

### **Portfolio Assignments for Mathematics 396**

You will have **three** portfolio assignments. Each problem should be written with the task of illustrating a given prescribed problem solving strategy and should require at least three mathematical steps to solve! Try to make the problems **interesting** and **relevant** to children's lives, and thus useful for you upon entry into the teaching profession. **The problem should be appropriate for grades levels 4 – 7.**

Have fun and use your imagination. Try to write each problem ON YOUR OWN, without borrowing from other resources. Cite your reference if applicable.

**INSTRUCTIONS:** There are three parts to each assignment. See the Course Schedule for the due dates for each part of each portfolio.

#### **PART A:**

1. **Write your very own multi-step story problem for grades 4-7 that can be solved and will be solved most effectively using the prescribed problem solving strategy below:**
  - a. **Portfolio 1:** draw a diagram, use a picture, or eliminate possibilities (**a table is NOT a picture/diagram**) (choose one of these strategies)
  - b. **Portfolio 2:** use sub-problems or patterns or counting techniques (choose one)
  - c. **Portfolio 3:** use Venn diagrams, working backwards or algebra (choose one)
2. **Answer the following questions:**
  - a. What mathematical ideas should the students know in order to be able to do this problem?
  - b. What additional ideas should the students learn from doing this problem?
  - c. What should the teacher know for this problem?

#### **PART B: For Part B you will be looking at Portfolio PART A written by a classmate.**

1. Solve the problem. The steps in your solution should be clear and readable, but you need not go into a lot of detail or explanation. If the problem cannot be solved as written, please explain in detail why and suggest ways to fix the problem so that it can be solved.
2. Ask Clarifying questions. What could be added to the problem to make it clearer or what information is unnecessary for the problem and does not add value?
3. Was the problem most easily solved using the prescribed strategy?
4. Was the problem appropriate for grade levels 4-7?
5. Other than what was suggested in Part A, are there additional mathematical ideas a student doing this problem should know?
6. Other than what was suggested in Part A, are there additional mathematical ideas a teacher should know?
7. Give a suggestion on how the problem could be improved or modified in a constructive way.

**PART C: For part C you will receive your original problem PART A back as well as PART B as completed by a classmate.**

1. Revise your problem according to the suggestions given in PART B
2. Solve the problem and verify your solution. Your solution should differ from that given in PART B in some way (i.e. you should NOT just copy their answer). Your verification should solve the problem in a DIFFERENT way than your original solution.

**GRADING:**

Parts A and B will be graded based on completeness and quality of answers to the questions. Each part is worth 10 points.

Part C of the portfolio problem is assessed on a scale of 22 points as follows:

**Problem:** Twelve (12) points are given for this section of the assignment which contains the wording of the actual revised problem:

- Two (2) points are given for a problem that can be best solved using the prescribed strategy in the assignment.
- Two (2) points are given for writing a problem that illustrates an important mathematical idea for the grade level.
- Three (2) points are given for an interesting story.
- Three (3) points are given for clarity and good use of language.
- Two (3) points are given for using the suggestions given in Part B.

The remaining ten (10) points are assigned as follows:

- Six (6) points for a complete and correct **Solution**.
- Four (4) points for **Verification**. The full 4 points for verification will only be given if the verification is different from the solution.