

About the Dana Center



The **Charles A. Dana Center** at The University of Texas at Austin works with our nation's education systems to ensure that every student leaves school prepared for success in postsecondary education and the contemporary workplace.

Our work, based on research and two decades of experience, focuses on K–16 mathematics and science education with an emphasis on strategies for improving student engagement, motivation, persistence, and achievement.

We develop innovative curricula, tools, protocols, and instructional supports and deliver powerful instructional and leadership development.

Addressing the Crisis in Developmental Mathematics and College Readiness

Susan Hudson Hull
Director, Mathematics
Charles A. Dana Center
The University of Texas at Austin

NCTM Annual Conference, Denver
April 20, 2013

The Charles A. Dana Center

at the University of Texas at Austin © 2012

There are serious disconnects HS→Higher Ed

- HE: 67% of community college students are referred to one or more developmental math courses (and 80%+ in some systems)
- HE: Developmental education is broken...
 - 33% complete the developmental sequence
 - 20% complete a gateway math course
 - 25% or less go on to earn a CC credential or transfer to 4-yr univ

“Developmental math is a burial ground for the aspirations of myriad students.” -- Uri Treisman

There are serious disconnects HS→Higher Ed

HS preparation often has not led to college readiness

“Well, I think the biggest thing for them is, here, they’ve graduated from high school but they come and take our placement test and they’re still in pre-college ... math and they don’t understand that if they stop taking math in their sophomore year that, you know, they don’t get it...

and I think the sad thing is that they say... *‘no one told me that I should be taking math all the way through’.*”

-community college advisor (Stanford University Project report, 2004)

There are serious disconnects HS→Higher Ed

- 80% of NYC students are deemed not “college ready” on graduation
- Estimates are that 2/3 of students will be deemed not “college ready” on PARCC, SBAC
- A significant number of states are moving to prohibit students who are not “college ready” from receiving financial aid

What is college readiness?

However...20% of students are “severely misidentified” and placed into remediation (they could have passed entry college courses with B or better). -Ed Week, Feb 20, 2013

Needed: A several-pronged approach to smooth transition HS → Higher Ed

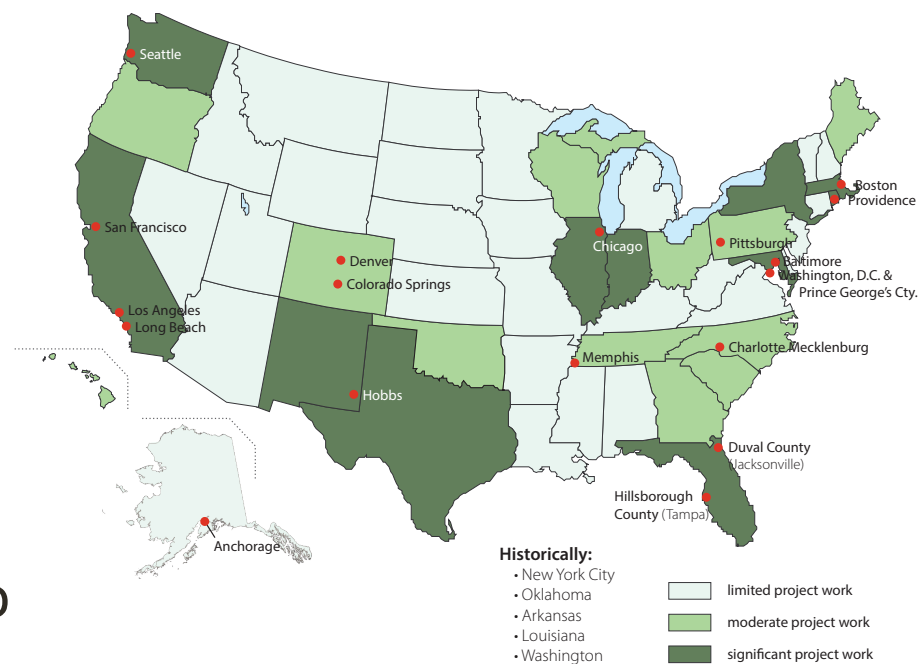
- Redesign higher education remediation at scale: the Dana Center's New Mathways Project
- Support CCSSM implementation to provide college-ready mathematics for all students
- Introduce a new breed of 4th-year high school mathematics courses that provide an additional pathway into college readiness
- Work in the policy sphere to ensure students can transition successfully

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Charles A. Dana Center at the University of Texas at Austin

- Over 20 years of state and national leadership in mathematics education
- Dana Center staff include math educators K-16, policy experts, student success experts
- Brings proven tools and processes to support districts to successfully implement the CCSS



New Mathways Project: Setting the agenda

Charles A. Dana Center at the University of Texas at Austin

- Led development of original curricula for pathways to college success —Statway and Quantway—in partnership with the Carnegie Foundation

Texas Association of Community Colleges

- Represents all 50 community college systems in Texas
- Represents the interests of community colleges in state policymaking and budgeting

A unique partnership of colleges setting the agenda for reform

- addresses issues from the classroom to state policy
- allows for collaboration and input from people at all levels of the system

NMP: Four fundamental principles

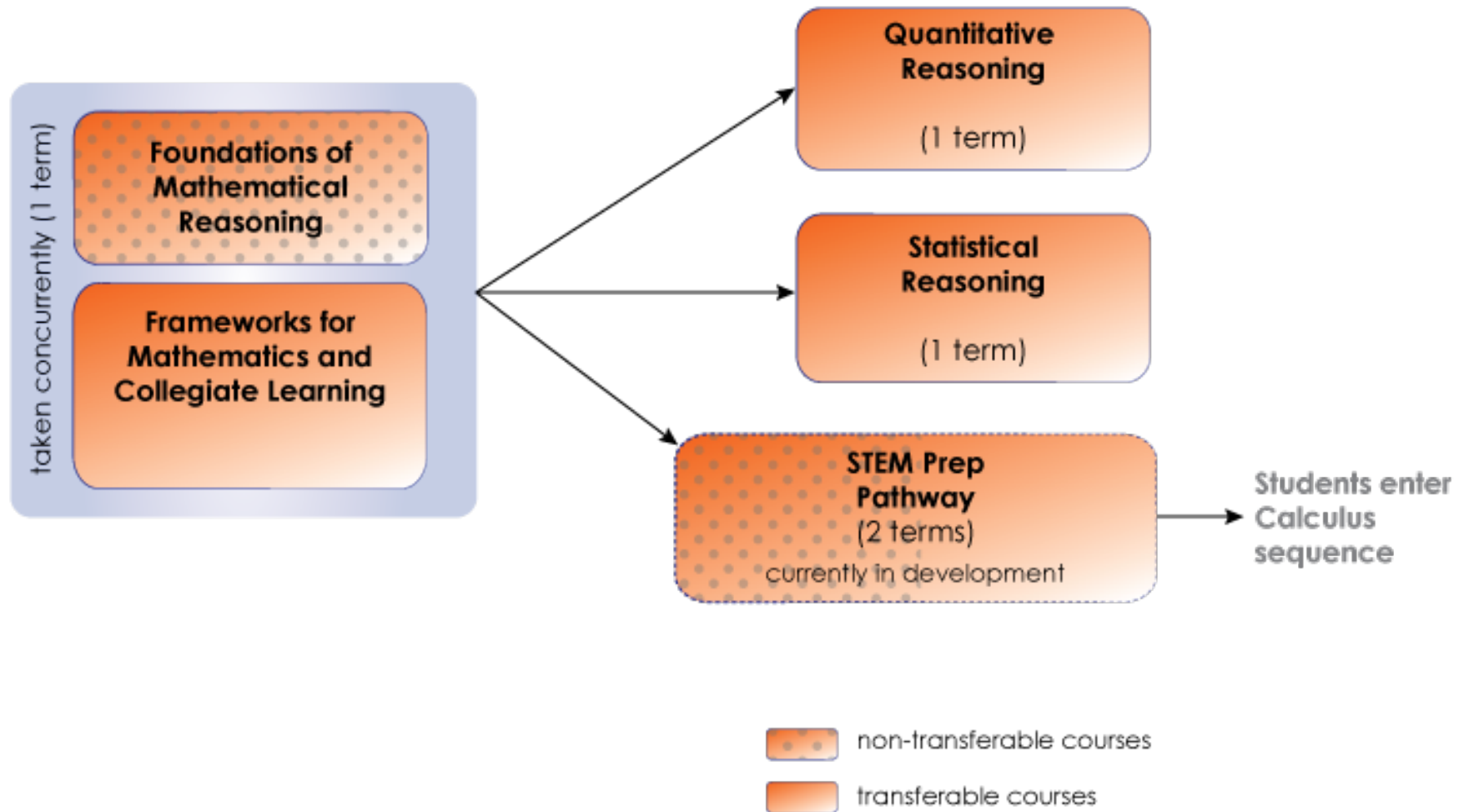
A systemic approach to improving student success and completion by reforming developmental and gateway mathematics:

1. **Multiple pathways** with relevant and challenging mathematics content aligned to specific fields of study
2. **Acceleration** that allows students to complete a college-level math course within 1 year—more quickly than in the traditional developmental math sequence.
3. **Intentional use of strategies** to help students develop skills as learners and experience college success
4. **Curriculum design and pedagogy** based on proven practice

We strongly believe that early college mathematics, whether it is developmental or college-level, should focus on preparing students for their programs of study, not on reteaching a full high school curriculum.

Charles A. Dana Center
Higher Ed Issue Brief #1
June 2012

The NMP Courses



Dana Center's Role

- State level: Broadly support reform based on the four principles
- Institutional level: Build tools and services that help colleges implement systemic reform
- Faculty and classroom level: Develop materials and services to support on-the-ground implementation based on input from and engagement with community college faculty and staff

Working with Colleges

- **Codevelopment partners (9):** Participate in original development of materials and services; first to implement; take a leadership role in supporting other colleges
- **Active Learning Sites:** Implement one to two years later; prepare for implementation through a mentoring relationship with codevelopment partners
- **Capacity Building Sites:** Implement three to four years later; focused on informing faculty and building buy-in

Key Characteristics of NMP Courses

- **Common entry point:** Students create a completion plan and, through a structured process in the student success course, select the appropriate math pathway
- Pathways designed to **create a coherent and consistent experience** for students and reinforce retention across terms
- **Student success strategies are embedded** in math courses to apply and reinforce concepts from the student success course
- Strong **embedded support for instructors** is provided.
- **College-level content is integrated into the Foundations course** so that students are challenged and engaged
- Courses are designed to support the development of **strong reasoning and problem-solving skills**

NMP Co-Requisite Courses: Term 1

- Foundations of Mathematical Reasoning (pre-college)
 - Develop foundational skills and conceptual understanding in the context of college-level course material
 - Numeracy, proportional reasoning, algebraic reasoning, descriptive statistics, and basic probability and modeling
- Frameworks for Mathematics and Collegiate Learning
 - College-level learning frameworks course
 - Concepts from learning sciences for students to acquire strategies and tenacity necessary to succeed in math, other college coursework, and future careers
 - Concepts will be applied, practiced, and reinforced in math courses

Key Resources under development for NMP

- Curricular resources for each course
- Professional learning opportunities – general and specific to the NMP course materials
- Technical assistance tools and services

Timeline for Development and Implementation

Courses	First Implementation	Publically Available
Frameworks for Mathematics and Collegiate Learning*	Spring 2013	Fall 2013
Foundations of Mathematical Reasoning	Fall 2013	Fall 2014
Statistical Reasoning	Spring 2014	Spring 2015
Quantitative Reasoning	Spring 2015	Spring 2016
STEM-Prep and bridge course	Spring 2016	Spring 2017

*A PDF version of the Frameworks course will be published for open use.

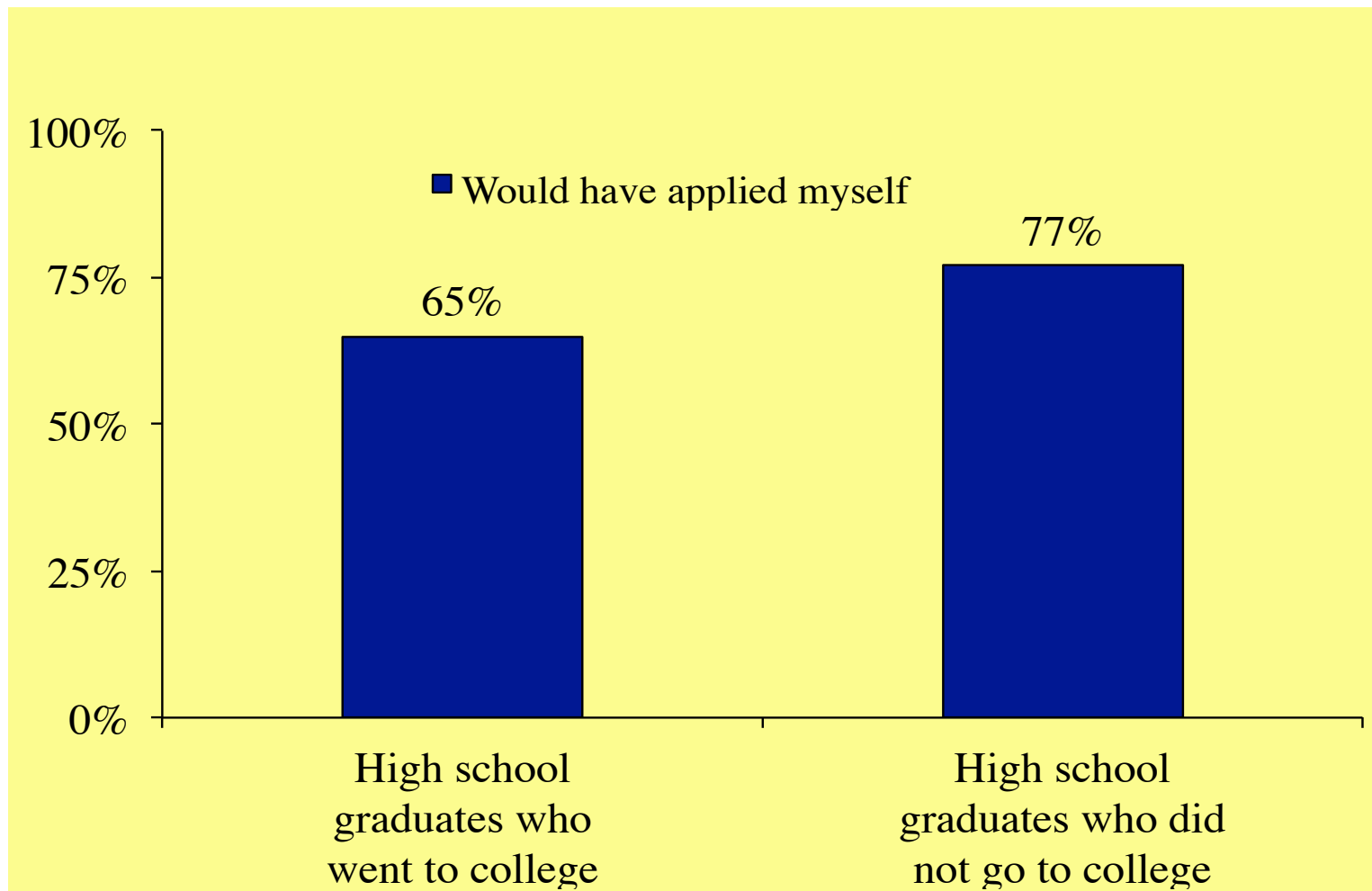
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CCSSM: College and work ready on graduation

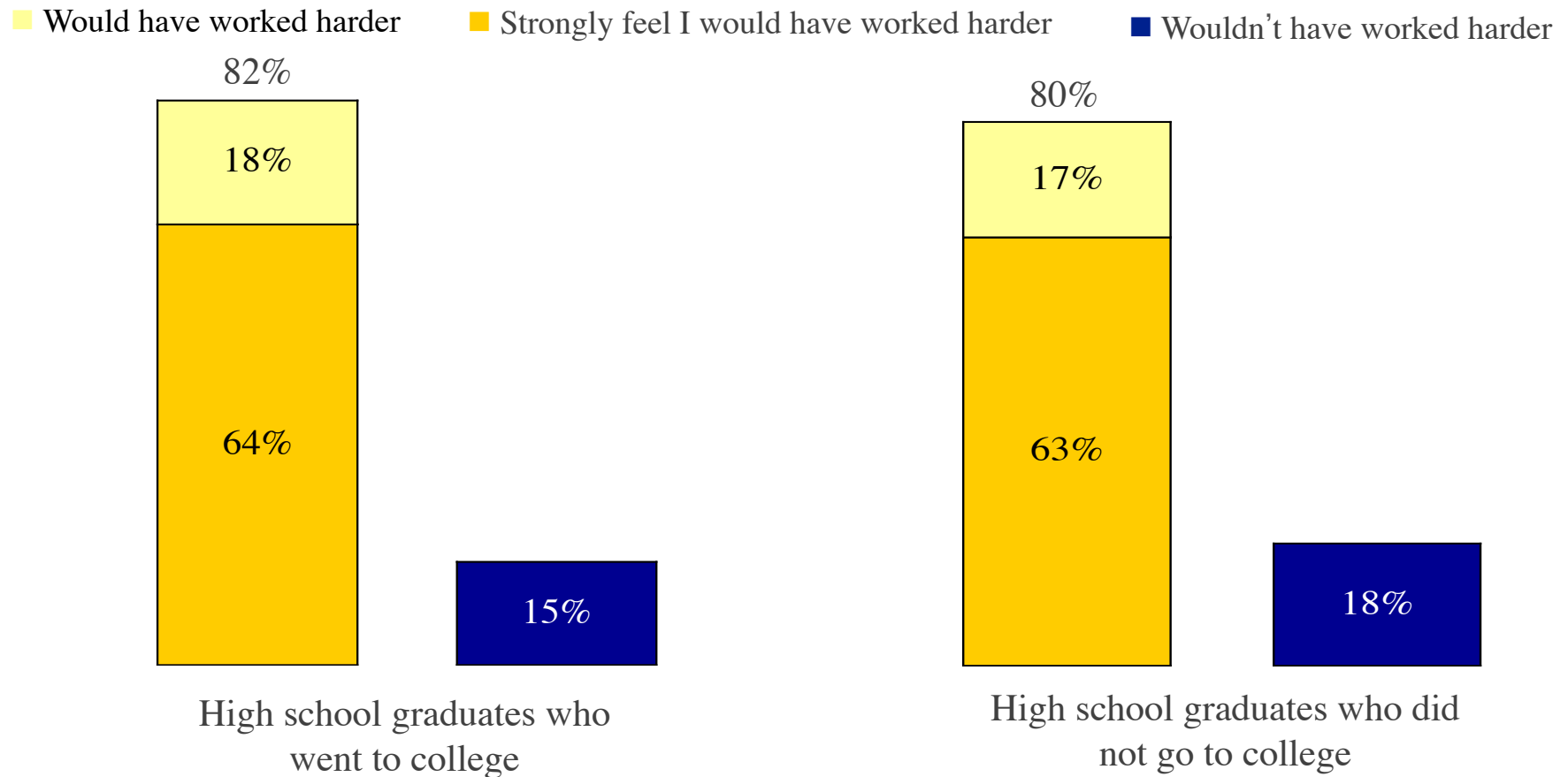
“... all students must have the opportunity to learn and meet the same high standards if they are to access the knowledge and skills necessary in their post-school lives.” -CCSSM,

Knowing what they know today, high school graduates would have worked harder



Source: Peter D. Hart Research Associates/Public Opinion Strategies, *Rising to the Challenge: Are High School Graduates Prepared for College and Work?* prepared for Achieve, Inc., 2005.

If high school had demanded more, graduates would have worked harder



Source: Peter D. Hart Research Associates/Public Opinion Strategies, *Rising to the Challenge: Are High School Graduates Prepared for College and Work?* prepared for Achieve, Inc., 2005.

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Achieve, 2005

Majority of graduates would have taken harder courses

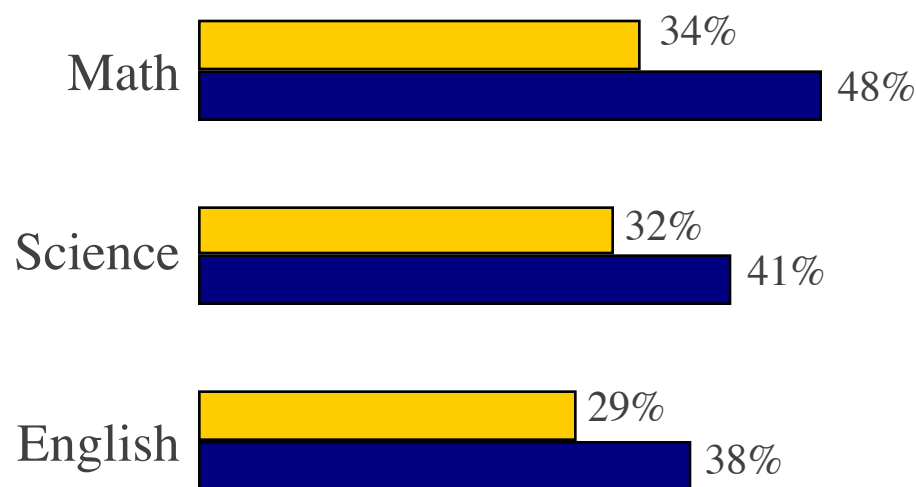
Knowing what you know today about the expectations of college/work ...

Would have taken more challenging courses in at least one area

□ College students
■ Students who did not go to college



Would have taken more challenging courses in:



Source: Peter D. Hart Research Associates/Public Opinion Strategies, *Rising to the Challenge: Are High School Graduates Prepared for College and Work?* prepared for Achieve, Inc., 2005.

Achieve, 2005

CCSSM: Raising the bar for college and work readiness on graduation

“A college and workplace readiness curriculum should be a graduation requirement, not an option, for all high school students.” -Achieve, 2004

Dana Center K-12 work: Supporting implementation of the CCSS (ie, ensuring college readiness) in every classroom for every student

- District commitment and structures to support teaching and learning CCSS
- Common understanding of the CCSSM and its vertical alignment
- Teacher collaboration around aligned curriculum
- Assessments for teaching and learning
- Resources that support teaching and learning the CCSSM
- Resources that reshape students' academic **identities**, enhance academic engagement, and transform student achievement



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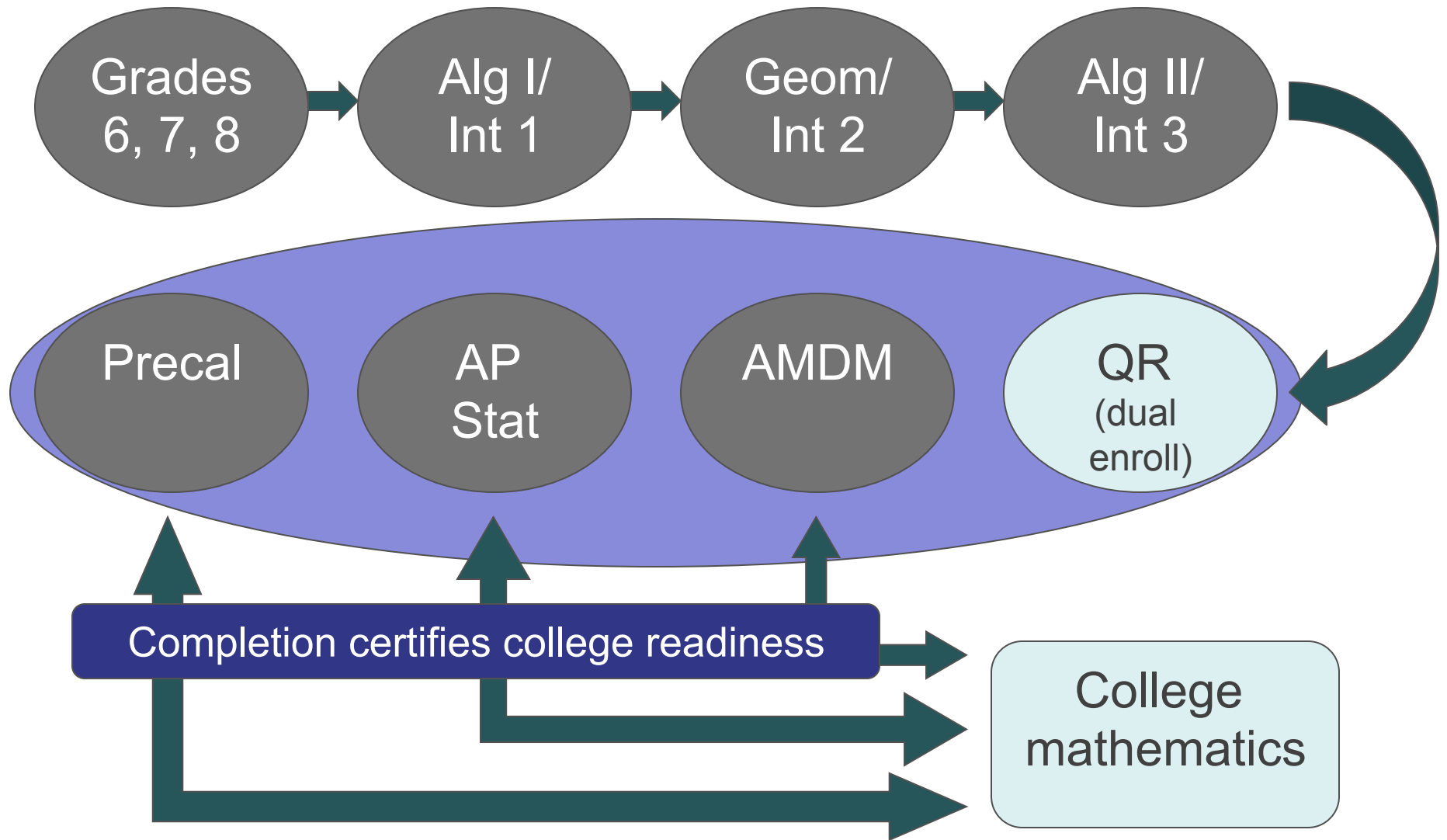
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Why new pathways to college readiness?

It is important to note the limitations of current placement tests in accurately identifying student academic skills as well as the absence of examination of other student characteristics like noncognitive skills and prior academic performance in the placement process.

Charles A. Dana Center
Higher Ed Issue Brief #2
July 2012

4th-year HS courses: Pathways to college readiness



Quantitative Reasoning: A proposed new dual enrollment course

If the goal of college readiness is for students to succeed in college-level courses, students need access to—and experience in—college-level courses.

Quantitative Reasoning: A proposed new dual enrollment course

- Similar outcomes as college-level QR courses
- Content meaningful to students professional, civic, and personal lives
- Develops skills in interpreting, understanding, and using quantitative information
- Teaches algebraic and modeling skills through quantitative literacy lens
- Emphasizes critical thinking and strategic reasoning
- Designed for non-STEM intending students

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Working through policy issues for smooth transitions

- Goal is to align the work of the CCSSM with higher education policies so students can transition successfully
- Essential to create new pathways for students to be college ready upon graduation so need support of HS and HE
- Given in the past...
 - Historical disconnections between K-12 and higher education
 - Few incentives for K-12 and higher ed to collaborate
- Essential to work in the policy sphere with Education Commission of the States, Complete College America, Education First, NCTM, and others
- Core Principles for Transforming Remedial Education: A Joint Statement, Dec, 2012

College readiness is a continuum, not an event.

Charles A. Dana Center
Higher Ed Issue Brief #2
July 2012

Contact Information

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