MATHEMATICAL REASONING WITH CONNECTIONS (MRWC)

GENERAL FAQ's

What is MRWC?

MRWC is a new fourth year mathematics course designed to prepare students for the expectations and rigor of college mathematics courses. It reinforces and builds on mathematical topics and skills developed in Integrated 1-3 (or Algebra 1-2 and Geometry). It is designed as a bridge to both STEM and non-STEM majors.

Who should take MRWC?

Any student who has successfully completed Integrated 1-3 (or Algebra 1-2 and Geometry) and is planning to enter a college or university.

Prerequisites for MRWC:

- C or better in Integrated 1-3 (or Algebra 1-2 and Geometry)

Recommended for MRWC:

- SBAC = 2
- EAP Conditional SBAC = 3
- EAP Ready SBAC = 4 or calculus-bound students who want to build a stronger foundation

Not Recommended for MRWC:

- D or lower in Integrated 1-3 (or Algebra 1-2 and Geometry)
- SBAC =1

Does the MRWC curriculum follow the CA Framework for Advanced Mathematics?

Yes, the MRWC's curriculum covers all the optional + (plus) standards from Integrated 3. These standards are not included in the 11th grade SBAC and may not be covered in Integrated 3 textbooks. The + standards are included in the curriculum in the CA Mathematics Framework for Precalculus.

What are the key design features of the MRWC curriculum?

MRWC is designed around the recommendations for student performance as described in the Mathematical Practices and the ICAS[1] *Statement on Competencies in Mathematics Expected of Entering College Students* authored jointly by the California Community Colleges, the California State University, and the University of California. The MRWC curriculum:

- Reorganizes the traditional pathway of topics to emphasize the connections between algebra, geometry, trigonometry, statistics, etc.
- Focuses on deep conceptual understanding by making connections between multiple representations
- Embeds the Mathematical Practices as an integral part of the curriculum
- Uses mathematical puzzle activities as an educational discovery and engagement strategy
- Focuses on communal sense-making through group work
- Emphasizes both procedural and numerical fluency
- Promotes flexible and strategic thinking and critique of reasoning

[1] Intersegmental Committee of the Academic Senates of the California Community Colleges, the California State University, and the University of California

Does MRWC replace Precalculus?

MRWC is written to serve as a bridge course between either:

- Integrated 3 / Algebra 2 and precalculus
- Integrated 3 / Algebra 2 and a college General Education course in mathematics, statistics or quantitative reasoning

Will MRWC satisfy 'a-g'?

Yes, MRWC has been approved for Program Status in the area "c"/Advanced Mathematics. Program status means that schools do not have to individually submit a course description. For the current MRWC schools, UC has added the MRWC course to each school's a-g course list. In subsequent years, schools will simply need to select MRWC as one of their a-g offerings.

Do students need to take MRWC now that California State Universities are not giving the ELM (CSU Mathematics placement test)?

Yes. Taking a fourth-year math course, such as the MRWC, is more important now than ever before. The CSU is moving towards requiring 4 years of college prep math as an admissions requirement. Course placement will be determined by multiple measures, one of which will be grades in a CSU-sanctioned senior level math class. Students who are underprepared will be required to enroll in a developmental course concurrently with the college-level math course required for their major. These developmental courses may curtail students' subsequent options in career pathways.

MRWC will help keep options open for students who may change career paths later. The new CSU directives to eliminate remedial courses will greatly limit students' ability to transfer between courses and majors once they have enrolled in college. It is going to be more important than ever that students receive a strong mathematical foundation in high school before entering college to ensure all majors are accessible in college.

Will MRWC meet the EAP Conditional requirement?

Yes, with a grade of C or better in both semesters.

Will MRWC satisfy the Early Start requirement for EAP Not Yet Ready students?

As part of a pilot program, MRWC has been approved by the following institutions to allow all students who received a "2" on the SBAC and with a C or better in MRWC to go directly into non-remedial college-credit mathematics, statistics, and quantitative reasoning courses.

- Chaffey College
- College of the Desert
- Moreno Valley College
- Norco College
- Riverside City College
- San Bernardino Valley College
- CSU San Bernardino
- CSU Pomona
- CSU Long Beach
- CSU San Jose

Will MRWC validate a D grade in a lower-level course?

Yes, a C grade or better in MRWC will validate grades in lower mathematics classes.

How will MRWC help students at the collegiate level?

MRWC will help students prepare for college-level math, saving both money and time.

- In Fall 2015, 27 percent of entering CSU freshmen needed remedial or developmental courses in mathematics. Almost the same number had not taken a fourth year of college-prep high school math.
- A U.S. Department of Education study found that 58 percent of students who do not require remediation earn a bachelor's degree, compared to 27 percent of students enrolled in remedial math.
- Most significant academic achievement gains are found among students who take rigorous math in junior and senior years.
- Students who engage in a fourth year of math tap into and build upon their advanced analytic skills and are more likely to have better success in postsecondary course work.

Is there a connection between MRWC and ERWC?

MRWC is modeled after CSU's ERWC as a rigorous and challenging college prep mathematics course. It is designed to serve the same population of students as ERWC.

DISTRICT/SITE FAQ's

What is an MRWC Team?

An MRWC team consists of the following people

- 2 teachers at the same site who are credentialed to teach advanced mathematics classes
- 1 instructional coach
- 1 site administrator
- 1 site counselor

Additional people can be included in the school's MRWC Team subject to approval by the MRWC Curriculum Development Committee.

What are the District responsibilities?

The responsibilities of the district and the grant will be specified in an MOU to be signed by all parties. The following is a summary of the main items in the MOU listed as the district responsibilities.

- Ensure the MRWC course is placed on the master schedule and appropriate students are enrolled in the course
- Ensure MRWC teachers have the appropriate math credential and attend all required training
- Maintain the integrity of MRWC materials are used exclusively in MRWC courses
- Ensure the team attends all training
  - Teachers/Coach = 20 days (10 days in-contract hours and 10 days out-of-contract hours)
  - Administrator and counselor = two 1/2 days (in-contract hours)
- Pay for substitutes (10 days)
- Pay for travel to PD and other related local travel costs
- Agree to cooperate in the collection of the grant-required data and assessment administration (Demographic data, CAASPP data, course grades, course rosters, course assessments, and surveys)
- Agree to inform the eligible students enrolled in the MRWC course and their parents of the purpose and premise of study
- Provide resources for MRWC teachers to reproduce student worksheets and assessments.
- Agree to complete online MRWC site administrator, coach and teacher surveys as required by the project team

What is the teacher stipend amount?

- $2000 stipend for work associated with implementing MRWC and out-of-contract hours (10 days)
- Option to purchase 4 quarter-units of graduate credit at $70 per unit from CSUSB

What materials are provided by MRWC?

MRWC provides

- Teacher Binder which provides content discussion, students activities and exercises, and pedagogical suggestions for delivering the curriculum
- Classroom set of all mathematical puzzle games
- PDFs of student activity worksheets to be copied by the district
- Access to PowerSchool, which includes videos, teacher-created resources, and other resources to support course implementation

Can any school offer the MRWC course?

Only schools who have been invited to participate in the i3 Pilot implementation can offer the MRWC course on their campuses. Teachers, instructional coaches, and site administrators must be trained. If your school would like to be a part of future implementation cycles, please contact Teresa Cummings at teresakaycummings@gmail.com.

MRWC Administrative Team

- Mike Barney - Executive Director, Instructional Services, Riverside County Office of Education
- Diana Ceja – Administrator, Riverside County Office of Education
- Teresa Cummings - i3 MRWC Project Director
- Jay Fiene - Dean, College of Education CSU San Bernardino
- Ekaterina Forrester - External Evaluator, Illuminate Education, Inc
- Melanie Janzen – Curriculum Coordinator for Secondary Mathematics, SBCSS

For additional information or questions, please contact: Teresa Cummings at tcummings@rcoe.us or 916-204-4227