



CARNEGIE MATH
PATHWAYS
WestEd

Creating a Path to College Success for Every Student

An Overview of Carnegie Math Pathways

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Speakers



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Of the 1,100,000 first-time students enrolling in community college annually,



3 out of 5 students
are placed in a remedial math course.

We need a solution that...

- **Accelerates** mathematics completion
- Significantly **increases outcomes**
- Equips students with **rigorous learning and transferable knowledge**
- **Closes the gap**, works for all students
- **Increases college completion**



Course Offerings



Quantway
Quantitative Reasoning Pathway

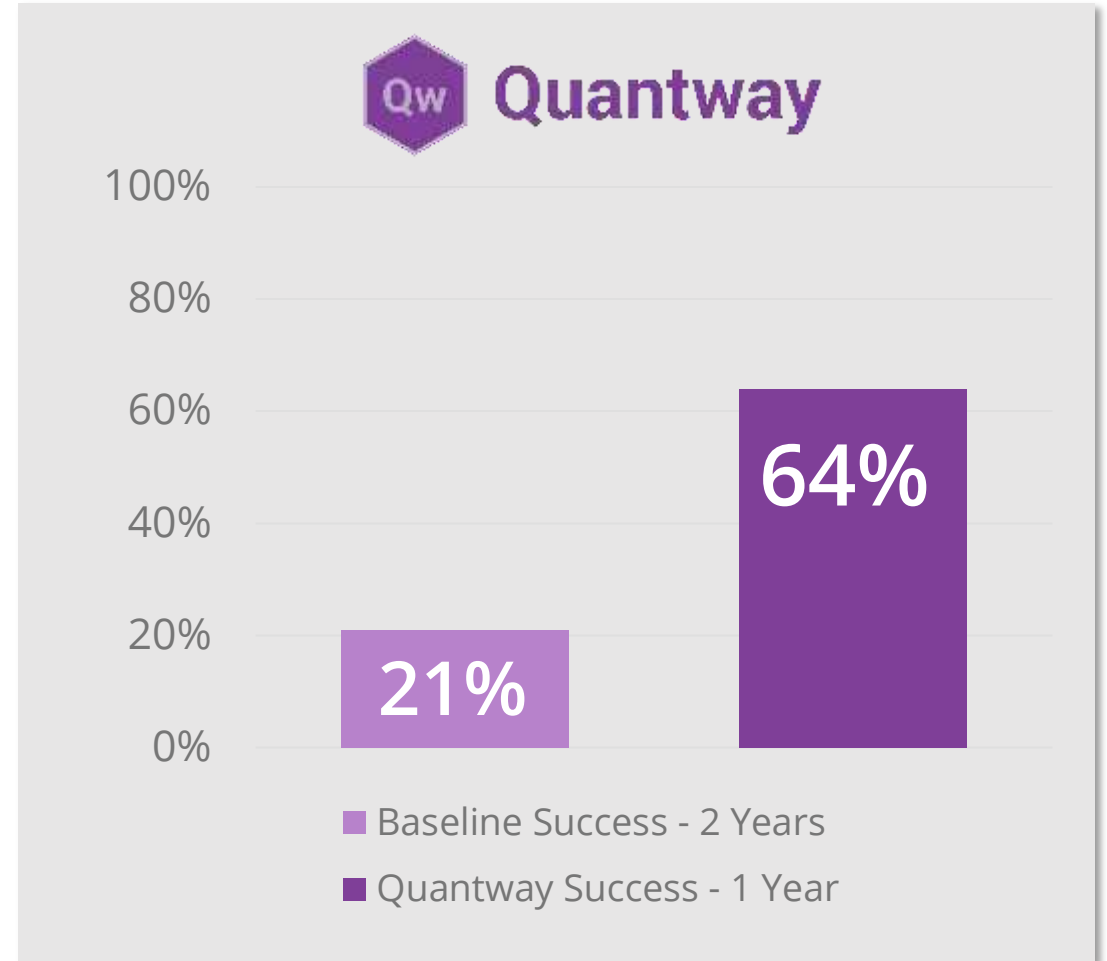
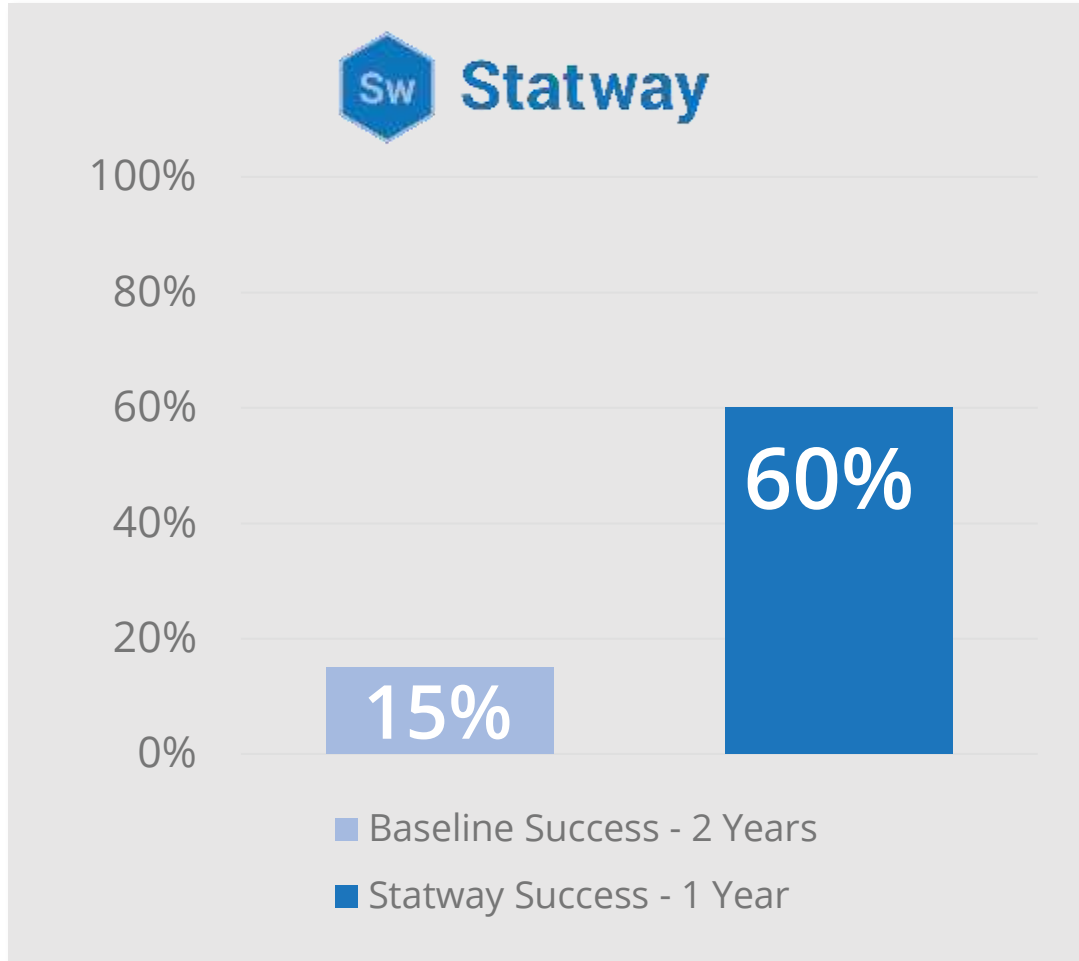


Statway
Statistical Reasoning Pathway

Endorsed by:



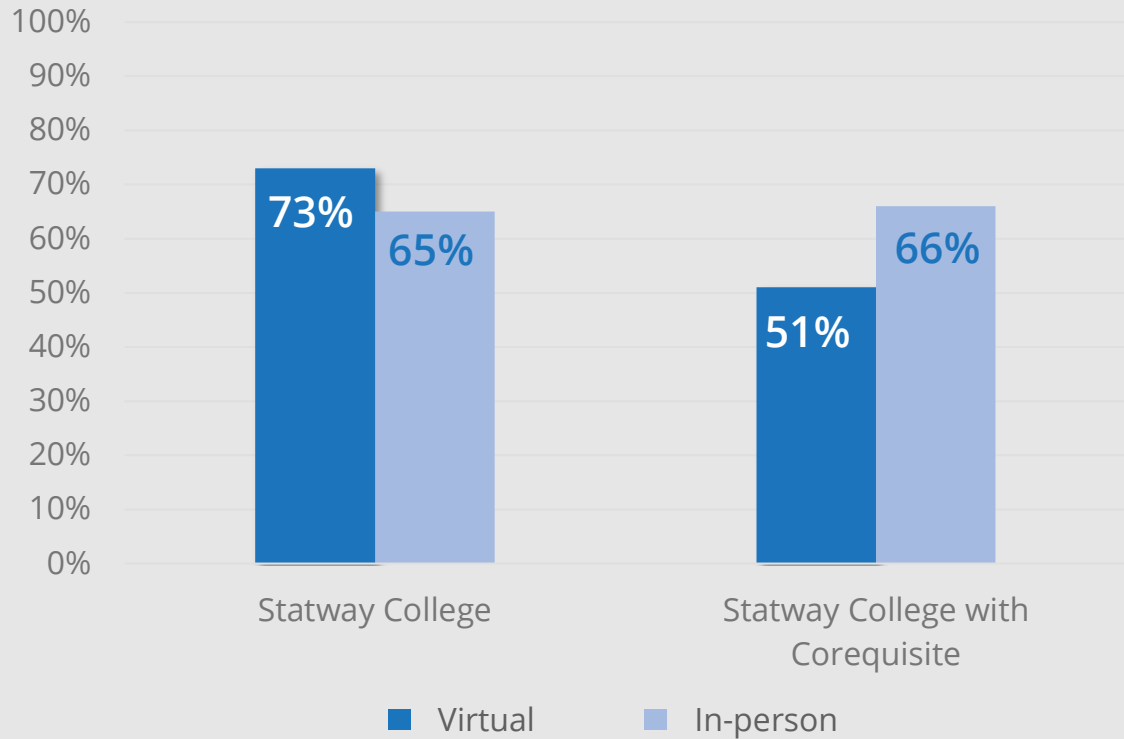
Student Success (2019-20)



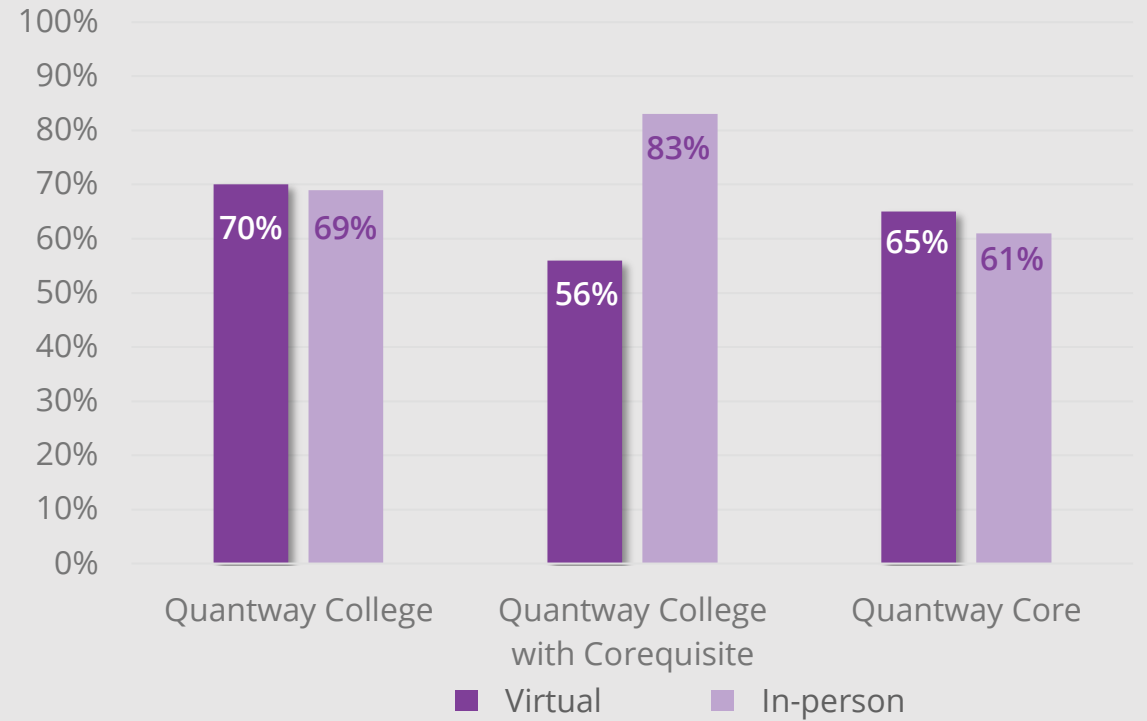
Student Success in Quantway and Statway Virtual

(Fall 2019 through Fall 2020)

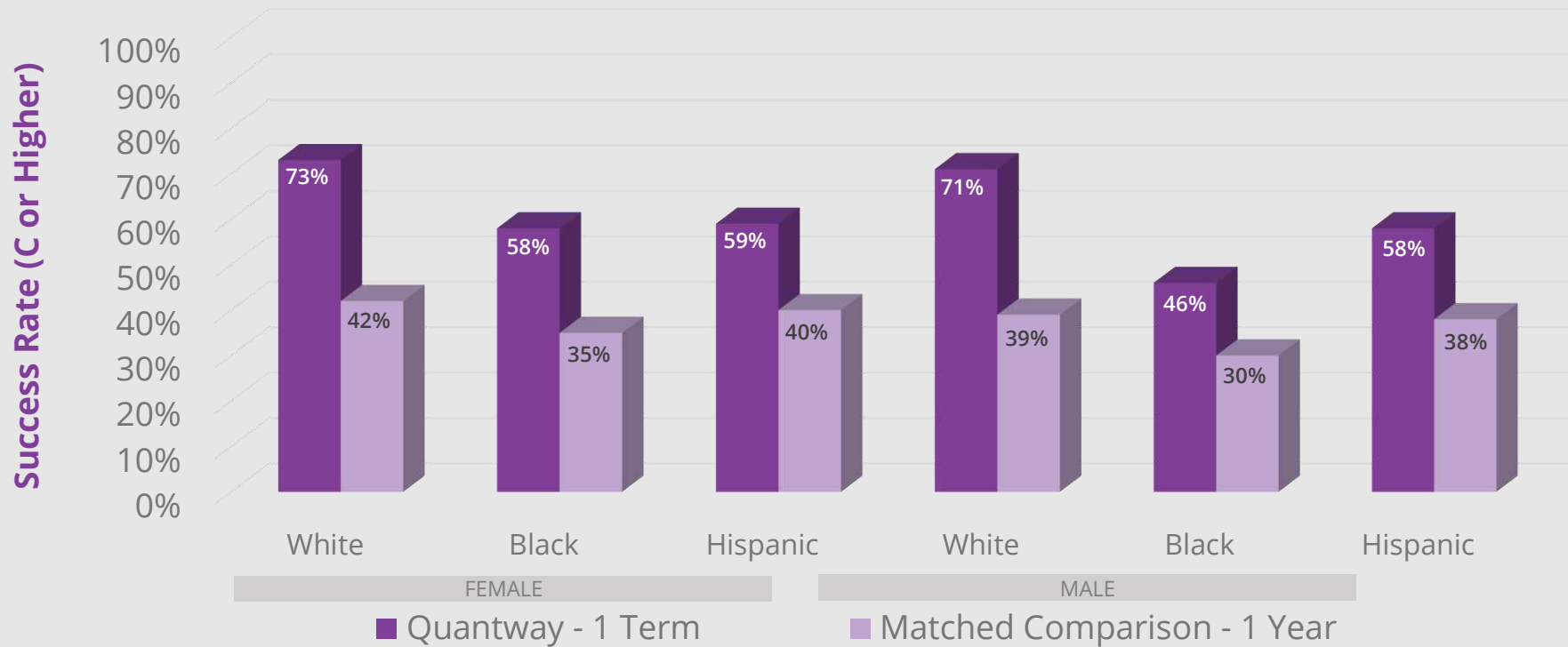
Sw Statway



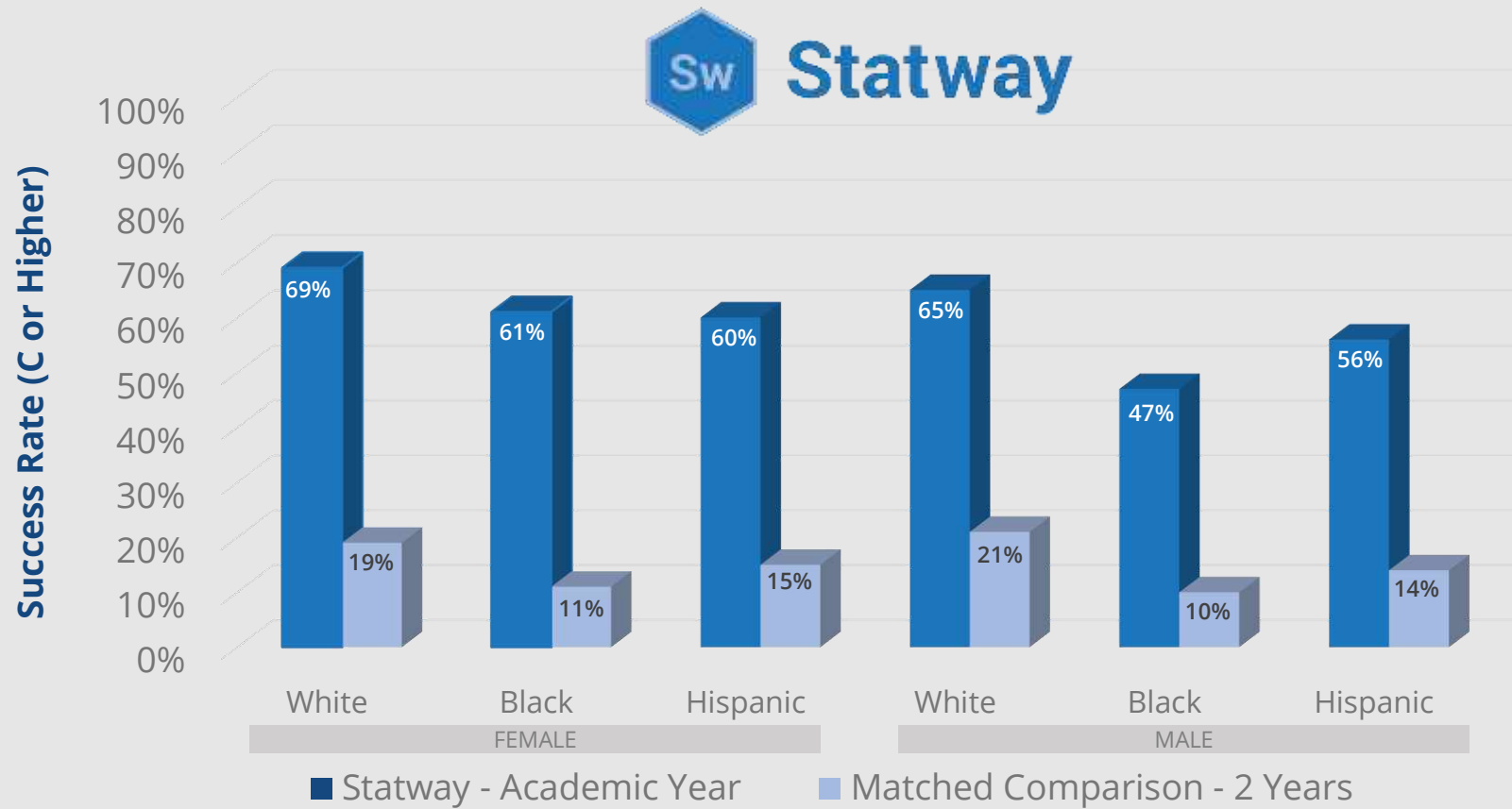
Qw Quantway



Advancing Equity: Improving Outcomes For Diverse Subgroups (2019-20)



Advancing Equity: Improving Outcomes For Diverse Subgroups (2019-20)



The Move to Corequisite Math Education

- A number of states moving to corequisite because of either state mandates or state HE system policies
- Primary goal - enable more students to complete gateway math in freshman year vs. traditional sequences
- Carnegie Math Pathways offers corequisite versions of Statway and Quantway for classroom, hybrid and online delivery
- Corequisite and online corequisite versions of both Statway and Quantway on par with Carnegie Math Pathways' historical course completion rates

And we're seeing the same results for our corequisite courses since their debut in 2018...

Quantway and Statway Corequisites had an average **65%** success rate

65%

3X

That's **more than three times** the success rate of the traditional remedial approach

Intentional Design

Our network of faculty have developed a suite of courses following a set of critical design principles:

Accelerated Pathways



Help more students achieve college math credit in less time and advance toward their goals

Relevant curriculum and researched-based pedagogy



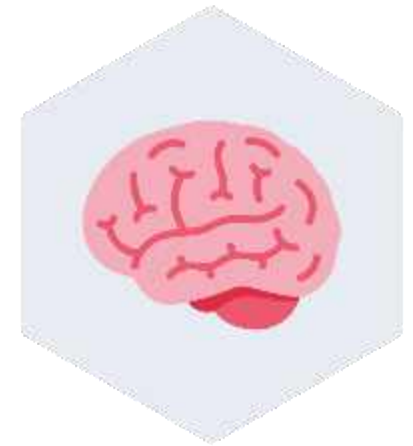
Ensure high quality learning opportunities for all students

Appropriate supports built into the course



Deliver targeted and effective scaffolding for students who need additional support

Embedded Social Emotional Supports



Foster growth mindset, confidence, and belonging to support the whole learner

Innovative and Relevant Curricula



**Understanding
Heart Rate**
QW lesson

**Trends in Social
Media**
QW lesson



**Authentic and Contextualized
Lesson Contexts**

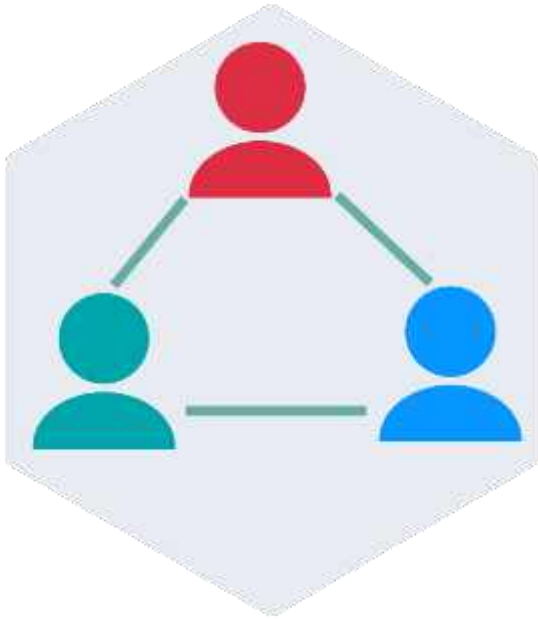


**Online Homework
Platform**

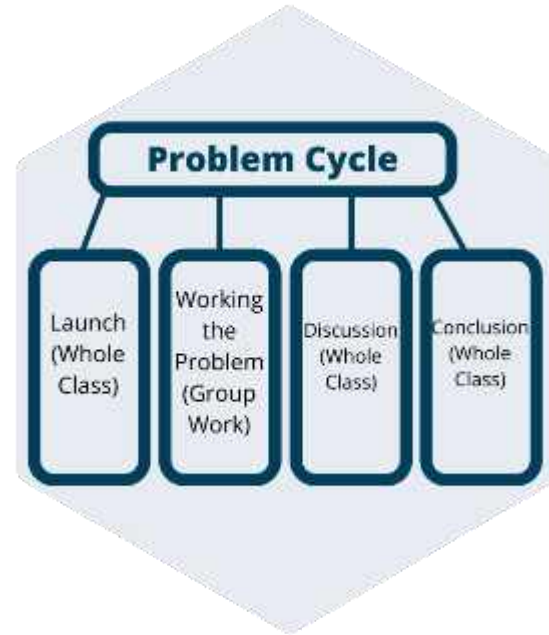


**Language and
Literacy Supports**

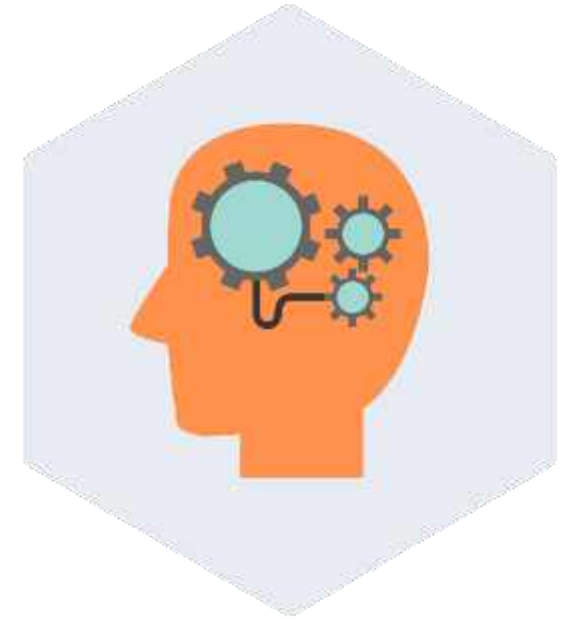
Research-Based Pedagogy



Active, collaborative instructional model

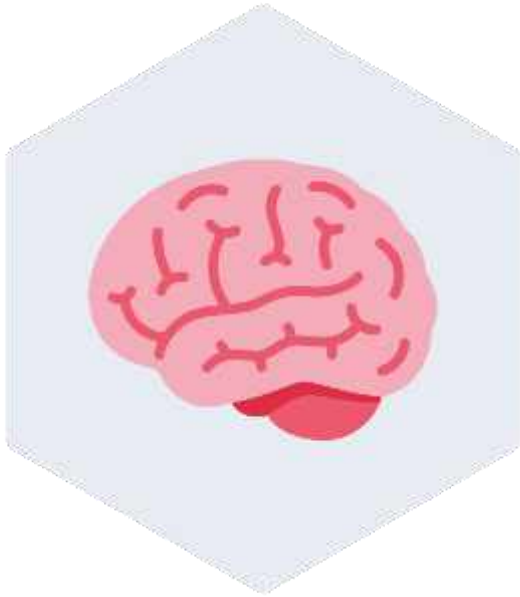


Problem Cycle Instructional Routine



Supporting deeper and more flexible understanding of math concepts

Social Emotional Supports for Students



Building growth mindset



Fostering belonging



Reducing math anxiety



Promoting use of good learning strategies

Research Indicates Three Critical Learning Opportunities

To achieve flexible expertise, students need recurring and sustained opportunities for:

Productive struggle – with important mathematics.

Explicit connections – between concepts, procedures, problems, situations

Deliberate practice – increasing variation and complexity over time

Comparable Concepts

Linear Equations

Find the equation of the line passing through the points

$$(2,-4) \text{ and } (-3,7).$$

Write the equation in slope-intercept form.

Quantway Problem Situation

In 1950, each person in the U.S. consumed an average of 36.4 gallons of milk during the year. In 2000, that number had decreased to 22.6 gallons of milk per person.

Meanwhile, the average number of gallons of soft drinks consumed per person in 1950 was 10.8. By 2000, this number increased to 49.3 gallons of soft drinks per person.

What are the linear equations that can model the consumption of milk and consumption of soft drinks in the U.S. from 1950 to 2000?

Mindsets about Ability

Fixed Mindset (intelligence is fixed)

- “If I have to try hard, I’m clearly not smart.”
- There is no point in trying if one is not a “natural.”
- If you’re “dumb”, you have to rely on “luck.”

Growth Mindset (intelligence is malleable)

- “Trying harder makes you smarter.”
- Obstacles can be overcome through effort, help from others, and use of improved strategy
- Note: It’s NOT just about effort. Also strategy and help.

You Can Grow Your Brain

New Research Shows the Brain Can Be Developed Like a Muscle

By: Lisa S. Blackwell and David S. Yeager

Many people think of the brain as a mystery. We don't often think about what intelligence is or how it works. And when you do think about what intelligence is, you might think that a person is born either smart, average, or dumb—either a “math person” or not—and stays that way for life.

But new research shows that the brain is more like a muscle—it changes and gets stronger when you use it. Scientists have been able to show just how the brain grows and gets stronger when you learn.



Everyone knows that when you lift weights, your muscles get bigger and you get stronger. A person who can't lift 20 pounds when they start exercising can get strong enough to lift 100 pounds after working out for a long time. That's because muscles become larger and stronger with exercise. And when you stop exercising, the muscles shrink and you get weaker. That's why people say “Use it or lose it!”

But most people don't know that when they practice and learn new things, parts of their brain change and get larger, a lot like the muscles do. This is true even for adults. So it's not true that some people are stuck being “not smart” or “not math people.” You can improve your abilities a lot, as long as you practice and use good strategies.



A Section of the Cerebrum

Inside the outside layer of the brain—called the cortex—are billions of tiny nerve cells, called neurons. The nerve cells have branches connecting them to other cells in a complicated network. Communication between these brain cells is what allows us to think and solve problems.

HEALTH & SCIENCE News You Can Use

“Most people don't know that when they practice and learn new things, parts of ***their brain change*** and get larger, a lot like the ***muscles*** do. This is true **even for adults**. So it's not true that some people are stuck being “not smart” or “not math people.” ***You can improve*** your abilities a lot, as long as you ***practice*** and ***use good strategies***.”

Professional Learning and Support for Faculty and Administrators



Personalized Coaching for Faculty and Administrators



Institution and Classroom data analytics



Network-led improvement teams

Effective Faculty Professional Development for Instructional Improvement



Resources:

- **Faculty Support Program:**
 - **Faculty Mentor**
 - **New Faculty Training** (in-person and virtual options)
 - **Pathways Online Preparation (POP) Course** Online PD course for new Pathways instructors
 - **Pathways Teaching Certificate** Awarded upon completion of training and support activities
- **Online instructional resources** for all faculty
- **Instructional coaching** for returning faculty

Institutional Implementation Support

Institutional Coaching Support



Strategic Team Planning
at Pathways events



What College Leaders Are Saying

We spend a lot of time talking about equity, and equity issues, and really reaching students. Statway is really one of the few initiatives that has shown real promise for moving the needle.

Matthew Judd,

Dean, Natural Science Division

Mt. San Antonio College



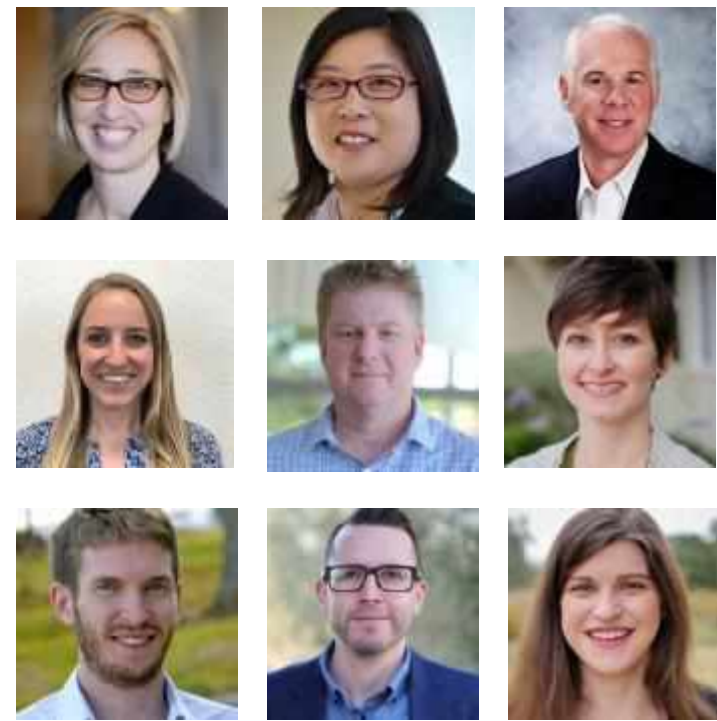


What Students Are Saying

This class has taught me a lot, and not just about math. I know it sounds cliché, but this class changed my life.

Stephanne Johnson
Former Quantway Student
Bay Mills Community College

Support from the Carnegie Math Pathways Team and Leaders in our Network



Staff



Faculty Mentors



Administrator Coaches



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Learn more at: www.carnegiemathpathways.org

Or email: info@carnegiemathpathways.org

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