<https://nrich.maths.org/>

<https://www.youcubed.org/tasks/>

<https://www.ashleigh-educationjourney.com/throwback-thursday-enrichment-ma/>

<https://mathforlove.com/lessons/rich-tasks/>

It takes time to collect appropriate resources for each grade level. Ideally, the task should be aligned with the outcome: For instance, if working on place value, consider having students explore other number systems like Egyptian numbers, base 60 system, or binary code. All of these extend an understanding of place value, but lie outside curriculum.

Consider letting students explore, within guidelines, something that interests them, and have them develop it for future students needing enrichment, or for their classmates. They could present to classmates, or create games to reinforce grade level concepts for classmates, or explore games and activities, and rate and prepare them for classmates. There are great collections of challenges that some kids enjoy -- Sudoku, logic puzzles, mensa puzzles, kenken, and web sites that have daily challenges and create online communities. Peer tutoring can be powerful, and being tasked with teaching others extends reasoning and understanding for peer tutors. Engaging in enriched activities should be *instead* of some of the practice, assuming the student doesn't need it—but not in *addition to*. Too often the reward for getting work done early in math is more work!