

## Math Portfolios

**Portfolio definition:** A portfolio is a purposeful collection of student work that tells the story of a student's efforts, progress, or achievement. It must include student participation in the selection of portfolio content, criteria for selection, criteria for judging merit, and evidence of student self-reflection. Arter, 1990

Specifically, a portfolio consists of purposeful, not random collections of student work—a number of pieces of work produced by individual students and assembled for a specific purpose.

### Reasons for using portfolios:

- To engage students in learning content;
- To help students learn the skills of reflection and self-evaluation;
- To help students understand what quality work is;
- To document student learning in areas that do not lend themselves to traditional assessment; and
- To facilitate communication with parenting adults.

### Decisions related to developing portfolios:

- Purpose and type
- Timeframe—grading period, semester, year, several years
- Selection of entries
- Organization—standardized or not?
- Management
- Storage and access
- Finding Time
- Ways to involve parents
- Grading and assessment

### Types of portfolios:

- Working**--Holding tank--a receptacle for work in progress.
- Display, Showcase, or Best Works**--Works selected to show the highest level of achievement for the student—Here's who I am and here's what I can do.
- Assessment**--Documentation about what the student has learned--portfolio entries demonstrate mastery of the curriculum objectives.

### Four Steps of Portfolio Development

#### **1. Collection**

*The teacher needs to define and communicate the purpose of the portfolio. Expectations about what types of work to collect—and what not to collect also need to be communicated. In addition, it is important to designate a time frame for the portfolio.*

### What might be appropriate content for a math portfolio?

- Homework problems
- Student created problems
- Problems the student felt were especially interesting and challenging
- Problems that required multiple solution approaches or strategies
- Problem that required the generation, presentation of data in chart or graph, and interpretation of the data

- Student examples of how math is applied in everyday life
- Results of a team investigation (including a description of the problem, the difficulties encountered, possible solutions, final solutions or products)
- Samples of problems that reveal student strengths or evidence of persistence
- Samples of best efforts or tests that reveal accomplishments
- Problems that required the use of technology
- Sample problems that show progress over time
- Long term math investigation

## 2. Selection

*Teachers can develop criteria for selection of products or samples or collaboratively establish criteria with the students. Teachers then need to clearly communicate guidelines to the students. It may be helpful to develop a Table of Contents (to convey the organization). Often portfolios include a letter from the student to the portfolio evaluator.*

## 3. Reflection

*Reflection is when students articulate their thinking (usually in writing and often in response to teacher provided prompts) about some aspect of the mathematical process and their progress as a mathematician. For example, the students comment on why they selected a particular problem, what they especially liked about the way they solved the problem, what they will do differently they next time they encounter a similar problem, their areas for improvement, their strengths as mathematicians, etc.*

Decide how reflection will be systematically incorporated in the portfolio process. Teacher generally identify prompts that direct the student to respond in some productive ways.

## 4. Projection

*Projection involves giving students the opportunity to review and evaluate their portfolio to date; to celebrate their progress and to set goals for future growth.*

### Important considerations:

Decide on grading and evaluation

- Assign grades only to items in assessment portfolios
- Evaluate items in an assessment portfolio against clear criteria using a scoring rubric, scoring guide (or checklist, rating scale) which the students have helped to create.
- Assess the portfolio for completeness and organization.

Develop ways for parents to comment on the portfolios

Hold student led conferences on *Portfolio Night*

Reference: Danielson, C., & Abrutyn, L. (1997). *An Introduction to Using Portfolios in the Classroom*. Alexandria, VA: ASCD.