

# Parent Discussion



Brian Bickley · Nov. 10, 2021

# Ohio's High School Graduation Requirements



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## Ohio's Whole Child Framework

A blueprint to meet students' social-emotional, physical and safety needs.

[Learn more](#)



Search:  
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Pathways

## QUICK LINKS



Graduation  
Requirements



Mathematics  
Modeling and



# High School Math Pathways

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Diverse  
Learners



# High School Math Pathways Toolkits

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Successful implementation of the high school math pathways requires a coordinated effort between high school teachers, administrators, counselor and parents in addition to higher education admissions, advisors, and placement personnel.

## Administrator/Counselor Toolkit

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# Student Decision Tree Parts 1 & 2

#EachChildOurFuture

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_ Year in School: \_\_\_\_\_

## STUDENT DECISION TREE-PART 1

**Step 1: Take a [Quiz](#) to discover your career interests.**

Write your top three clusters based on the survey below.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

**Step 2: Read about the [OhioMeansJobs K-12 Career Clusters](#).**

Pick your top three career clusters to explore. Tip: You may want to start with the career clusters from Step 1, but it is not required.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_



# Career Cluster Inventory

# Career Cluster Inventory



Get started



Budget  
Calculator



Lifestyle  
Calculator



# Student Decision Tree Parts 1 & 2

#EachChildOurFuture

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1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_



## K-12 Career Clusters

## OhioMeansJobs K-12

### Career Clusters



**Agriculture, Food, and Natural Resources:** Agriculture, food, and natural resources workers produce agricultural goods. This includes food, plants, animals, fabrics, wood, and crops. You might work on a farm, ranch, dairy, orchard, greenhouse, or plant nursery. You could also work in a clinic or laboratory as a scientist or engineer. Some agriculture, food, and natural resources workers market, sell, or finance agricultural goods. For example, you might market products made from plants and animals. Or, you might sell services that farmers and ranchers use to improve products. You could also work to conserve natural resources or protect the environment.

**Architecture and Construction:** Architecture and construction workers work on buildings and other structures. This includes highways, bridges, houses, and buildings. You might create the designs or plans for new structures. Or, you might use the plans to build it or manage the workers on the project. Some architecture and construction workers do skilled trades, like carpentry, painting, or plumbing. For example, you might do all the electrical work for a renovated office space. Or, you might work as a landscaper and take care of flowers and trees on large properties.

**Arts, Audio/Video Technology, and Communications:** Arts, audio/video technology, and communications workers use creativity and their talents on the job. You might work for an audience as a performer or artist. This includes painters, dancers, sculptors, actors, and singers. Or, you might work behind the scenes to make a performance successful. This includes set designers, editors, broadcast technicians, and camera operators. Some audio/video technology and communications workers have high-profile jobs. For example, you might work as a news reporter or fashion designer. Or, you might use your creative talents with technology and work as an animator, graphic designer, or film editor.

**Business, Management, and Administration:** Business, management, and administrative workers give the support needed to make a business run. You might check employee time records or train new employees. Or, you might work as a top executive and provide the overall direction for a company or department.

**Education and Training:** Education and training workers guide and train people. As a teacher, you could influence young lives. You could also support the work of a classroom teacher as a counselor, librarian, or principal. You could coach sports activities or lead community classes. You could also work with adults. For example, you could lead training to employees in a business. Or, you could work as a university or college professor for undergraduate or graduate students.

**Finance:** Finance workers keep track of money. You might work in financial planning, banking, or insurance.

# Student Decision Tree Parts 1 & 2 (Page 2)

#EachChildOurFuture

**Step 4: Explore your favorite career clusters with the [OhioMeansJobs Career Clusters Tool](#).**

- Visit the website linked above and explore the career clusters you named in Step 2.
- Career pathways are located on the left side of each specific career cluster page. Click on all the pathways and review the available jobs.
- List up to 10 careers you are interested in based on your salary and postsecondary educational preferences?

# Ohio Means Jobs Career Clusters



For Job Seekers For Employers For Students News & Events

My Profile

Enter Job Title    Enter Keywords    in    Enter Job Location    OH ▼    [Search Jobs](#)    [Search WorkKeys](#)

## Career Clusters

Career pathways are typical paths by which an individual might reach employment in a certain occupation. While they are by no means the only way to become employed in a given occupation, they offer a general guideline. While these career pathways are organized by their primary industry, it should also be noted that career pathways and occupations can be found across multiple industries.

Select a Career Cluster below to begin exploring!



**Agriculture, Food & Natural Resources** →

Production, processing, marketing, distribution, financing, and development of agricultural commodities and resources.



**Architecture & Construction** →

Designing, planning, managing, building and maintaining of buildings and other structures.



**Arts, Audio/Video Technology & Communications** →

Designing, producing, exhibiting, performing, writing, and publishing multimedia content.

# Ohio Means Jobs Career Clusters

High School Diploma or Equivalent

Level of Education Needed

**Farmers, Ranchers, And  
Other Agricultural  
Managers**

Ohio Annual Salary:  
\$49,700 - \$83,590

Yearly Projected Openings:  
8,750



Show Details



Show Courses



Name of Career

Annual Salary

Projected Openings

Identifies Relevant Courses

**School District:** Ohio Department of Education

**National Career Cluster:** Agriculture, Food & Natural Resources

**Ohio Career Field:** Agricultural and Environmental Systems

**National Career Pathway:** Agribusiness Systems

**Ohio Career Pathway:** Agribusiness and Production Systems

**Occupation:** Farm Labor Contractors

Middle School	7	Agriculture, Food and Natural Resources	Grade 7 Math	Grade 7 Science	Grade 7 Social Studies	Integrated ELA 7-8	Physical Education and Health Education	World Language	
	8	Animal and Plant Science	Grade 8 Math	Grade 8 Science	Grade 8 Social Studies	Integrated ELA 7-8	Physical Education and Health Education	World Language	
Secondary	9	Livestock Selection, Nutrition, and Management	Algebra OR Math 1	American History OR Government OR World Civilizations	Integrated ELA 1	Physical Education and Health Education	Physical Science OR Biology	World Language	
	10	Agronomic Systems	American History OR Government OR World Civilizations	Biology OR Chemistry OR Physics	Geometry or Math 2	Integrated ELA 2	Physical Education	World Language	
	11	Business Management for Agricultural and Environmental Systems	Mechanical Principles	Algebra 2 OR Math 3	American History OR Government OR World Civilizations	Chemistry OR Physics OR Environmental Science OR Physical Geology	Integrated ELA 3	World Language	
	12	Agricultural and Environmental Systems Capstone	Global Economics and Food Markets	American History OR Government OR World Civilizations	Integrated ELA 4	Quantitative Reasoning OR Precalculus	Chemistry OR Physics OR Environmental Science OR Physical Geology	Legal Issues	

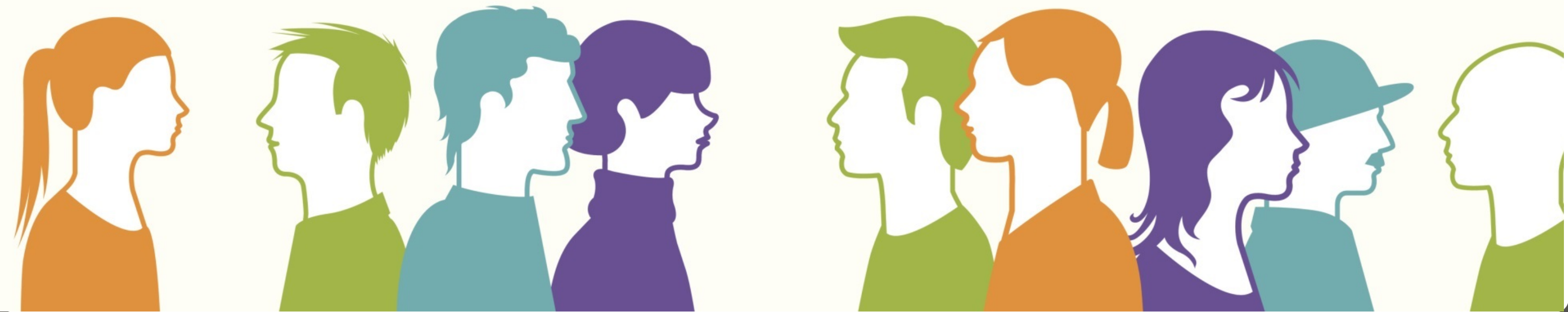
Required Technical Courses
Courses with College Credit Opportunities
Required Courses
Recommended Electives

# Questions to Consider

- Think about the types of careers your student may be interested in?
- Look at the pay/salary ranges.
- Identify the mathematics courses that are most applicable.
- Does this career require calculus?
- Does this career require a college degree?
  - If so, is it a 2-year? 4-year degree? Or advanced degree?



# Debrief



# Student Decision Tree Part 3

## Ohio's High School Math Pathways

### STUDENT DECISION TREE - PART THREE

This decision tree shows alignment between majors/careers and high school math pathways courses. The information is broad and should be used for general guidance only, as alignments may vary by higher education institutions. Please check your local community colleges or four-year feeder schools and adjust the chart as necessary.

For their third unit of mathematics, students may wish to explore one of their new pathway courses such as Statistics & Probability, Data Science Foundations, or Computer Science/Discrete Math. However, if students decide to pursue a major within that pathway that requires Calculus, they should take Algebra 2 for their fourth unit of mathematics.

### Quantitative Reasoning

#### Bachelor's or above (non-Calculus)

- Art History
- Communication Studies
- Criminal Justice (Applied degree)
- English
- History
- Human Resources Assistants\*
- Intervention Specialist
- Journalism\*
- Music
- PreK-5 Elementary Education
- Philosophy
- Public Relations/Advertising\*
- Social/Human Services (AAB to BSW)\*
- Social Work (AA to BSW)\*
- Studio/Fine Arts
- Telecommunication\*
- Theatre

#### Associate degree

- Applied Business (AAS)\*
- Applied Marketing (AAB)\*
- Computer Network Support Specialists\*
- Dental Hygienists\*
- Occupational Therapist Assistants\*
- Web Developers\*

#### Other Careers

- Agribusiness Systems
- Animal Systems
- Construction
- Design/Pre-Construction
- Environmental Service Systems
- Facility and Mobile Equipment
- Maintenance
- Food Products and Processing Systems
- Lodging

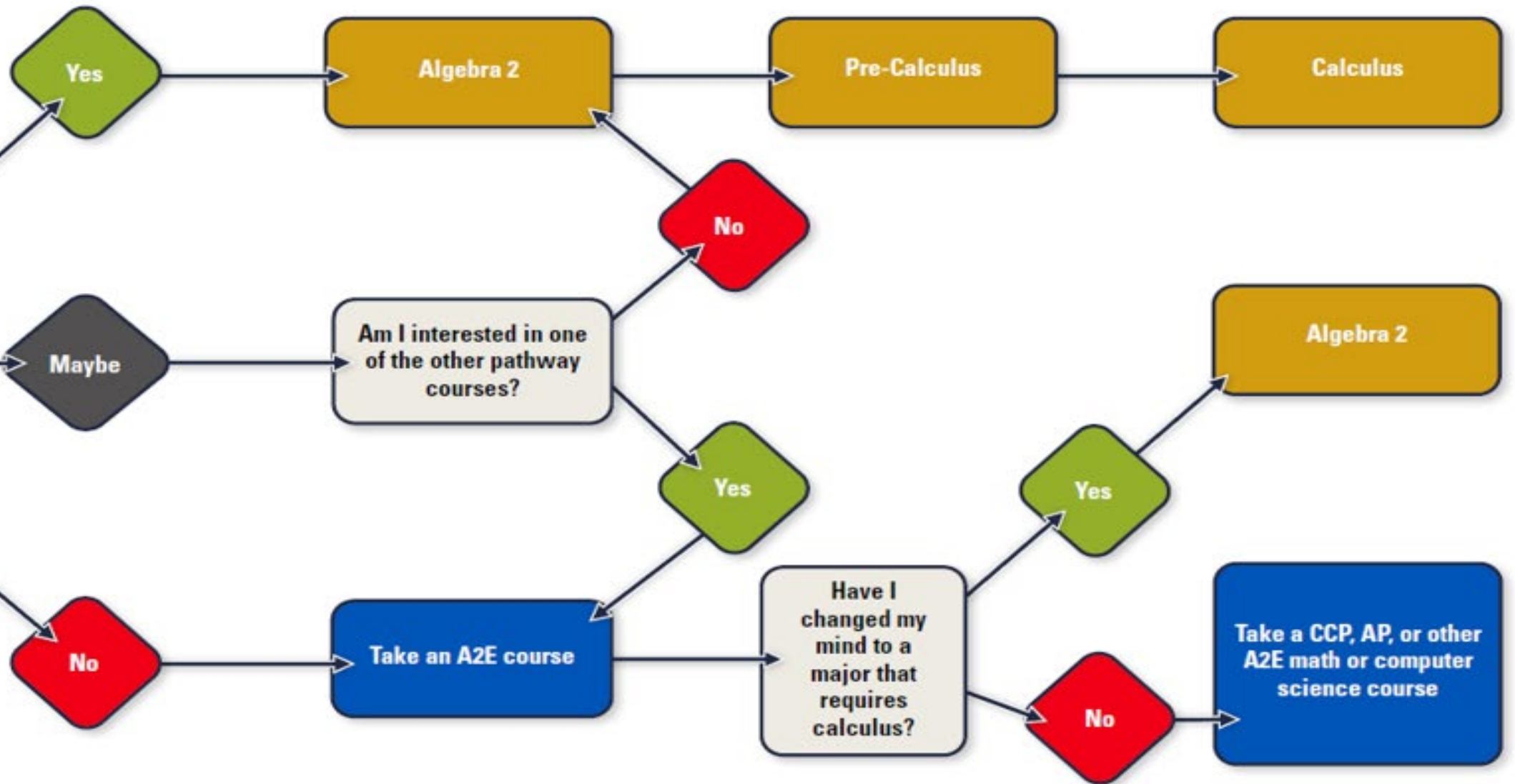
- Logistics Planning & Management Services
- Maintenance/Operations
- Natural Resource Systems Plant Systems
- Power, Structure and Technical Systems
- Recreation, Amusements, and Attractions
- Restaurants and Food/Beverage Services
- Sales and Service
- Transportation Operations
- Transportation Systems/Infrastructure
- Travel & Tourism

# Student Decision Tree

## Majors that Require Calculus



Am I going to college and does my intended major require Calculus?



**A2E** = Algebra 2 Equivalency  
**CCP** = College Credit Plus  
**AP** = Advanced Placement

### Majors that Require Calculus

- Actuarial Science
  - Accounting
  - Agribusiness
  - Architecture\*
  - Astronomy
  - Astrophysics
  - Aviation (B.S)
- Biology\*\*
  - Biochemistry
  - Bioinformatics
  - Biomedical Science
  - Botany
  - Business (B.S)
  - Chemistry
- City and Regional Planning\*
  - Computer Science (B.S)
  - Data Analytics (B.S)
  - Earth Science
  - Economics
  - Engineering
  - Environmental Science
- Finance
  - Forensic Science
  - Forestries, Fisheries, and Wildlife
  - Geology\*\*
  - Information Science
  - Logistics Management
  - Marketing\*\*\*
- Mathematics
  - Math or Science Teacher
  - Microeconomic Theory
  - Neuroscience
  - Nutrition Science (B.S)
  - Operations Management
  - Physics
- Physiological Optics
  - Public Health
  - Pre-Health Professional (Doctor, Vet, Pharmacy)
  - Psychology (B.S)
  - Real Estate and Urban Analysis

\* Check with your local institution. \*\* Some institutions may require Precalculus for Bachelor's of Arts Degrees. \*\*\* Check with your local feeder school. Some Marketing programs may require statistics.



**Connecting the High School Math Pathways to  
College Credit Plus (CCP) and the Ohio  
Guaranteed Transfer Pathways**

## Connecting the High School Math Pathways to College Credit Plus and the Ohio Guaranteed Transfer Pathways

### WHAT ARE THE OHIO GUARANTEED TRANSFER PATHWAYS?

The Ohio Guaranteed Transfer Pathways are designed to provide a clearer path to degree completion for students pursuing associate degrees at Ohio's public community colleges with plans to transfer to Ohio public universities to complete their bachelor's degrees. The Ohio Guaranteed Transfer Pathways also constitute agreements between public community colleges and universities confirming that community college courses meet major preparation requirements and will be counted and applied toward the bachelor's degree. Students still must meet all university program admission requirements.

Because the Ohio Guaranteed Transfer Pathways align college majors to entry-level math courses, these also are useful for school counselors when advising students about which courses to take in high school, including those students who are planning to enter directly into four-year institutions directly after graduation. Students can search transferable courses by major, academic cluster or even institution. More information can be found on the [Ohio's Transfer to Degree Guarantee webpage](#).

### HOW CAN COLLEGE CREDIT PLUS SUPPORT A STUDENT'S PATHWAY TO GRADUATION?

College Credit Plus can be a life-changing opportunity for Ohio's high school students. Students who otherwise would not have access to college coursework can experience the rigors of college coursework and begin to accrue credits toward a degree. Some students even have the opportunity to earn degrees while in high school.

As school leaders explore the connections between College Credit Plus coursework and Ohio's Math Pathways, these courses can more directly align to a student's intended post-high school pathway. Building intentional pathways through a student's math pathway into a college math course within the College Credit Plus program can provide direct connections between a student's learning and his or her future aspirations.

### HOW CAN THE OHIO GUARANTEED TRANSFER PATHWAYS HELP COLLEGE CREDIT PLUS STUDENTS?

College Credit Plus is Ohio's dual enrollment program, where students in grades 7-12 can earn both high school and college credits. Since the Ohio Guaranteed Transfer Pathways map out the first two years of coursework for multiple programs across the state, Ohio Guaranteed Transfer Pathways can give College Credit Plus students excellent direction in the exact courses they will need to take to complete degrees. If students know their career interests, students and advisers can use Ohio Guaranteed Transfer Pathways to plan for the coursework toward the degree program of their choice, which will ensure a seamless transition to public colleges or universities in Ohio. Students can get a great head start by planning early and starting on this path while still in high school.

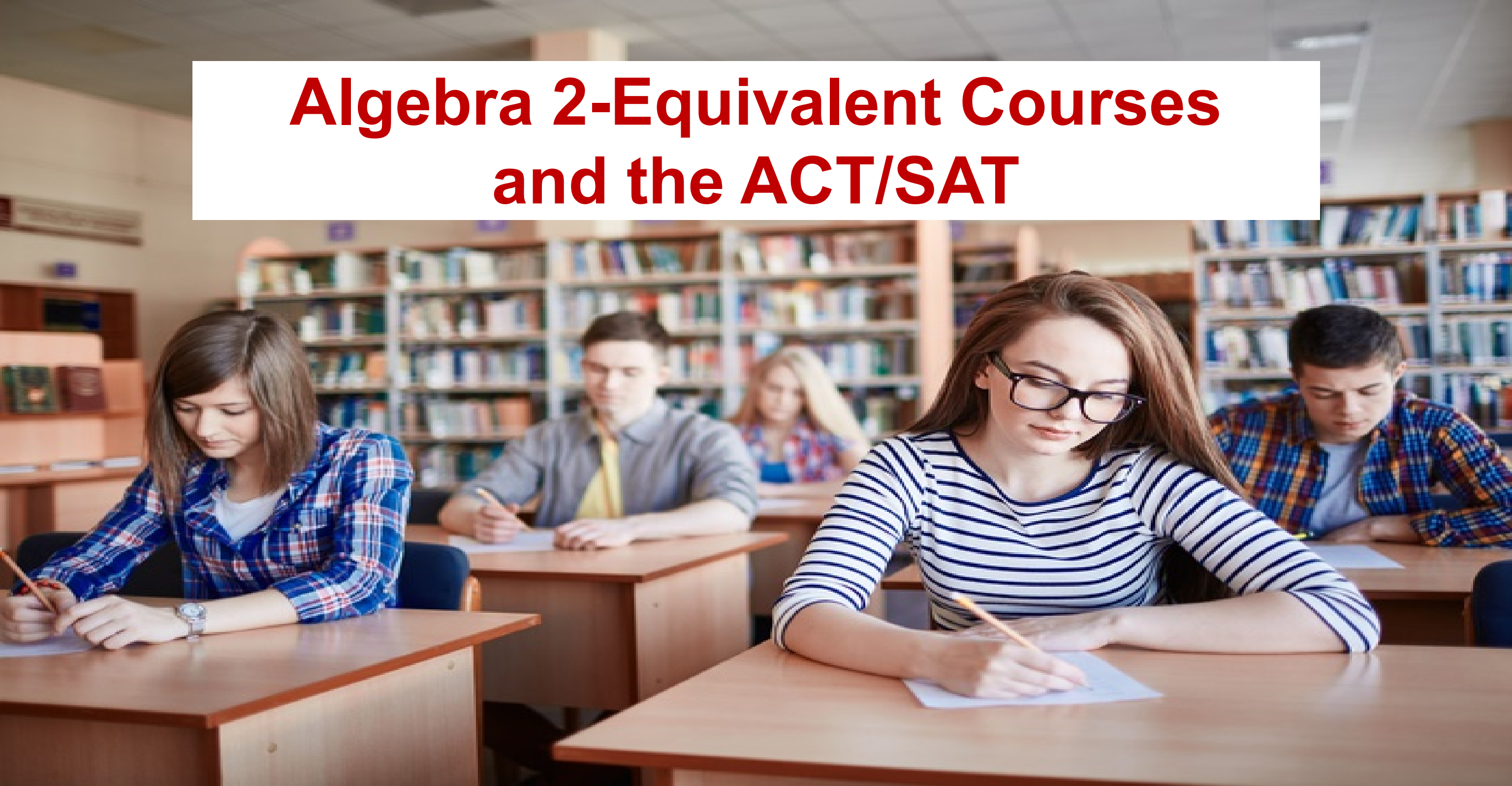
# WHAT ARE THE OHIO GUARANTEED TRANSFER PATHWAYS?

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# HOW CAN THE OHIO GUARANTEED TRANSFER PATHWAYS HELP COLLEGE CREDIT PLUS STUDENTS?

# WHAT ARE APPROPRIATE COLLEGE CREDIT PLUS MATH COURSES FOR STUDENTS TO TAKE BASED ON THE ALGEBRA 2 EQUIVALENCY COURSE?

# Algebra 2-Equivalent Courses and the ACT/SAT



# Algebra 2- Equivalent Courses and the ACT/SAT

## Algebra 2-Equivalent Courses and the ACT/SAT

### INTRODUCTION

More university systems are moving away from using standardized tests, such as the ACT/SAT, in admissions as there has been growing research indicating measures other than the ACT/SAT, such as grade-point average, are better predictors of student success in postsecondary institutions (Morrison, 2020). This move away from standardized testing and placement has been accelerated since the COVID-19 pandemic. Although there is movement in this direction, the Ohio Department of Education realizes the ACT and SAT still are factors for many students. This guide can help educators, parents and students navigate the ACT and SAT test blueprints and standards for Algebra 2-equivalency courses.

Equivalency to Algebra 2 is defined in terms of  [rigor](#) not content. All the new math pathways courses promote critical thinking and analysis needed for standardized testing such as the ACT and SAT. No single course, not even Algebra 2, incorporates all tested standards. It is recommended ACT and SAT prep occur naturally in conversations throughout the lessons reviewing application of previously learned content. Analyzing the [ACT College and Career Readiness Standards](#) and [ACT Blueprint](#) and [SAT Blueprint](#), students who have been successful in Algebra and Geometry should be able to get a [remediation-free score in mathematics](#) (ACT of 22, SAT of 530, Accuplacer NextGen 263). Students aiming for top scores on standardized tests such as the ACT and SAT will need exposure to a variety of courses, including Algebra 2 and an equivalent course that covers advanced statistics concepts. See the individual test blueprints for more information.

### DETAILS ABOUT INDIVIDUAL COURSES

**Advanced Quantitative Reasoning.** Ohio's Quantitative Reasoning course, titled Mathematical Modeling and Reasoning, is equivalent to a traditional Algebra 2 course that prepares students for college and careers in the areas of critical thinking and mathematical reasoning. This course more closely aligns with the ACT than the other new math pathways courses. This is because this course was designed to help students obtain a remediation-free score in mathematics. The Quantitative Reasoning workgroup looked closely at the ACT and Accuplacer NextGen QAS blueprints when designing the course. Although this course does not cover all the ACT standards associated with Algebra 2 (such as those associated with complex numbers), it covers a variety of other ACT standards not associated with Algebra 2 (such as the statistics standards). Additionally, this course could help students with modeling questions on the ACT, which are at least 27% of total test items. For more information, see the Mathematical Modeling and Reasoning and ACT alignment document (link coming soon). Please note most tested topics on the ACT and SAT are introduced in middle school math courses, Algebra I and Geometry. A significantly smaller portion of tested items comes from higher-level math courses.

Ohio's Mathematical Modeling and Reasoning course was not intentionally aligned with the SAT. There may be some gaps when it comes to the Passport to Advanced Mathematics section, but students should gain ground in the Statistics and Probability section.

Questions?



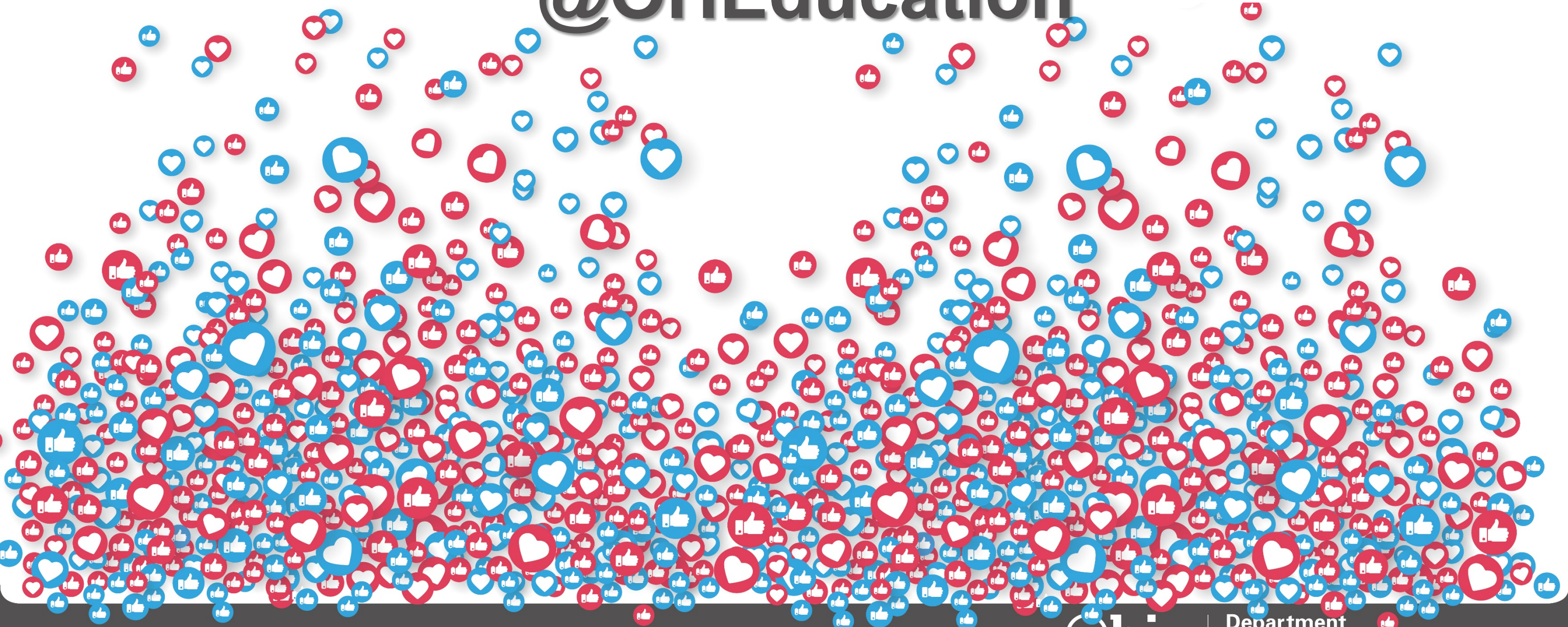


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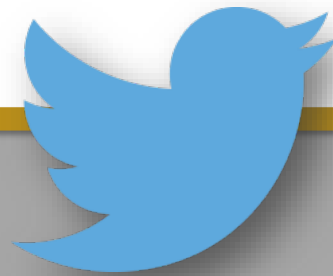


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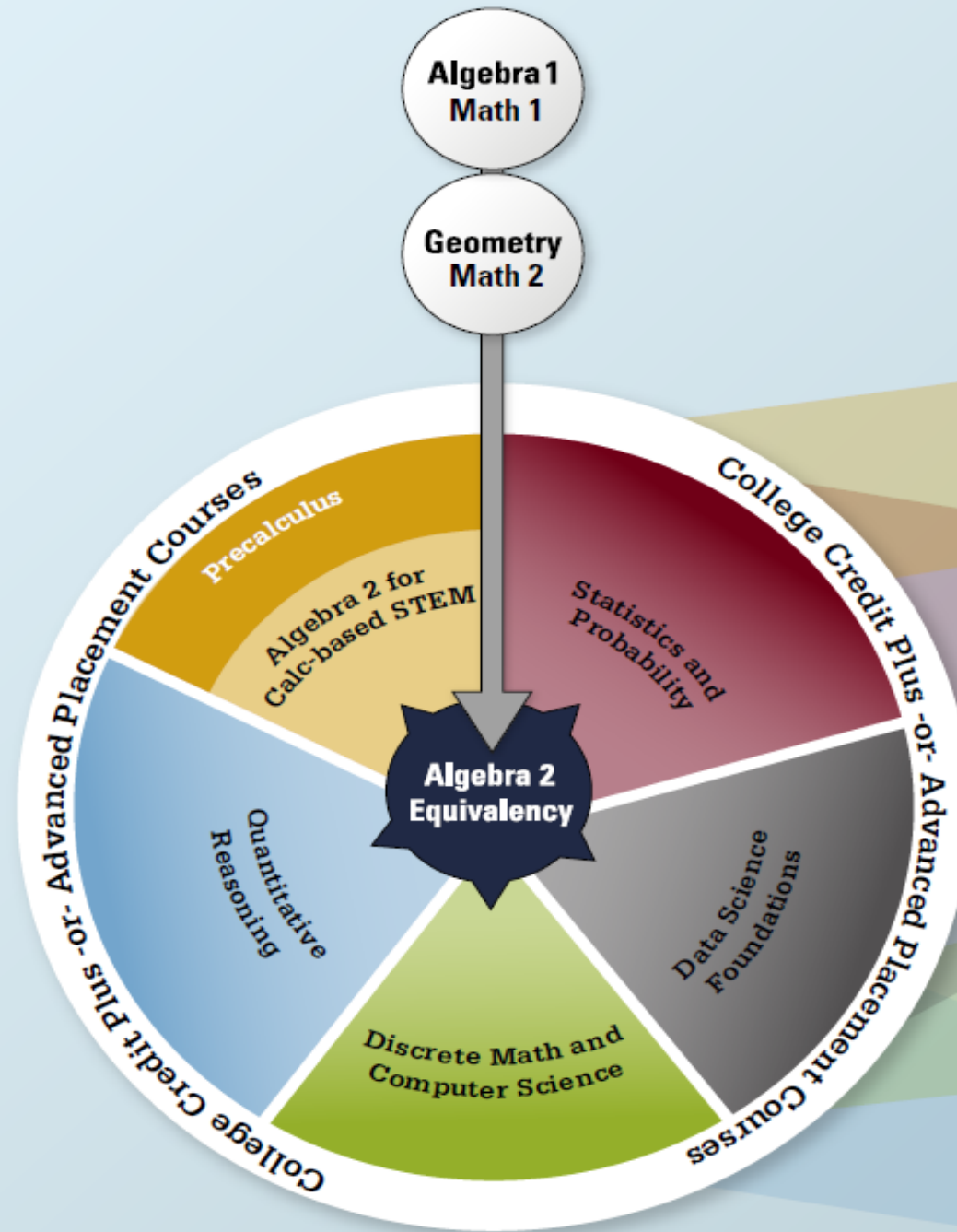
**Celebrate educators!**

**#OhioLovesTeachers**

# Ohio's High School Math Pathways

## Math Pathways

**ALL**  
Pathways are college preparatory



### Potential Careers

#### Algebra 2

Doctor/Veterinarian	Financial Manager
Engineer	Scientist
Farm Manager	

#### Statistics and Probability

Human Resource Manager	Political Scientist
Medical Technician	Social Worker
Nurse	Firefighter

#### Data Science and Foundations

Software Quality Assurance	Public Relations Specialist
Journalist	Sales Representative
Marketing Research Analyst	

#### Discrete Math / Computer Science

Computer Systems Analyst	Software Developer
Computer Support Specialist	Web Developer
Cybersecurity Analyst	

#### Quantitative Reasoning

Elementary School Teacher	Musical Composer
Graphic Designer	Technical Writer/Editor
Lighting/Set Designer	Construction Tradesperson

Districts may offer 1 or more courses listed in addition to Algebra 2.