A Process for Addressing Accessibility in Mathematics

By Amy Brodesky, Lauren Katzman, Caroline Parker, and Elizabeth Murray

INTRODUCTION

> "Excellence in mathematics education requires equity--high expectations and strong support for all students."
>
> *Principles and Standards for School Mathematics (*NCTM, 2000, p.12)

This document describes a process that teachers can use to make mathematics more accessible to students with disabilities. The process is a collaborative one, involving the sharing of expertise, co-planning, and coordination by mathematics teachers, special education teachers, and other service providers. (See Figure 1 on page 2.) Teachers begin by considering the strengths and needs of their students (learner profile) and the mathematical goals and tasks in the lessons (lesson profile). They identify barriers to accessibility by evaluating the match or mismatch between the lesson and the learners. The next step involves math and special education teachers together coplanning accessibility strategies to address the barriers while maintaining high standards. In the classroom, the teachers implement the accessibility strategies and then evaluate student learning and revise strategies as needed.

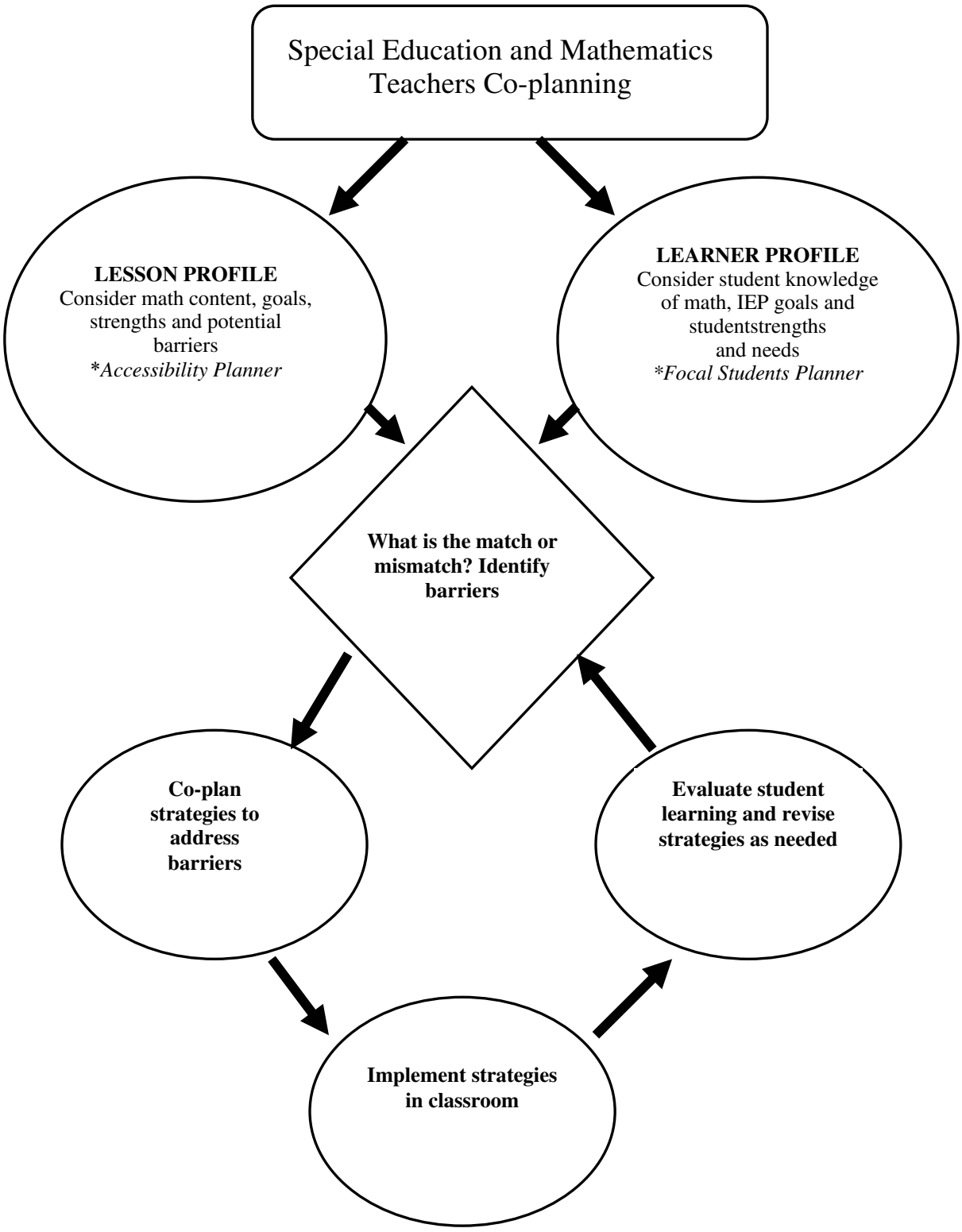
A. LEARNER PROFILE: CONSIDER THE STUDENTS

Identifying students' strengths and needs is an essential component of planning and implementing accessible lessons. Several educational approaches use learner profiles to tailor instruction to meet the needs of diverse learners, including *Universal Design for Learning* (CAST, 2001*), Multiple Intelligences (*Gardner, 1993), *Differentiated Learning* (Tomlinson, 1999), and *All Kinds of Minds/ Neurodevelopmental Processing* (Levine, 1994). Each approach provides a different lens for identifying students' areas of strength and need. For example, UDL focuses on learner differences in the recognition, strategic, and affective networks of the brain, while Gardner's work identifies eight types of intelligences: logical/mathematical, linguistic, spatial, musical, kinesthetic, natural, interpersonal, and intrapersonal.

The *Addressing Accessibility* project builds on these general educational approaches by identifying particular areas that are integral to learning mathematics. Students' strengths and needs in the following eight areas have a strong impact on their success with mathematics: conceptual processing, language, visual-spatial processing, organizing, attention, memory, psycho-social skills, and fine-motor skills. For example, a student with visual-spatial processing difficulties may struggle with interpreting and creating graphs, misalign numbers for computation, and misinterpret 2-D and 3-D geometric representations, while a student with strengths in this area may excel at visualizing solutions and drawing diagrams. The eight areas provide a lens for identifying students' strengths and needs and creating learner profiles that can be used to inform lesson planning and instruction. (See page 3.)

All students, including those with disabilities, fall along a continuum of learner differences in these eight areas. Students with the same disability label may vary greatly in their abilities to read, express ideas, think abstractly, organize, focus, attend, remember, or interact

Figure 1: ACCESSIBILITY PLANNING PROCESS



What are the roles of the eight learning areas in mathematics?

- **Conceptual Processing**: Standards-based mathematics emphasizes the need for students to build a deep understanding of mathematical concepts. Understanding concepts involves making connections between ideas, facts, and skills and the metacognitive process of reflecting upon and refining that understanding. In middle school, students begin to work with more abstract mathematical concepts, such as variables and linear functions. They use more symbolic representations than in the elementary grades.

- **Language:** Communication is one of the ten standards included *the Principles and Standards for School Mathematics*. Students need to describe strategies, explain their reasoning, justify solutions, and make persuasive arguments. In class discussions, they need to build on the thinking of their classmates and to ask questions to clarify ideas. Reading also plays a central role in the study of mathematics. Standards-based mathematics presents problems in real-world contexts. Students need to read information about these contexts, figure out which information is key, and ignore extraneous details.

- **Visual-Spatial Processing:** In standards-based mathematics, students build and deepen their understanding of concepts by creating, comparing, and using multiple representations. Students use visual-spatial processing to work with representations in each of the content strands. For example, in algebra, students extend visual patterns in order to determine a rule, analyze graphical representations of functions, and create mathematical models. In geometry, they visualize rotations of geometric figures, compare the attributes of polygons, and draw -D representations.

- **Organization:** Solving complex mathematics problems involves several organizational demands: figuring out how to get started, carrying out a sequence of steps, keeping track of information from prior steps, monitoring progress and adjusting strategies accordingly, and presenting solutions in an organized manner. Students must also organize their time to insure that they do not rush through tasks and make careless errors, or spend an excessive amount of time and not complete the task.

- **Memory:** Learning mathematics involves both long-term and short term memory. Students use their long-term memories to perform calculations, carry out procedures, and use mathematical vocabulary with fluency and accuracy. They use their short-term or working memory to keep track of several pieces of information for a brief time, such as keeping track of calculations when solving multi-step problems or performing mental calculations.

- **Attention:** In middle school, the increasing complexity of math content and types of tasks leads to increasing demands on students for extended attention spans. Students have to listen to directions and explanations, participate in class discussions, and work effectively by themselves. They need to complete multi-step investigations and long-term projects, pay attention to details, and complete tests and assessments, often within a limited time frame.

- **Psychosocial Skills**: Standards-based mathematics curricula place a strong emphasis on the communication of mathematical ideas through classroom discourse. Students work together in pairs or small groups to carry out mathematical investigations and then share their findings in a whole class discussion. They may give their peers constructive feedback to help them improve a problem solution or project report. All these types of tasks involve psychosocial skills.

- **Fine Motor Skills**: Fine motor skills consist of precise, coordinated movements of the fingers and hands. These skills are needed to carry out a variety of mathematical tasks including performing calculations, writing explanations, making tables and graphs, using manipulatives, drawing representations, cutting out shapes, and building scale models.

with peers. Considering students' strengths and needs is essential for planning accessible and effective mathematics instruction. The Addressing Accessibility approach focuses on both strengths and needs in order to move away from a deficit model that focuses only on student weaknesses. Teachers can plan strategies that build on students' strengths to help overcome their weaknesses.

Since middle school mathematics teachers typically teach about 100 students, it is unrealistic for them to create individual learner profiles for all their students. An alternative is to use a *Focal Student* approach in which three students are chosen as proxies for the range of diverse learners in a class. Teachers select a typical student, a student with an IEP that affects his/her performance in mathematics, and a high performing student. Math and special education teachers work together to identify the strengths and needs of these three students in the eight areas and then plan lessons accordingly. (See Appendices A & B: Example Focal Students Planner and Focal Students Planner.) By planning with these focal students in mind, teachers can better address the range of students in the class.

B. Lesson Profile: Consider the Mathematics

The process of examining math lessons begins with the central questions: 1) What are the important math goals in the lesson? 2) What barriers might get in the way of all students reaching those goals? Standards-based mathematics emphasizes building deep understanding of mathematical topics. A unit or lesson's mathematical goals may include concepts, skills, problem solving strategies, and processes, such as reasoning and communication. In order for teachers to plan accommodations for students with disabilities, they need to consider which aspects of the mathematics are most important for all students to know. Identifying the essential math goals can be more challenging that would be expected, especially for teachers with limited backgrounds in mathematics. Teachers may benefit from discussing the math goals with their colleagues during common planning time or on-going support meetings.

Teachers also need to consider the goals of the Individual Education Plans (IEP) of students with disabilities. However, students' IEP goals are often written in a way that focuses on specific skills, such as learning to add two digit numbers, and these goals do not align well with the standards-based approach (Thompson, Thurlow, & Whetstone, 2001 and McDoneel, McLaughlin, &Morison, 1997). Although IDEA '97 requires that IEPs be aligned with the general education curriculum, this has not yet become common practice. Many IEPs do not provide the information teachers need to set curriculum-based goals for students with disabilities. By communicating with each other, math and special education teachers can clarify goals and prioritize them so that they can plan lesson accommodations accordingly.

C. Identify Barriers

A lesson may include barriers to accessibility in terms of the math content and/or the types of tasks students need to carry out. As a first step, teachers must consider whether students are missing prerequisite knowledge and skills. If students with disabilities have recently moved from a separate special education math curriculum to the general education curriculum, there may be some gaps in their content knowledge. Other barriers may be caused by the match or mismatch of the content demands with students' strengths and needs in the eight areas described above. (See Appendix C for Guiding Questions.)

In standards-based mathematics curricula, students learn math content by carrying out investigations in which they need to perform a variety of tasks including collecting data, conducting experiments, creating graphs, and communicating ideas. In order to plan accessible lessons, teachers need to consider the types of tasks students need to carry out, whether these

tasks will cause barriers for some students, and whether the tasks are essential to the math goal. A student with fine motor difficulties may spend 30 minutes on making a table, leaving little time to focus on the content goal of understanding linear relationships. The time making the table would be well spent if making a table is a central goal of the lesson, but if it is not, then the student would benefit from using a table template that will allow him or her to focus on the primary lesson goal of understanding linear relationships. If the focus of the lesson is on making tables, then it would be important to provide tools to better enable the student to carry out the goal, such as finger-grip rulers or computer software programs.

D. CO-PLAN STRATEGIES TO ADDRESS BARRIERS

After identifying barriers in the lesson, math and special education teachers need to co-plan accessibility strategies that will address these barriers while maintaining the important mathematics and high standards. (See Appendix D, *Strategies to Consider* and Appendix E, *Accessibility Planner.)* There are many possible strategies for addressing barriers, and one idea often leads to the next. However, sometimes the strategies can go too far, changing the lesson so much that it becomes unrecognizable and loses the important mathematics or pedagogy. The accessibility strategies need to work in concert with the pedagogical approaches of standards-based mathematics, which include inquiry-based investigations, teaching for deep understanding, making connections, and classroom discourse. For example, teachers need to select strategies that will support students in carrying out an inquiry-based investigations without reducing it to a sequence of small step-by-step procedures.

As a starting point for planning strategies, teachers can consider general instructional practices, such as extending time for tasks, before deciding to alter the curriculum. If additional support is needed, teachers can plan adaptations to the curriculum, such as rewording directions to increase clarity and adjusting the level of difficulty. If teachers identify a need for major curricular adaptations, this may indicate that students are missing prerequisite knowledge or skills and would benefit from a short-term intervention, such as tutoring or additional math time in the Learning Center. The goal of the intervention is to build missing math content, enabling the students to continue with the general mathematics curriculum.

Accessibility strategies must be matched to students' strengths and needs in order to be effective. The chart on the next page shows some examples of common student challenges for each of the eight areas and possible accessibility strategies. Teachers need to decide how much accommodation is needed and which strategy is most likely to be effective, given students' strengths and needs and classroom resources and constraints. The following are some questions to help teachers plan effective accessibility strategies:

Guiding Questions to Plan Effective Accessibility Strategies:

- *What kind of strategies are needed? Instructional strategy, curricular adaptation, modification, or short-term intervention?*
- *Does the strategy retain the important math goals and help the student understand them?*
- *Is the strategy a good match to students' strengths and needs? Does the strategy build on students' strengths? Does it provide scaffolding and supports for areas of need?*
- *Does the strategy set appropriate expectations for student performance?*
- *Is the strategy built on the shared expertise of the math and special education teachers?*
- *Is the strategy reasonable to prepare and implement, given the teachers' resources and times?*
- *Is the strategy part of a long range plan for addressing student needs? (For example, will the amount of scaffolding be reduced over time in order to build particular skills?)*

Specific Task	Common Student Challenges	Possible Accessibility Strategies
Conceptual-Processing Learn, represent new concepts	• Focuses on the small parts and does not see the big picture • Does not identify key points	• Use multiple representations • Provide resource sheets with summary information on complex concepts • Use concept map software
Language: Read directions	• Has difficulty decoding words • Reads slowly	• Read aloud • Use a tape recorder • Digitize materials and use Text to Speech software, such as CAST eReader.
Visual-Spatial Processing: Interpret visual representations	• Does not connect graphics to the concepts they represent	• Provide a handout of representations for students to draw on, highlight, measure, and/or cut out • Offer manipulatives
Organization: Find information in prior work	• Does not organize class notes well and thus has trouble finding needed information	• Use a notebook organization system and reinforce it with notebook checks
Memory: Perform mental calculations	• Cannot keep steps of calculation in working memory	• Allow student to use pencil and paper • Have students talk about operations instead of doing the calculations • Allow the use of calculators
Attention: Complete long-term projects	• Loses track of what needs to be completed	• Provide a project organizer • Schedule frequent check-in points
Psycho-Social: Work in pairs or small groups	• Distracts the group • Causes tensions because of weak social skills	• Set clear expectations for student collaboration and individual accountability in small groups
Fine Motor: Create a graph, table, chart, etc.	• Can not draw and position straight lines correctly • Unable to write numbers small enough for graph paper grids	• Provide templates for forms • Use larger grids • Provide finger grip or nonskid rulers • Provide software graphing programs

E. IMPLEMENT STRATEGIES

Strategy implementation will differ depending on the roles of the math and special education teachers and the school structures. If math and special education teachers are co-teaching in an inclusion classroom, they might each be involved in implementing the strategies. For example, the math teacher might incorporate the strategies by presenting information in multiple ways and by providing scaffolding to help students build their understanding of a conceptually difficult topic. The special education teacher might move around the room to clarify directions, suggest organizational strategies, and help students work through a frustration point. In an inclusion classroom, the students can draw on the expertise of each teacher, benefiting from the math content knowledge of the math teacher and the learning strategies of the special education teacher.

However, in many math classrooms, the math teacher is alone or has the assistance of a paraprofessional who may have limited or no training in the curriculum. This can feel both isolating and overwhelming and it is important that the math teacher gets support by having planning time with the special education teacher and paraprofessional. By focusing on the mathematical goals and potential barriers, the teachers can plan adaptations, discuss strategies that the math teacher can implement, and suggest ways that paraprofessional can support

students. Although the special education teacher is not in the classroom, she or he can prepare adaptations of tasks or assessments for the mathematics teacher to use. The mathematics teacher can incorporate general accessibility strategies, such as providing both visual and verbal directions, into his/her teaching practices for the whole class. He or she can use multiple versions of tasks or assessments and use flexible grouping of students as ways to meet the range of learning needs. The paraprofessional can work one-on-one with students who need additional support.

Some accessibility strategies are designed for use outside of the math class, with students getting additional math time and support in the Resource Room or Learning Center. During that time, the special education teacher might preview mathematical vocabulary and concepts for upcoming lessons or focus on areas of difficulty for students. Many teachers find that giving students more time to learn the mathematics is particularly effective. Previewing the lessons in the Learning Center or Resource Room enables students with disabilities to feel more confident and less frustrated in mathematics class.

A key question for implementing accessibility strategies is whether to use them with one student, some students, or the whole class. The answer to this question will vary depending on the types of barriers in the lessons and the needs of the student population. Some students with significant disabilities may require accommodations that are not appropriate for use with the whole class. For example, one student with a visual impairment was given a specially designed abacus that had yellow beads on a black background for high contrast. Some accommodations may be beneficial for students who are struggling, regardless of whether they have disabilities. Other adaptations may benefit the whole class by helping to clarify directions or to focus attention on the important mathematics.

Some teachers are hesitant to implement multiple versions of a task in their classroom. They are concerned that students will think the practice is unfair or that some will be embarrassed because their work looks different from their peers. Teachers can address these issues by creating a classroom culture in which there is respect for learner differences. In this culture, students come to understand that 'fair" does not mean that every student gets the same task, but instead that each student gets work that is challenging for him or her. Everyone in the class is expected to work hard and to achieve high expectations and standards. This goal is highlighted by the *Teaching Principle* which states that "effective teaching requires a challenging and supportive classroom learning environment." (NCTM, 2000, p.12).

F. EVALUATE AND REVISE STRATEGIES

After teachers implement an accessibility strategy, it is important to evaluate the strategy's effectiveness and to revise it as needed. Collaborative planning groups provide an opportunity for teachers to bring in examples of student work to look to for evidence of students understanding the important mathematics. Participants discuss whether the accessibility strategy was effective, whether they would use it again, and what they would do in the future.

In one district, math and special education teachers planned strategies in one collaborative group meeting and then reflected on their experiences using the strategies at the next meeting. In many cases, teachers were pleased to find that their accessibility strategies had improved the understanding and performance of all the students in the class, not just those with disabilities. At one meeting, a mathematics teacher reflected on her experiences using adaptations for a data analysis project. For this long-term project, students were asked to write a survey question, collect data from two populations, graph the data, make comparisons, and write their conclusions in a report. Given the focal strengths and needs of the class, the math teacher and special education teacher identified potential barriers in the areas of organization, attention, and language. They developed several adaptations including a Project Organizer which divided

the project into smaller parts with due dates and a Writing Template on which they rewrote the comparison questions as statements for students to complete. The teachers were extremely pleased to find that the quality of the projects was much higher than it had been in the previous three years when they did not use these strategies. They felt that the strategies were beneficial to *all* the students in the class, enabling them to be organized, attend to details, and to express their ideas in writing.

In some cases, the process of evaluating an accessibility strategy brings out the need to revise expectations for students. In one collaborative planning group, math and special education teachers made several adaptations to a quiz because they were concerned that the level of difficulty was too high for their students with disabilities. At the next planning group meeting, they reflected on student performance on the adapted quiz. They were surprised to find that students performed better than they had thought they would. The teachers realized that they had set expectations too low and decided that they would not use as many adaptations in the future.

In other cases, teachers may find that additional strategies or alternative approaches are needed. The evaluation process may bring to the forefront barriers to accessibility that the teachers did not identify during the planning process. Sometimes, teachers find that the adaptation itself causes confusion. In one planning group, teachers discussed the effectiveness of a table template that they had added to an assessment problem as an organizing tool. While the table helped some students, it had confused others and caused them to lose focus on the problem. The teachers realized that in their class work, they had not been working directly with tables as information organizers and so when the students saw the table, rather than provide a needed scaffold, it caused confusion. These examples highlight the importance of the evaluation process for helping teachers develop effective accessibility strategies.

Guiding Questions for Evaluating the Effectiveness of Accessibility Strategies:

- *Did the student exhibit understanding of the important mathematics? (Evidence could include class participation, analysis of student work, observations, and interviews)*
- *Was the student able to carry out the task?*
- *How much frustration and confusion did the student experience?*
- *Did the accessibility strategy help to prepare the student for the mathematics content in the next lesson? (Does the strategy help to support the progression of math content goals in the unit?)*
- *Is there a need to revise the strategy and/or goals for students? If so, how would you revise the strategy and/or goals/expectations for students?*

CONCLUSIONS

In order to provide effective mathematics education for students with disabilities, accessibility strategies need to be incorporated into classroom teaching. By viewing lessons through an accessibility lens, math teachers and special educators can identify potential barriers and plan accommodations that fit their students' strengths and needs. By using the process described in this document, teachers can design and implement strategies that will enable students to reach the important mathematical goals while maintaining the integrity of the content and the pedagogy.

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Appendices

Appendix A: Example Focal Students Planner

Appendix B: Focal Students Planner

Appendix C: Planning and Implementing Accessibility Strategies

Appendix D: Strategies to Consider

Appendix E: Accessibility Planner

Example Focal Students Planner

Planning lessons with a few focal students in mind is a useful model for addressing the diverse learning needs of students. It is helpful to focus on three types of students; a typical learner, a student with a disability that affects their achievement in math (who has an IEP) and a high performing student. This example planner below is for three 7th grade students.

Student	Strengths	Needs
Typical Student		
Conceptual	-Able to move from the concrete to abstract	
Language	-Reads at grade level; active participant in class discussions	-Difficulty explaining mathematical ideas in writing
Visual-Spatial	-Excels in work with manipulatives	-Struggles with geometric representations
Organization	-Very organized in preparing classwork and homework	-Disorganized with time and projects
Memory	-Good memory when concept is understood	
Attention	-Attention good when working with a focused partner	-Limited attention span when working alone
Psycho-social	-Works well in small groups	
Fine-Motor	-Excellent fine motor skills	
Student with IEP		
Conceptual	--Builds understanding when working with concrete tasks.	-Difficulty making generalizations and solving abstract problems.
Language	-Good comprehension of oral information	-Decodes/writes at a 2nd grade level
Visual-Spatial	-Works well with manipulatives	-Copying takes a great deal of time and is often incorrect
Organization		-Notebook and classwork are disorganized
Memory	-Good memory for concepts	-Difficulty remembering facts
Attention	-Attention good when using manipulatives	-Gets distracted during class discussions
Psycho-social	-Works well in small groups	
Fine-Motor		-Handwriting very difficult to read

Example Focal Students Planner, con't.

Student	Strengths	Needs
High Performing Student *L.K.*		
Conceptual	-Proficient at making generalizations and solving abstract problems	-Difficulty connecting mathematical concepts with real-world situations
Language	-Excellent reading comprehension; strong verbal skills; proficient with math vocab.	-Impatient with explaining ideas in writing
Visual-Spatial	-Good at creating and interpreting graphs	-Difficulty creating and interpreting 2-D representations of 3-D objects
Organization	-Has strong strategies for organizing multi-step problems, uses time efficiently	-Notebook is disorganized
Memory	-Excellent memory for concepts and facts	
Attention	-Can work for long periods of time	
Psycho-social	-Works well in groups, likes to help peers	
Fine-Motor	-Writing and drawing skills are good	

Focal Students Planner

Planning lessons with a few focal students in mind is a useful model for addressing the diverse learning needs of students. It is helpful to focus on three types of students; a typical learner, a student with a disability that affects their achievement in math (who has an IEP) and a high performing student.[1] When you fill in this table, consider students' strengths and needs in the following areas: Math Content, Conceptual Processing, Language, Visual/Spatial, Organization, Memory, Attention, Psycho-Social, and Fine-Motor.

Student	Strengths	Needs
1. Typical Student	-	-
2. Student with an IEP	-	-
3. High Performing Student	-	-

Planning and Implementing Accessibility Strategies

Goals

- Making the mathematics more accessible to diverse learners
- Increasing the chances of learner success
- Building on students' strengths

Cautions

- Changing the task so much that you lose:
  * The important mathematics
  * The integrity of the content and/or pedagogical approach
- Setting expectations too low for students

Guiding Questions for Identifying Potential Barriers

- What are the important mathematical goals?
- What barriers might get in the way of students reaching these goals?
- What prerequisites do students need? What prerequisites are students missing?
- What are the areas of difficulty and common misconceptions for this content?
- What kinds of lesson demands are there in the areas of conceptual processing, language, visual-spatial processing, organization, memory, attention, psycho-social skills, and fine motor skills?
- What is the match or mismatch of the lesson demands with students' strengths and needs?
- What specific tasks may cause barriers for students? Are these tasks essential to the math goals?

Guiding Questions for Planning and Implementing Accessibility Strategies

- What kind of strategy is needed? Adaptation, modification, or short-term intervention?2
- Does the adaptation retain the important math goals and help the students understand them?
- Does the strategy build on students' strengths? Does it provide scaffolding for areas of need?
- Does the strategy set appropriate expectations for student performance?
- Does the strategy build on the shared expertise of the math and special education teachers?
- What is each teacher's role in preparing and implementing the strategy?
- Is the strategy reasonable and realistic for teachers to prepare and implement?
- How will the strategy be used in the classroom? Is it designed for an individual student, for several students, or for the whole class?

Guiding Questions for Evaluating Accessibility Strategies

- Did the students exhibit understanding of the important mathematics? (Evidence could include class participation, analysis of student work, observations, and interviews)
- How much frustration and confusion did the students experience?
- Did the accessibility strategy help to prepare the students for subsequent lessons?
- Is there a need to revise the strategy and/or goals/expectations for students? If so, how would you revise the strategy and/or goals/expectations for students?

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[2] The terms accommodation, adaptation, and modification are often used interchangeably which can be confusing. The goal of the accommodations and adaptations is to provide the scaffolding and support students need to reach the original math goals of the lesson. In contrast, modifications involve altering the mathematical goals. Interventions are designed to help students build missing prerequisite knowledge and skills.

Strategies to Consider

General Adaptation Strategies

- Adjust the amount of time
- Adjust the amount of work
- Adjust pacing to optimize attention
- Provide both visual and auditory directions
- Provide frequent feedback
- Use frequent assessments
- Use multiple representations
- Offer manipulatives
- Set up an organizational system for notebooks/binders
- Teach organizational strategies
- Reduce the amount of copying for students
- Reduce classroom distractions: auditory and visual
- Use flexible grouping
- Set clear guidelines for group work
- Build on the same writing processes as Language Arts
- Use graphic organizers, e.g. concept maps
- Create wall charts for vocabulary and key information
- Offer tools such as highlighters and post-its to help students focus
- Offer technology supports such as tape recorders, overhead projectors, portable keyboards, calculators, and software programs

Curiculum Adaptation Strategies

- Identify important mathematical goals and set priorities
- Clarify directions
- Reformat handouts to reduce distracting elements and increase white space
- Adjust the level of difficulty:
  *Use friendlier numbers
  *Use simpler language
  *Reduce the complexity of the tasks
- Use additional representations or examples
- Use an alternative approach
- Provide additional problems
- Provide Graphic Organizers to help students organize ideas
- Provide Project Organizers to help students keep track of tasks
- Provide Templates for tables, graphs, writing, and other tasks
- Provide Resource Sheets with key information on concepts to reduce copying and note- taking

Short Term Intervention Strategies

- Use assessments to identify missing mathematical knowledge and skills
- Set short term goals
- Co-teach by using an alternative teaching model in which a small group of students is taught separately from the larger group to accomplish a specific instructional goal
- Use a pull-out or partial pull-out model
- Use a MathLab model in which students have an additional period of math to preview lessons and to get extended time on classwork and homework
- Provide additional support in Resource Room or Learning Center

Accessibility Planner

What are the important mathematical <u>goals</u> in the lesson?

What are the potential <u>barriers</u> to accessibility? *Consider: •Math Content •Page Layout •Contexts •Sequence/Jumps •Amount of Material •Level of Difficulty •Types of Task Demands: Conceptual Processing, Language, Visual/Spatial Processing, Organization, Memory, Attention, Psycho-Social, and Fine-Motor.*	**What <u>strategies</u> might you use?** Consider your students' strengths and needs in the eight areas. Brainstorm strategies to promote accessibility.

How will you <u>implement</u> the strategies with your students? **How will you <u>evaluate</u> their effectiveness?**