

algebra for special education students

Algebra for Special Education Students: Bridging the Gap to Mathematical Understanding

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Editor: Dr. Michael Garcia, a specialist in mathematics education and co-author of several textbooks on adapting math curricula for students with learning disabilities, oversaw the editing of this report. His expertise ensured the accuracy and relevance of the information presented regarding algebra for special education students.

Keywords: algebra for special education students, special education mathematics, adapted algebra curriculum, inclusive math instruction, learning disabilities and algebra, differentiated instruction in algebra, algebra accommodations, assistive technology for algebra, teaching algebra to diverse learners, algebra for students with autism.

1. Introduction: The Challenges of Algebra for Students with Special Needs

Algebra often presents significant challenges for students with learning disabilities, ADHD, and autism spectrum disorder. These challenges can stem from difficulties with working memory, processing speed, executive functions, and abstract reasoning – all crucial skills for success in algebra. Effective instruction in algebra for special education students requires a nuanced understanding of these learning differences and the implementation of tailored strategies. This report explores the specific challenges faced by these students, examines evidence-based teaching approaches, and offers practical recommendations for educators.

2. Identifying Specific Learning Needs in Algebra

Before implementing any intervention, accurately identifying the specific learning needs of each student is paramount. A comprehensive assessment should include:

Cognitive Assessment: Evaluating working memory capacity, processing speed, and executive functions.

Academic Assessment: Analyzing the student's understanding of foundational math concepts prerequisite to algebra (e.g., fractions, decimals, integers).

Adaptive Behavior Assessment: Assessing the student's organizational skills, self-regulation strategies, and ability to follow multi-step instructions.

Data collected from these assessments informs the creation of Individualized Education Programs (IEPs) or 504 plans that outline specific accommodations and modifications necessary for success in algebra for special education students.

3. Evidence-Based Strategies for Teaching Algebra to Students with Special Needs

Research consistently highlights the efficacy of several teaching approaches for algebra for special education students:

Explicit Instruction: This approach involves clear, step-by-step explanations, frequent modeling, and ample opportunities for guided practice. Breaking down complex concepts into smaller, manageable parts is critical.

Differentiated Instruction: Tailoring instruction to meet the diverse needs of individual students, adjusting the level of support, pacing, and task complexity. This might involve providing visual aids, graphic organizers, or manipulatives.

Universal Design for Learning (UDL): Creating flexible learning environments that provide multiple means of representation, action and expression, and engagement. This could involve offering choices in assignments, using various technologies, and incorporating collaborative learning activities.

Assistive Technology: Utilizing tools such as graphic calculators, speech-to-text software, and equation editors can significantly improve access to algebra for students with specific learning challenges. For example, a student with dysgraphia might benefit from using an equation editor to avoid the frustration of handwriting complex algebraic expressions.

Collaborative Learning: Working in small groups or pairs can provide opportunities for peer support and learning through explanation and discussion.

4. The Role of Technology in Algebra for Special Education Students

Technology offers powerful tools for supporting algebra for special education students. Interactive whiteboards can engage students visually, while software programs can provide individualized practice and feedback. Furthermore, learning management systems (LMS) can help organize assignments and provide timely support. The effective use of technology needs careful consideration of the student's specific needs and preferences.

5. Addressing Anxiety and Motivation in Algebra

Many students with special needs experience significant anxiety related to mathematics. This anxiety can hinder learning and performance. Creating a supportive classroom environment, emphasizing effort over innate ability, and providing positive reinforcement are essential for

building confidence and fostering a positive attitude towards algebra for special education students.

6. The Importance of Data-Driven Instruction

Regular monitoring of student progress through formative assessments is crucial for adjusting instruction and providing timely interventions. Data analysis helps educators identify areas where students struggle and tailor their teaching accordingly. This cyclical process of assessment, analysis, and adjustment ensures that algebra for special education students is accessible and effective.

7. Collaboration and Professional Development

Effective instruction in algebra for special education students requires strong collaboration between general education teachers, special education teachers, and other support staff. Ongoing professional development for teachers is essential to stay abreast of best practices and evidence-based strategies.

8. Case Studies: Success Stories in Algebra for Special Education Students

(This section would include 2-3 detailed case studies showcasing successful implementation of the strategies mentioned above, with anonymized student data to protect privacy.)

9. Conclusion

Teaching algebra to special education students requires a multifaceted approach that considers individual learning needs, utilizes evidence-based strategies, and leverages technology effectively. By implementing the recommendations outlined in this report, educators can create inclusive learning environments that empower all students to achieve success in algebra. The key lies in individualized instruction, consistent assessment, and a collaborative effort to bridge the gap to mathematical understanding for these students. The payoff is significant: improved academic outcomes, increased confidence, and a more equitable educational experience for all.

FAQs:

1. What are the most common challenges faced by students with learning disabilities in algebra? Students with learning disabilities often struggle with abstract reasoning, working memory, and processing speed, all essential for mastering algebraic concepts.
2. How can I differentiate instruction in algebra for a diverse classroom? Differentiate by adjusting the complexity of problems, providing visual aids, using manipulatives, and offering varied assessment methods.
3. What assistive technologies are helpful for students with special needs in algebra? Graphic calculators, speech-to-text software, and equation editors can significantly assist students.

4. How can I address math anxiety in my students? Create a supportive learning environment, focus on effort rather than grades, and provide positive reinforcement.
5. What are some effective strategies for teaching algebraic concepts explicitly? Break down complex concepts into smaller steps, model problem-solving strategies, and provide ample opportunities for guided practice.
6. How can I incorporate Universal Design for Learning (UDL) principles in my algebra class? Provide multiple means of representation, action and expression, and engagement. Offer choice in assignments and use varied assessment methods.
7. What role does collaboration play in supporting students with special needs in algebra? Collaboration between general and special education teachers, parents, and support staff is crucial for individualized instruction and support.
8. How can I effectively use data to inform my instruction in algebra? Regularly monitor student progress through formative assessments and adjust instruction based on data analysis.
9. Where can I find more resources and professional development opportunities on teaching algebra to students with special needs? The National Council of Teachers of Mathematics (NCTM), the NCLD, and various universities offer resources and professional development programs.

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1. "Adapting Algebra Curriculum for Students with Learning Disabilities": This article explores specific modifications to standard algebra curricula to better suit the needs of students with learning disabilities.
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4. "Effective Strategies for Teaching Abstract Algebraic Concepts to Students with Autism": This paper focuses on teaching abstract concepts to students with autism using concrete examples and visual supports.
5. "Building Confidence and Reducing Math Anxiety in Special Education Students": This article details strategies to foster positive attitudes toward mathematics.
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7. "Formative Assessment Strategies for Monitoring Student Progress in Algebra": This focuses on effective assessment methods for tracking student understanding and adjusting instruction.
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9. "The Impact of Explicit Instruction on Algebra Achievement for Students with Learning Disabilities": This research study investigates the effectiveness of explicit instruction on algebra performance.

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book--filled with invaluable ideas and strategies adaptable for grades K-12--educators will know just what to teach and how to teach it to students with learning difficulties.

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authors Jo Boaler, Jen Munson, and Cathy Williams heard the same message—that they want to incorporate more brain science into their math instruction, but they need guidance in the techniques that work best to get across the concepts they needed to teach. So the authors designed Mindset Mathematics around the principle of active student engagement, with tasks that reflect the latest brain science on learning. Open, creative, and visual math tasks have been shown to improve student test scores, and more importantly change their relationship with mathematics and start believing in their own potential. The tasks in Mindset Mathematics reflect the lessons from brain science that: There is no such thing as a math person - anyone can learn mathematics to high levels. Mistakes, struggle and challenge are the most important times for brain growth. Speed is unimportant in mathematics. Mathematics is a visual and beautiful subject, and our brains want to think visually about mathematics. With engaging questions, open-ended tasks, and four-color visuals that will help kids get excited about mathematics, Mindset Mathematics is organized around nine big ideas which emphasize the connections within the Common Core State Standards (CCSS) and can be used with any current curriculum.

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The achievement of students of color continues to be disproportionately low at all levels of education. More than ever, Geneva Gay's foundational book on culturally responsive teaching is essential reading in addressing the needs of today's diverse student population. Combining insights from multicultural education theory and research with real-life classroom stories, Gay demonstrates that all students will perform better on multiple measures of achievement when teaching is filtered through their own cultural experiences. This bestselling text has been extensively revised to include expanded coverage of student ethnic groups: African and Latino Americans as well as Asian and Native Americans as well as new material on culturally diverse communication, addressing common myths about language diversity and the effects of English Plus instruction.

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Had Tracy Johnston Zager, 2023-10-10 Ask mathematicians to describe mathematics and they'll use words like playful, beautiful, and creative. Pose the same question to students and many will use words like boring, useless, and even humiliating. Becoming the Math Teacher You Wish You'd Had, author Tracy Zager helps teachers close this gap by making math class more like mathematics. Zager has spent years working with highly skilled math teachers in a diverse range of settings and grades and has compiled those ideas from these vibrant classrooms into this game-changing book. Inside you'll find: 'How to Teach Student-Centered Mathematics:' Zager outlines a problem-solving approach to mathematics for elementary and middle school educators looking for new ways to inspire student learning Big Ideas, Practical Application:' This math book contains dozens of practical and accessible teaching techniques that focus on fundamental math concepts, including strategies that simulate connection of big ideas; rich tasks that encourage students to wonder, generalize, hypothesize, and persevere; and routines to teach students how to collaborate Key Topics for Elementary and Middle School Teachers:' Becoming the Math Teacher You Wish You'd Had' offers fresh perspectives on common challenges, from formative assessment to classroom management for elementary and middle school teachers No matter what level of math class you

teach, Zager will coach you along chapter by chapter. All teachers can move towards increasingly authentic and delightful mathematics teaching and learning. This important book helps develop instructional techniques that will make the math classes we teach so much better than the math classes we took.

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algebra for special education students: *Big Ideas Math* Ron Larson, Laurie Boswell, 2019

algebra for special education students: *Algebra Workouts: Radicals* Tony G. Williams, 2009-09-01 Add the vital warm-up process to your algebra lessons with these workouts designed to capture students' interest and reinforce their skills. A broad range of concepts is covered from linear equations to factoring to pure fun. Each workout is easily reproducible and includes an answer key or mini-lesson demonstrating how to solve each problem. Essential teaching tips for the algebra classroom are also included.

algebra for special education students: *Algebra Workouts: Polynomials* Tony G. Williams, 2009-09-01 Add the vital warm-up process to your algebra lessons with these workouts designed to capture students' interest and reinforce their skills. A broad range of concepts is covered from linear equations to factoring to pure fun. Each workout is easily reproducible and includes an answer key or mini-lesson demonstrating how to solve each problem. Essential teaching tips for the algebra classroom are also included.

algebra for special education students: *Leveled Texts for Mathematics: Algebra and Algebraic Thinking* Lori Barker, 2011-06-01 With a focus on algebra, a guide to using leveled texts to differentiate instruction in mathematics offers fifteen different topics with high-interest text written at four different reading levels, accompanied by matching visuals and practice problems.

algebra for special education students: *Algebra Workouts: Foundation* Tony G. Williams, 2009-09-01 Add the vital warm-up process to your algebra lessons with these workouts designed to capture students' interest and reinforce their skills. A broad range of concepts is covered from linear equations to factoring to pure fun. Each workout is easily reproducible and includes an answer key or mini-lesson demonstrating how to solve each problem. Essential teaching tips for the algebra classroom are also included.

algebra for special education students: *The Three Questions* graf Leo Tolstoy, 1983 A king visits a hermit to gain answers to three important questions.

algebra for special education students: *Algebra Workouts: System of Equations* Tony G. Williams, 2009-09-01 Add the vital warm-up process to your algebra lessons with these workouts designed to capture students' interest and reinforce their skills. A broad range of concepts is covered from linear equations to factoring to pure fun. Each workout is easily reproducible and includes an answer key or mini-lesson demonstrating how to solve each problem. Essential teaching tips for the algebra classroom are also included.

Additional Resources

Algebra - Wikipedia

Elementary algebra, also called school algebra, college algebra, and classical algebra, [22] is the oldest and most basic form of algebra. It is a generalization of arithmetic that relies on ...

Introduction to Algebra - Math is Fun

Algebra is just like a puzzle where we start with something like " $x - 2 = 4$ " and we want to end up

with something like " $x = 6$ ". But instead of saying "obviously $x=6$ ", use this neat step-by-step ...

Algebra I - Khan Academy

The Algebra 1 course, often taught in the 9th grade, covers Linear equations, inequalities, functions, and graphs; Systems of equations and inequalities; Extension of the concept of a ...

Algebra | History, Definition, & Facts | Britannica

May 9, 2025 · Algebra is the branch of mathematics in which abstract symbols, rather than numbers, are manipulated or operated with arithmetic. For example, $x + y = z$ or $b - 2 = 5$ are ...

Algebra - What is Algebra? | Basic Algebra | Definition - Cuemath

Algebra is the branch of mathematics that represents problems in the form of mathematical expressions. It involves variables like x , y , z , and mathematical operations like addition, ...

How to Understand Algebra (with Pictures) - wikiHow

Mar 18, 2025 · Algebra is a system of manipulating numbers and operations to try to solve problems. When you learn algebra, you will learn the rules to follow for solving problems. But ...

What is Algebra? - BYJU'S

Algebra is one of the oldest branches in the history of mathematics that deals with number theory, geometry, and analysis. The definition of algebra sometimes states that the study of the ...

Algebra in Math - Definition, Branches, Basics and Examples

Apr 7, 2025 · This section covers key algebra concepts, including expressions, equations, operations, and methods for solving linear and quadratic equations, along with polynomials ...

Algebra - Simple English Wikipedia, the free encyclopedia

People who do algebra use the rules of numbers and mathematical operations used on numbers. The simplest are adding, subtracting, multiplying, and dividing. More advanced operations ...

OpenAlgebra.com: Free Algebra Study Guide & Video Tutorials

Free algebra tutorial and help. Notes, videos, steps. Solve and simplify linear, quadratic, polynomial, and rational expressions and equations.

A SPECIAL EDUCATION GUIDELINE FOR GRADUATION ...

The age of graduation for special education students. 3. The type of diploma a special education student receives. 4. The due process requirements for notifying parents of graduation or aging ...

PROJECT AAIMS: ALGEBRA ASSESSMENT AND INSTRUCTION ...

enrollment of approximately 600 students; about 12 percent of these students receive special education services. Approximately 13 percent of the district's students are eligible for free and ...

Texas Assessment Program Frequently Asked Questions

The Texas Education Agency (TEA), in collaboration with the Texas Higher Education Coordinating Board (THECB) and Texas educators, developed the STAAR program in ...

STATE ALGEBRA EXAMINATION AND SPECIAL EDUCATION: ...

state algebra examination for all high school students including students in special education programs. The study explored implementing an option that extends the traditional one year ...

IEP Goals and Objectives Bank (Redmond, Oregon)

Vocational/Career Education To search the contents of the Goal Bank for a specific item, press Ctrl + F. The Goal Bank has been designed to allow users to locate specific goals as used in ...

Chapter 1 Historical Overview of Assessment in Texas

RP53, the state reestablished development of the Algebra I EOC assessment, and began developing EOCassessments in Geometry, Biology, Chemistry, Physics, and U.S. History. ...

Evidence-Based Systematic Review of Literature on Algebra ...

Journal of Special Education, Remedial and Special Education. Finally, the authors conducted ancestral searches of accepted articles as well as reviewed the included articles of systematic ...

Transition Planning for High School Students in - Westside ...

Transition Planning for High School Students 2 in Special Education High school is the last step students must take before they transition to adulthood. It an important time in the lives of ...

Remedial and Special Education - ResearchGate

Remedial and Special Education 2008 29: 352 originally published online 10 June 2008 Larry J. Kortering, Terry W. McClannon and Patricia M. Braziel ... A Look at What Algebra and Biology ...

List of Published Math Intervention Programs and ...

Transition to Algebra (EDC): program that focuses on Algebra 1 content to support struggling math learners. Instead of reteaching the same algebra curriculum in the same way to ...

Provide Scaffolded Supports - Exceptional Children

Students must be explicitly taught (HLP 16) on how to use various scaffolds and receive feedback on the extent to which they are ... the book High-Leverage Practices in Special Education: The ...

Supporting a Student With a Learning Disability Working on ...

students with LD as they engage with algebra (Hord, Ladrigan, & Saldanha, 2020). Working Memory and Students with LD. In the United States, students with LD are a relatively ...

Mathematics Learning for Students with Special Needs

most common obstacle in special mathematics education covers the school culture, curriculum, and administrative aspects (Aljundi & Altakhayneh, 2020; Preston et al., 2018). Students' ...

theRepository at St. Cloud State - St. Cloud State University

Culminating Projects in Special Education Department of Special Education 8-2020 Secondary Math Placement Decisions for Students in Special Education Erin Burnette ...

Students with IEPs Graduation Decision-Making Tool - Ohio ...

cohort. All students in Ohio can follow a typical pathway to graduation. However, a student with an Individualized Education Program (IEP) in Ohio also may also graduate via additional options ...

Teach students to intentionally choose from alternative ...

master one strategy for solving algebra problems? 2. My special education students need a very structured process for solving algebra problems. Introducing multiple strategies and asking ...

SPECIAL EDUCATION LEARNING ENVIRONMENTS ...

Special Education students and teachers as debate regarding the best model of instruction rages on. A Special Needs student's instructional environment is delineated in the child's ...

Recommendations for Progress Monitoring in ...

performance to inform the instruction of individual students in general and special education in grades K-8." According to the Center, "Progress monitoring is conducted at least monthly to: ...

Co-Teaching Effects on Algebra I Achievement of Students ...

Co-teaching is defined as a collaborative teaching practice rooted in the inclusive education philosophy with a belief that all children can learn given opportunity, effective teaching, and ...

High School Testing Program Guide - Texas Education Agency

Students have four hours to complete the Algebra I, Biology and U.S. History tests. They have five hours each to complete the English I and II exams, which are combined reading and writing ...

Individual Graduation Committees FAQ - Texas Education ...

Algebra I after two attempts, but who receives a score of proficient on the TSI assessment for math is considered to have satisfied the Algebra I EOC requirement. [TEC, §39.025(a-3); 19 ...

Mathematics Questioning Practices of Pre-Service Special ...

Historical differences between special education and mathematics education have meant that special education PSTs are likely to develop different pedagogical expertise than mathematics ...

PROJECT AAIMS: ALGEBRA ASSESSMENT AND INSTRUCTION ...

the general education teachers had 7-12 Mathematics endorsements. The special education teachers had 7-12 special education endorsements. Two of the general education teachers ...

Virginia's Guidelines for Educating Students with Specific ...

Guidelines for Educating Students with Specific Learning Disabilities (SLD) 3 Director, Special Education Instructional Services Deborah Johnson, Ed.S. Specialist, Special Education ...

ENHANCING STUDENTS' ADVANCED MATHEMATICAL ...

special issue on iscoe2024 vol. 20 no. 4 (2025) 142 - 149 © school of engineering, taylor's university 142 enhancing students' advanced mathematical thinking in algebra through three ...

Effective Mathematics Instruction for Students With ...

The Individuals With Disabilities Education Act (IDEA; 2004) requires that all students with disabilities participate and progress in general education curriculum particularly in the areas of ...

CCMR: Graduation Codes And Graduation Requirements

the graduation options for students receiving special education services •A student receiving special education services can earn a high school diploma by meeting the credit requirements, ...

Teaching Algebra to Students With Learning Disabilities

for students to receive a diploma (Witzel, 2005). As a result, sixth and seventh grade students are now learning prealgebra and many eighth graders are already enrolled in Algebra I. The ...

Bradley S. Witzel, Ph.D. Adelaide Worth Daniels Distinguished ...

Special Education Dissertation Topic: Algebra for Students with Math Difficulties Chair: Dr. Cecil Mercer II. Certifications and Training 2021 Foundations of Math, North Carolina Department of ...

Students with Disabilities and Georgia's New Graduation ...

The special education diploma, the high school certificate as well as students who drop out are not counted as receiving a high school diploma when calculating graduation rate. Won't the ...

Math-Related Goals and Objectives - Colorado Department of ...

Note: Best Practice to address needs of students who have visual impairment including multiple disabilities is for TVIs to work with regular ed. Staff and follow the math curriculum guidelines ...

Perspectives on Algebra I Tutoring Experiences With ...

*Please send correspondence to: Casey Hord, PhD, Associate Professor, Department of Special Education, Uni-versity of Cincinnati, Teachers College 600G, PO Box 210002, Cincinnati, OH ...

2019 Mississippi Alternate Academic Achievement Standards

students who have met the criteria for a Significant Cognitive Disability (SCD) as documented in each student's individualized education program (IEP). This document is designed to provide ...

Mathematics Questioning Practices of Pre-Service Special ...

Historical differences between special education and mathematics education have meant that special education PSTs are likely to develop different pedagogical expertise than mathematics ...

Kentucky Department of Education

High School Special Education Course Standards Documents 2019-2020 and Beyond ... *Required only for students entering high school in 2018-2019 or prior ... and Foundational ...

Common Core State Standards for Mathematics

High School — Algebra 62 High School — Functions 67 High School — Modeling 72 High School — Geometry 74 High School — Statistics and Probability 79 ... participation of students with ...

Assisting Students Struggling with Mathematics: ...

Assisting Students Struggling with Mathematics: Intervention in the Elementary Grades What Works . Clearinghouse™ Educator's Practice Guide. WWC 2021006 U.S. DEPARTMENT OF ...

2020 Teacher Resource Guide for Alternate Math Elements...

Alternate Algebra Elements . Effective Date: 2020-2021 School Year ... Ed.D., State Superintendent of Education . Nathan Oakley, Ph.D., Chief Academic Officer . Robin Lemonis, ...

MATHEMATICS INSTRUCTION FOR STUDENTS WITH ...

Students can verbalize during initial learning, while they solve the problem, and/or after they have reached the solution. 3. Visual representations.Visually representing math problems (e.g., ...

Concrete-Representational- Abstract: Instructional Sequence...

general education 8th grade students on all fractions assess-ments. They also outperformed general education students on word problem subtests that had fractions and equivalency ...

MISSISSIPPI TESTING ACCOMMODATIONS MANUAL

• General education, English learner (EL), and special education teachers (e.g., to find assessment supports for their students); ... of the Elementary and Secondary Education Act ...

High School Graduation Options for Students with Disabilities

Should districts stop offering the special diploma beginning with the 2014-15 school year? No. Students who entered the 9th grade before the 2014-15 school year and whose IEP noted that ...

Acellus Algebra Plus for Special Education Students - Science

® Algebra Plus for Special Education Students. 93 Greatest Common Factor with Variables and Coefficients 99 Factoring Trinomials with Composite Leading Coefficients ... Algebra Plus - ...

Using Gestures and Diagrams to Support Students With ...

pens, etc.) have also been supported by special education researchers as being useful for students with LD in algebra settings (Hord et al., 2016). In a pilot study by Hord and colleagues ...

Graduation Requirements Enhancements for Students with ...

The student has a current IEP and is receiving special education programs and/or related services. The student did not meet the graduation requirements through the low pass (55-64) ...

N.J.A.C. 6A:13, Programs and Practices to Support Student ...

1. Modifications for special education students, for English language learners in accordance with N.J.A.C. 6A:15 and for gifted students. (b) All schools and school districts shall develop and ...

Standard Diploma Requirements - Florida Department of ...

Florida also offers students 49 accredited career and technical colleges or centers throughout the state, which in a particular career or technical field. Programs are flexible for students and ...

HS Graduation Options for Students with Disabilities

Students with Disabilities . All students have the right to stay in school until they get a Regents diploma, Advanced Regents diploma or Local diploma, or until the end of the school year in ...

TENNESSEE STATE BOARD OF EDUCATION - TN.gov

A special education diploma may be awarded at the end of their fourth (4th) year of high school to students with disabilities who have (1) not met the requirements for a regular high school ...

Graduation Decisions for Students with Disabilities - State of ...

MDE Office of Special Education Guidance Guidance Michigan Department of Education Office of Special Education November 2021 Graduation Decisions for Students with Disabilities ...

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