

Inquiry Core: Scientific Inquiry

Submitting a course for inclusion in CSU’s Inquiry Core Curriculum is an opportunity to think creatively about how you can spark students’ curiosity and help them see the value of the knowledge and methods of your discipline.

Inquiry Core Curriculum Requirements

All courses in the CSU Inquiry Core Curriculum must be:

- Offered at the 100- or 200-level;
- Accessible and inviting to first-year non-major students;
- Adopt an Inquiry Orientation to design and delivery; and
- Include one or more Signature Assignments

Scientific Inquiry Requirements

All courses fulfilling the “Scientific Inquiry” requirement must:

- Meet OT-36 *Natural Sciences Learning Outcomes*
- Develop and assess the Core Competencies of *Critical Thinking & Quantitative Literacy*

Instructions for Completion

- Complete this document in Adobe Acrobat Reader. If you find that you cannot enter any additional text in a textbox, it is because you are using an incompatible PDF reader.
- Include the Core Curriculum Syllabus Statement in your syllabus
- Attach this completed document, your syllabus, and an overview of your signature assignment(s) in Curriculog.

[The CSU Core Curriculum Handbook](#)

Contact the Core Curriculum Director: corecurriculum@csuohio.edu

Course Code & Title	Associated Lab Code & Title (if applicable)

OT36 Outcome Mapping

For each OT36 learning outcome provided in the left column, indicate the following:

- (a) How the course embeds the outcome.
- (b) How student achievement of the outcome will be assessed.
- (c) Where in the syllabus, signature assignment overview, or other provided documentation the embedding and assessing of the outcome is evidenced.

OT36 Outcome	(a) Course Embed	(b) Assessment of Outcome	(c) Evidence of (a) and (b)
Understand the basic facts, principles, theories and methods of modern science.			
Explain how scientific principles are formulated, evaluated, and either modified or validated.			
Use current models and theories to describe, explain, or predict natural phenomena.			

OT36 Outcome	(a) Course Embed	(b) Assessment of Outcome	(c) Evidence of (a) and (b)
Apply scientific methods of inquiry appropriate to the discipline to gather data and draw evidence-based conclusions.			
Demonstrate an understanding that scientific data must be reproducible but that it shows intrinsic variation and can have limitations.			
Apply foundational knowledge and discipline-specific concepts to address issues or solve problems.			
Explain how scientific principles are used in understanding the modern world, and understand the impact of science on the contemporary world.			

OT36 Outcome	(a) Course Embed	(b) Assessment of Outcome	(c) Evidence of (a) and (b)
Gather, comprehend, apply and communicate credible information on scientific topics, evaluate evidence-based scientific arguments in a logical fashion, and distinguish between scientific and non-scientific evidence and explanations.			

Inquiry Orientation

Core Curricular courses are expected to take an inquiry orientation toward course design, organization, and instructional method. While complete “Inquiry Based Education” is not required, courses should include the following two components:

- Organize learning around the exploration and investigation of problems or questions that would be of interest to and engaging for first year students;
- Require students to engage, individually or collaboratively, in some of the stages of inquiry.

[Learn more about designing for inquiry](#)

Major Problems/Questions: What are the major problems and/or questions that frame your course?

Stages of Inquiry: How will students be engaged in the inquiry process in the course? What activities and/or assignments will be used to develop students’ ability to engage in inquiry?

Core Competency Mapping

The core competencies required are provided below. For each competency, do the following:

- (a) Indicate which two learning outcomes the course will especially focus on developing and assessing through one or more signature assignments. The available learning outcomes can be found on the [CSU Core Competencies](#) page of the [Core Curriculum Handbook](#).
- (b) Indicate how each identified learning outcome is embedded or understood in the course.

[CSU Core Competencies](#)

Core Competency 1: Critical Thinking	
Core Competency Learning Outcome	Associated Course Learning Outcome <i>and/or</i> description of how the outcome is embedded in the course
Core Competency 2: Quantitative Literacy	
Core Competency Learning Outcome	Associated Course Learning Outcome <i>and/or</i> description of how the outcome is embedded in the course

Signature Assignments

Each core curricular course is required to have at least one signature assignment and to assess all chosen core curriculum learning outcomes through signature assignments. All signature assignments include two parts: some form of authentic assessment (i.e., not an exam or quiz) and a personal reflection related to the assignment and/or course.

To complete this section, do the following:

- (a) Indicate the signature assignment(s) of the course, briefly describing it.
- (b) Indicate which core competency learning outcome(s) the signature assignment will assess and how it will do so.
- (c) Provide at least one of the reflection prompts you will provide students. You are welcome to provide students with options but need only provide one possibility here.

If you are using more than three signature assignments, include an additional attachment in Curriculog answering the same prompts as below for each additional signature assignment.

[Learn more about Signature Assignments](#)

Signature Assignment Name/Description	Core Competencies Assessed and how	Reflection Prompt

Inquiry Pathway

Core Curricular courses may be included in one or more established [Inquiry Pathways](#). Core courses are not required to be included in any pathway.

If you would like this course to be included in a pathway, answer the questions below.

Pathway:
How will the course meaningfully and substantively contribute to the pathway theme?
Pathway:
How will the course meaningfully and substantively contribute to the pathway theme?

Spring 2024

Dr. Erin Avram

SI 329

e.avram@csuohio.edu

MWF 12:25 - 1:15

BH 405



CHM 151

Chemistry Around Us

3 credit hours

Course Synopsis

This course is an introduction to chemistry, focusing on chemical thought and how it affects our lives.

This course is part of Cleveland State University's Inquiry Core Curriculum, emphasizing critical thinking and quantitative literacy, meeting the scientific inquiry requirement.

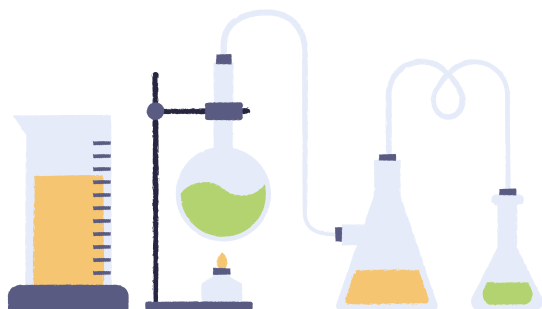


Learning Objectives

1. Explain the relevance and importance of chemistry in everyday life
 2. Apply chemical concepts to solve quantitative and qualitative problems
 3. Critically evaluate chemistry-related information from a variety of sources
-

Required Materials

1. Text: Chemistry Around Us (a FREE, open education text)
 - a. Links provided in each Blackboard module
2. Scientific Calculator: Texas Instruments TI-30X IIS
3. Computer with Respondus Lockdown Browser installed
 - a. Rent a computer for free at CSU's Mobile Campus



Work Sessions

Mondays and Wednesdays
• 1:30 - 3:00 pm



Quick Links for Success

1. Tutoring and Academic Success Center
2. CSU's Mobile Campus
3. CSU's Health and Wellness Center
4. Lift Up Vikes
5. Counseling and Academic Success Clinic
6. LGBTQ+ Student Services
7. Veteran Student Success Services
8. Office of Disability Services
9. Academic Integrity Policy

Grading Details

Type	Points
OneNote Portfolio	200
Homework Assignments	110
Chemistry in the Media Paper	60
Exams (4 exams, 100 points each)	400
Final Exam	150
Total	920

Grade	Percentage
A	93.00 – 100.00
A-	90.00 – 92.99
B+	87.00 – 89.99
B	83.00 – 86.99
B-	80.00 – 82.99
C+	77.00 – 79.99

Grade	Percentage
C	70.00 – 76.99
D	60.00 – 69.99
F	< 60

Specific details, directions, and rubrics for all graded assignments can be found in Blackboard



Tips for Success

1. Schedule times daily to complete coursework
2. Keep up with the portfolio daily
3. Read the assigned text before class
4. Complete all assignments before the due dates
5. Attend class and work sessions
6. Use the six effective learning strategies
7. Ask questions (in class, via email, or in work sessions)
8. Regularly check your comprehension



CHM 151 Class Schedule Spring 2024

Week	Day	Date	Topic	Reading Assignment Before Class	Assignments Due
1	M	15-Jan	NO CLASS - MLK Day		
	W	17-Jan	What is Chemistry?		
	F	19-Jan	Properties of Matter	1.1	Welcome Survey
2	M	22-Jan	All About the Elements	1.2	
	W	24-Jan	Measuring Matter	1.3	Homework #1
	F	26-Jan	Unit Conversions	1.4	
3	M	29-Jan	Density and Temperature	1.5	
			<i>Last Day to Drop</i>		
	W	31-Jan	Review		Homework #2
F 2-Feb Exam 1					
4	M	5-Feb	Structure of an Atom	2.1	
	W	7-Feb	Isotopes and Ions	2.2	
	F	9-Feb	Lewis Dot Structures	2.3	
5	M	12-Feb	Naming Ionic Compounds	2.4	Homework #3
	W	14-Feb	Naming Covalent Compounds	2.5	
	F	16-Feb	Moles and Molar Mass	2.6	
6 M 19-Feb NO CLASS - President's Day					
	W	21-Feb	Balancing Chemical Equations	2.7	
	F	23-Feb	Review		Homework #4
7 M 26-Feb Exam 2					
	W	28-Feb	Gas Laws	3.1	
	F	1-Mar	Gas Law Applications		
8	M	4-Mar	Atmosphere	3.2	
	W	6-Mar	Air Pollution	3.3	Homework #5
	F	8-Mar	Greenhouse Gases	3.4	Portfolio Check #1
	M	11-Mar	NO CLASS - SPRING BREAK		
	W	13-Mar	NO CLASS - SPRING BREAK		
	F	15-Mar	NO CLASS - SPRING BREAK		
9	M	18-Mar	Ozone Layer	3.5	
	W	20-Mar	Evidence of Climate change	3.6	
	F	22-Mar	Review		Homework #6 Article Choice Due
10 M 25-Mar Exam 3					
	W	27-Mar	Water Distribution	4.1	
	F	29-Mar	Hydrologic Cycle	4.2	
			<i>Last Day to Withdraw</i>		
11	M	1-Apr	Safe Water Drinking Act	4.3	Homework #7
	W	3-Apr	Acid Rain and Water Hardness	4.4	
	F	5-Apr	Water Treatment Process	4.5	
12 M 8-Apr NO CLASS - ECLIPSE (and work day for paper)					
	W	10-Apr	Flint Water Crisis	4.6	Paper Due
	F	12-Apr	Review		Homework #8
13 M 15-Apr Exam 4					
	W	17-Apr	Discovery of Radiation	5.1	
	F	19-Apr	Nuclear Reactions - Alpha Decay	5.2	
14	M	22-Apr	Nuclear Reactions - Beta Decay		
	W	24-Apr	Ionizing and Non-ionizing Radiation	5.3	Homework #9
	F	26-Apr	Skin Cancer	5.4	
15	M	29-Apr	Half-life	5.5	
	W	1-May	Applications of Nuclear Chemistry	5.6 (student choice)	
	F	3-May	Review		Homework #10
16	M	6-May	FINAL EXAM 12:30 - 2:30 pm Nuclear chemistry and cumulative	**Note Start Time**	Portfolio Check #2

Flint Water Crisis

Module 4 Day 6

Learning Objectives

- Outline the events of the Flint Water Crisis
- Consider multiple issues of water, including human rights, the role of governments on ecological resources and utilities, citizen action, and health

Class Activities

1. Flint Water Crisis Resources
 - [Flint Water Crisis Summary Video](#)
 - [Flint Water Crisis Reading Assignment](#)
2. With your group, create a timeline of the key events of the Flint Water Crisis
3. Based on your group number, answer the discussion questions for your assigned theme - be prepared to summarize your thoughts to the class. You can do additional online research to gather data to support your claims.
 - a. Record your responses to the discussion questions here:
4. Choose either "natural resource management" or "national risks" and answer the discussion questions
 - a. Record your responses to the discussion questions here:
5. Reflection
 - a. Critically state the issue you investigated in Question 3, be sure to use (and cite) specific evidence to support your claims.
 - b. What is the impact of this environmental crisis?
 - c. What changes should be made to prevent this kind of crisis from happening again?



Rubric for Critical Thinking (from AAC&U Critical Thinking VALUE Rubric)

	Capstone 4	Milestone 3	Milestone 2	Benchmark 1
Explanation of the Issue	Issue/problem is stated clearly and described comprehensively delivering all relevant information necessary for full understanding	Issue/problem is stated, described, and clarified so that understanding is not seriously impeded by omissions	Issue/problem is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown	Issue/problem is stated without clarification or description
Evidence	Information is taken from source(s) with enough interpretation and/or evaluation to develop a comprehensive analysis or synthesis.	Information is taken from source(s) with enough interpretation and/or evaluation to develop a coherent analysis or synthesis	Information is taken from source(s) with some interpretation and/or evaluation, but not enough to develop a coherent analysis or synthesis	Information is taken from source(s) without any interpretation or evaluation

Flint, Michigan: Lethal Water

Discussion Guide

Assignment

1. Read the case “Flint, Michigan: Lethal Water.”
2. Look at the associated graphic, “Flint, Michigan: Lethal Water: Understanding the Connections.”
3. Reflecting on the wheel graphic as you consider what you read in the case, select one of the themes to answer the corresponding discussion questions

Discussion Questions: Understanding the Connections

The graphic contains a photograph of the inside of one of the city water pipes in Flint, Michigan, that was affected by the contaminated water discussed in the case. The wheel of words around the pipe identify 15 different themes or connecting factors (circles of influence) related to the community that played a role in the water/lead crisis in Flint, Michigan, and responses to it. The 15 “circles of influence” each overlap, a reminder that the crisis had many causes and requires interconnected responses. Consider each of the 15 themes individually and in relation to the others, across and among different groups of themes and factors.

As a group, answer the discussion questions for your theme. Consider how your theme relates to the other themes presented in the graphic. Be prepared to summarize your responses for the class.

Science

- How did science play a role in diagnosing the problem?
- Did outdated standards contribute to the crisis?
- Science is data—numbers. Where in the story were people trying to argue their case using data? Whose data was believed? Whose data was questioned? Why?
- As you consider the other themes/factors of the crisis (below), think about how science is connected with them in creating (or solving) health problems.

Local Industry, Economics, Employment

- What local industry is Flint, Michigan, best known for?

This discussion guide was originally developed by the Global Health Education and Learning Incubator at Harvard University in 2017. It is used and distributed with permission by the Global Health Education and Learning Incubator at Harvard University. The Incubator’s educational materials are not intended to serve as endorsements or sources of primary data, and do not necessarily reflect the views of Harvard University.

Discussion Guide: Flint, Michigan: Lethal Water

- Who was the leading employer, and how did changes in industry and employment affect the economic security and prosperity of Flint residents and the city? Did these economic changes play any role in the original plan to find a cheaper water source?
- How does the current employment situation in Flint affect those who live there after the water crisis?
- Think about how jobs and industry affect: loss of industry, abandoned homes, lower tax income to pay for city utilities, and the efforts to maintain a survival infrastructure (water, electricity, schools, jobs, security, food, governance).

Civil Rights

- Why are civil rights especially important for Flint residents?
- How do you think racial discrimination in civil rights in America might play a role in the Flint crisis? (hint:^a)
- Some critics of the Flint crisis called the Emergency Managers “dictators” because of the decision-making power they had due to the city’s impending risk of bankruptcy. Do you think this comment is justified? Do you think Flint citizens’ civil rights were shortchanged due to the appointment of “emergency managers”?
- How might a focus on civil rights help address attempts at urban renewal in Flint?

Poverty

- How does the poverty rate in Flint compare to poverty rates elsewhere in the United States?
- Discussions about poverty often use the words inequity and inequality as if they mean the same thing, but they do not; *inequity* is a lack of fairness or injustice while *inequality* is a disparity or difference in size or circumstances. How would you use these two words in relation to those affected by the Flint crisis?
- How did poverty increase Flint children’s risk of exposure to lead in the water? How did poverty affect families’ access to healthy foods and the ability to find and purchase safe water alternatives?
- What is the connection between poverty and health care access in the United States? Consider the stressors of poverty and how they increase poor health.

National Risks

- Discuss the role of national safety in this local crisis. For example: The Flint crisis illustrates the failure of an American governance at the city, state, and federal levels, despite political systems designed to create national norms of health for all who live in the U.S. What happened in Flint alarms experts because it is a symptom of a crisis that could happen elsewhere. For example, Professor Marc Edwards’ interest in the Flint story arose from his discovery of similar issues in Washington, D.C. The crisis in Flint concerns many because it was so easy for incompetence and poor governmental choices to result in the violation of national standards designed to keep people safe and healthy in their homes.
- Many who moved away from Flint said they will never quite trust the water, no matter where they live. Do you agree? Why or why not?

^a Barret J. “Environmental Justice in Maryland” Environmental Law Clinic, University of Maryland September 2015, https://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=2555&context=fac_pubs. Accessed June 23, 2016.

Politics

- Political factors play a big role in the Flint water crisis. How did politics affect health in this story? Consider the distinct effects of local city government in Michigan with that of national organizations such as the Environmental Protection Agency (EPA).
- How influential in decisions about safe water were: Political budgetary concerns? The Receivership (near-bankruptcy) status of the city? The EPA? The literal cost of raising water prices? What were the negative political consequences of the crisis?
- How do you think political factors might play a positive role in cleaning up water and healthy access to water in Flint?

Health

- In Flint, a non-health-related series of crisis situations led to a health crisis. Consider how health often depends on social factors much more than it depends on good medicine. What social factors in Flint are not directly about health that nonetheless harmed children's health?
- Are Flint's children at special risk because they are poor and may have substandard access to proper medical care? Why?
- Discuss the consequences of lead exposure. What is the short-term vs. long-term impact? What amount of lead is a healthy dose?
- Discuss the consequences and potential health costs to Flint citizens of other contaminants that were discussed in this story (e.g., *E. coli*; trihalomethane).

Policy

- What policies did state government workers pay attention to in deciding to switch Flint's water source?
- What is the role of government policy in the legal debates over costs and consequences? Does this change depending on what level of government (federal, state and local) is acting? What policies were ignored?
- How are legal policy, environmental policy, and health policy all part of the debates and factors in this narrative?

Parents' and Citizen Advocacy

- What parent voices did you hear, and which did you most identify with? Do you think racial bias played a role in the crisis, since the most vocal parent covered in the news—and the researcher and physician who championed the need for change—were not members of the African American community in Flint?
- How important were the voices of parents in identifying the Flint water crisis and pushing for national attention and change?
- Discuss the importance of citizen action in local environmental crises.

Environment

- The Flint water crisis was caused by human action that led to environmental contamination. Environment includes not only the natural environment (water, soil, air), but also the social environment of urbanization. How did the crisis affect Flint's environment?
- Do you know what happens to contaminated pipes when they are replaced or upgraded? How does such "waste disposal" affect the broader environment?

Discussion Guide: Flint, Michigan: Lethal Water

- What environmental effect do you think followed from Flint residents new need to depend entirely on safe water from other sources (e.g., plastic bottles that need proper recycling)?

Legal Action

- Who blamed who in the Flint water crisis? Who had power to push for legal action? What positive role does legal action play in a crisis like Flint's?
- Debate the issue of liability in a situation where government workers were expected to comply with their supervisors and act on decisions they did not always understand.
- What legal action might have the greatest power to improve the lives of those children whose learning potential is permanently affected by lead poisoning as a result of the crisis?

Public Health Campaigns

- How did public awareness of health issues influence this story? What form did public information about health and health risk in Flint take?
- Usually public health campaigns are driven by citizens in collaboration with local public health organizations, including local government. Discuss the role of the public health organizations in the Flint crisis in communicating effective timely information about the risks in the water.

Governance

- International, national, state, and local government organizations are responsible for governance decisions that make it possible for ordinary people to live well, affecting both economics and health. Yet often those responsible for economic governance (the budgets) compete with those responsible for health governance (health systems and health care access). Discuss these competing governance tensions as they played a role in the Flint water crisis. How can those who govern budgets increase their focus on the importance of health?
- How can those who govern health effectively communicate with politicians who care primarily about balancing the books?
- Why is health important for economic flourishing and development around the world?

Public Safety Regulation

- Public safety is regulated by policies, by laws, by citizen action, and by national influence. How was public safety compromised in the Flint water crisis?
- What regulations played a role in the debates? Think about how public safety regulations relate to the other connecting influences and related factors in the "Flint Water Crisis Wheel."

Natural Resource Management

- Do you agree that water is a human right? What should the role of government be in ensuring essential water is safe? Affordable?
- Do some research to find the international documents online that spell out exactly what global leaders have agreed upon related to the human right to water. Look at the language in these documents that describe issues of affordability, access, safety, and health. Think about similar issues related to debates over access and ownership to natural resources such as clean air, adequate food supply, and fossil fuels.

Deflategate

Module 3 Day 2

Learning Objectives

- Describe the relationships between temperature, pressure, and volume of gases
- Use the combined gas law to analyze the properties of gases

Learning Activities

1. Watch: [Deflate-Gate, the Latest Scandal to Plague NFL](#) (Watch 0:00 - 1:45)

Summarized NFL Rules about the pressure in footballs:

- a. Each team shall provide 12 footballs 2.5 hours before the start of the game to be approved by the officials
 - b. Each football must be inflated to a pressure between 12.5 and 13.5 psi. This is gauge pressure, meaning that the football must be inflated to 12.5 - 13.5 psi *above* atmospheric pressure (typically around 14.7 psi)
2. Brainstorm: What are some factors that could affect the pressure inside a football?
 3. What was the actual pressure inside one of the Patriot's football if the atmospheric pressure is 14.70 psi and the pressure gauge reading is 12.5 at 22 °C? (Hint: See #1b)
 4. Using your previous calculation, what would be the new pressure inside the football if it was moved from the warm locker room (22 °C) to the football field (9°C)?
remember temperature must be in Kelvin
 5. What would you anticipate the pressure gauge reading to be for the football in question 4 if the atmospheric pressure is 14.7 psi?

6. Here are the halftime measurements of the pressure in the Patriots' and Colts' footballs:

Table 1: Halftime measurements of the pressure in the Patriots footballs.

<i>Patriots Ball</i>	<i>Pressure Measured with Gauge 1 (psi)</i>	<i>Pressure Measured with Gauge 2 (psi)</i>
1	11.50	11.80
2	10.85	11.20
3	11.15	11.50
4	10.70	11.00
5	11.10	11.45
6	11.60	11.95
7	11.85	12.30
8	11.10	11.55
9	10.95	11.35
10	10.50	10.90
11	10.90	11.35

Table 2: Halftime measurements of the pressure in the Colts footballs.

<i>Colts Ball</i>	<i>Pressure Measured with Gauge 1 (psi)</i>	<i>Pressure Measured with Gauge 2 (psi)</i>
1	12.35	12.70
2	12.30	12.75
3	12.95	12.50
4	12.15	12.55

6. Based on your calculations in #5 and the data provided in #6, what conclusions can you draw? (be sure to use evidence to support your claim).
7. At the start of half-time, the pressure of the Patriots' footballs were immediately measured. *After* this was complete, the Colt's footballs were measured.
- How would this approach impact the data that was collected?
 - How could the data collection methods have been improved?

Gas Law Practice Problems

1. Sometimes leaving a bicycle in the sun on a hot day will cause the tires to blowout. Explain this phenomenon.
2. The pressure underwater increases with depth. While scuba diving, a diver will release air bubbles. Explain what happens to the volume of these bubbles as they rise to the surface (assume they remain intact).
3. A can of spray paint is used until it is empty, except for the propellant gas which is at a pressure of 1344 torr at 23°C. If the can is then thrown into a fire ($T = 475\text{ }^{\circ}\text{C}$), what will the pressure be in the hot can?
4. A high-altitude weather balloon is filled with 1.41×10^4 L of hydrogen gas at a temperature of 21°C and a pressure of 745 torr. What is the volume of the balloon at a height of 20km, where the temperature is -48°C and the pressure is 63.1 torr?
5. A balloon that is 100.21 L at 21°C and 0.981 atm is released and just barely clears the top of Mount Crumpet in British Columbia. If the final volume of the balloon is 144.53 L at a temperature of 5.24 °C, what is the pressure experienced by the balloon?

Extra Practice Problems:

1. <https://www.physicsclassroom.com/calcpad/launch/CPGL3>
2. <https://www.physicsclassroom.com/calcpad/launch/CPGL4>
3. <https://www.physicsclassroom.com/calcpad/launch/CPGL5>
4. <https://www.physicsclassroom.com/calcpad/launch/CPGL6>

Rubric for Quantitative Literacy (from AAC&U Quantitative Literacy VALUE Rubric)

	Capstone 4	Milestone 3	Milestone 2	Benchmark 1
Calculation	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are presented clearly and concisely.	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem	Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem	Calculations are attempted but are both unsuccessful and are not comprehensive
Application/Analysis	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work	Uses the quantitative analysis of data as the basis for basic judgments, drawing plausible conclusions from this work	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work