Math Pathways to College and Career Readiness

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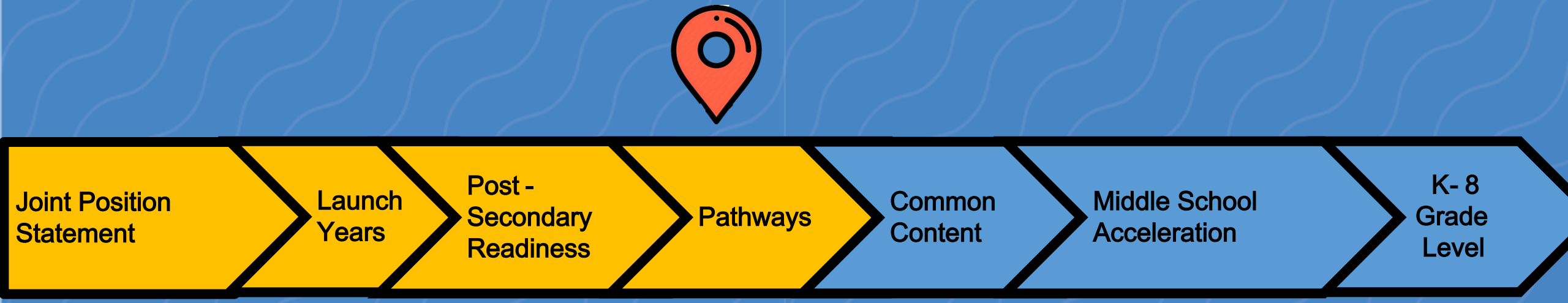
From Foundations to Futures: A PD Series on Readiness, Access, and Alignment



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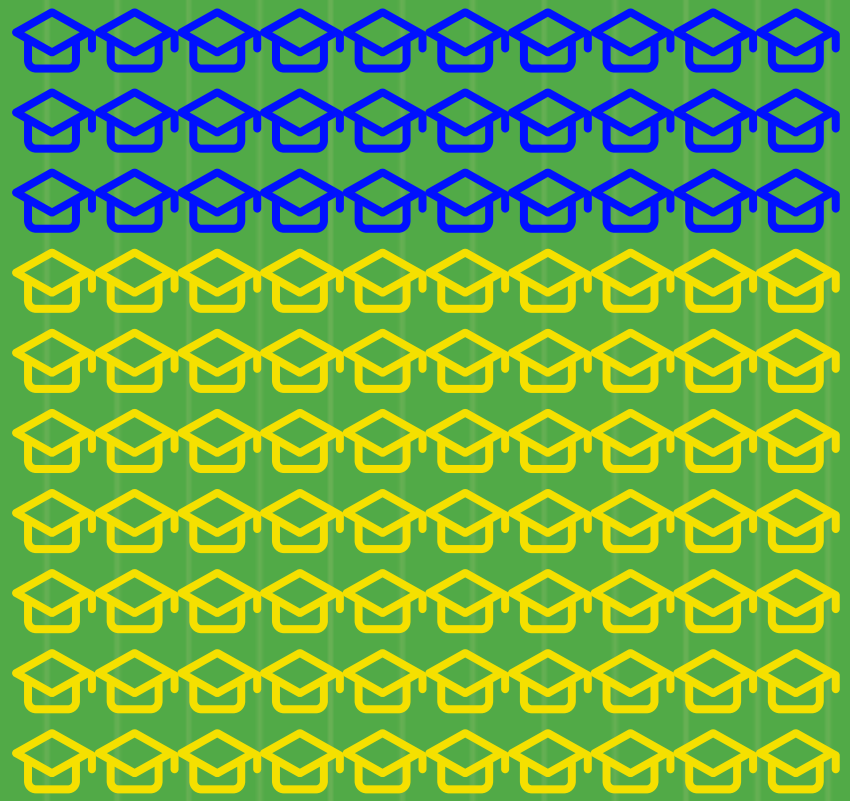
Did You Know...

from 2020 – 2023, only 30% (blue) of college degrees awarded in Connecticut required calculus?

70% (yellow) of bachelor's degrees granted in CT do not require calculus.



Institutions' Average % of Bachelors Recipients Requiring Calculus, 2020-2023 by State, data found on TPSE Math here.

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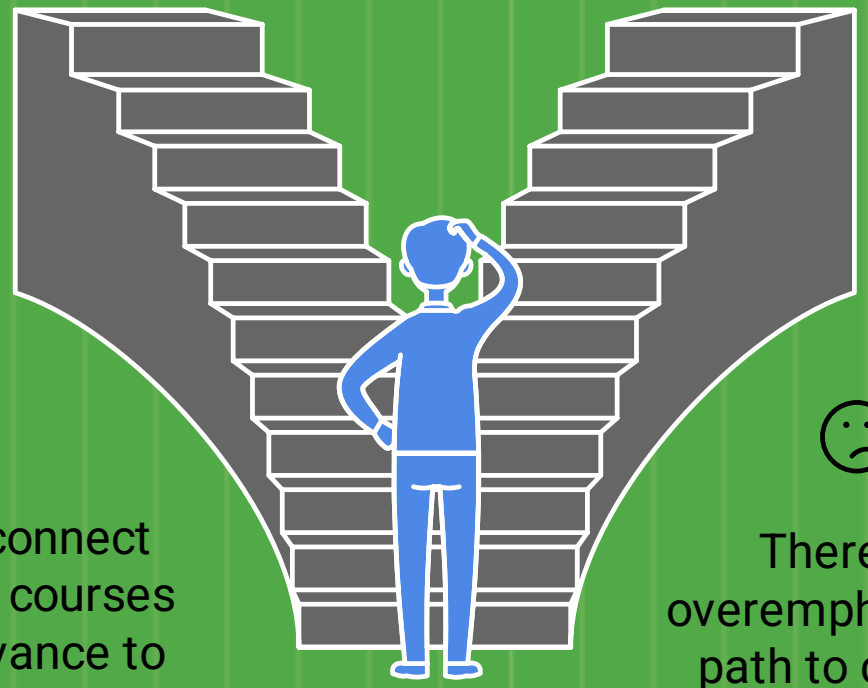
The State of Math in CT: Issues

Career Goals

Calculus



There's a disconnect between math courses and their relevance to students' future goals and career advancements.

There’s an overemphasis on a path to calculus that disserves many students.

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Addressing the Issues

Mathematics Pathways ensure that students' math experiences benefit their post-secondary goals.

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Introduction to Math Pathways

Mathematics Pathways are **sequences** of courses or other learning opportunities that foster students' mathematical development in alignment with their **interests and post-secondary goals**.

Pathways increase the relevance of, and access to, high-quality secondary mathematics content for **all** students and reflect a commitment to advancing access and achievement in mathematics.

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Value of Math Pathways

Course placement and offerings are based on student interest and future goals, not solely on academic performance.

RELEVANCE AND ACHIEVEMENT:
Promoting student course choice increases relevance, leading to better attendance, engagement, and achievement.

ACCESS AND READINESS:
Providing access to courses aligned with career trajectories prepares students for post-secondary plans.

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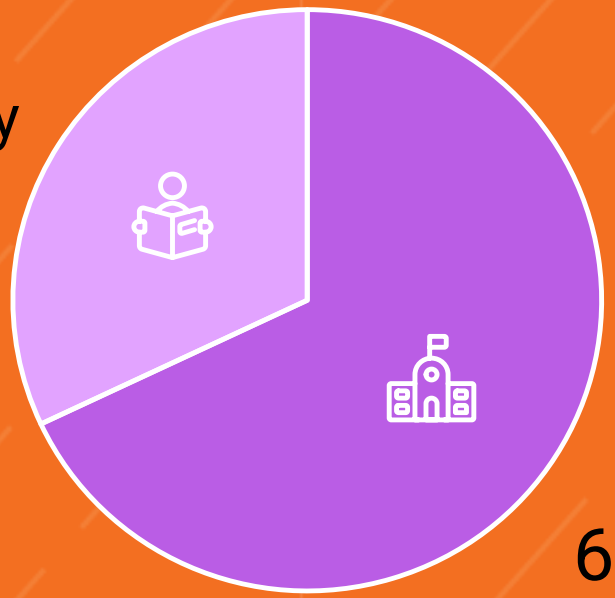
CT Class of 2023: Enrollment in College or University

32%

Not Enrolled in College/University



68% Enrolled in College/University

High School Graduating Class of 2023 Statewide Data (within one year post-graduation)

Source: public-edsight.ct.gov

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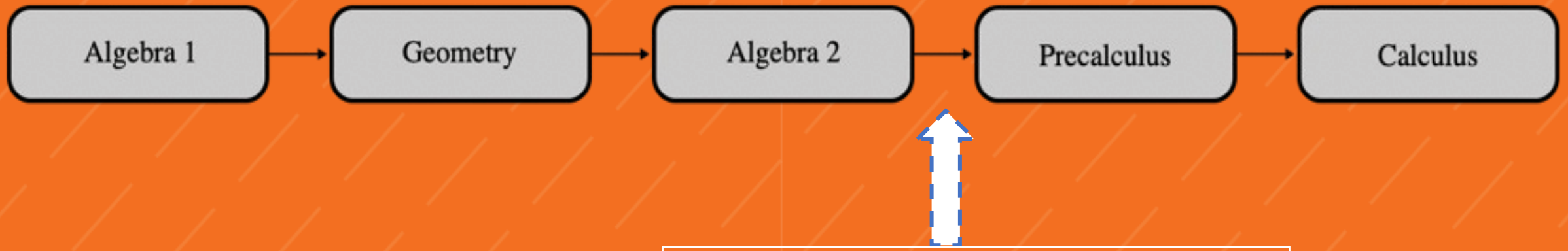
The Common HS Math Sequence in CT



Progression continues based on academic performance, not student interest or future goals

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Student Anecdotes

Hannah wants to go to college. She is passionate about helping others and is considering social work.

➤ Hannah takes Precalculus and Calculus to appear competitive on her college applications.

Tristan likes building bikes and is undecided about his future. He has not enjoyed math previously.

➤ Tristan takes a Consumer Math course because he was told the course was "practical for daily life."

William loves music and would like to pursue it in college.

➤ William takes College Algebra because he has college intentions, but precalculus was not a good fit.

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Think About Your School

Think about the current mathematics options in your school.

- Which students does your system currently serve well? Why does it work for these students?
- Which students does your system not serve well? Why doesn't it work for these students?

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Guiding Principles

- High school math experience should benefit students' post-secondary goals.
- All pathways have their own merit and should align with valuable post-secondary plans.
- When student aspirations change, students should have the flexibility to explore other pathways.

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Possibilities: Other States' Work

Indiana

Data sourced from Indiana Dept. Of Education here.

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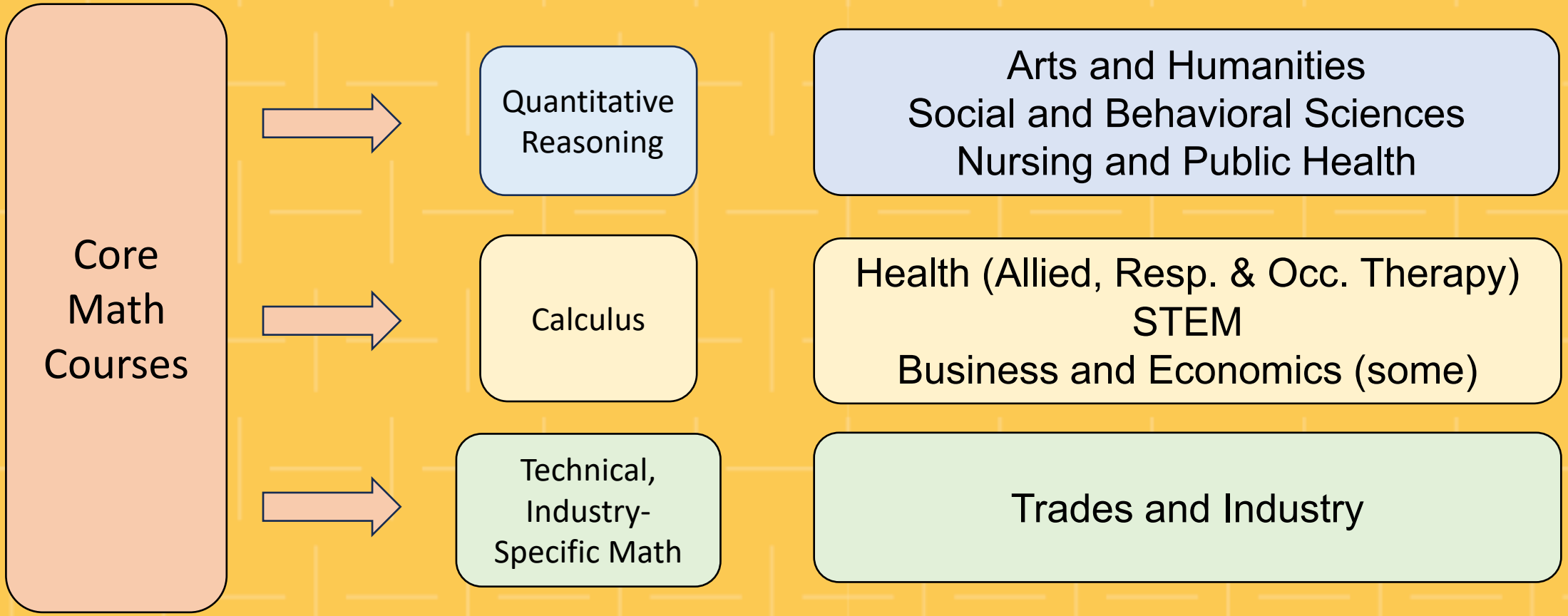
Possibilities: Other States' Work (Indiana)



Data sourced from Indiana Dept. Of Education here.

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Further Student Anecdotes

Based on Hannah's interest in social work, and the Math Pathway for that field, she takes Quantitative Reasoning. Calculus is not a requirement for her intended major.

Tristan likes building bikes and is undecided about his future. He has not enjoyed math previously.

➤ Tristan takes a consumer math course because he was told the course was "practical for daily life."

William loves music and would like to pursue it in college.

➤ William takes College Algebra because he has college intentions, but precalculus was not a good fit.

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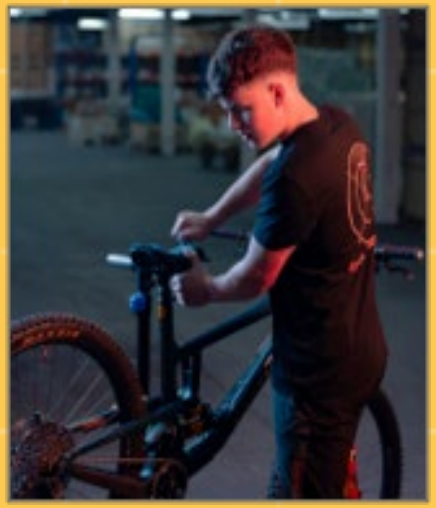
More Student Anecdotes

Based on Hannah's interest in social work, and the Math Pathway for that field, she takes Quantitative Reasoning. Calculus is not a requirement for her intended major.



Tristan grows more interested in manufacturing. He decides to take a Technical Math course, as it includes math relevant to technical work.

William loves music and would like to pursue it in college.

➤ William takes College Algebra because he has college intentions, but precalculus was not a good fit.

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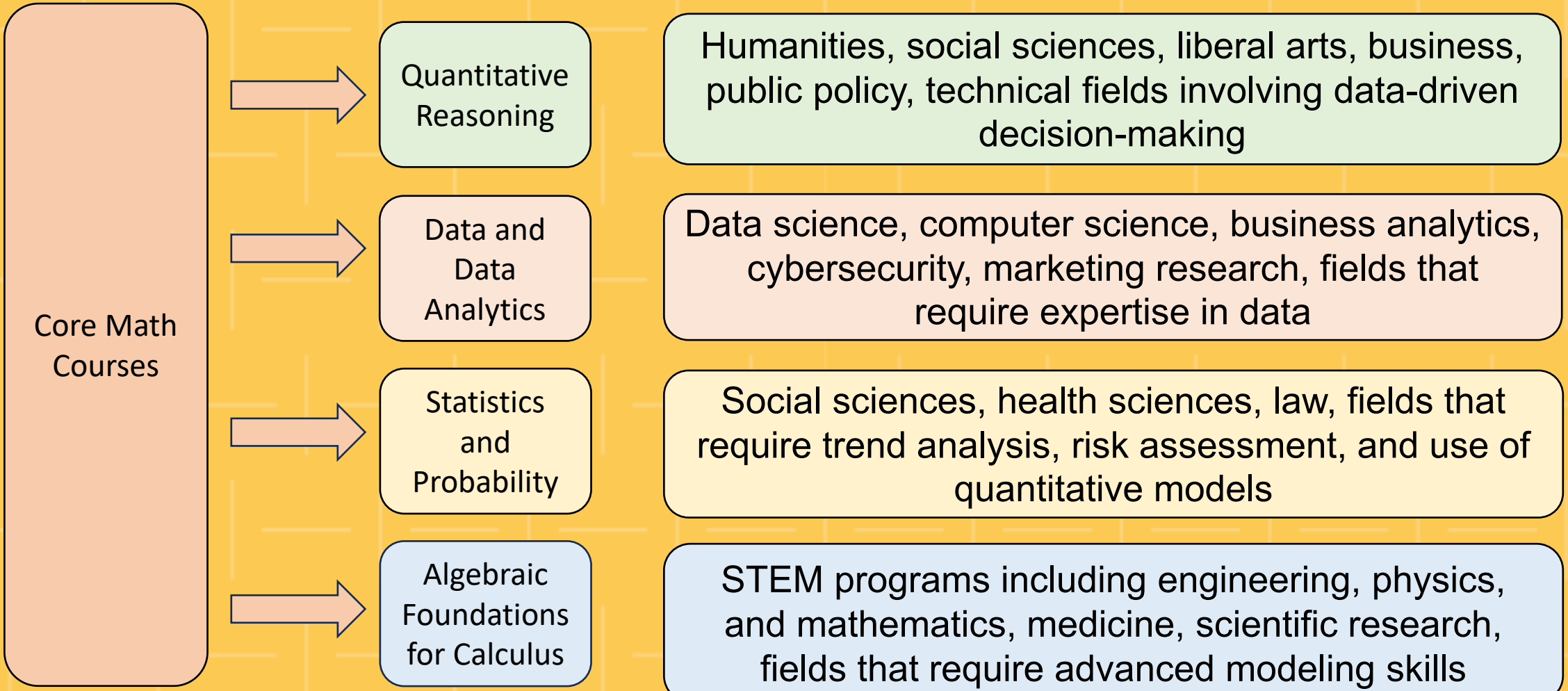
Possibilities: Other States' Work (Maryland)



Information gathered from Maryland Public Schools here (Appendix C).

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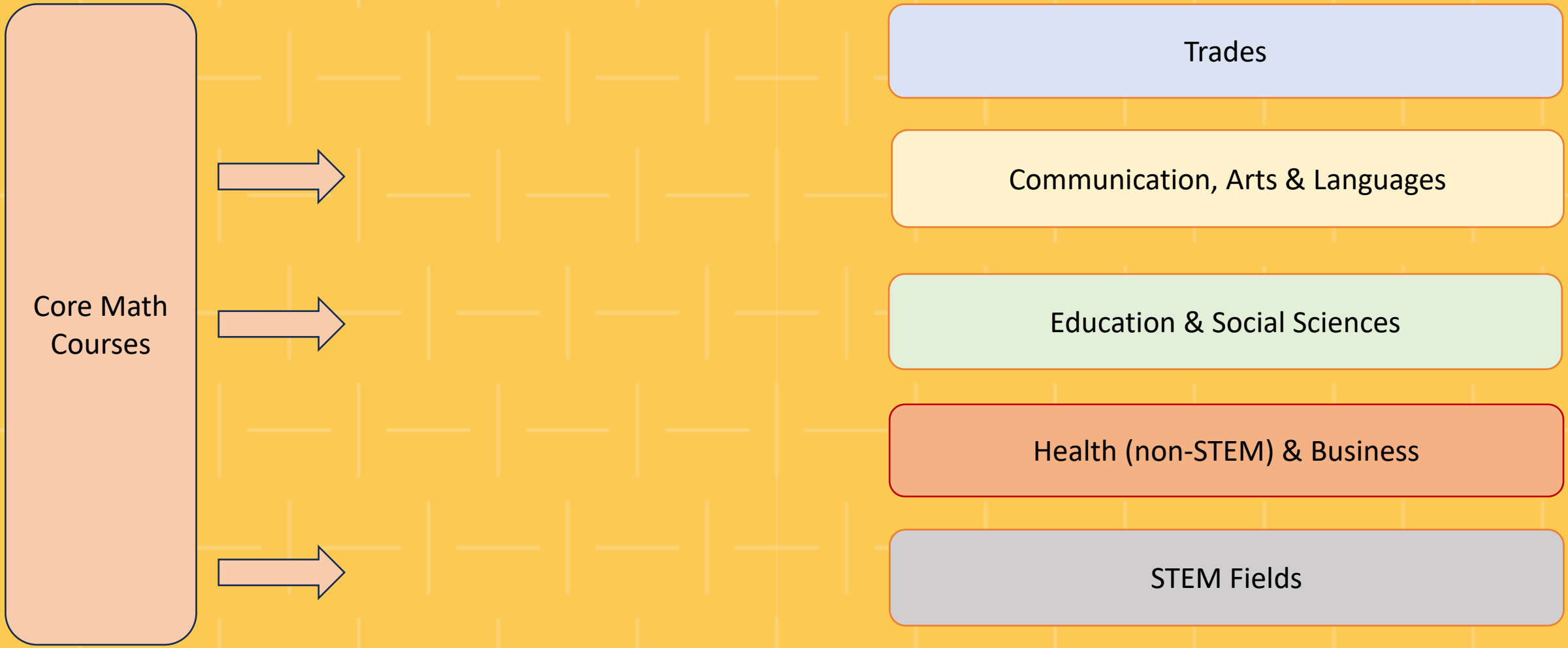
Possibilities: Other States' Work (Idaho)

Information gathered from Idaho State Dept. Of Education here (page 4).



Possibilities: Other States' Work (More from Idaho)

Information gathered from Idaho State Dept. Of Education here (page 4).

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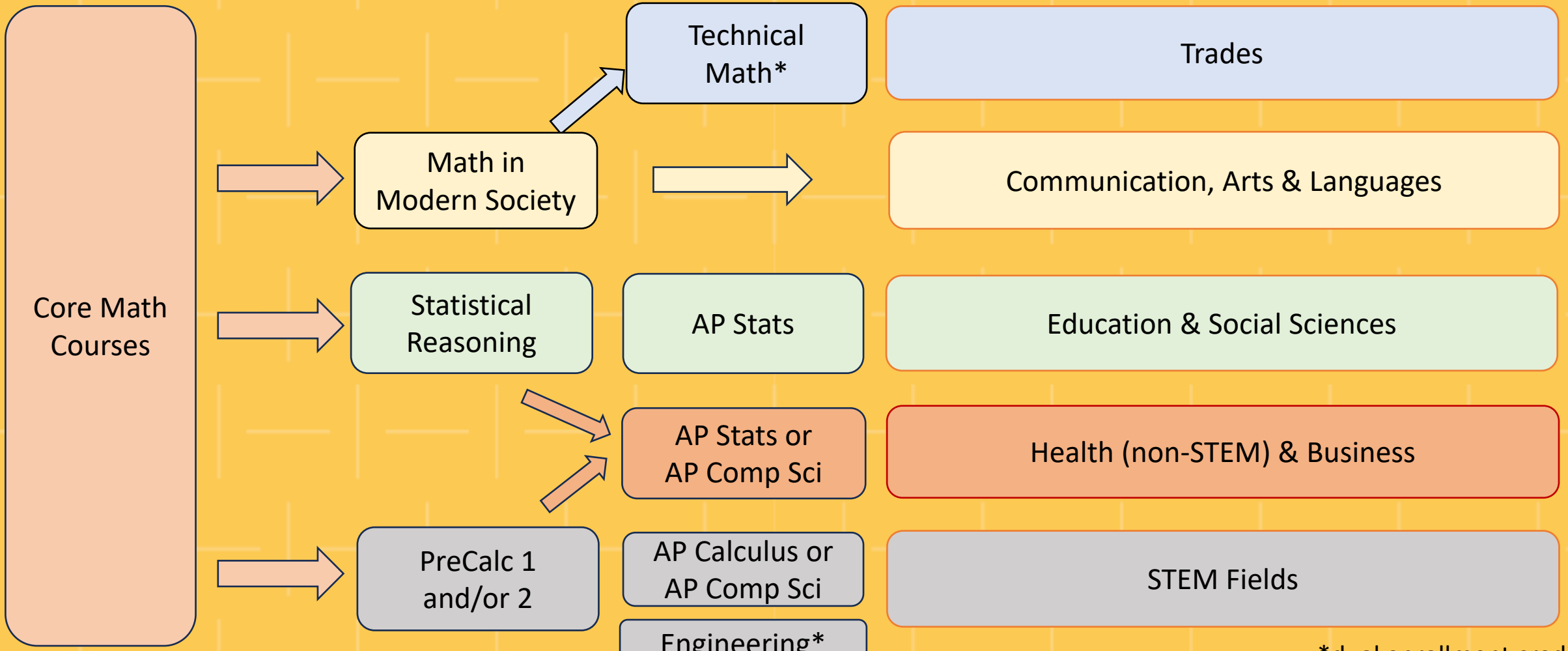

*dual enrollment credit

Additional Student Anecdotes

Based on Hannah's interest in social work, and the Math Pathway for that field, she takes Quantitative Reasoning. Calculus is not a requirement for her intended major.

Tristan grows more interested in manufacturing. He decides to take a Quantitative Reasoning course, as it includes math relevant for technical work.

William decides to take Math in Modern Society which will set him up for success in his four-year degree program in Music, and in life.

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CT: Robust Opportunities

	Statistics	Calculus	Computer Science and Data Science	Financial Literacy/ Consumer Math	Applied Math and Modeling	Discrete Mathematics
% offering course	97%	100%	40%	29%	17%	29%
% offering AP or ECE	79%	97%	34%	0%	0%	20%

CT's 35 Alliance Districts are all poised to make changes with their current course offerings.

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Where is Your School or District Now?

- What math options do you have for students not intending on a major requiring calculus?
  - Can students switch between your options?
- Given your student population and interest, what kind of math pathway(s) would your students find relevant for their futures?
- What courses are already designated AP, dual enrollment, or CT State certificates?

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Next Steps

- Start the conversation with stakeholders:
  - ALL math courses are important
  - Not all fields have the same requirements
- Provide resources to help students understand which choice best serves their aspirations, and clearly communicate this to all stakeholders

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Commitments and Questions

Commitment	Choices and Questions
High-quality Mathematics	Can all pathways include options for dual enrollment or AP?
Relevant Mathematics	How many pathways are needed to meet student needs? Include tech pathways? Or ensure access to nearby tech options?
Access	What supports are needed for below-grade-level students to ensure access to a pathway sequence? How can co-requisites (rather than pre-requisites) support access?
Feasible	How can you best leverage existing courses and personnel to strategically innovate? How do pathways align with district graduation requirements in math?

From Foundations to Futures: A PD Series on Readiness, Access, and Alignment

NEXT

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For More Information

Professional Development (PD) Playlist

Pathways Fast Facts

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FAQs

Q: We already have a manufacturing pathway at our school. Is this the same pathway you're talking about?

A: No. A manufacturing pathway is a *professional pathway* that specifies the courses (from all areas) to gain manufacturing skills and/or certifications. A *math pathway* is one or more courses that develops the mathematics appropriate for a profession or group of professions.

Q: Are pathways and tracking the same thing?

A: No, pathways and tracking are not the same. Math pathways are design to provide access, not limit access, and are designed to allow all students an opt-in choice for meaningful, high quality mathematics instruction relevant for their future. A track is often a faster or slower pace of common materials, and students are generally placed in a track and cannot move flexibly among them.

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Resources

How do students and families make decisions?

- Utilize this guide from Texas
- Ohio has a questionnaire and graphic on the last page
- Discussion with guidance team to best support your students in their math course selections

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Thank you!

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