# Opportunities in Math and CTE

# **October 7, 2024**













#### **Opportunities in Math and CTE Planning Committee Members**

#### A very special thank you to the Opportunities in Math and CTE Planning Committee Members

NAME	ORGANIZATION
Dorothy Blackwell	MDE-OES
Ben Boerkoel	MDE-OES
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Rashell Bowerman	MDE-OES
Melinda Cucinella	Wexford-Missaukee ISD
Kathy Dewsbury-White	Michigan Assessment Consortium
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Jill Kroll	MDE-OCTE
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Katie Marchionna	Project Tomorrow
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Ginger Rohwer	MiSTEM
Tammy Rutledge	Eastern Upper Peninsula ISD
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Megan Schrauben	MiSTEM Network, LEO
Todd Schultz	Wexford-Missaukee ISD
Marianne Srock	Macomb ISD
Tim Staffen	Calhoun ISD
Shawn Sweeney	Ionia ISD
Dorthy Switalski	MDE-OCTE
Candace Vinson	MDE-OCTE
Shannon Williams*	Macomb ISD
Yincheng Ye	MDE-OCTE

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#### Opportunities in Math and CTE: A workshop to support regional math improvement planning Monday, October 7, 2024 8:00 a.m. to 3:30 p.m.

#### AGENDA

- 7:45 8:15 BREAKFAST and Registration
- 8:15 8:45 Welcome and overview of the day
  - Perkins Improvement plan process
  - District improvement plan process
  - Michigan Merit Curriculum Flexibility
- 8:45 9:15 Team discussion: Team members share existing initiatives within the region in the realm of math improvement.
- 9:15-10:10 Setting the Stage!
  - Career Curriculum Development Association (CCDA)
  - MiSTEM math strategy & supports
  - Inside the Mathematics Scholastic Aptitude Test (SAT)

#### 10:10-10:20 BREAK

10:20 - 11:00	<ul> <li>Presentation: Effective Strategies for Teaching Math in Context.</li> <li>Regional Strategy – CTE Number Talks &amp; Formative Assessments</li> </ul>
11:00-11:15	Math Action Plan: Share out the math action plan template and process. Template overview. Setting the stage for the afternoon, review schedule, and action plan outcomes.
11:15 – 12:00	WORKING LUNCH: Team reflection and discussion of strategies for the region.
12:00-12:50	<ul> <li>Presentation: Effective Strategies for Teaching Math in Context.</li> <li>Critical Thinking in Mathematics with Tabletop Games</li> </ul>
1:00 - 2:30	<b>Breakout Presentations:</b> Effective Strategies & Tools for Teaching Math in Context. 1:00-1:40 – Session 1 1:50-2:30 – Session 2
2:30 - 3:15	Regional work time to build a collaborative action plan with evaluation plan.
3:15 – 3:30	Award door prizes, wrap up, next steps and submit action plan and evaluation plan.

3:45 – 5:00 Additional team planning time for teams that wish to work longer.





# **Breakout Sessions**

	Sesson 1	Session 2	
Room	1:00-1:40	1:50-2:30	
100	<ul> <li>Math Talk Moves for CTE Teachers</li> </ul>	<ul> <li>Utilizing Math strategies for special needs students</li> </ul>	
Michigan/ Superior	Embedding Algebra 2 in CTE	<ul> <li>Data Science Opportunities for Math and CTE</li> </ul>	
104	MICIP and CTE	MICIP and CTE	
IT South	<ul> <li>How to Data Dive w/ OCTE</li> </ul>		
202	Computational Thinking Toolkit	Computational Thinking Toolkit	
203	<ul> <li>AMPED</li> </ul>	Geometry in Construction	
206	<ul> <li>Balancing Summative and Formative Assessment Practice in the Classroom to Support Student Learning</li> </ul>	<ul> <li>Balancing Summative and Formative Assessment Practice in the Classroom to Support Student Learning</li> </ul>	
Mackinaw		Work Keys to Improve Math	





#### **Breakout Session Descriptions**

#### Title: **AMPED**

Presenter(s): Becky Arbic, Contextual Math Teacher

Description: Algebra in the Manufacturing Process, Entrepreneurship and Design (AMPED) is a contextual course that covers all state Algebra standards while teaching students the design, manufacturing and entrepreneurship skills needed to run a business. Learn how to improve math attitude and test scores while teaching students real world skills.

# Title: Balancing Summative and Formative Assessment Practice in the Classroom to Support Student Learning

Presenter(s): Annlyn R. McKenzie, Curriculum Coordinator, Muskegon Area Career Tech Center

Description: Using assessment to leverage learning is key to teacher and student success. This session will illustrate the right balance of summative and formative assessment practices to successfully support student growth and success.

#### Title: Computational Thinking Toolkit

Presenter(s): Katie Marchionna, Computational Thinking Project Manager, Project Tomorrow

Description: In this session, hosted by Project Tomorrow, participants will discover why and how Computational Thinking (CT) serves as a toolkit for student math success, career preparation, and a gateway to achievement in Career Technical Education (CTE). Together, we'll become computational thinkers, applying the four key CT concepts to both mathematical and real-world contexts, while exploring how CT integration across the curriculum supports student success in future careers.

#### **Breakout Session Descriptions**

#### Title: Data Science Opportunities for Math and CTE

Presenter(s): Jim Licht, Math Consultant at St. Clair County RESA and Ginger Rohwer, Greater West Michigan Region Director, MiSTEM Network

Description: Join us to learn about data science - what it is, career pathways, job outlook, and tips for how to leverage data science to improve math skills in CTE programs.

#### Title: Embedding Algebra 2 in CTE

Presenter(s): Todd Schultz, Mathematics Instructor, Wexford-Missaukee Career Technical Center

Description: Integrating Algebra 2 lessons into a CTE program can be a strategic way to provide students with both practical skills and essential mathematical knowledge. Here's a structured approach to incorporating Algebra 2 concepts into your CTE curriculum.

#### Title: Geometry in Construction

Presenter(s): Becky Arbic, Contextual Math Teacher

Description: Geometry in Construction is a contextual way to teach all state standards of Geometry in the context of building a home. Learn how to pair CTE Building Trades with Geometry to create a class that excites students and improves math skills and introduces students to the awesome potential of Building Trades.

#### Title: Math Talk Moves for CTE Teachers

Presenter(s): Minna Turrell, Supervisor of Secondary Math and Science Instructor at St. Clair County RESA

Description: An education consultant in St. Clair County will present on how CTE teachers can utilize instructional strategies centered on engaging conversations to strengthen students' understanding of embedded math content in their CTE programs.

#### **Breakout Session Descriptions**

#### Title: MICIP and CTE

Presenter(s): Dot Blackwell, MDE MICIP Lead

Description: How to transform your District continuous improvement through Michigan Integrated Continuous Improvement Process (MICIP). A presentation on utilizing the MICIP platform and integrating CTE priorities in Data Stories and Strategy Implementation.

#### Title: Utilizing Math Strategies for Special Needs Students

Presenter(s): Jenny Luna, Special Education Teacher Consultant at St. Clair County RESA

Description: A special education consultant will provide strategies and samples for differentiating instruction in CTE programs for math and related content.

#### Title: WorkKeys to Improve Math

Presenter(s): Lesley Murphy, Principal & CTE Director at St. Clair County RESA; Brad Robbins, Assistant Director of Curriculum and Instruction

Description: At St. Clair County Technical Education Center, we use WorkKeys curriculum pretest and test results to identify students' academic gaps. Individualized goals are created as needed. Through WorkKeys curriculum, customized lessons are created for students on their baseline scores. That data informs our practice of offering retakes for improvement.

#### Title: How to Data Dive w/OCTE

Presenter(s): Dr. Yincheng Ye, OCTE Research Consultant

Description: Hands-on guidance on finding your district and regional mathematics data for CTE students and all Michigan students.



#### Office of Career and Technical Education Regional Designation Crosswalk with Core Performance Indicators (CPI)'s not Met <u>2022-2023</u>

Team Leaders	Perkins Fiscal Agency	Perkins Grant Region	Career Education Planning Districts (CEPD)	CPI's Not Met (i.e. <90% of target)
Tom Knight	Gogebic-Ont. ISD	01	01, 02	4S1
Tom Knight	Delta-Schoolcraft ISD	02	03, 04, 05	2S2
Tom Knight	Eastern U.P. ISD	03	06	2S2, 5S1
Christine Black	Alpena Public Schools	04	08, 09	2S1, 2S2
Yincheng Ye	Wexford-Miss. ISD	05	07, 10, 13	2S2
Yincheng Ye	Clare-Gladwin RESD	06	11, 12, 15	2S1, 2S2
Yincheng Ye	Mecosta Osceola ISD	07	14, 19, 20	2S1, 2S2
Yincheng Ye	Muskegon Area ISD	09	21	2S1, 2S2
Christine Lewis	Gratiot-Isabella RESD	10	18, 22, 53	2S1, 2S2
Tom Knight	Tuscola ISD	11	24, 25, 26, 28	2S1, 2S2
Christine Lewis	Ottawa Area ISD	12	33	None
Christine Black	Kent ISD	13	32, 50	2S1, 2S2
Christine Lewis	Clinton Co. RESA	14	31, 51, 52	2S2
Yincheng Ye	Genesee ISD	15	29, 20	2S2
Christine Black	Macomb ISD	16	27, 40	2S2
Christine Black	Livingston ESA	17	38	None
Yincheng Ye	Oakland Schools	18	39	None
Christine Lewis	Berrien RESA	19	34, 48, 49	None
Christine Lewis	Kalamazoo RESA	20	35, 47	None
Tom Knight	Calhoun ISD	21	32 (Barry), 36	2S1, 2S2
Christine Black	Hillsdale ISD	22	37, 45, 46	2S1, 2S2
Yincheng Ye	Washtenaw ISD	23	43	5S1
Tom Knight	Detroit Public Schools Community District	24	41	2S1, 2S2, 5S1
Christine Lewis	Bay-Arenac ISD	27	16, 17	2S1, 2S2, 5S1
Christine Black	Saginaw ISD	28	23	2S1, 2S2, 5S1
Christine Lewis	Wayne RESA	29	42	2S1, 2S2, 5S1
Christine Black	Monroe ISD	30	44	2S2

#### **List of Presenters**

Presenter	Organization	Email Address
Becky Arbic	Eastern Upper Peninsula ISD	barbic@eupschools.org
Scott Black	Macomb ISD	sblack@misd.net
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Christine Lewis	MDE Office of Career and Technical Education	LewisC35@Michigan.gov
Jim Licht	St. Clair County RESA	licht.jim@sccresa.org
Jenny Luna	St. Clair County RESA	luna.jenny@sccresa.org
Katie Marchionna	Project Tomorrow	kmarchionna@tomorrow.org
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Marianne Srock	Macomb ISD	msrock@misd.net
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Ginger Rohwer	MiSTEM Network	rohwergi@gvsu.edu
Dorthy Switalski	MDE OCTE	switalskid@michigan.gov
Minna Turrell	St. Clair County RESA	turrell.minna@sccresa.org
Tricia Walters	Shiawassee RESD	walters@sresd.org
Shannon Williams	Macomb ISD	swilliams@misd.net
Danielle Wolsker	Shiawassee RESD	wolsker@sresd.org
Yincheng Ye	MDE Office of Career and Technical Education	YeY@Michigan.gov

#### Opportunities in Math and CTE Workshop

#### GLOSSARY

**Balanced Assessment:** The use of different types of assessment for different purposes by different users. Can also mean the use of assessments for learning (to guide instruction as it is occurring) and of learning (to measure how much students have learned at the conclusion of instruction). All users have access to relevant assessment information.

**CEPD:** Career Education Planning District – a collection of providers of career technical education organized by geographic area.

**Comprehensive Balanced Assessment System:** A coordinated system of assessments aligned to standards and success criteria for the whole child. The assessments and assessment processes are used to inform instruction, measure progress, specify additional learner needs, guide in-depth supports, indicate growth toward competencies and provide information regarding outcomes.

**CPI:** Core Performance Indicator – Quantifiable measure used to gauge performance towards a goal. As applied in Perkins V to CTE concentrators per legislation they are numbered 1S1, 2S1, 2S2, 2S3, 3S1, 4S1 and 5S1. These indicators include:

- **1S1:** Four-year adjusted cohort graduation rate
- **2S1:** Academic Proficiency in Reading Language Arts
- 2S2: Academic Proficiency in Mathematics
- 2S3: Academic Proficiency in Science
- **3S1:** Post-Program Placement
- 4S1: Nontraditional Program Concentration
- **5S1:** Program Quality Attained Recognized Postsecondary Credential

**CTE:** Career and Technical Education – Organized educational activities that:

- Offer a sequence of courses that provide individuals with academic content and technical knowledge and skills to prepare for further education and careers; provides technical skill proficiency or a recognized postsecondary credential
- Include competency-based, work-based, or other applied learning
- Coordinate between secondary and postsecondary programs through programs of study as practicable

**CTE Concentrator:** A student who has completed at least 2 courses in a single CTE program (secondary level).

**Formative Assessment:** A planned ongoing process used by all students and teachers during learning and teaching to elicit and use evidence of student learning to improve understanding of intended disciplinary learning outcomes and support students to become more self-directed learners.

**Measurable Outcome:** A specific, quantifiable end-result that can be observed and documented; an indicator of whether a target/goal has been reached.

**MICIP:** Michigan Integrated Continuous Improvement Process – an improvement process with a dedicated platform used by educational entities required to submit improvement plans to the state.

**MTSS:** Multi-Tiered System of Supports – A comprehensive framework comprised of a collection of research-based strategies designed to meet the individual needs and assets of the whole child at all levels.

**OA:** Operating Agency – a direct provider of career technical education instruction at the secondary level.

**REGION:** A collection of CEPDs receiving Perkins funding.

**RIP:** Regional Improvement Plan – A plan required under legislation when a region has not met the SDLP in a specific CPI.

**SDLP:** State Determined Levels of Performance – The identified percentage of CTE concentrators meeting a CPI.

**Summative Assessment:** An assessment that provides information regarding the level of learner, program, or school success at an endpoint in time. Administered at the conclusion of learning to determine the effectiveness of a recently concluded program, make inferences about a learner's mastery of curricular aims, and/or meet local, state and federal accountability requirements.

Торіс	Resource Title	Source
	Strategy Area: Assessments	
Assessment Literacy	Assessment Literacy Standards This website provides information regarding a common framework to assist K-12 educators, students, families, and policymakers in becoming more knowledgeable about assessment purposes and uses. The standards are intended for long-term use in the field of education, to continually support assessment literate educators. These Standards were endorsed by the MI SBOE in 2016. A full glossary of assessment terms accompanies these standards.	https://bit.ly/4d7bRoy
Balanced Assessment	Assessment Tools in Continuous Improvement This website provides resources and tools explaining how assessment supports a continuous improvement process; because a balanced assessment system helps provide information and data that is needed to implement the continuous improves process and ultimately, improve student achievement.	https://bit.ly/47vaAXc
SAT	Scholastic Aptitude Test (SAT) Task Force This website of the Michigan Association of Intermediate School Administrators (MAISA) provides resources and support for administrators, teachers, counselors, students, and parents with implementing the revised SAT and preparing for success.	• • • • • • • • • • • • • • • • • • •

Торіс	Resource Title	Source
	Strategy Area: Curricular/Instructional Approaches	
Discourse	<ul> <li><b>3</b> Strategies for Scaffolding Mathematical Discourse in Your Classroom. (2022). ASCD.</li> <li>Association for Supervision and Curriculum Development (ASCD) blog post from Angie Hall and Marc Dembowski discussing scaffolding discourse.</li> </ul>	https://binged.it/4e2V cnu
Project Based Learning	Fancher, C., & Telannia Norfar. (2021). <i>Project-Based Learning in the Math</i> <i>Classroom</i> . Routledge.	
	Fancher & Norfar (2021) explain how to keep inquiry at the heart of mathematics teaching and helps teachers build students' abilities to be mathematicians. The book outlines basic teaching strategies and provides advanced strategies for teachers who are already implementing inquiry-based methods. The book includes practical advice about strategies the authors have used in their own classrooms, and each chapter features strategies that can be implemented immediately.	
	Strategy Area: Family and Community Engagement	
Family Engagement	Michigan's Department of Lifelong Education, Advancement, and Potential webpage This website supports family engagement/partnerships as a collaborative relationship between families, educators, providers, and partners to support and improve the learning, development, and health of every learner. Explore MDE's family engagement definition, the family engagement framework, and family engagement resources.	https://bit.ly/3MLRXok

Торіс	Resource Title	Source
Family Engagement	Joyce Levy Epstein. (2019). School, family, and Community Partnerships: Your Handbook for Action. Corwin, A Sage Publishing Company.	
	When schools, families, and communities collaborate and share responsibility for students' education, more students succeed in school. Based on 30 years of research and fieldwork, the fourth edition of <b>School, Family,</b> <b>and Community Partnerships: Your</b> <b>Handbook for Action</b> , presents tools and guidelines to help develop more effective and more equitable programs of family and community partnerships.	
Family Engagement	Student Attendance and Engagement Guidance	Upcoming resource from the MDE
	Strategy Area: Socio-Cultural Initiatives	
Culturally Responsive Practices	<ul> <li>Hammond, Z. (2015). Culturally responsive teaching and the brain: Promoting authentic engagement and rigor among culturally and linguistically diverse students. Corwin.</li> <li>Employing neuroscience research, Zaretta Hammond offers an approach for creating brain compatible culturally responsive instruction.</li> </ul>	
Culturally Responsive Practices	Lou Edward Matthews, Jones, S. M., & Parker, Y. A. (2022). Engaging in Culturally Relevant Math Tasks. Corwin Press. Culturally relevant math tasks provide opportunities for a path towards connecting mathematics to the self, community and world of students.	

Торіс	Resource Title	Source
Culturally Responsive Practices	<b>Boaler, J. (2024).</b> <i>Math-ish.</i> HarperCollins. Differences between each learner's relationship with learning mathematics are offered as a key to unlocking mathematics potential. Using research, Dr. Boaler guides the reader through several principles including: mindset; visual approaches; physical movement and communication; learning styles; and diversity in learning mathematics.	
	Strategy Area: Socio-Emotional Programs	
Growth Mindset	<b>youcubed</b> This Stanford Graduate School of Education website features Dr. Jo Boaler, Nomellini & Olivier Professor of Education at Stanford University as co-founders of www.youcubed.org to give teachers, parents and students the resources and ideas they need to inspire and excite students about mathematics.	https://bit.ly/47vur8E
Motivation	Ilana Seidel Horn. (2017). <i>Motivated:</i> <i>designing math classrooms where students</i> <i>want to join in</i> . Heinemann. <i>Motivated</i> shows why certain teaching strategies create classroom climates where students want to join in. This book explores the key factors of motivational math classrooms along with strategies for weaving each one into your instruction.	
Social Emotional Learning	Michigan Department of Education's Social-Emotional Learning webpage	https://bit.ly/4egVyqe

Торіс	Resource Title	Source
	Strategy Area: Targeted Interventions	
MTSS	Michigan Department of Education's Multi- Tiered System of Supports (MTSS) webpage	https://bit.ly/3zmintE
Tutoring	<ul> <li>Kraft, Matthew A., and Grace Falken.</li> <li>(2021). A Blueprint for Scaling Tutoring Across Public Schools. (EdWorkingPaper: 20-335). Retrieved from Annenberg Institute at Brown University:</li> <li>A paper discussing tutoring as a powerful tool for accelerated learning. Kraft &amp; Falken (2021) discuss seven design principles identified that characterize highly effective tutoring programs based on the result of a meta-analysis.</li> </ul>	https://bit.ly/4gpAYWu
Tutoring	Michigan Department of Education's Targeting Support with Tutoring webpage	https://bit.ly/3XH7qF3
Tutoring	Michigan Department of Education's Targeted Support with Tutoring guide	https://bit.ly/47vur8E

Торіс	Resource Title	Source
	Multiple and Miscellaneous Strategy Areas	
CTE-Math	Maine Department of Education, Math-in-CTE webpage	https://bit.ly/3XMtFB2
CTE-Math	Pennsylvania Department of Education, Math T-Charts webpage	https://bit.ly/3MPE88A
CTE-Multiple	AdvanceCTE Learning that Works Resource Center	https://bit.ly/4d4wpv0
CTE-Multiple	National Research Center for Career and Technical Education	https://bit.ly/4eiFapm

Торіс	Resource Title	Source
Multiple	National Council of Teachers of Mathematics. (2014). <i>Principles to actions:</i> <i>Ensuring mathematical success for all.</i> NCTM, National Council of Teachers of Mathematics.	
Multiple	Allsopp, D. H., Lovin, L. H., & Sarah Van Ingen. (2018). <i>Teaching mathematics</i> <i>meaningfully: solutions for reaching</i> <i>struggling learners</i> . Paul H. Brookes Publishing Co.	
Multiple	MIStrategy Bank	https://bit.lv/3TvWz4T
Multiple	What Works Clearinghouse	https://bit.ly/3B9c25x

Торіс	Resource Title	Source
Multiple	Visible Learning (John Hattie) – influences on student achievement and effect sizes	https://bit.ly/4e6b88q
	RESOURCES ACCOMPANYING PRESENTATIONS	
	Table-Top Games (Math Game Cards)	https://bit.ly/4enWRUg
	<i>Parrish, S., &amp; Dominick, A. (2022). Number talks. Fractions, decimals, and percentages: a multimedia professional learning resource. Math Solutions.</i>	