

Math Pathways at UWM

Kevin McLeod

Math Department Faculty

kmcleod@uwm.edu


Kelly Kohlmetz

Mathematical Literacy Coordinator

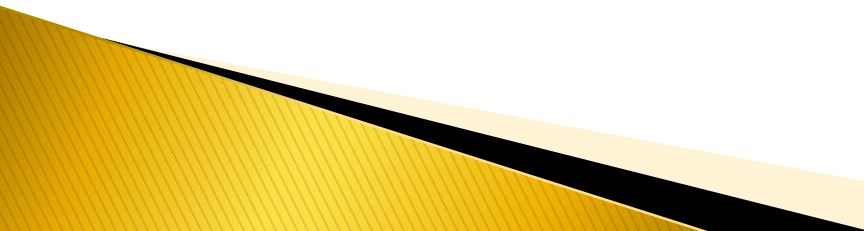
kellyk2@uwm.edu

UW-System Math Steering Committee Meeting
August 16, 2017

Session Overview

- ▶ UWM context
 - ▶ Overview of Carnegie program
 - ▶ UWM data
 - ▶ Strengths, Challenges and Next Steps
 - ▶ Questions
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About UWM students

- ▶ Over 30,000 students (25,000 undergraduate)
 - ▶ Over 75% full-time
 - ▶ Average age of new freshmen = 18.4
 - ▶ Over 90% Wisconsin residency
 - ▶ Average ACT = 21.5
 - ▶ Approximately 2,500 incoming freshman each fall
 - ▶ **Over 40% of new freshmen require remediation**
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Pre-reform


Lost approximately 20% of students at each stage:

- ▶ in transition from Math 090 (Basic Math) to Math 095 (Beginning Algebra)
- ▶ in transition from Math 095 to credit bearing math (Math 103, Math 105, or Math 175)
- ▶ before completion of credit bearing math course

Began looking at research, national trends and successful programs to deal with situation



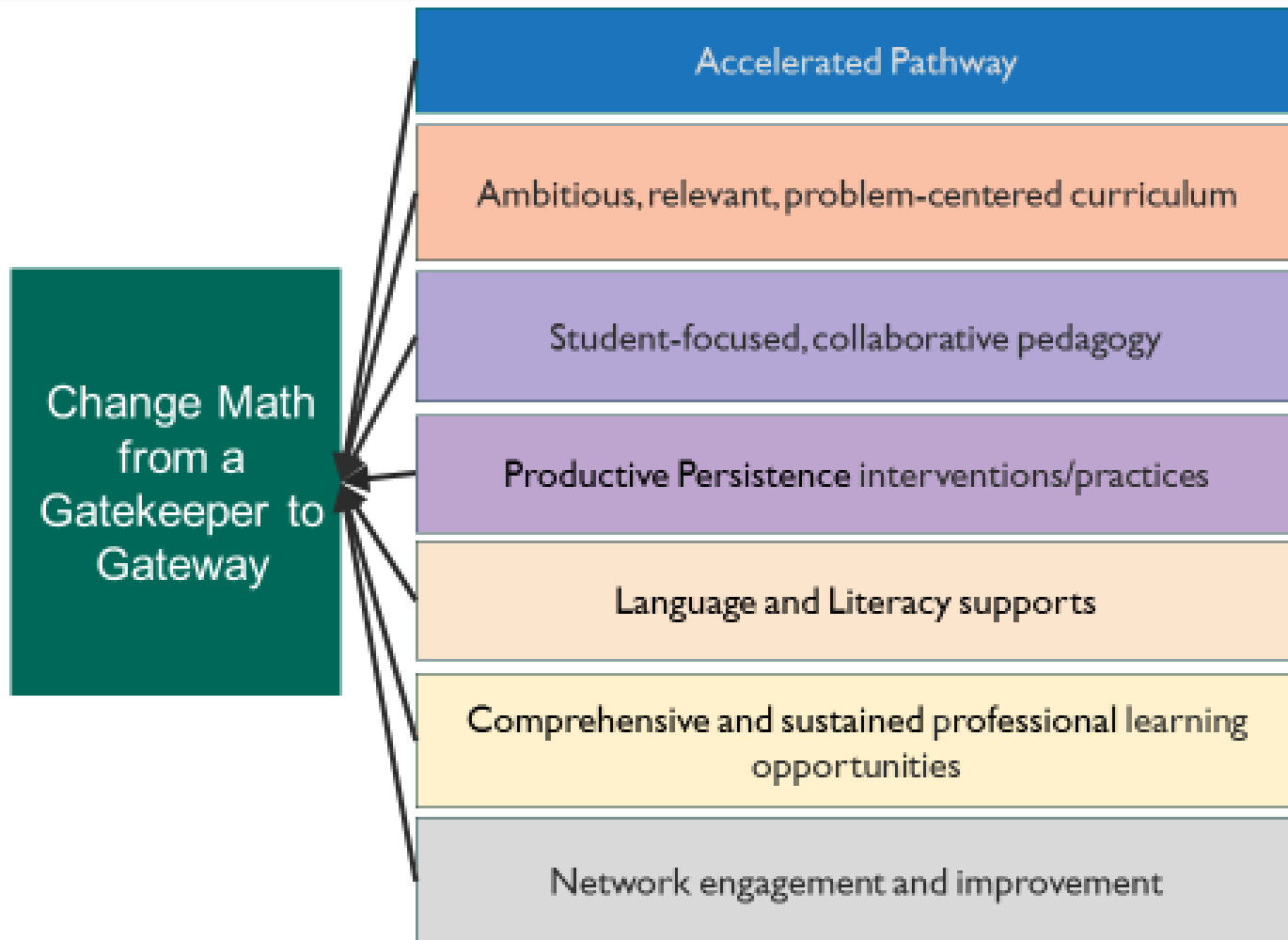
Existing credit bearing courses are unchanged

- ▶ Math 103, Math 105 and Math 175 still exist
 - ▶ Students are still able to test directly into these courses as before
 - ▶ See course map for UWM
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New Math Literacy Pathway


- ▶ Math 092 -> Math 102
 - Use one set of materials for both semesters
 - Students will satisfy GER QLA requirements in two consecutive semesters
- ▶ Designed for any not declared as STEM major
- ▶ New format with group work and class discussions:
 - explaining reasoning (verbally and in writing)
 - evaluating answers (does it make sense)
 - college success skills integrated

Carnegie Overview



Carnegie Overview

Three key questions:

1. How can we design course structures for the realities of our students' lives in order to give them the best chance for success?
 2. How can we best support powerful mathematics learning and students' persistence and engagement?
 3. How can student success outcomes be sustained and improved?
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Carnegie Overview

1. How can we design course structures for the realities of our students' lives in order to give them the best chance for success?

Shorten the sequence and reduce transition
points
Acceleration

Keep students together
Cohort model



Carnegie Overview

2. How can we best support powerful mathematics learning and students' persistence and engagement?

Make curriculum productively challenging and relevant to students' lives

Employ instruction that promotes development of flexible expertise and engages students actively and collaboratively

Integrate productive persistence into math curriculum and pedagogy

Carnegie Overview

3. How can student success outcomes be sustained and improved?

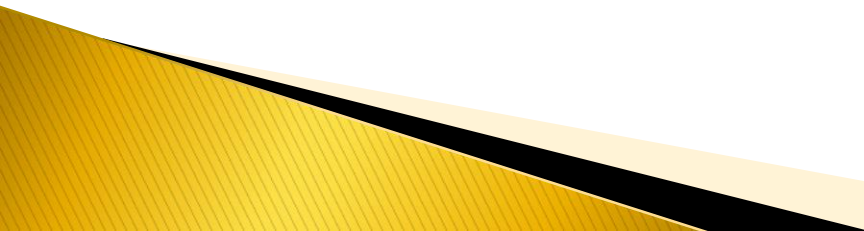
Provide sustained, meaningful opportunities for learning from and about practice

Organizational/Institutional coordination to support effective and sustained implementation.

Ongoing collaboration to accelerate and spread learning (across the network)



Sample Quantway I (Lesson 2.8)

- ▶ In the homework to prepare for this lesson, students do a series of problems to discover that the minimum wage did not increase enough from 1997 to 2014 to keep up with the cost of a movie ticket.
 - ▶ During this lesson, students explore index numbers and learn about the Consumer Price Index (CPI).
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Sample Quantway I (Lesson 2.8)

One problem of lesson:

Who had more purchasing power? (Provide quantitative information to support your answer.)

- The person making minimum wage (\$0.25 per hour) in 1938.
- The person making minimum wage (\$7.25 per hour) in 2014.

Sample Quantway I (Lesson 2.8)

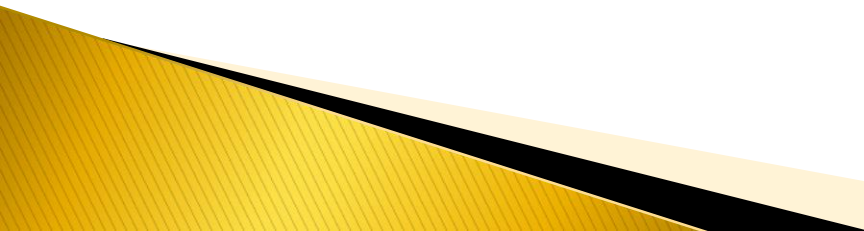
Homework has students extend what was learned in class. For example:

The rent on a building in 2008 was \$1,350 per month. The landlord changes the rent relative to changes in the CPI-U. Use the CPI-U to calculate the rent in 2014. Round to the nearest dollar.

Sample Quantway II (Lesson 7.4)

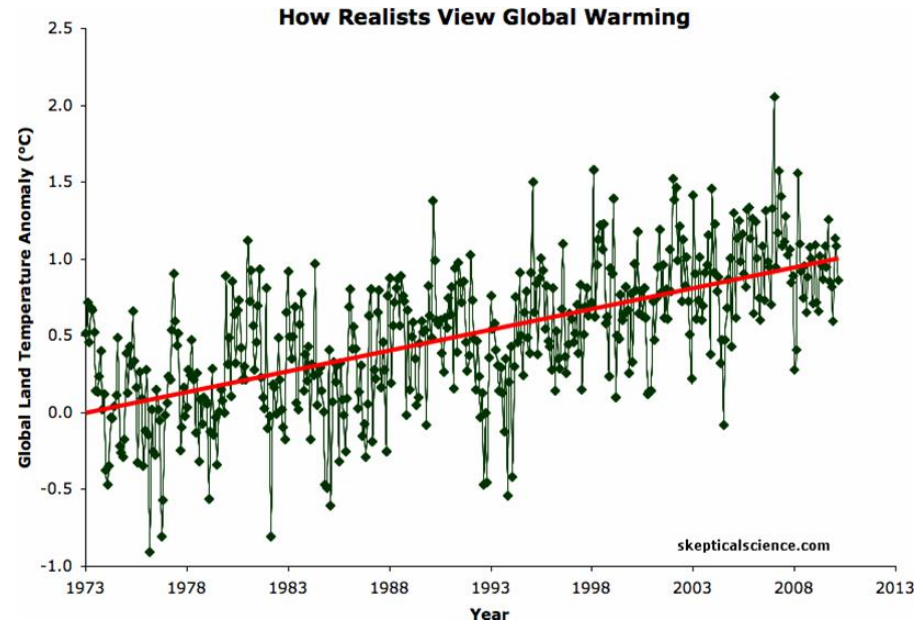
Students have been working with linear models. In this lesson they consider the two sides of the global warming issue.

Below are two graphics showing the data for the “Global Land Temperature Anomaly” or the change in average global land temperature for the years 1973–2011. Also shown on the graph is a best-fit line that is a linear model representing the trend of the data.



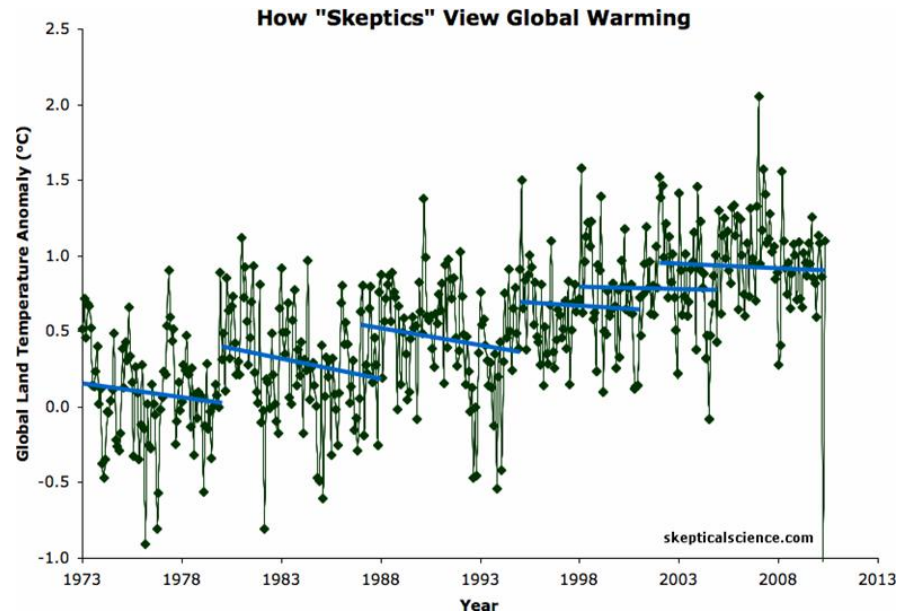
Sample Quantway II (Lesson 7.4)

- Do you think the line of best-fit is reasonable?
- Estimate the equation.
- Explain what the model is saying about the general pattern of global temperature anomalies.
- Predict what happens in 2020 and 2050. Do you think this is a reliable prediction for 2050? Why or why not? Explain with sentences.

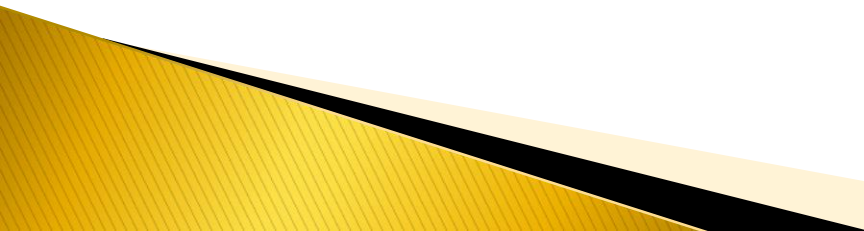


Sample Quantway II (Lesson 7.4)

- What do the line segments represent as a whole?
- Estimate the equation of the last line segment.
- Could we use this equation to predict what happens in 2020? Why or why not?
- If you look at the overall trend of the data, it is increasing. However, each line segment in the piecewise function is decreasing. What does this mean? Explain what the model is saying about the general pattern of global temperature.



Data for first two years at UWM

- ▶ We are three years into the redesign
 - curriculum revisions made after first year
 - last year's data not yet available
 - ▶ Around 70% of freshmen completed dev. math, compared to historic 55%
 - ▶ Persistence rate of just under 90%, compared to historic rate of around 75%
 - ▶ Twice as many of lowest placed students were able to complete a credit-bearing math course in two semesters as previously they did in four
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Pass rate for Math Lit Pathway

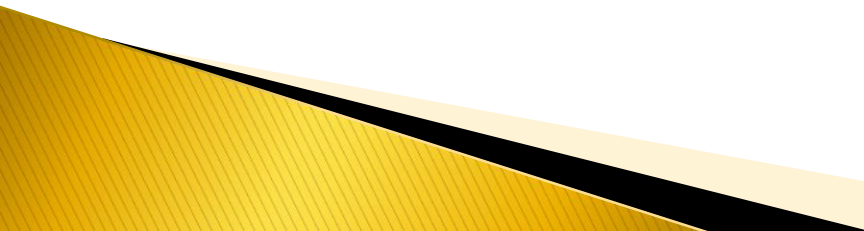
Semester	
Fall 2015	78%
Spring 2016	65%*
*remove 43 repeats	77%
Fall 2016	80%
Spring 2017	60%*
*remove 10 repeats	71%

Semester	
Spring 2016	???
Fall 2016	71%*
*remove 15 repeats	84%
Spring 2017	81%

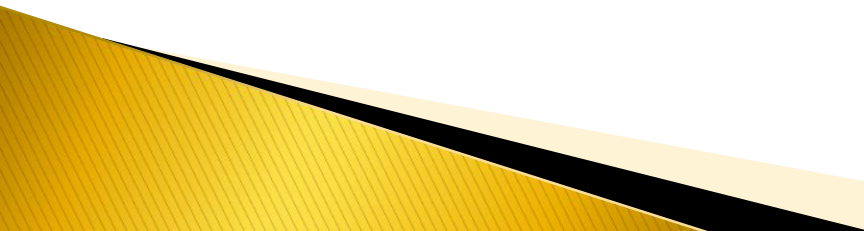
Math 092

Math 102


Strengths of UWM situation

- ▶ Administration “encouraging” improvements in math – especially at developmental level
 - ▶ Department Chair heading charge
 - ▶ Large pool of instructors, some of whom who were already using group work in their courses and/or willing to try something new
 - ▶ Credit transfer out of a 4-year institution is less of an issue
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Challenges with UWM situation

- ▶ Determination of expectations for a college-level math course
 - 4-year same as 2-year?
 - ▶ Instructor turnover
 - Many sections taught by graduate students and ad-hocs
 - ▶ Willingness of other departments to accept Math Literacy as a course prerequisite
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Next steps

- ▶ Increasing rigor in Math 102
 - ▶ Teach Math 092+Math 102 as co-req
 - ▶ Develop interventions for repeating students
 - Require co-req study skills course ?
 - Restrictions on repeating same dev math course ?
 - Other ?
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Questions?

Feel free to contact either of us for additional information!

❖ **Kevin McLeod:** kmcleod@uwm.edu

Math Department Faculty

❖ **Kelly Kohlmetz:** kellyk2@uwm.edu

Math Lit Pathways (092 & 102) Coordinator

