Tips to Implement the UDL Guidelines: Math Examples

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Tips for math teachers on how to use the UDL Guidelines to review their lessons.

Recruiting Interest	Perception	Physical Action
• Encourage students to self-differentiate their learning by providing options/choices for learning and sharing what they know about a mathematics concept. As an example, allow a student to draw a physical model instead of an equation to represent an application problem. • Design project-based learning experiences so students have authentic, meaningful connections to mathematics to learn and share what they know, such as the math tasks found at map.mathshell.org or GEMS • Provide challenge options that delve deeper into mathematical concepts and create connections across domains • Design physical or virtual "escape rooms" for students to encourage solving problems to meet a goal using mathematics (i.e. Breakoutedu.com)	• Design multimodal learning (i.e. visual and auditory) • Use technology to supplement content and to enhance instruction (i.e. IXL math) • Encourage students to use text-to-speech when accessing word problems • If possible, record mini-lessons and/or provide copies of notes so students can refer back to them • Use manipulatives, pictures, number lines, and graphs of functions and relationships to teach mathematical concepts	• Use online tools (i.e. Desmos) • Use physical or virtual manipulatives at the concrete level as learning a new concept (i.e. Math Learning Center apps) • Encourage the use of assistive technology (speech-to-text devices, calculators, etc).

Novak EDUCATION

Sustaining Effort & Persistence	Language & Symbols	Expression & Communication
• Always post lesson goals and target success criteria • Provide time for individual exploration before asking students to share their thinking with others (Think~Pair~Share) • Provide frequent opportunities for students to collaborate and engage in mathematical discourse • Allow for cooperative group work and group self-assessment using student-created rubrics • Encourage students to ask questions for further clarification once they have "entered a problem" • Provide daily constructive feedback to all learners	• Pre-teach vocabulary and symbols, especially in ways that promote connection to the learners' experience and prior knowledge (i.e, Frayer model) • Provide word banks and/or create word walls • Provide learners with language models and structures (such as sentence frames). • Provide access to translation tools for English language learners • Create examples and non-examples of vocabulary terms	• Design performance-based learning tasks and assessments • Allow students to create multimedia presentations of solutions, such as digital storytelling, blogs, podcasts • Have student create videos to explain their thinking about a task or a mathematical topic • Allow students to explore mathematical content through games and encourage accountability for what they have learned while playing the game • Incorporate the Standards for Mathematical Practice
Self Regulation	**Comprehension**	**Executive Functions**
• Use exam wrappers for students to reflect on their learning • Provide answer/solution keys to support student reflection and teach students how to use the solution keys to further their understanding • Ask questions to guide	• Use warm-up, application problems to activate background knowledge (i.e, What I know, and what I need to know) • Foster visualization to increase comprehension • Design explicit instruction that is highly sequenced and indicates to	• Ask students to estimate before solving problems • Use of assessment checklists, scoring rubrics, and multiple examples of annotated student work/performance examples • Design graphic organizers and flowcharts to support student

self-monitoring and reflection • Provide brain breaks • Help students to recognize stressors • Assist students to recognize their mistakes and how to learn from them	students why the learning is important • Follow the concrete to representational to abstract • Model think-alouds as you model and solve problems • Analyze student errors and address misconceptions • Chunk content during explicit instruction • Employ flexible grouping strategies for targeted instruction, when necessary.	progress for solving mathematical tasks • Use formative assessments frequently so students can reflect on their progress • Incorporate instructional routines to encourage relational thinking and justification (3 Act Tasks, WODB, etc.) • Understand the structure of operations