

SONOMA STATE MATHEMATICS SUBJECT MATTER PROGRAM PROGRAM PORTFOLIO REQUIREMENT

In order to complete your secondary teaching track major in mathematics, you must create a Mathematics Portfolio. You should begin compiling the portfolio in MATH 390, which is normally taken in the first semester of the sophomore year. (Transfer students should begin working on the portfolio concurrently with the first mathematics coursework at SSU.) You will complete the portfolio and present it for evaluation in MATH 490, which must be taken in the last year of your undergraduate program. Successful presentation of the portfolio is an exit requirement from the Mathematics Subject Matter Program and the major.

Purposes

The main formative, or educational, purposes of the portfolio are for you to compile important or illustrative pieces of your work, use these to synthesize what you have learned, and reflect on the significance of your learning and its application to your future career as a teacher. The main summative, or evaluative, purpose of the portfolio is to assure the faculty that students completing the Mathematics Subject Matter Program are knowledgeable in undergraduate-level mathematics content and aware of its relevance to secondary teaching.

Contents and Structure

Your portfolio must include entries in all of the following clearly identified domains:

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My Teaching Philosophy: Beginning of Program

Content Domains:

- Number and Algebra
- Geometry and Measurement
- Probability and Statistics
- Calculus and Analysis
- Mathematical Structure and Connections
- Mathematical Applications and Modeling
- Reasoning and Problem Solving
- Representations and Mathematical Communication
- Mathematics in History, Culture, and Work

My Teaching Philosophy: End of Program

Summary Reflection

Here is a more detailed description of what is expected in each of these domains.

Teaching Philosophies: These expositions should draw on your experiences as an observer of middle and high school teaching and your work with students of that age, as well as your

own experiences as a student of mathematics. Each of these portfolio entries should be at least two or three pages long, though they may be longer. The Beginning Teaching Philosophy will be evaluated on:

- Depth of thought — Is it based on some combination of observation, theory, and personal experience? Does it demonstrate analysis and reflection?
- Rationale and coherence — Is the piece well organized and coherent? Does the exposition flow smoothly? Are claims or conjectures supported by evidence, examples, or arguments? Are the ideas consistent, or if not, are inconsistencies or ambiguities articulated as such?
- Writing quality — Is the writing clear and grammatically correct, with proper spelling, punctuation, and diction?

The Ending Teaching Philosophy will be evaluated on depth of thought, rationale and coherence, and also on:

- Evidence of growth — Does the piece show evidence of your learning and growth regarding mathematics education over the course of your Subject Matter Program?

Content Domains: In each of these domains, your portfolio must include two or three artifacts that demonstrate your understanding or learning of important ideas and processes in that domain. These artifacts typically come from your coursework at Sonoma State and from your middle or high school observation site(s), though other items may be chosen as appropriate. Individual artifacts can be large (e.g., a paper or project you've written, a homework assignment or exam you've completed, a collection of student work you've analyzed) or small (e.g., a single problem solution you produced, a question you explored and answered in an interesting way, a graphic explanation of a bit of mathematics, photos of a poster, model, or geometric form that you created). You do not have to showcase your best work at SSU; it is entirely acceptable to present a failure that became a turning point in your thinking or to show a reworking of an activity or exam where you learned from that revision. The artifacts must involve you in some significant way — rather than a worksheet your observation teacher developed, for instance, present something you participated in, such as a problem that you used to tutor a student or a quiz that you helped grade. The portfolio as a whole must include a variety of different types of artifacts.

The collection of artifacts in each domain must be accompanied by a written reflection that: a) describes each artifact and the important ideas and/or processes it represents; b) explains their significance to you; and c) describes their relevance to secondary mathematics teaching. Only one reflection is required for each domain (say, Geometry and Measurement), not a separate reflection for each artifact — but the reflection should connect the various artifacts in some way.

Each of the Content Domains will be evaluated on:

- Examples with reflection on your own learning — Are the artifacts appropriate and significant for the domain? Do they demonstrate some aspect of your learning? Does the reflection explain these points adequately?
- Connections with secondary level mathematics teaching — Does the reflection explain connections between what you are learning through university coursework in this domain and the world of mathematics in secondary school?

Summary Reflection: This should look back across your learning and experience overall in the program and also look ahead to mathematics teaching as a career. The reflection should address three areas: a) Mathematics — What have you learned about the field of mathematics as a discipline? What are your mathematical strengths and weaknesses? What aspects of mathematics do you like or dislike, and why? Other thoughts? b) Career — What path do you project for your career at this point? How has your experience at Sonoma State changed, reinforced, or informed this choice? Other thoughts? c) Portfolio — To what extent and in what ways was creating this portfolio a worthwhile task for you? What aspects did you like or dislike, and why? Other thoughts?

The Summary Reflection will be evaluated on:

- Depth of thought — Is it based on some combination of observation, theory, and personal experience? Does it demonstrate analysis and reflection?
- Rationale and coherence — Is the piece well organized and coherent? Does the exposition flow smoothly? Are general ideas supported by evidence, examples, or arguments? Are the ideas consistent, or if not, are inconsistencies or ambiguities articulated as such?
- Evidence of synthesis — Does the reflection draw on the range of portfolio domains and contents? Does it connect them in meaningful ways to derive a bigger picture?

Presentation

Portfolio contents must meet college-level standards of writing (i.e., well organized, clear, correct in grammar and spelling, neat). Your expositions and reflections must be word-processed, but the format of the artifacts may vary. You are encouraged to be creative in design and appearance, within the structural guidelines above. Your portfolio may be bound or assembled in a 3-ring binder. In MATH 490, all portfolios will be submitted for final assessment on a schedule determined by the instructor and the students.

Assessment

Mathematics Subject Matter Program faculty will assess your portfolio using the attached rubric. Note that each domain has between two and four elements, or assessment criteria. Your portfolio will be evaluated on every one of these elements. In addition, the portfolio as a whole will be assessed on two Overall Criteria:

- Writing quality — Is the writing clear and grammatically correct, with proper spelling, punctuation, and diction?
- Organization and presentation — Is the portfolio well organized and easy to read? Is it neat and attractive?

Each element in your portfolio will be judged as meeting one of three levels of performance: exceeds expectations, meets expectations, and does not meet expectations. A portfolio containing any elements that do not meet expectations in the three summative categories, or more than two such elements in the remaining categories, must be revised and resubmitted for assessment. A passing portfolio is required for successful completion of the Mathematics Subject Matter Program and a grade of Credit in MATH 490.