

**NPTT PROGRAM
EDCI 554 PORTFOLIO
James F. McCue**

Table of Contents

Topic 1	June 7, 2005	3
Topic 3	June 12, 2005	6
Topic 4	June 19, 2005	9
Topic 5	June 26, 2005	15
Topic 6	July 04, 2005.....	20
Topic 7	July 10, 2005.....	31
Topic 8	July 10, 2005.....	4

For Topic one, my task upon review of chapter 2, “Curriculum Development” and chapter 1, “Philosophy as a Basis for Curriculum Decisions” is to answer the following questions (1,3,5,6,7) from page 3 in the Allan C. Ornstein article.

Question #1:

How does philosophy guide the organization and implementation of curriculum?

A defined philosophy provides a framework for organization of schools and their classrooms. Based on this framework, the critical building of a school’s purpose, what subjects to be taught, what methods and materials to use in the implementation of the chosen curriculum can be answered. Also, philosophy provides a means of tackling issues such as determining the goals of a school’s education, what will a subject’s content be along with its organization; it also helps define what the process of teaching and learning will be for teacher and student. With answers in hand finally, detailed questions can be answered to, what textbooks to use for a subject, what and how much homework should be assigned, how to test students on their knowledge gained on a subject.

Question #3:

What are the sources of knowledge that shape your philosophical view of curriculum?

My past education, upbringing and experience in life, as well as what I'm learning about teaching in the NPTT program, provide a major source of knowledge used in shaping my philosophical view on curriculum. What I deem as value based on my continued growth and development through life provide my bases of philosophy for curriculum.

Question #5:

What is the major philosophical issue that must be determined before we can define a philosophy of curriculum?

The question of what is education must be addressed and agreed to in order to proceed to defining what a school's purpose is. This is because schools deal with education of children.

With this structure or framework in place, then the philosophy, aims and goals of curriculum can be pursued.

Question #6:

What are the four major educational philosophies that have influenced curriculum in the United States?

They are Perennialism, Essentialism, Progressivism and Reconstructionism. Table 1.1 on page 6 gives an overview of these educational philosophies. It is interesting to note the differences each one has with respect to six categories of philosophical base, instructional objective, knowledge, role of teachers, curriculum focus and related curriculum trends. I find myself leaning towards essentialism and progressivism.

Question #7:

What is your philosophy of curriculum?

Upon review of the four types of educational philosophies listed on Table 1.1 on page 6 and analyzing each one against my values and beliefs, I conclude that essentialism and progressivism best fit my philosophy of curriculum. I feel essentialism best fits the philosophy needed for elementary education curriculum to establish a foundation for early growth and development. On the other hand, progressivism provides the opportunity for young adults to explore and learn about the world and discover their interests, which will allow them to grow and develop into productive adults and have a rewarding life.

Also, I find myself associating with many of the traditional philosophies listed on Table 1.2 on page 8. I consider these my core values that form a nucleus. Surrounding the nucleus with rings are my contemporary values. The nucleus and rings form a very strong attraction with each other. This I believe will give me an excellent philosophy of curriculum to base my math teaching on.

For Topic three, my task upon review of national and Montana standards for mathematics is to answer the following five questions from chapter four of the “Curriculum Today” by G.D. Armstrong.

Question #1:

Are standards now in place that establish clear learning expectations for students?

Yes, for mathematics, the national standard is sponsored by the National Council of Teachers of Mathematics (NCTM) located at www.nctm.org and the Montana state standard is sponsored by Montana Office of Public Instruction (OPI) located at www.opi.state.mt.us

The NCTM web site contains three national standards, the 1989 “Curriculum and Evaluation Standards for School Mathematics” and the 1991 “Professional Teaching Standards for School Mathematics and the 1995 “Assessment Standards for School Mathematics”. The website-based version appears as one integrated standard with the following high level content:

- Vision for School Mathematics
- General Standards for School Mathematics: K4 through Grade 12
- Specific Standards for K4 through Grade 2
- Specific Standards for Grades 3 through 5
- Specific Standards for Grades 6 through 8
- Specific Standards for Grade 9 through 12

- Working Together to Achieve the Vision

The Montana mathematics standard at OPI is broken down into two categories; the first is the “Montana Standard for Mathematics” which identifies seven content standards showing benchmark measurements for grades 4, 8 and 12. The second is the “Montana Comprehensive Assessment System Mathematics”. This contains grade level learning expectations for grades 3 through 8, 10th and graduation. Specific expectations are given for each grade under the four classifications of Advanced, Proficient, Nearing Proficiency and Novice. These classifications follow the Federal Law, No Child Left Behind (NCLB) scaling of proficiency.

Question #2:

Were these standards developed nationally, at the state level, at the local level, or at a combination of the three levels?

The mathematics standards were developed at a combination of national and state level. I am not aware of any local Montana math standards.

Question #3:

To what extent are tests that students take tied to these standards?

Testing is tied extensively to these standards. Montana’s Standards for Mathematics requires testing of the seven content standards at grades 4, 8 and graduation. The Montana Comprehensive Assessment System tests learning expectations for grades 3, 4, 5, 6, 7, 8, 10 and graduation.

Question #4:

If there has been a move toward establishing learning standards and testing students' levels of proficiency against them, have there been any implementation problems? If so, what are they?

With Montana having state standards for mathematics and working towards meeting the intent of the NCLB act of 2002, I'm sure there have been some implementation problems. One example would be new students moving in from out of state who are behind the state standards and test poorly. Because schools are given a short period of time to raise the students' math levels, it must hurt the school's ranking when the NCLB ratings are calculated.

Question #5:

If actions have been taken to establish standards, has there been a generally positive, negative, or neutral impact on levels of student performance?

I believe there has been a general overall positive impact for Montana's students in regards to establishing mathematics standards. Establishing a math standard provides a guideline to raise the student's mathematic skill level to use after graduation from high school. In today's very technology advanced economy, higher math levels are required to be successful and compete in the new global economy. Also, math standards provide an overall structure to a mathematics program for the state to follow. With this structure, benchmarks can be established and measured each year to satisfy the federal NCLB law. One downside effect can be the stress produced from meeting the new NCLB performance requirements and the consequences of not meeting them.

For Topic Four, my task upon review of three reading assignments is to create Stage 1 of My Curriculum Unit using the templates provided. I will provide a background section first to lay the groundwork of my Curriculum Unit called “The Rock Garden.”

Background:

The inspiration for this curriculum unit came from my visit to Missoula for a job interview at Bonner School (K-8) in Bonner, Montana. My interview was on a Thursday. However, I decided to revisit the school two days later on a beautiful Saturday afternoon to reflect on the possibility of my dream of being a math teacher in the Missoula area coming true. When I was walking around the school, I realized just how much land the school had and thought to myself how nice it would be for the town of Bonner to have a community garden. With the town so small, the school seemed like a logical focus and center for the community. It would be a perfect place for the community to have a quiet place to reflect while enjoying the beautiful views of the mountains—a community project where the school’s 8th graders each year would lead the effort of providing a graduation gift to the school and community by working on the Rock Garden. This would be an excellent charity project that would create a strong bond with the community, enabling the 8th graders to give back to and leave a positive mark on the school and community.

With this idea in my mind, I was brainstorming on what my curriculum unit would be for this course and then it dawned on me that my own personal experience with home improvement projects the past two years required many math skills that 8th graders should be able to do. The goal of the two-week unit is for students to be math consultants to a homeowner who has several home improvement projects that he/she needs help with. The students will be providing a

written report and presentation on their recommendation for each of the problems/questions requested by the homeowner. This project will provide valuable experience and evidence of their ability to apply math to solving real life problems (RLPs). Listed below is the overall structure of the unit.

- The unit will be conducted at the end of the 8th grade during May.
- The unit will tie the first five of the Montana Standards for Math to the lesson.
- Listed below are a few of the home improvement projects that will be used for the students to provide mathematical solutions.
 - Backyard flood problem, drainage solution required
 - Creation of rock garden in back left hand corner of yard
 - Expanding the driveway
 - Painting the entire outside of a house
 - Installing a retaining wall
 - Lining flower gardens with brick
 - Installing patio blocks on the garage side of the house.
 - Building storage shelves in the garage
- All of these projects required some math calculations to be performed, such as algebra and geometry, in order to successfully complete the project.
- The big idea for this unit is for students to realize that math skills have real life applications in solving common problems.
- Students will turn in a report of their findings for each problem presented, then they will be put in groups of three to make a group presentation.

Stage 1: “The Rock Garden”

CS - Content Standards/Overarching Performance Goals:

Montana Standards for Mathematics: for end of Grade 8 at advanced level of performance

1. Students engage in the mathematical process of problem solving and reasoning, estimation, communication, connections and applications, and using appropriate technology.
 - 1.1 Formulate and solve multi-step and non-routine problems using a variety of strategies.
 - 1.2 Select and apply appropriate estimation strategies throughout the problem solving process.
 - 1.3 Interpret and communicate mathematical ideas and logical argument using correct mathematical terms and notations.
 - 1.4 Recognize and investigate the relevance and usefulness of mathematics through applications both in and out of school.
 - 1.5 Select and use appropriate technology to enhance mathematical understanding. Such as; paper and pencil, calculator, computer.

2. Students demonstrate understanding of and an ability to use numbers and operations.
 - 2.1 Use the four basic operations with whole numbers, fractions, decimals and integers.
 - 2.2 Use mental mathematics and number sense in using order of operations and order relations for whole numbers, fractions, decimals and integers.
 - 2.3 Use the relationships and applications of ratio, proportions, percent and scientific notion.
 - 2.4 Develop and apply number theory concepts in real world and mathematical problem situations.

3. Students use algebraic concepts, processes and language to model and solve a real world and mathematical problems.
 - 3.1 Understand the concept of variable, expression and equation.
 - 3.2 Represent situations and number patterns using tables, graphs, verbal rules, equations and models.
 - 3.3 Recognize and use the general properties of operations.
 - 3.4 Solve linear equations using concrete, numerical and algebraic methods.
 - 3.5 Investigate inequalities and nonlinear relationships informally.

4. Students demonstrate understanding of shape and an ability to use geometry.
 - 4.1 Identify, describe, construct and compare plane and solid geometric figures.
 - 4.2 Understand and apply geometric properties and relationships (ex: Pythagorean Theorem)
 - 4.3 Represent geometric figures on a coordinate grid.
 - 4.4 explore properties and transformations of geometric figures.
 - 4.5 Use geometry as a means of describing the physical world.

5. Students demonstrate understanding of measurable attributes and an ability to use measurements processes.
 - 5.1 Estimate, make and use measurements to describe, compare and/or contrast object in real-world situations.
 - 5.2 Select and use appropriate units and tools to measure to a level of accuracy required in a particular setting.

5.3 Apply the concepts of perimeter, area, volume and capacity, weight and mass, angle measure, time and temperature.

5.4 Demonstrate understanding of the structure and use of systems of measurements including English and Metric.

5.5 Use the concepts of rates and other derived and indirect measurements.

5.6 Demonstrate relationships between formulas and procedures for determining area and volume.

U - Understandings: Students will understand that...

- Basic math skills obtained through 8th grade can be applied to solving real life problems (RLPs), such as home improvement projects.
 - Algebra and Geometry have real life applications.
 - Math as a cultural tool is available for everyone to use for his/her benefit.
 - Problem solving logic can be applied to RLPs.
 - Performing as an individual and with a group produces positive results.
 - Appreciate achieving an Advanced Rating of Performance is important in achieving success in high school math.
 - Math can be an exciting and fun activity to learn and apply.
-

Q – Essential Questions:

- In the eyes of the student, is math really important and do they need to learn it?
- Can students really master basic math skills to prepare for high school and apply math knowledge in real life situations?

- Can math be fun and not boring to students?
 - Can students apply their math skills to solve RLPs?
 - Can students appreciate math as a cultural tool for all to use?
 - Can math teachers make a positive impact on students' interest in learning and using math skills?
-

K - Students will know:

- How to apply their basic math knowledge and skills to solving RLPs.
 - How to work independently and in a small group to provide a solution to a RLP.
 - How important math knowledge and skills will be in their lives.
 - How to present their findings in a written report and oral presentation.
 - How to apply general problem solving skills to a RLP.
-

For Topic Five, my task upon review of chapters one, eight through ten of classroom assessment and the four other articles assigned is to create a Stage 2 (Assessment) using the UbD templates and a rubric for one performance assessment of my curriculum unit called “The Rock Garden.” First, let’s give an overall structure of the Rock Garden unit to set-up Stage 2.

Overall Structure of Rock Garden Unit

- This is an end of the year 8th grade math unit lasting two weeks in duration.
- An overall Powerpoint presentation will be given on the first day to the class providing a general description of the unit, what’s expected of them and a schedule of events.
- The Unit Set-up is as follows:
 - Students are going to be math consultants to a homeowner who has Home Improvements Projects (HIP’s) that he/she wants to accomplish.
 - These HIP’s require mathematical solutions that the homeowner wants recommendations on and the students will be providing these recommendations.
- A series of Projects/Problems will be given to the students to solve.
- Each student will apply his/her math-accumulated knowledge and skills and any resources available (ex: math text book, working math portfolio) to solve the problem and create a one-page recommendation report with their solution.
- Students will be put into three person groups to generate a consolidated group report two pages in length.
- One person in the group will be assigned to be the spokesperson and give a 3-5 minute oral/powerpoint presentation on the group’s report to the class for review. The class will be representing the homeowner. Each student will be spokesperson for a group during the unit.
- The student’s Show portfolio will include their performance tasks and self-assessments from this unit.

Stage 2: Assessment Evidence for “The Rock Garden”

PT – Performance Tasks:

The following Performance Tasks will be assessed for the Rock Garden Math Unit.

1. Each Student will provide an Individual Recommendation Report, one page long for the Home Improvement Project/problem (HIP) provided by the homeowner.
2. Three person groups will be formed to generate a Group Recommendation Report, two pages long, for the HIP provided by the homeowner.
3. The assigned group’s spokesperson will give a 3-5 minute oral presentation using Powerpoint on the group’s recommendation report, with the other members providing back-up support if needed.
4. The class will provide overall feedback during the group’s oral presentation on whether they would accept the group’s recommendation.

OE – Other Evidence:

The following Other Evidence tasks will be assessed for the Rock Garden Math Unit.

- No quizzes or tests given in this unit.
 - Teacher will provide holistic observations on each student during the following:
 - Group discussions of a specific HIP in reaching a group’s consensus for the Group Recommendation Report.
 - How the class responds to each group’s oral presentation as they represent the homeowner.
-

SA – Self Assessment:

All students participating in the Rock Garden Math Unit will complete the following Self Assessment.

- A twelve question self-assessment questionnaire will be given to the students to measure how they feel about achieving the six desired understanding (U) of this math unit, they are:
 1. Basic math skills obtained through 8th grade can be applied to solving real life problems (RLPs), such as home improvement projects.
 - Algebra and Geometry have real life applications.
 2. Math as a cultural tool is available for everyone to use for his/her benefit.
 3. Problem solving logic can be applied to RLPs.
 4. Performing as an individual and with a group produces positive results.
 5. Appreciate achieving an Advanced Rating of Performance is important in achieving success in high school math.
 6. Math can be an exciting and fun activity to learn and apply.
-

Rubric:

For my Rock Garden Math Unit, I choose Performance Task #1: Each student will provide an Individual Recommendation Report, one page long, for the Home Improvement Project/Problem (HIP) provided by the homeowner. I decided an Analytic Rubric Frame would work best for this performance task.

Using the UbD work templates, I identified the following performance traits for this task, pertaining to the Individual Recommendation Report:

1. Evidence of understanding of the Home Improvement Project/Problem (HIP).
2. Evidence of analysis of the HIP.
3. Evidence of a solution to HIP.
4. The report is one page long.
5. The report is concise.
6. The report is very well organized.
7. The report is well written.
8. The report has clarity and is easy to understand.

I was able to compress the traits into three categories as follows:

A. Math Skills (Traits: 1-3)

B. Written Presentation Skills (Traits: 4-6)

C. English Skills (Traits 7-8)

I choose a quality level consisting of a five-point scale (0-4) with the following general descriptions for an 8th grade level using the Montana Math Standards:

Scale	Grade	General Description
4	A	Advanced Level
3	B	Proficient Level
2	C	Near Proficient Level
1	D	Novice Level
0	F	Inexperienced Level

Listed below is my Analytic Rubric Frame for Performance Task #1 of my Math Unit:

Criteria: Scale:	Math Skills	Written Presentation Skills	English Skills
Weights:	70	20	10
4	<ul style="list-style-type: none"> Advanced Level of 8th grade math, demonstrated in understanding, analysis & solution to HIP in report 	Report is: <ul style="list-style-type: none"> One page long Very well organized 	Report is: <ul style="list-style-type: none"> Very well written Exceptionally clear Through/complete
3	<ul style="list-style-type: none"> Proficient Level of 8th grade math, demonstrated in understanding, analysis & solution to HIP in report 	<ul style="list-style-type: none"> Between 1 & 1 ¼ pages long Well organized 	Report is: <ul style="list-style-type: none"> Well written Generally clear/able to follow Substantial
2	<ul style="list-style-type: none"> Near Proficient Level of 8th grade math, demonstrated in understanding, analysis & solution to HIP in report 	<ul style="list-style-type: none"> Between 1 ½ & 2 pages long Average organization 	Report is: <ul style="list-style-type: none"> Marginally written Lacks clarity/difficult to follow Partial/Incomplete
1	<ul style="list-style-type: none"> Novice Level of 8th grade math, demonstrated in understanding, analysis & solution to HIP in report 	<ul style="list-style-type: none"> Greater than 2 pages long Poorly organized 	Report is: <ul style="list-style-type: none"> Poorly written Almost no clarity Very hard to understand
0	<ul style="list-style-type: none"> No evidence given in report 	<ul style="list-style-type: none"> No evidence given 	<ul style="list-style-type: none"> No evidence given

For Topic Six, my task upon review of chapters six and seven of *Classroom Assessment* by Popham is to create a test using the guidelines for each type of question given in the chapters for my curriculum unit called “The Rock Garden.” There will be five parts to my test as follows:

1. Five True/False Questions
2. Five Multiple Choice Questions
3. Five Matching Questions
4. Five Fill-in the Blank Questions
5. One Essay Question

First, I’ll discuss how this test fits within the structure of the Math Unit.

Test within the Structure of “The Rock Garden” Unit

- Under Other Evidence of my Stage 2, I stated there would be no quizzes or tests given for this unit. Realizing the difficult position that put me in for meeting this assignment, I brainstormed the need for a “Qualifier Test” concept for students to take at the very beginning of this Unit. This will emulate the real world in order for a person to become a certified expert and provide consultation; they must be qualified in demonstrating the knowledge and skills to be a consultant. In fact, I believe the concept adds a valuable component to the unit.
- This qualifier test will build confidence in each student upon passing it, in that they are ready to become a math consultant for the Rock Garden Unit and succeed in completing the tasks required.
- Students will be notified about the Qualifier Test one week in advance of the beginning of the Unit and encouraged to review and brush up on their math skills in preparation for the exam.
- An Advanced Level of 8th grade math will be required to pass this exam. While this is a high standard to expect the students to meet, I believe many students will pass on the 1st round and all will pass on the 2nd round.

Overall Directions:

This 50-point Qualifier Test will consist of five (5) parts, with the following assigned point values:

Points	Part	Name
10	1	Five True/False Questions
10	2	Five Multiple Choice Questions
10	3	Five Matching Questions
10	4	Five Fill in the Blank/Short Questions
10	5	One Essay Question [1-page Recommendation Report]
50		

- The purpose of this test is to qualify you to become a certified math consultant for the Rock Garden Unit. You will be providing mathematical solutions to various home improvement projects/problems (HIP's) requested by the homeowner.
- High standards are expected by the homeowner, so you must achieve a very high proficiency level (A) to become qualified. Therefore, a score of 90% (45/50) must be attained. A review of the test will occur beforehand. If needed, you will be allowed to retake the exam until this proficiency level has been achieved.
- Upon passing the exam, a certificate will be issued to you.
- One period, about 50 minutes, will be allocated to take this exam.
- Pace yourself, think clearly and focus, check your work and provide the correct answers to the questions.
- Put forth your **best** effort!

Part 1: Five True/False Questions

10 points

Directions: Answer the following five (5) questions with a

T for a True Statement or

F for a False Statement

Note: Each question is worth 2 points for a total of 10 points.

1. _____ The area of a right triangle is its base times height. ($b \cdot h$)

2. _____ The volume of a block/cube is its area times height. ($A \cdot h$)

3. _____ For a right triangle, its diagonal or hypotenuse can be determined if the two sides are known.

4. _____ The parallelogram theorem can be used to determine if a triangle is a right triangle.

5. _____ The area of a circle is pi times its radius squared ($\pi \cdot r^2$)

Part 2: Five Multiple Choice Questions

10 points

Directions: Select the correct response to each of the five (5) multiple-choice questions given and write the answer on the blank provided.

Show all calculations in the work area provided.

Note: Each question is worth 2 points for a total of 10 points.

1. _____ If a driveway is 50 ft. long and 20 ft. wide, how many cubic feet (cu ft.) of concrete is required for a depth of 6" (inches) ?

- A. 30 cu ft
- B. 40 cu ft
- C. 50 cu ft
- D. 60 cu ft

2. _____ A homeowner wants to lay pavers (24" x 24") costing \$2.50 apiece along the entire garage side of his house, which measures 30 ft. long by 4 ft. wide.

How much will the total amount of pavers needed cost the homeowner to buy?

- A. \$ 45
- B. \$ 55
- C. \$ 65
- D. \$ 75

3. _____ A homeowner's back yard is 150' by 50'. He has a flooding problem and wants to know how many cubic yards (cu yds) of rain will gather in his backyard if it rains at a rate of $\frac{1}{4}$ " per hour for 12 hours?

- A. 50 cu yds
- B. 60 cu yds
- C. 70 cu yds
- D. 80 cu yds

4. _____ A homeowner needs to build a brick retaining wall that is 4 ft high and 16 ft long. If a brick measures 2" high and 8" long (2" x 8"), how many bricks should the homeowner purchase? Note: The bricks will be laid longwise with no mortar between the bricks.

- A. 576 bricks
- B. 586 bricks
- C. 676 bricks
- D. 786 bricks

5. _____ A homeowner wants to put a 2" depth pebble walkway through his rock garden measuring a total of 56 ft long by $1\frac{1}{2}$ ft wide. How many tons of pebble should he order? (Deliveries are only made in $\frac{1}{2}$ -ton increments; make sure he has enough.) Note: Assume 1-ton of pebble = $1\frac{1}{2}$ cubic yards

- A. $\frac{1}{2}$ ton
- B. 1 ton
- C. $1\frac{1}{2}$ tons
- D. 2 tons

Part 3: Matching Questions

10 points

Directions: On the line to the left of Column A (measurements) write the letter of its corresponding formula/solution from Column B.

Each formula in column B may be used no more than one (1) time.

Note: Each match is worth 2 points for a total of 10 points.



Column A

Column B

(Measurements)

(Formula)

- | | |
|---|-----------------------------|
| _____ 1. Area of a Right Triangle | A. $\text{SQRT}(A^2 + B^2)$ |
| _____ 2. Area of a Right Rectangle | B. $\text{Pi} * D$ |
| _____ 3. Volume of a Cylinder | C. $\frac{1}{2} * B * h^2$ |
| _____ 4. Volume of a Block | D. $L * W * h$ |
| _____ 5. Length of a Diagonal
(Right Triangle) | E. $\frac{1}{2} * B * h$ |
| | F. $\text{Pi} * r^2 * h$ |
| | G. $L * W$ |

Part 4: Fill in the Blanks

10 points

Directions: Answer each of the following questions by filling in the blanks.

Show all calculations in the work space provided.

Note: Each question is worth 2 points for a total of 10 points.

1. How many cubic inches (cu in) of storage space would a homeowner have if he purchased a 20' x 10' x 6' shed? (Do not figure in the attic storage area)

Answer: _____

2. Cubic inches for most homeowners is a hard measurement to get a handle on; convert your answer from #1 into cubic yards.

Answer: _____

3. A homeowner has 3 separate flower gardens with the following dimensions:

1. Rectangle 10' x 4' (L x W)
2. Triangle 6' x 8' (side 1 x side 2) Note: The diagonal is 10' in length.
3. Circle 8' in diameter

What is the total surface area of all 3 gardens in feet?

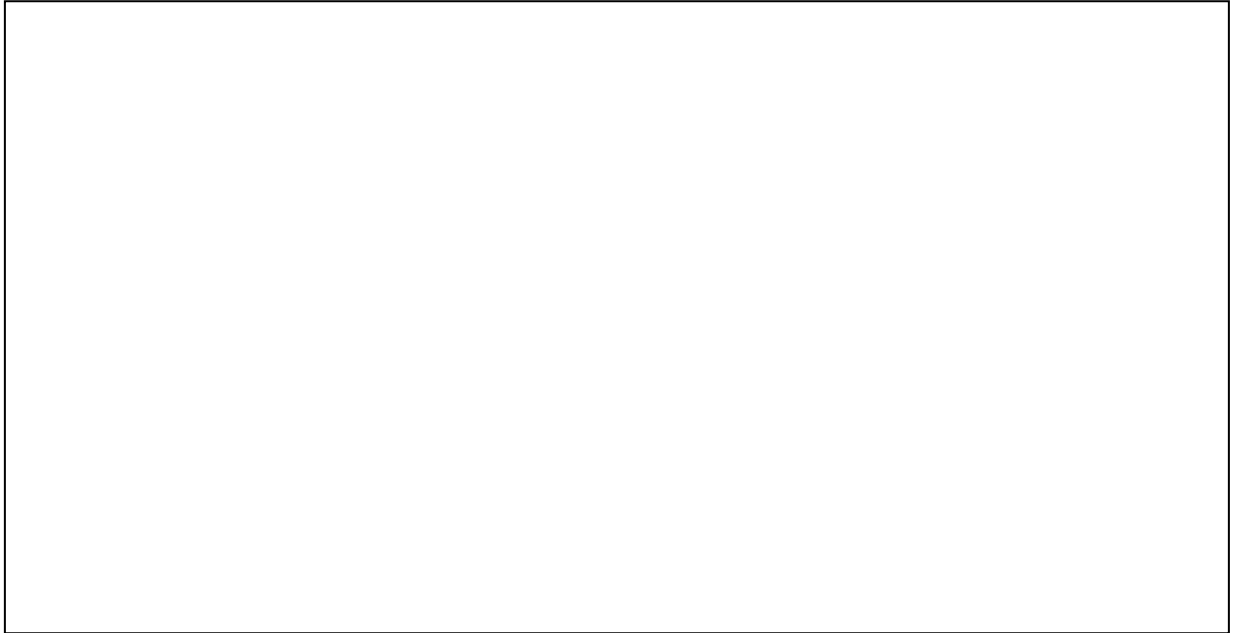
Answer: _____

4. Upon knowing the answer from Question #3 above for how many square feet of surface area he has in the 3 gardens, the homeowner would like to know how many cubic yards (cu yds) of mulch should he order for a depth of 2" ?

Answer: _____

5. Now the homeowner would like to know how many bags of mulch to buy, rounding up to the next whole bag? Note: 1-bag of mulch is 1500 cubic inches in size.

Answer: _____



Part 5: One Essay Question

10 points

Directions: You have been hired to be a math consultant to review/analyze the following homeowner's Home Improvement Project/Problem (HIP) and to provide a one (1) page recommendation report using the outline provided on the next page. Use the work space below to solve the problem, then fill in the report.

Note: One HIP recommendation report is worth a total of 10 points.

A homeowner has a home improvement project consisting of solving his back yard-flooding problem in the back left hand corner. His proposed design solution is to install five (5) plastic heavy-duty containers into 5 holes below ground in the back corner so they can collect rainwater. His back yard dimensions are 150' x 50', and the storage capacity of one container can be determined from its dimension of 3' height and 20" diameter. His question is: Can the 5 containers hold 1" of rainfall onto the back yard? (Yes or No) Show all work in the work space provided and fill in the Recommendation Report. Determine the following calculations in making your recommendation:

1. What is the surface area of the backyard?
2. What is the volume of 1" of rain onto the backyard?
3. What is the total volume of the 5 containers?

<div style="border: 1px solid black; width: 44px; height: 32px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;">1</div>	<div style="border: 1px solid black; width: 44px; height: 32px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;">2</div>	<div style="border: 1px solid black; width: 44px; height: 32px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;">3</div>
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HIP Recommendation Report

I. Brief Summary of Home Improvement Project/Problem:

II. Description of Solution to Problem: (show summary of math calculations)

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III. Recommendation/Answer to Problem: (brief and well organized)

For Topic Seven, my task upon review of chapters two through ten of *Classroom Instructions That Works* by Marzano/Pickering/Pollock is to create the Stage 3 Learning Plan for my curriculum unit called “The Rock Garden.” using the UbD template.

First, I’ll review my key elements used for the Learning Plan discovered from answering the WHERETO checklist within the UbD template.

W.H.E.R.E.T.O:

W: Where

Where are the students coming from?

- Accumulation of mathematical knowledge and skills gained at the end of the 8th grade level of education.

Where are the students going?

- Apply their accumulated math knowledge and skills to real life problems, such as home improvement projects/problems (HIP’s)

Where is the Rock Garden Unit (RGU) going?

- On the 1st day of the unit, I will give a PowerPoint overview presentation on the RGU, explaining:
 - Student will take a qualifier exam to become a “Certified Math Consultant” hired by a homeowner to solve his/her HIP’s.
 - There will be no tests or quizzes after the qualifier exam.
 - There will be 21 HIP’s to solve.
 - There will be 7 groups of three students each.
 - Each student will turn in an Individual Recommendation Report (IRR) for each HIP.
 - Students will discuss a set of 3 HIP’s at a time to produce a Group Recommendation Report (GRR) for the set.
 - Each group will give a 15-minute presentation of its assigned set with each student contributing one HIP solution for 5 minutes from the set.

- There will be 15 minutes of class discussions about the group's presentation.
- An explanation of grading and rubric will be given for the RGU.
- The 17 class period schedule with class events will be presented.
- Sample IRR's and GRR's will be handed out.

H: Hook and Hold

How will the unit hook and hold students attention?

- During the Introduction in the 1st class of the unit, the following questions will be asked of the students:
 - Is math really important? and Do students really need to learn it?
 - Do students believe the math they learned so far in 8th grade can be applied to real life problems?
 - Propose one type can be home improvement projects/problems (HIP's) that homeowners encounter and must solve.
 - Ask students to relate to their own families' experiences and HIP's encountered.
 - Now ask if students would like to be "Certified Math Consultants" and help homeowners to solve math problems related to HIP's.
 - The class will say "YES" of course; now they are hooked and I will introduce them to the Rock Garden Unit via the PowerPoint Presentation.

E: Experience and Equip:

What experiences will help students to explore the big ideas and essential questions?

- Solving HIP's individually and through discussion groups that will give presentations for class discussions will be the vehicles for students experiencing the big ideas and finding answers to the essential questions of the Unit.

What equipment is required for students to perform?

- The students will be equipped with the following to perform the tasks assigned in this unit:
 - Their minds filled with 8th grade level of mathematical knowledge
 - Math toolbox (3x5") index cards filled with math formulas contained within a box that has been filled throughout the year.

- Homework portfolio
- Math text book
- Ruler, contractor and compass
- Calculator
- Computer/Internet
- RGU kit: clipboard, mechanical pencil, graph paper and organizer
- Math Consultant Certificate and Pin

R: Reflect and Rethink

- Students will be able dig deeper into HIP’s during the group’s discussion of every 3-HIP set for a total of seven in creating the Group’s Recommendation Report (GRR).
- Also, during the class discussions that will follow each group’s presentation of its assigned set of HIP’s.

E: Exhibit Understanding and Self Evaluation

- Students will be exhibiting understanding with the following tasks:
 - Writing up IRR’s for the 21 HIP’s covered in the unit.
 - Participating in group discussions to contribute to the GRR for each set of HIP’s.
 - Giving a 5-minute presentation on one HIP.
 - Participate in class discussions after each group’s presentation.
- Students will perform self evaluations through the following:
 - Complete the 12-question survey about the Rock Garden Unit. This will assist in evaluating whether the student achieved the six understandings of the unit.
 - Complete the 5-question self-evaluation on their own performance:
 1. What is your assessment of the IRR’s that you wrote?
 2. How did you interact during your group’s discussions in generating GRR’s?
 3. What is your assessment of the presentation that you gave for your assigned HIP?
 4. Did you give meaningful contribution to the class discussions that followed each group’s presentation?
 5. How do you rate your overall performance during the Rock Garden Unit?

T: Tailoring

- Using the UbD Tailoring Template; I've filled in the quadrants with the following, starting in the upper right-hand corner, going counter clockwise:
 - **I.**
 - Solve the mathematical problem of the HIP
 - Use math knowledge and skills to answer the HIP question
 - Students participate in group discussions
 - Students participate in class discussions during each group's presentation
 - **II.**
 - Read and review the HIP's to understand what the homeowner is asking
 - Listen and read the Intro Presentation on the Rock Garden Unit
 - **III.**
 - Students will apply their learned math knowledge in solving the HIP's.
 - **IV.**
 - Students will write up Individual Recommendation Reports
 - Students contribute to their Group's Recommendation Reports

O: Organization

How will the Unit's activities be organized?

- I've organized this end of the year 8th grade unit based on a class size of 21 students.
- 17 class periods lasting about three weeks is required to complete this unit.
- The Qualifier Exam will be given in the 2nd class, with no tests or quizzes afterwards.
- Hook the class during the 1st class in the verbal introduction with questions for the class to ponder and answer, followed by the overall PowerPoint presentation on the RGU.
- Cycle through the 7 sets of HIP's performing the following tasks:
 - Present the 3-piece HIP set with the class
 - Students write-up their IRR for the set
 - Group discussions take place to generate the GRR

- The group assigned to the set will make their presentation to class with each student covering one HIP.
- Class discussions on each groups presentations will occur.

- On last class, teacher will give a wrap-up/summary with a question and answer session followed by handout of the survey and self-evaluation questions.

- Listed below is the complete class schedule for the unit with each day's events listed.

Rock Garden Math Unit's Class Schedule

Class =====	Day ====	Class Activities =====
1	Fri	<ol style="list-style-type: none"> 1. Give Intro/Overview of Unit with Powerpoint presentation 2. Organize students into 7 groups of 3 students each. 3. HW: Prepare for Qualifier Exam
2	Mon	<ol style="list-style-type: none"> 1. Give Qualifier Exam
3	Tues	<ol style="list-style-type: none"> 1. Review exam, students retake missed questions for certification 2. Present Certifications to students 3. Present Set 1: HIP's (1-3) 4. HW: Write up Set 1 IRR's
4	Wed	<ol style="list-style-type: none"> 1. Turn in Set 1 IRR's 2. Group discussion on Set 1 3. HW: Write up GRR on Set 1 Group # 1 prepare for Set 1 Presentation
5	Thur	<ol style="list-style-type: none"> 1. Turn in Set 1 GRR 2. Group #1 give Set 1 Presentation with class discussions 3. Present Set 2: HIP's (4-6) 4. HW: Write up Set 2 IRR's
6	Fri	<ol style="list-style-type: none"> 1. Turn in Set 2 IRR's 2. Group discussion on Set 2 3. HW: Write up GRR on Set 2 Group # 2 prepare for Set 2 Presentation
7	Mon	<ol style="list-style-type: none"> 1. Turn in Set 2 GRR 2. Group #2 gives Set 2 Presentation with class discussions 3. Present Set 3: HIP's (7-9) 4. HW: Write up Set 3 IRR's
8	Tues	<ol style="list-style-type: none"> 1. Turn in Set 3 IRR's 2. Group discussion on Set 3 3. HW: Write up GRR on Set 3 Group # 3 prepare for Set 3 Presentation
9	Wed	<ol style="list-style-type: none"> 1. Turn in Set 3 GRR 2. Group #3 gives Set 3 Presentation with class discussions 3. Present Set 4: HIP's (10-12)

Stage 3 – Learning Plan for the Rock Garden

Learning Activities:

- Students get hooked on the concept of becoming a “Certified Math Consultant” and help a homeowner solve his/her Home Improvement Projects/problems.
- Students listen, absorb, grasp, ask questions and read the Rock Garden Unit via the overall PowerPoint presentation given by teacher.
- Students prepare for and take the Qualification Exam.
- Students earn their Certification, are given their Certificate and pin, and are now ready to be consultants.
- The following activities are conducted for each set of HIP’s
 - Class is presented with the set of 3 HIP’s to understand and solve.
 - Each student will write-up an Individual Recommendation Report (IRR) and turn in.
 - Each student is assigned to one of seven groups for discussions/review of the 3-HIP set to contribute towards the Groups Recommendation Report (GRR), which will be turned in.
 - The group assigned to the set will prepare and give a presentation covering the 3 HIP’s covered in their GRR. Each student will present one HIP of the set.
 - The class will discuss the group’s recommendations for the set covered.
 - IRR’s and GRR’s will be graded.
 - The presentation will be graded.
 - Group and class discussion grades will also be given.
- There will be seven sets of 3 HIP’s covered in the unit.
- Seventeen class periods will be allocated to complete the Rock Garden Unit following the schedule listed under “Organization.”
- On the last class, a wrap-up summary will be conducted with questions and answers.
- Also, the class will fill out a twelve-question survey along with a five-question self-evaluation questionnaire to assist them on their performance.
- Students will keep their work in the RGU Organizer for use in their Show Portfolios.

For Topic Eight, my task upon review of chapter four of *Daily Planning for Today's Classroom* by Price and Nelson is to create a Lesson Plan for my curriculum unit called "The Rock Garden." using the Instructor's template.

First, I'll give a quick overview of the lesson plans needed for the unit.

Overview of Lesson Plans:

There will be a total of nine lesson plans to complete the Rock Garden Unit's seventeen class schedule listed as follows:

Lesson # =====	Title =====	Class =====
0	Introduction and Qualifier Exam	1, 2
1	Set #1 of HIPs (1-3)	3-5
2	Set #2 of HIPs (4-6)	5-7
3	Set #3 of HIPs (7-9)	7-9
4	Set #4 of HIPs (10-12)	9-11
5	Set #5 of HIPs (13-15)	11-13
6	Set #6 of HIPs (16-18)	13-15
7	Set #7 of HIPs (19-21)	15-17
8	Closing	17

- Lesson 0 will cover the introduction of the unit along with the overall PowerPoint presentation. Also, the Qualifier Exam will be given.
- Lessons 1-7 will have the same structure and format just rotating the HIPs that are covered.
- Lesson 8 will cover the wrap-up and summary of the unit along with handing out the survey and self-evaluation questions.

For this assignment, I will create lesson plan #1 using the generic lesson plan first in order to gain experience, then I'll use the instructor's lesson plan template.

Generic Component Lesson Plan #1:

Component # 0: Overall Description

- Upon students passing the Qualifier exam, the students will be given a Qualified Math Consultants (QMC) certificate and will be striving to earn their Certified Math Consultant (CMC) Certificate upon successful completion of this unit.
- Lesson #1 will cover set #1 of HIPs 1-3.
- Length: 3 periods (or classes) long broken down as follows:
 - 1st – Class 3
 - Last 15-minutes present Set #1 (1-3) HIPs using a PowerPoint presentation and handout.
 - Assign HW: Complete IRRs for Set #1.
 - 2nd – Class 4
 - Collect IRRs for Set #1.
 - Use full period to conduct group discussions and preparations for GRR's
 - Assign HW: Complete GRR's for Set #1.
 - Group #1; prepare 15-minute presentation on its GRR for Set #1.
 - 3rd – Class 5
 - Collect Group's GRR's.
 - Group #1 gives its 15-minute presentation on Set #1.
 - 15-minute class discussions on Set #1 with Group #1.
 - Wrap-up and give assessment of class performance of Set #1.
- The purpose of this lesson is to have students apply their 8th grade math knowledge and skills in solving the three Home Improvement Projects/Problems (HIPs) given in Set #1.
 - Each student will solve the HIPs and write-up a one page Individual Recommendation Report (IRR) to be graded.
 - Seven groups will be formed of 3 students apiece to discuss the 3 HIPs and put together a Group Recommendation Report (GRR) to be turned in.
 - Group #1 will prepare and then present their GRR to the class for discussions.

Component #1: Preplanning Tasks

- Create Set #1: HIPs (1-3) for Lesson
 - Ideally, each set will have the 3 HIPs connected or related to each other.
- Prepare a 15-minute PowerPoint Presentation for Set #1, HIPs 1-3.
- Plan to grade the IRRs and GRR's with a one-day turnaround.
- **Objective:**
The objective of lesson #1 is for the students to apply their math knowledge and comprehensive skills to perform analysis and synthesis in preparing an evaluation or recommendation for a homeowner's set #1 of specific of HIPs (1-3).
- **Standard:** From Stage 1, Content standard
MT math standards 1-5 at the advanced level of performance for 8th grade will be met.
- **Lesson Model:**
The Structured Discovery Lesson Model will be exercised.

Component #2: Lesson Set-up

- 1st period, during the last 15 minutes of class, announce the beginning of Set #1 of HIPs.
- Brief review of teacher expectations of students for this lesson will be given.
 - Put forth your best efforts.
 - Apply math excellence in solving the HIPs and writing IRR.
 - Truly believe and become a Qualified Math Consultant (QMC) to earn your Certified Math Consultant (CMC) status by completing this unit.
 - Work together as a consultant group in preparing/writing the GRR.
 - Positive class discussions concerning the assigned group's presentation are required.
- 2nd period at beginning of class, announce collection of Set #1's IRRs and formation of the 7 groups to conduct discussions and preparations for GRR's.
- 3rd period at beginning of class, announce collections of GRR's and Group #1's presentation of Set #1.

Note: Group members will stand together in front of class with each member presenting a 5-minute speech on one HIP, with a 15-minute class discussions afterward. The class will role-play as the homeowner.

Component #3: Lesson Opening

- 1st period after the lesson set-up is given, discuss in students' terms this lesson's objective and purpose.
 - Objective: As Qualified Math Consultants (QMCs), they will tackle and apply their trade as apprentices with their 1st set of HIPs (1-3). Their objective is to successfully complete all seven sets and earn their Certified Math Consultants (QMCs). They will perform the following tasks:
 - Provide IRRs for each HIP.
 - Discuss within their groups the set of HIPs and prepare a GRR.
 - Group #1 will give a 15-minute presentation on their GRR for Set #1.
 - The class will role-play as the homeowner during the post 15-class discussions that follows to ask questions.
 - Purpose: The purpose of this unit is to provide students an opportunity to experience how important learning and applying math skills is to real life.
 - Many students will become homeowners in the future and will have to tackle similar problems such as the HIPs in this unit.
 - Students can have fun in taking on the challenges of solving Real Life Problems (RLPs).
 - Students can earn their QMCs and demonstrate they are masters of their craft.

Component #4: Lesson Body

- 1st period:
 - After the lesson set-up and opening, give the PowerPoint Presentation on Set #1 HIPs (1-3). Along with a handout of the presentation, explain and present the HIPs.
- 2nd period:
 - Collect the IRRs from the class for set #1.

- Organize the 7 groups for set #1 discussions and preparation of GRR's.
- Teacher will mingle between the groups to evaluate and assist/guide groups in their efforts towards completion of GRR.
- 3rd period:
 - Collect the GRR's from the class for set #1
 - The teacher will perform the following:
 - Monitor Group #1's presentation on its GRR for Set #1.
 - Mediate the class discussions on the presentation given.
 - Wrap-up and summarize Set #1 and let class know how they did.
 - Give back the graded IRRs.
 - Give back the graded GRR's (next period).

Component #5: Extended Practice

- Students will prepare on their own accord the IRR for each HIP in the set.
- Students will collaborate and prepare a Group Recommendation Report for set #1.
- Students in group #1 will prepare and give one presentation on their assigned set of HIPs. Each student will present one HIP on his/her own and participate in the class discussions answering questions from the class.
- All students will participate in the class discussions after group #1's presentation.

Component #6: Lesson Closing

- After 3rd period class discussions of set #1, a brief wrap-up/summary will be conducted by the teacher with the following:
 - Review of the solutions to HIPs, if needed.
 - Give an overall assessment of how the class handled set #1 HIPs.
 - Answer any last minute questions.

Component #7: Evaluation

- Using Stage 2’s assessment evidence; Lesson #1 will have the following assessment of students:

Points	Activity
30	Students turned in set of 3-IRRs.
30	Each group’s GRR (applied equally to each student in group).
10	Each student’s participation during group discussions.
5	Each student’s participation during class discussion of group #1’s presentation.
10	For Group #1, student’s participation during class discussion.
10	For Group #1, student’s portion of group’s presentation on Set # 1.

- Note: Upon completion of unit with a passing grade, each student will have earned their Certified Math Consultant (CMC) Certificate.

The Rock Garden

Lesson #1

Name: Jim McCue

Grade Level: 8th

Length of lesson: 2 1/3 periods

Materials/Resources:

Resources: Overall Rock Garden presentation, Set #1 HIP overview presentation

Materials: Textbook, working portfolio, math supplies, calculator, computer, Internet
(from Stage 3 equipment list)

Standard: MT math standards 1-5 at the advanced level of performance for the 8th grade given in Stage 1.

Objective:

Desired behavior: Use objective stated from Component #1 of generic lesson plan.

Content: Set #1 consisting of Home Improvement Projects/problems HIPs (1-3) will be covered in this lesson.

Conditions of behavior: listed as follows:

- Students will complete 3 Individual Recommendation Reports (IRRs) for Set #1.
- Students will participate and prepare a Group Recommendation Report (GRR) for Set #1.
- Group #1 will give a 15-minute presentation on their GRR for Set #1.
- 15-minute class discussions will follow Group #1's presentation for question and answers on Set #1.

I. Introductory Activity

- Use Component #2 (Lesson Set-up) during the last 15 minutes of the 1st period.
- Use Component #3 (Lesson Start-up) during the last 15 minutes of the 1st period.

II. Explore the concept

- 1st period: review the six essential questions (1-6) from Stage 1; focus on Question #1 in particular.
- 1st period: discuss Set #1's HIPs (1-3) during the Powerpoint Presentation.

III. Organize Concept

- 1st period: during Set #1's PowerPoint presentation, give the schedule of events for lesson #1, also use Component #4 (lesson body) in the presentation.

IV. Practice the Concept

- Use Component #5 (Extended Practice)
 - 2nd period: Teacher will mingle between the groups to assist, advise and evaluate the students.
 - 3rd period: Teacher will mediate, monitor and evaluate Group #1 presentation and class discussions that will follow.

V. Independent Practice

- Students will solve Set #1 HIPs (1-3) independently and write-up their IRRs.
- Students will participate in preparing their group's recommendation report (GRR).
- Students will participate in the class discussions about Set #1.
- Group #1 will prepare and present their GRR to the class.

VI. If students finish early?

- 1st period: Begin analysis of Set #1 HIPs.
- 2nd period: After group discussions on Set #1, groups should begin their GRR.
- 3rd period: Begin analysis of Set #2 HIPs.

VII. Conclusion

- 3rd period: After class discussions of Set #1, conduct the wrap-up/summary using Component #6 (Lesson Closing).

Assessment: Use Component #7 (Evaluation) to conduct class assessment of Lesson #1.

KEY:	HW = Homework	GRR = Group Recommendation Report
	IRR = Individual Recommendation Report	HIP = Home Improvement Project