Summer Math Attack Program:
Adjusting Math Attitudes to Build Math Skills

Thanks for joining us! We will begin promptly at 2:00 p.m. ET.

- Use the "questions" area to submit questions as they arise.
- This webinar will be archived at NROCnetwork.org, and you will receive a follow-up email with a link to the recording and slides.
- Contribute to the Twitter conversation at #NROCpd.
- Do you need help with GoToWebinar? Email memberservices@NROC.org.
Changing the Way College and Career Readiness is Approached and Supported
NROC collaborates with educators to imagine, develop, test, & refine technologies that improve student success.
## WHAT WE OFFER

### NROC COURSES

<table>
<thead>
<tr>
<th>NROC MATH</th>
<th>NROC ENGLISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Algebra 1</td>
<td>• Developmental Math</td>
</tr>
<tr>
<td>• Developmental Math</td>
<td>• Developmental English</td>
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### WEB-BASED TOOLS

<table>
<thead>
<tr>
<th>EdReady</th>
<th>Hippo Campus</th>
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</thead>
<tbody>
<tr>
<td>a readiness system (to personalize a learner’s study path)</td>
<td>a curated repository of learning objects</td>
</tr>
</tbody>
</table>

NROC courses can be installed in a Learning Management System (LMS) or can be accessed through our web-based tools.

& a new product created in partnership with ACT®...
EdReady

EdReady is a math and English readiness system that employs a knowledge inventory to personalize a learner’s path to subject mastery within the context of a specific educational goal.
WEB-BASED TOOLS

Open and Designed for Institutional Customization

Goals

Knowledge Inventories

Resources

What do you want your students to be ready for?

Data Access

Readiness

Congratulations! You have completed your study plan and reached your target score of 40.

EdReady
Powered by NROC
Create goals that are meaningful to your students.

*(Goals group cohorts together.)*
Knowledge Inventories

Math Readiness

ADMIN VIEW: Define Scope

Customize the scope of learning objectives.

STUDENT VIEW: Scope = items on a study path
Select and prioritize content interventions.
Access data for planning, intervention, and evaluation.
MATH ATTACK:
Changing Math Attitudes to Build Math Skills

Selinea Moore-Allen and Carrie Riffee
Pikes Peak Community College TRIO Program
WHAT IS TRIO?

TRIO Student Support Services is a program that is Federally Funded by the U.S. Department of Education. Student Support Services aids first-generation, low-income students with disabilities, and Veterans to help them graduate and transfer to a 4-year university.

Some of the services provided by TRIO are: career exploration, writing assistance, success and academic coaching, course advising and selection, math group and one-one tutoring, cultural activities, scholarship assistance, 4-year campus visits, 4-year application fee waivers, and scholarship searches.

The TRIO Student Support Services Project is funded to serve 144 students per academic year. Participants must meet certain requirements set by the Department of Education in order to be eligible for services.
Math Attack
Deconstructed

Math Attack is an 8-day program designed to help students build confidence, persistence, and skills in math. Students meet 2 days a week for 4 weeks.

A typical day of Math Attack begins with a light snack and conversation surrounding a math myth, addressing math fear, and confidence. Students then receive a lecture centered around a mathematical concept covered in the EdReady Pre-assessment. Students then work in EdReady to reinforce understanding of the concept(s) covered.

The second day begins with a light snack, a short discussion on the previous day’s concept and then an activity is done outside the classroom so that students can “see” how the concept relates to the world in which they live.
SKILL ASSESSMENT

PRE-ASSESSMENT

The pre-assessment is completed in two phases on the FIRST day of the Math Attack program.

PHASE I: EdReady Pre-assessment

PHASE II: TRIO mathematics attitude assessment
PHASE I: EdReady Pre-assessment

• EdReady- 10 preselected questions for all 3 levels of Math Attack.

  • LEVEL 1: 0-4 correct questions
  • LEVEL 2: 4-6 correct questions
  • LEVEL 3: 7-10 correct questions
LEVELS

LEVEL 1: MA05018: Basic beginning stages of Algebra
SCOPE: NROC Developmental Math - 8 different scopes
Integers, proportions, and solving linear equations.

LEVEL 2: MA05518: Intermediate Algebra
SCOPE: NROC Developmental Math and NROC Algebra 1 - 7 different scopes
Systems of equations, quadratic functions, etc…

LEVEL 3: MA12118: College Algebra
SCOPE: NROC Algebra 1 - 5 different scopes
Exponential and logarithmic functions, Systems of equations with 2 or more variables.
### Administrative View

#### Selected scopes

(Please activate the scopes you want your students to have access to. Students will only be able to access active scopes (study paths)).

**Note:** If students have completed work in a scope (study path), you will no longer be able to remove it from this goal; however, you can hide the scope from future student use by deactivating it using the checkbox.

#### Search by tags:

<table>
<thead>
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<th>Name</th>
<th>Discipline</th>
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<th>Last Updated</th>
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Exponents and Polynomials

Recommended study time: 6 hours

Topics you need to study in this unit:

- Exponential Notation
  - NOT READY
  - LEARN
  - TEST

- Simplify by Using the Product, Quotient, and Power Rules
  - NOT READY
  - LEARN
  - TEST

- Products and Quotients Raised to Powers
  - NOT READY
  - LEARN
  - TEST

You have mastered 0 of 12 topics in this unit.
ATTITUDE ASSESSMENT
PHASE II: TRIO mathematics attitude assessment.

- Consists of 9 questions
- Each answer has an assigned point value 1-7
- Maximum points a student can obtain is 63
- The higher the score, the more positive the attitude towards mathematics
- The lower the score, the lower the self-efficacy
EXAMPLE QUESTIONS

Generally, I feel secure about attempting math problems.
7. Strongly agree
6. Agree
5. Somewhat agree
4. Neither agree nor disagree
3. Somewhat disagree
2. Disagree
1. Strongly disagree

I can get good grades in math.
7. Strongly agree
6. Agree
5. Somewhat agree
4. Neither agree nor disagree
3. Somewhat disagree
2. Disagree
1. Strongly disagree
It’s All About Attitude!!!

The model used to help facilitate the discussion about math attitude and fear was adapted by the *How to Learn Math: For Students*, Stanford Lagunita, designed by Dr. Jo Boaler from Stanford University. It can be found at:


Portions of this study are shown to students and discussed in depth as students explore their own fears and mindset about math. This discussion often helps students reduce their anxiety and fears about math. It opens up a unique dialogue that allows students to share with the advisors and math tutors about their own math traumas.
LECTURE

Math Attack is 2 days per week for 4 weeks. On the first day, students discuss a math myth, and then a lecture over a mathematical concept covered in the EdReady pre-assessment is given.

The understanding of the covered mathematical concept is reinforced using EdReady. Students work in EdReady for the remainder of the day.
DAY 2: HAVE FUN

The second day of Math Attack is a chance for students to do an activity!! This is an activity that reinforces the mathematical concepts covered in the lecture. Students learn by “seeing and doing.”
LAST DAY FIELD TRIP

THE MOST IMPORTANT THING TO DO IS TO THINK OUTSIDE THE CLASSROOM BOX!!!
Student persistence in EdReady increased their post-assessment score by 5-10 points.

More importantly, this persistence carried over to the FALL 2018 Semester - 95% of all students who participated in Math Attack passed their first math pathway course for their degree (usually a developmental math course).

80% of students who began in Fall 2018 will have completed the math requirement for their degree at the end of Spring 2019.

There are a few, because of their degree rigor, who will go on to Calculus I, II, III, or Trigonometry.
One of the most important aspects of Math Attack is the level of student engagement. We engage students by asking them questions, allowing them to work problems standing up, and encourage working in small student groups to discuss problems.

Open discussion is key. Sometimes the room is noisy with everyone giving input into solving problems and guessing solutions. Activity day is another way we engage students. Anything that can help students think about mathematical concepts in a significant way is our goal.

Math is Everywhere!!!
2018 PRE-ASSESSMENT SCORES

2018 POST ASSESSMENT SCORES
## ATTITUDE ASSESSMENT RESULTS

<table>
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<tr>
<th>Student</th>
<th>Question #</th>
<th>PRE</th>
<th>POST</th>
<th>Difference</th>
<th>PRE-Overall</th>
<th>POST-Overall</th>
<th>Difference</th>
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<tbody>
<tr>
<td>Q1</td>
<td>Generally, I feel secure about attempting math problems.</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>34</td>
<td>46</td>
<td>12</td>
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<tr>
<td>Q2</td>
<td>I can get good grades in math.</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>I have a lot of self-confidence when it comes to math.</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>I am at ease during math exams.</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>I am no good at math.</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q6</td>
<td>Mathematics is relevant to my life.</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q7</td>
<td>For some reason, even though I study, math exams are hard for me.</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q8</td>
<td>When I see a math problem that I am not sure how to solve, I try to work out the problem</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q9</td>
<td>Mathematics can be enjoyable and stimulating.</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td></td>
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</table>

**Student 1**

![Bar chart showing ATTITUDE ASSESSMENT RESULTS for Student 1](chart.png)
Math Attack Follow Through

Once Math Attack is completed, students that are eligible to receive TRIO services receive 16 hours of one-one tutoring (one hour per week).

Students also receive up to 6 hours of group tutoring on Fridays.

In addition, students receive confidence-boosting text messages and phone calls each week from the TRIO Success Coach. They also meet with their TRIO advisor at least every 2 weeks. This close monitoring helps students who may be struggling with math, other courses, or life.

Student persistence in college and math is monitored for 3 years.
LESSONS LEARNED

1. Students cannot be enrolled in a math course while attending Math Attack.

2. Persistence in EdReady carried over to persistence in the classroom, on homework, and exams.

3. Not ALL students will pass, but Math Attack interventions create a more “willing-to-learn” mindset.
QUESTIONS?
MEMBERSHIP WORKS BEST WHEN PARTNERS:

Commit
significant time and staffing to becoming facile with NROC courses and tools

Adapt
NROC’s suite of solutions to meet their students’ specific needs

Contribute
efficacy stories and original supplemental resources to the broader membership
Special thanks to our presenters:

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Carrie Rifflee  
Pikes Peak Community College  
carrie.rifflee@ppcc.edu  

Thank you for joining us!

You will be receiving a link to the recording and presentation assets at NROC.org.