

PWR Act

Transitional Math

Kathleen Almy
Research Associate, Mathematics
Center for P20 Engagement
Northern Illinois University



Today's plan

1. Overview of PWR Act and transitional math
2. A closer look with a focus on administrative and student services issues
3. Q&A

Postsecondary and Workforce Readiness Act (PWR Act)

Public Act 99-0674 (HB 5729); signed by Governor on 7/29/16

1. Postsecondary and Career Expectations (PaCE)
2. Pilot of Competency-based High School Graduation Requirements
3. College and Career Pathway Endorsements on High School Diplomas
- 4. Transitional Math Courses**
 - 4th year high school math courses designed to smooth transition to college and reduce remediation rates
 - Not dual credit or AP courses
 - Not for college credit

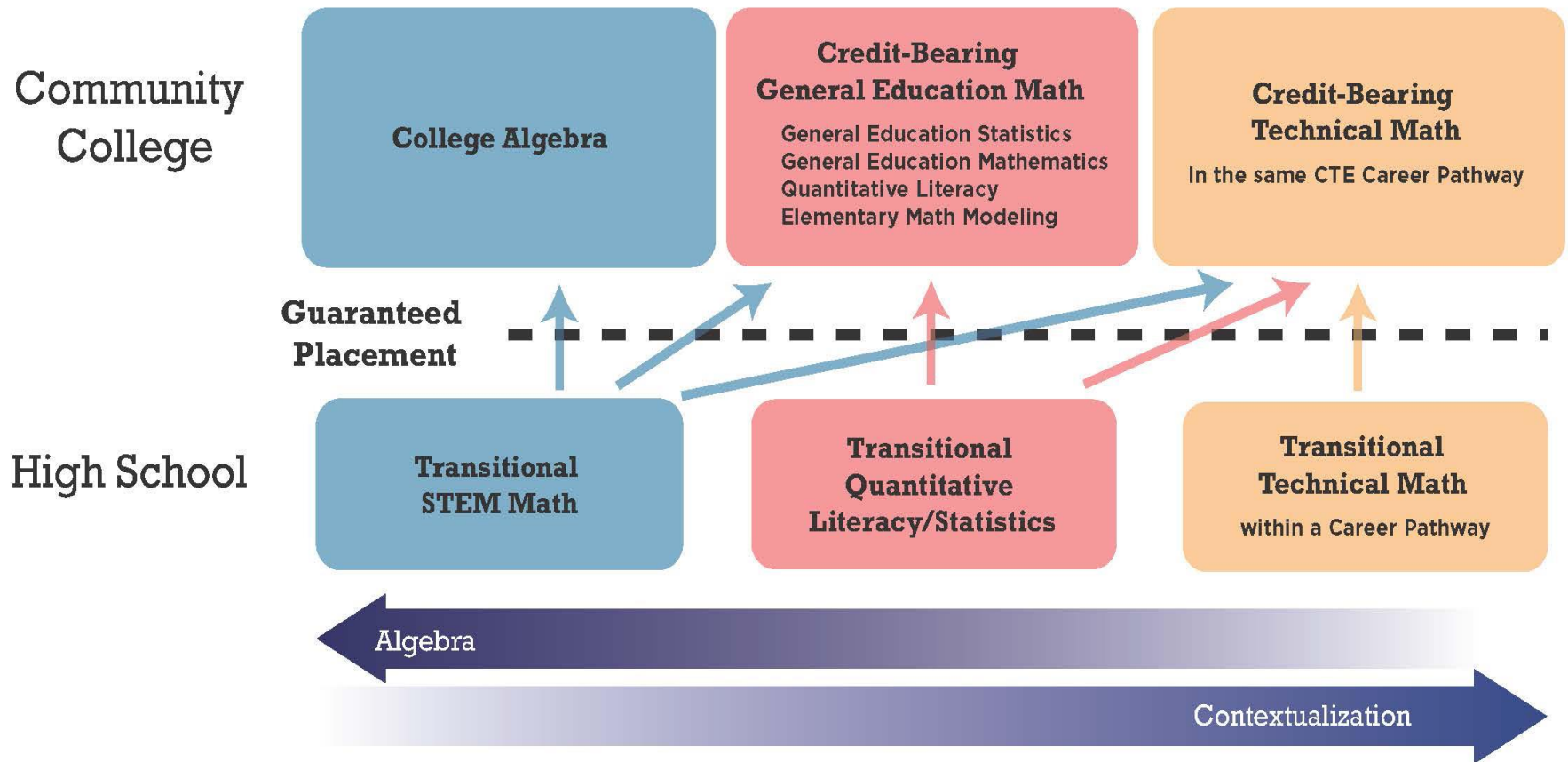
Transitional Math Courses Overview

Comprised of 3 pathways related to career pathways (**meta majors**):
STEM, QL/Statistics, and Technical Math

- High school courses designed to provide **guaranteed placement** at IL community colleges (without a placement test)
- Developed and administered through **high school and college partnerships**
- **Portability** beyond local colleges when they meet statewide criteria
- Provides schools **flexibility** with implementation
- **Statewide scaling** over next 4-5 years
- Work in conjunction with **co-requisite** redesigns
- Align with the **Common Core/Illinois Learning Standards**

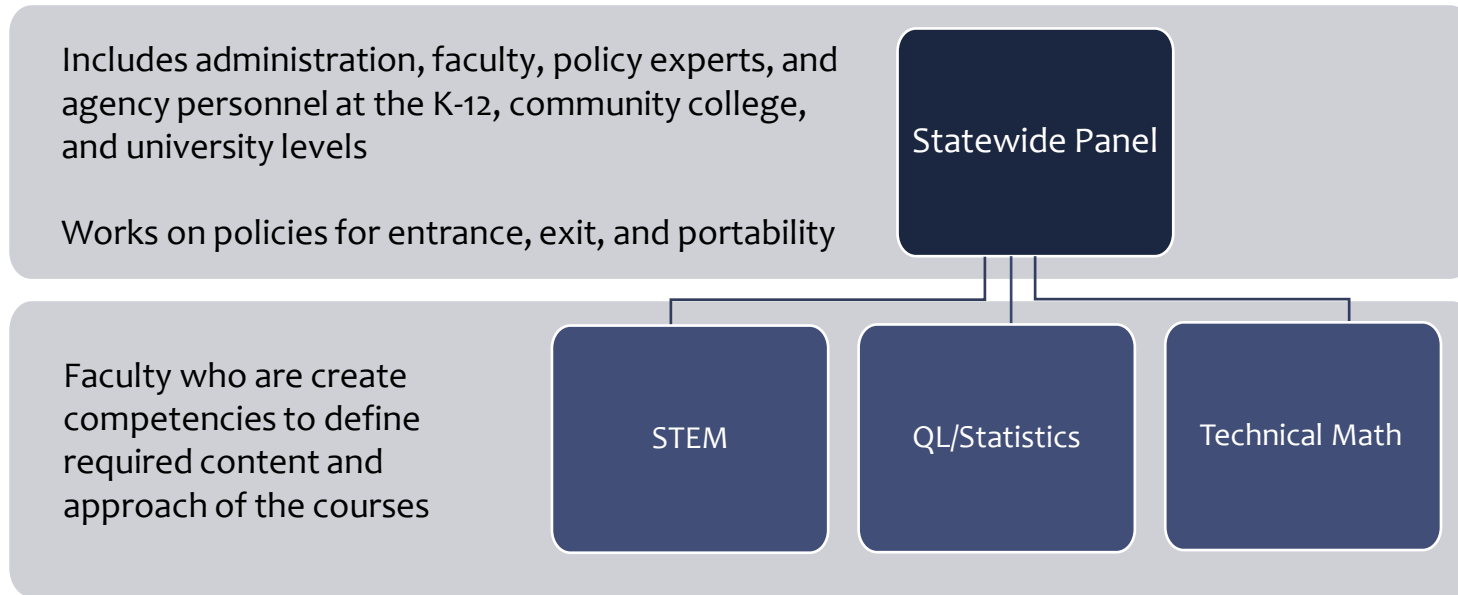
Rethinking Math: 12th Grade to 1st Year College

Transitional Math Pathways



Students who change to a path requiring more algebra may take a placement test or use alternative options, such as bridge courses or co-requisite courses, to accelerate that change.

Transitional Math Courses & Policy Development



Transitional Math Logistics

- Students must have met graduation requirement to take transitional math
(investigating options for this)
- Placement lasts 18 months after receiving it
- Students do not have to take a placement test at the end of the course
 - Schools can use placement tests as a component of assessment of courses
- Courses will be transcribed at high school and college level
(details still to be determined)
- Approval of courses will be done at the state level
 - Verify competencies and policies are met
 - Similar to IAI but not identical

Factors critical to transitional math success

- MOU establishing expectations that have been agreed upon by HS and CC
- Training and ongoing support for teachers
- Comprehensive advising approach
- Evaluation and improvement of courses over time
 - Requires a working relationship between HS and CC

Why?

Disclaimers

Issues of remediation and college readiness are shared concerns. There is no single group responsible for the current state.



9th – 11th grade

Freshman year
of college

Satisfying graduation requirements \neq College readiness as measured by 1 test

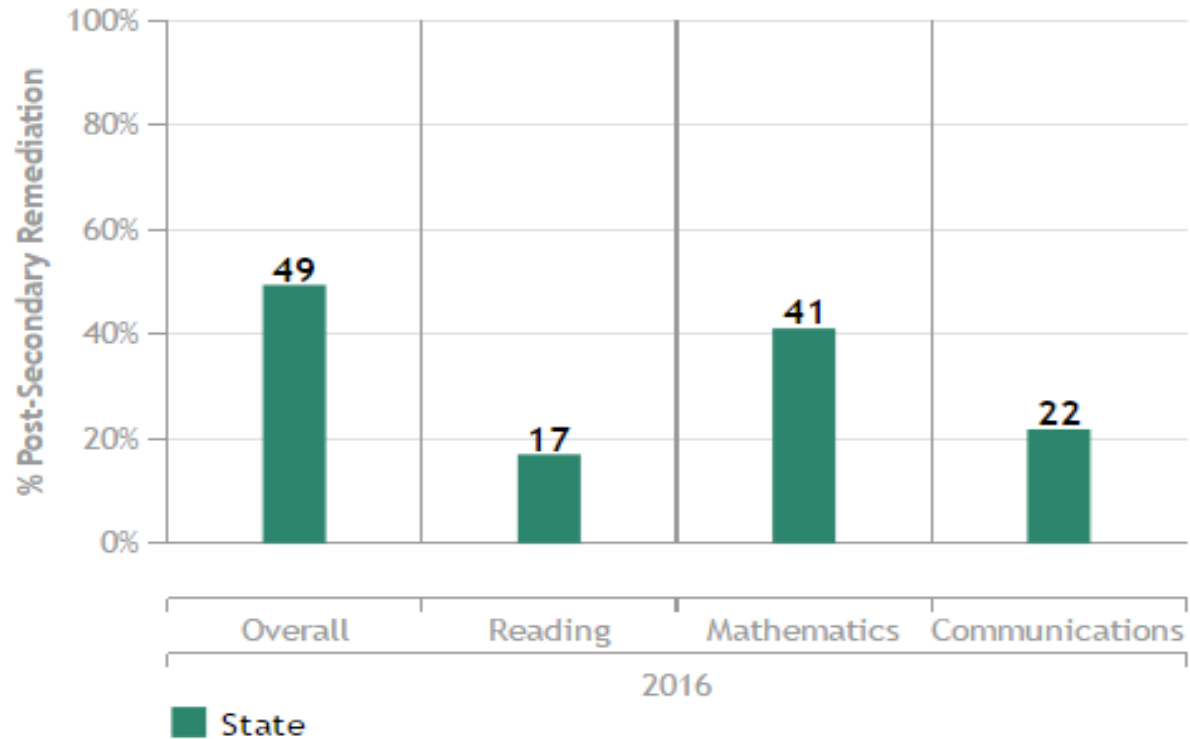


9th – 11th grade

Freshman year
of college

Placement test underplaces many students
End up in dev ed focused on college algebra prep
Only 10 – 11% make it through a credit bearing course eventually

Remediation Rates in Community College



Class of 2014

	State
Graduates (N)	132,661
Attending Illinois Community Colleges (N)	42,256
Attending Illinois Community Colleges (%)	31.9%
Enrolled in Remedial Courses (N)	20,894
Enrolled in Remedial Courses (%)	49.4%

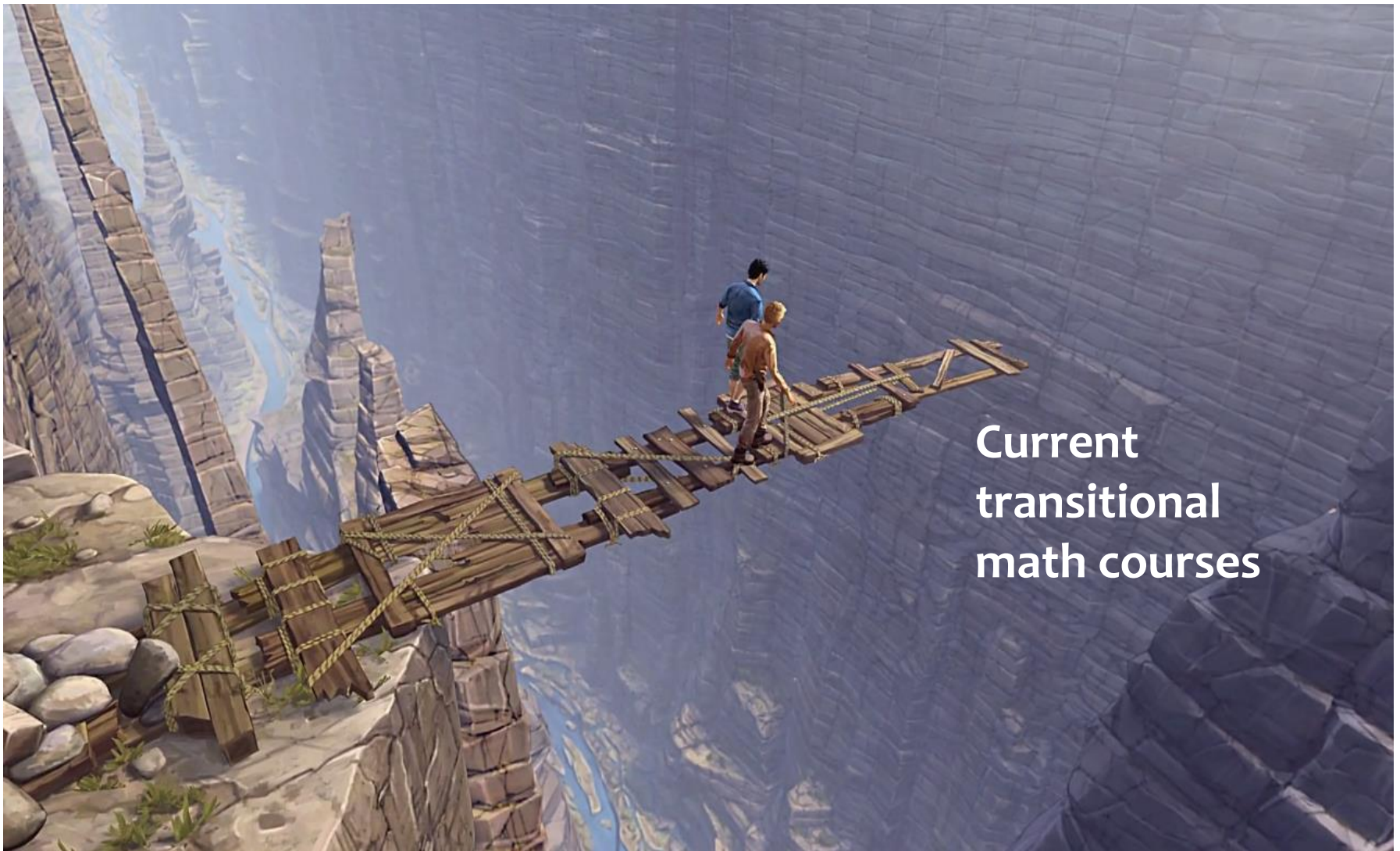
Source:
Illinois
Report Card

Assessment and Placement Research

By: Clive Belfield & Peter M. Crosta — February 2012

New York: Community College Research Center, Teachers College, Columbia University

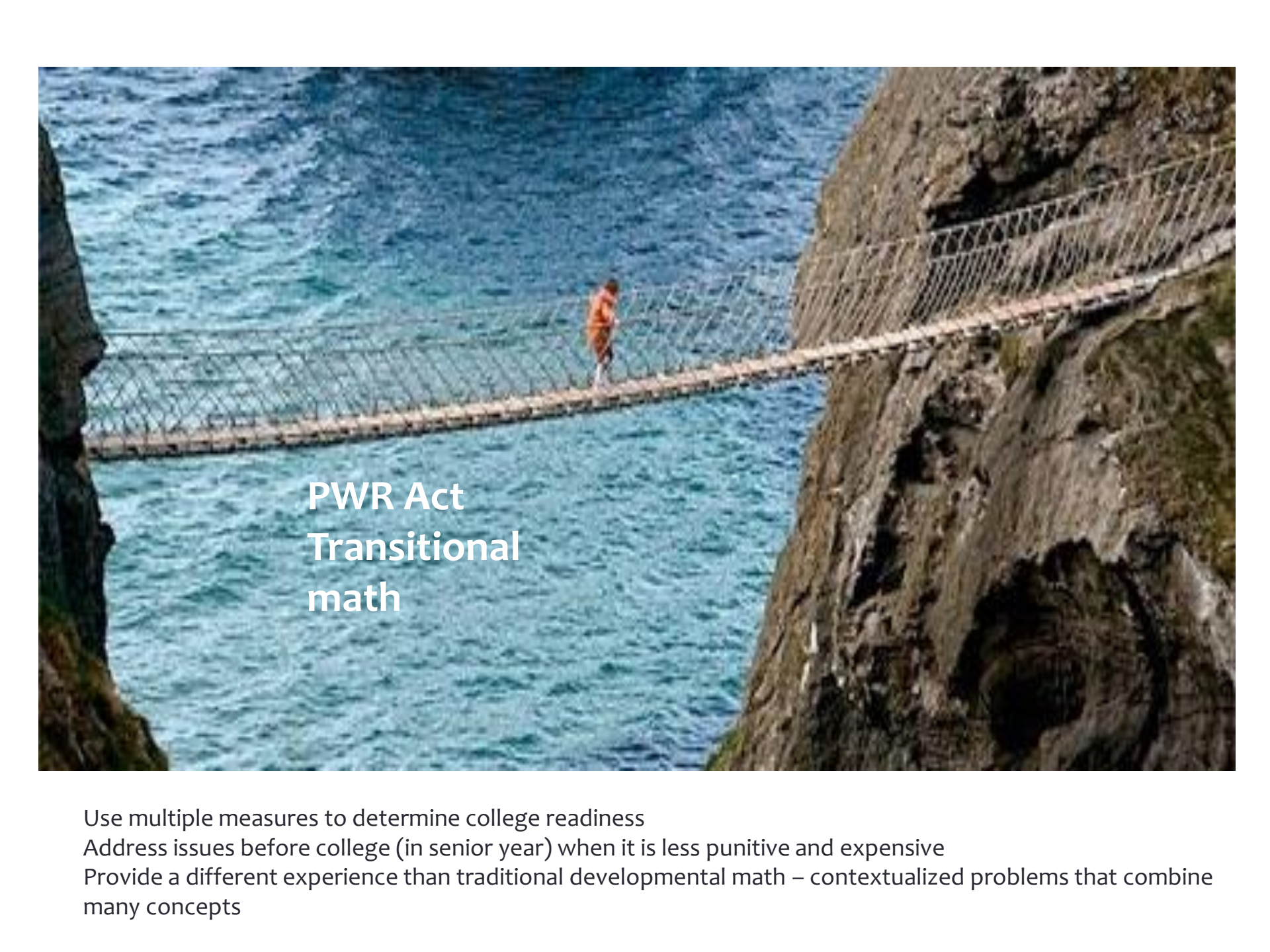
		Placement According to Exam	
		Developmental	College Level
Student Ability	Developmental	✓	Over-placed (English – 5%) (Math – 6%)
	College Level	Under-placed (English – 29%) (Math – 18%)	✓



Current transitional math courses

Some transitional math courses exist in IL as a natural evolution of college dev math reform
Done with local partnerships and grants

Issues: Not at scale, inconsistent approach, no portability

A photograph of a person walking across a suspension bridge over a body of water. The bridge is made of wooden planks and is supported by ropes. The water is blue and the surrounding cliffs are rocky. The text "PWR Act Transitional math" is overlaid on the image.

PWR Act Transitional math

Use multiple measures to determine college readiness
Address issues before college (in senior year) when it is less punitive and expensive
Provide a different experience than traditional developmental math – contextualized problems that combine many concepts

Moving forward

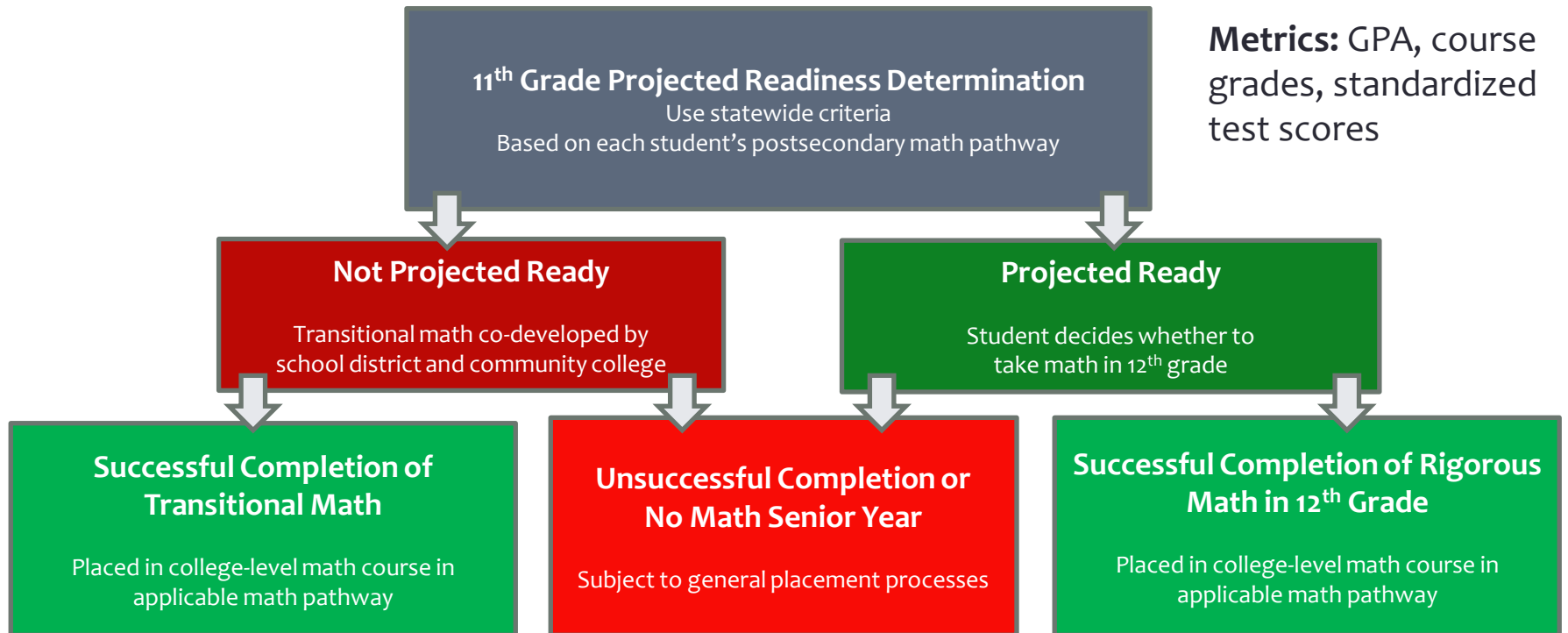
Things will change.

One group (HS or CC) cannot do it alone.

Everyone needs to come to the table to make this happen.

Who?

Junior year: determine college readiness



Advising matters

- Emphasize **students** choose a meta major
- Provide sample course maps for transitional math students
 - Especially important for STEM transitional students
- Encourage 4th year of math even more

Why would a student want to take a transitional math course?

- Avoid a placement test
- Save time and money when going to college
- Address the math weaknesses they have in interesting problems
- Students get to “do math”
 - See how math comes together and applies to their lives, work, and courses

Who can teach a transitional math course?

- A teacher must be certified to teach high school math.
 - HLC accreditation requirements applicable to CC faculty not applicable here
- Instruction can be integrated with other academic content or taught through a CBE model
 - A teacher in another academic area and a math teacher may have shared responsibility for instruction.
 - A teacher certified to teach high school math must have primary responsibility for determining if the transitional math competencies have been met.

What?

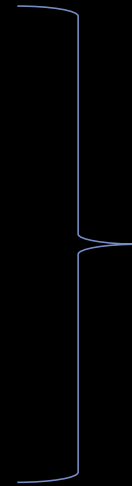
PWR Act Transitional Math: A new experience

- Designed for seniors to give them a different experience their last year (from first 3 years or traditional dev math)
- Integrate contextualized learning, problem solving, and college and career readiness
- Focus on complex problems, not just complex procedures

Readiness from a college math perspective: a working knowledge

Students can:

- Read and think critically
- Use mathematical skills
- Use technology
- Solve problems with words

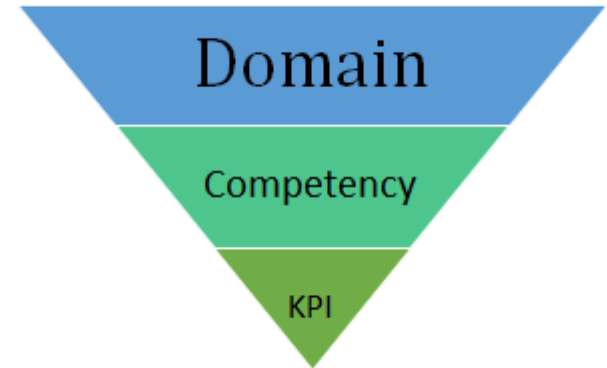


CONNECT
APPLY
RETAIN

NOTE: Traditional developmental math doesn't always address this either

Competencies vs. Standards

- Competencies are broad learning goals for a mathematical area called a domain
- Competencies illustrate how a student can integrate and apply skills in context for a domain
- Key performance indicators (KPI's) are more like standards
 - Emphasize higher elements of Bloom's taxonomy



Competencies define a core foundation with the ability to supplement for additional specific fields

Continuing the work of the Common Core

- Competencies align with CC/ILS
- Combine many skills in ways they were taught in CC but into bigger problems
 - Emphasize problems, not just exercises
- Use contexts relevant to a 17-year-old
- Emphasize content and process

Process Competencies: building college readiness

TM courses satisfy the **Common Core Standards for Mathematical Practice**:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Process Competencies: building college readiness

TM courses satisfy the non-cognitive skills outlined in the **Illinois Essential Employability Skills Framework.**

Personal Ethic	Work Ethic
Integrity Respect Perseverance Positive attitude	Dependability Professionalism
Teamwork	Communication
Critical thinking Effective and cooperative work	Active listening Clear communication

Quantitative Literacy and Statistics

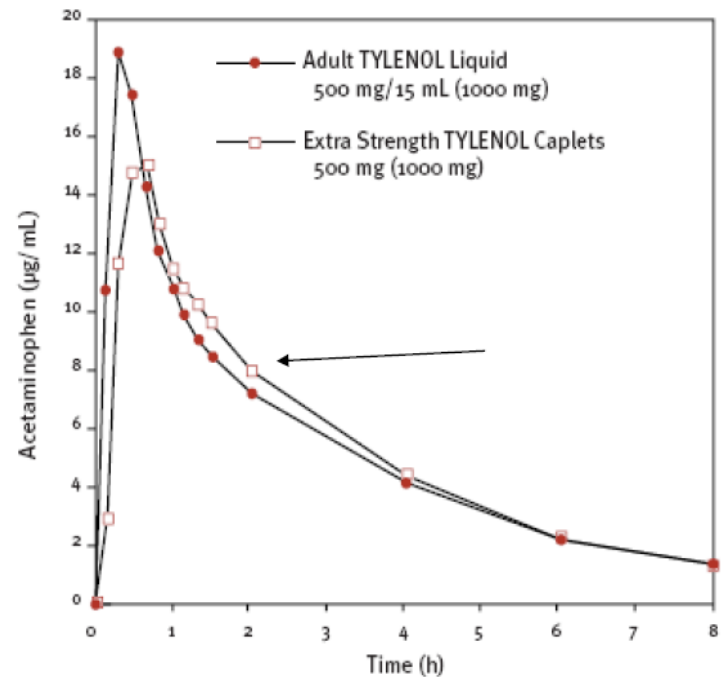
Aligns to PMGE courses like math literacy;
default pathway

Outcome course goal:

Use numeracy and basic algebra skills in
general education math courses

TM course emphasis:

Reading word-based problems and
determining the needed algebraic and
numeric concepts



Technical Math

Supports a smooth transition to a particular technical field and its math requirement

Outcome course goal:

Use numeracy in a technical math course

TM course emphasis:

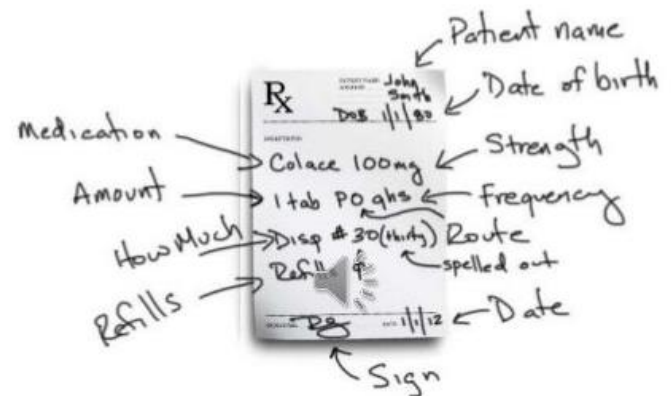
Using numeric skills easily in a variety of applied situations

A doctor orders dicloxacillin sodium 125 mg p.o. q.6.h. for a child who weighs 55 lb. The recommended dosage of dicloxacillin sodium for children weighing less than 40 kg is 12.5 to 25 mg/kg/day p.o. in equally divided doses q.6.h for moderate to severe infections. Is the dosage safe?

Abbreviation definitions

p.o. – medication is taken orally

q.6.h. – frequency of medication taken (every 6 hours in this case)



STEM

Develops and/or improves Algebra 2 skills while working in function contexts

Can be used as an Algebra 2 course or after one

Emphasis on problem solving, often in context, but also in non-contextualized situations

Outcome course goal:

Use algebra 2 skills and concepts successfully in a College Algebra class

TM course emphasis:

Transition from procedural algebra to graphical representations

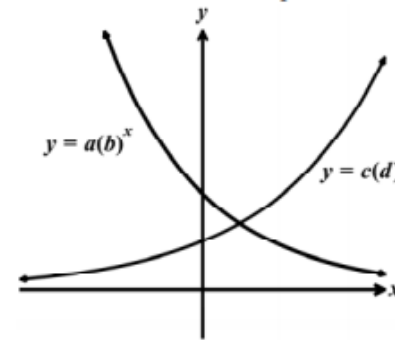
STEM

The graph below shows two exponential functions, with real number constants a , b , c , and d . Given the graphs, only one pair of the constants shown below could be equal in value. Determine which pair could be equal and explain your reasoning.

b and d

a and b

a and c



Source: eMathinstruction

Stacks of Cups Problem

You are the package design director for a paper products company that has decided to introduce different-sized paper cups in the general shape shown below as a new product line. Your design team has been given the assignment of designing a cardboard carton that could be used to package the cups for sale. Your supervisor has given you the following requirements.

All faces of the carton are to be rectangular.

The square base should be just large enough to accommodate a single stack of cups.

The height of your carton should be given as a function of the maximum number of cups it will hold, since the marketing director has not yet determined the number of cups that would be best to include for optimum sales.

All measurements should be given in metric units, preferably centimeters, since the company is an international one.

The expense of constructing the container should not be a factor in your proposal.

Since this is a new product for the team, you decide to study actual stacks of cups to help you discover which features of the cup affect the height of the stack. To do this, the team uses two types of plastic cups that were found around your office. Complete your study, then summarize your findings in a report that you will submit to your supervisor.

Source: The Pacesetter Curriculum, College Board

NOTE: This is the problem statement. In the Pacesetter Curriculum activity, many additional questions and problems related to the stacks of cups are included.

How?

Statewide Policies

- Define who can teach and take courses
- Outline needs of advising and professional development
- Establish course requirements to ensure rigor and standards
 - High schools and colleges determine policies and grading in line with the statewide policies
 - Create a MOU to explicitly state them
 - Course syllabus, topic outline, and pacing determined

Rigor and standards: input needed

The high school and college must agree to a grading structure that will include formative and summative assessments such that receiving a C or better indicates the competencies for the course were met and the student is considered ready for college-level math coursework in the appropriate pathway. Grading standards that support college readiness should be mutually established between the high school and college.

Option 1:

Grading limits on formative and summative assessments (e.g., 25% of the grade is from homework) should be established and agreed upon by both the high school and college so that the final grade is not determined entirely by participation nor by a single assessment. Problem and/or project-based learning tasks must be included in the grading scheme.

Option 2:

- At least 25% of the overall grade must come from problem or project-based learning tasks
- A single assessment may not be more than 50% of the final grade in the course
- No more than 25% of the course grade can come from formative assignments such as homework.

Will they all pass?

No.

Pass rates in pilots are often in the 70 – 85% range

Students who don't earn a C or better will be subject to placement at colleges

- Bridge courses

- Co-requisite courses

Data from Black Hawk College

Transitional math pilot of QL/Stats course

High School	Fall 2016	Spring 2017	% passing Spring term and receiving placement	C or better (both terms)	% passing both terms
1	17/21	14/16	88%	14/21	67%
2-I	23/32	20/21	95%	20/32	63%
2-II	24/32	15/22	68%	15/32	47%
2-Overall	47/64	35/43	82%	35/64	55%

Why are pass rates higher in high school courses than those of comparable college courses?

While rigor and standards may be different, often the issue is more complex.

Academic reasons

- Recency of prerequisite material
- Time on task
- Passing can be D instead of C

Non-academic reasons

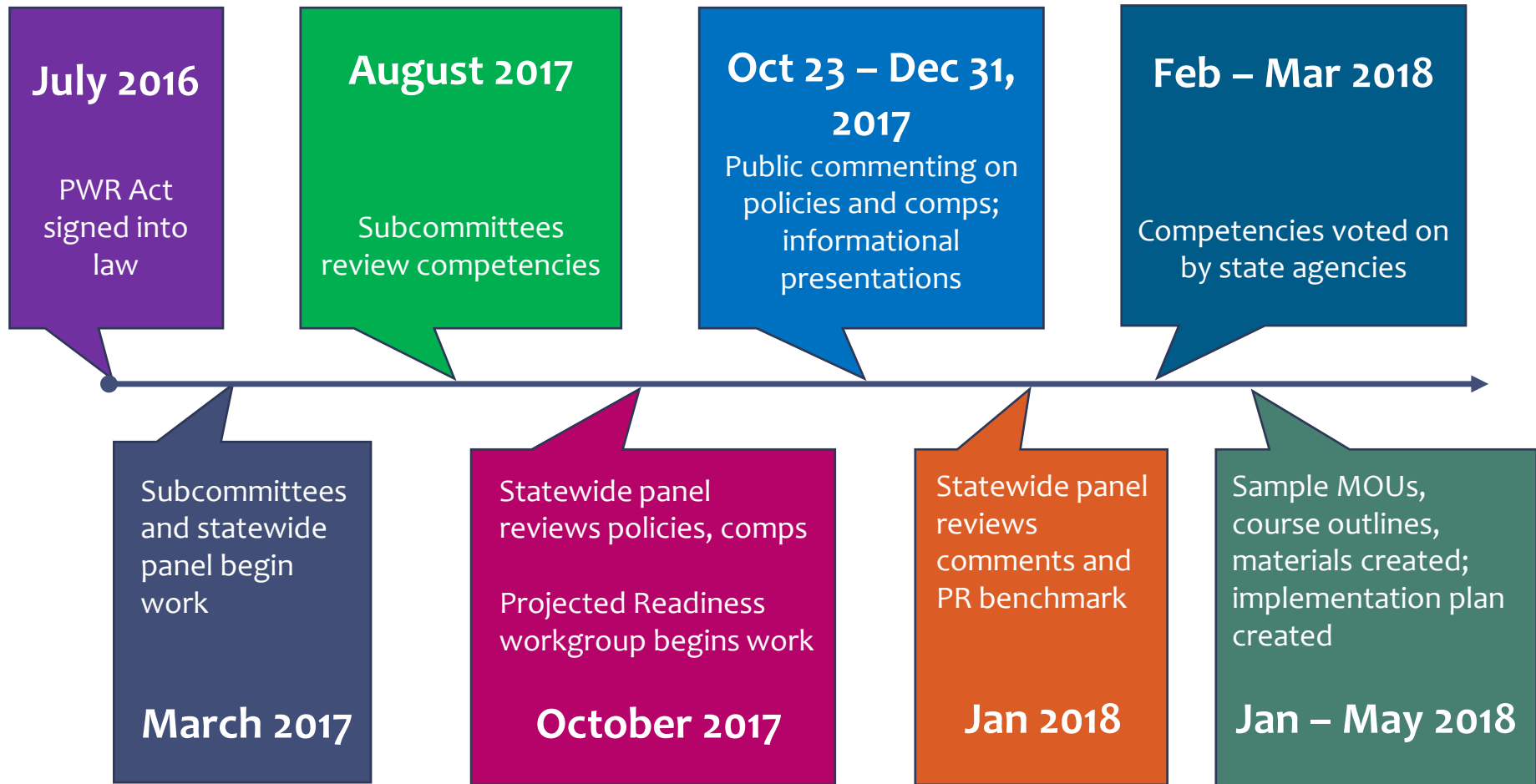
- Mandatory attendance
- Fewer issues with transportation
- Fewer students with children and full time jobs

Implementation

- ICCB supporting statewide implementation of transitional math through grants and staffing
- Draft policies and competencies in the three math pathways available for public comment now through Dec 31, 2017
- Pilot activities occurring in 20+ community college districts
- Outreach occurring with 4-year universities to obtain acceptance of transitional math courses
- Sample materials, MOU's, and PD will be created
- An approval and tracking/assessment process will be developed

When?

Policies and Competencies Timeline



By June 2018, policies and competencies must be approved.

By Jun 2019, ICCB and ISBE establish a statewide implementation plan.

For more information

Contact Kathleen Almy

kalmy@niu.edu

Public commenting <http://www2.iccb.org/iltransitionalmath/>

- Documents
- Survey to leave feedback
- FAQ
- Webinar recordings

PWR Act

pwract.org

