

## Observations

### Strengths. Continue to build on these.

- Interaction with students was very positive.
  - The students seemed engaged, comfortable asking questions, active in taking notes.
- Identified students by name.
- Good use of technology.
  - PowerPoint Presentation
  - ELMO as Whiteboard
  - ELMO for close-up view of experiment
- PowerPoint Slides were well designed.
  - One main point per slide
  - Good balance of text and non-textual elements
  - Good use of color
- Variety of teaching techniques
  - Lecture
  - Experiment/demonstration
  - Encouraged the students to “guess” the what would go on the right side of the equation, which stimulates the extrapolation of recently presented material to an application or similar concept
  - Worked mathematical equations with students
  - Real-time exercise related to the experiment
- Gaged learning of students using questions to test for comprehension.
- Thoroughly answered students’ questions.

### Opportunities for improvement.

- May want to wait longer after asking a question to provide students the opportunity to process the question, formulate a response and gage the social climate. Minimum of four seconds (which seems like an eternity) and up to ten seconds, depending on the complexity of the question.

## Focus Group Results (example responses)

### Q 1: How well prepared do you feel for the homework?

- The assignments are difficult, but resources are provided.
- Sometimes difficult to use the resources due to time constraints.
- Challenging but appropriate.

**Q 2: How well prepared do you feel for the quizzes? (Students automatically segued into what would have been the next area: tests.)**

- Well prepared.
- Quizzes are harder than the tests.
- Like that they are take home and that we can work in groups.
- The quizzes help us prepare for the tests.
- Feel well prepared for the tests.
- Tests were broader and encompassed more material.
- Test was too long.
- There was not as much “hand holding” for the second test.

**Q 3: How well prepared do you feel for the demonstration assessments?**

- He explains them well.
- They are creative and memorable.

**Q 4: How would you characterize the learning environment for this course?**

- Great!

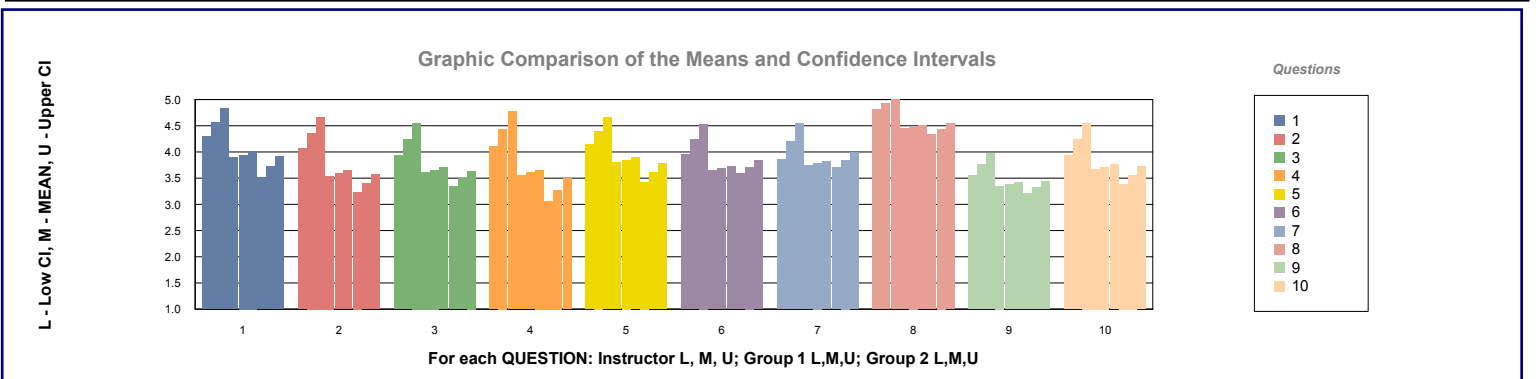
**Open-ended Survey Results (example responses)**

At the end of the class, we invited students to comment on what they would like you to start doing stop doing and continue doing to enhance the learning experience of the class. Below are some representative comments from that open-ended survey. There was considerably more agreement about the “Stop” and “Continue” categories than there was related to the “Start” category.

Start	<ul style="list-style-type: none"> <li>• Everything is really fine as it is</li> <li>• Integrating practice on the application-type problems we see on quizzes</li> <li>• Use more clearly organized powerpoints, just for us OCD people who are taking notes</li> <li>• May be a bit more time on the review for the test</li> <li>• Start talking about the readings in class and discuss the questions that accompany the readings</li> </ul>
Stop	<ul style="list-style-type: none"> <li>• Greeting our homework essays for word choice and style</li> <li>• Rushing through slides on powerpoints, especially ones that contain a lot of information</li> <li>• Making lectures so long that we don’t feel rushed</li> </ul>
Continue	<ul style="list-style-type: none"> <li>• Extremely nice. Always ready to teach</li> <li>• Passionate about the subject</li> <li>• Demonstrations in class to show concepts</li> <li>• Being a great teacher. He’s very organized and positive, a greater presenting the material in an organized an interesting way. (I have one</li> </ul>

	<p>bachelor's degree already, and Michael Evans is one of the best teachers I have ever had.)</p> <ul style="list-style-type: none"><li>• Giving quizzes and going over them before the exam so that we can study them</li><li>• Being enthusiastic about our subject</li><li>• Sending e-mails to the whole class</li><li>• Allowing discussion in class</li><li>• Smiling!</li><li>• During demonstrations in class</li><li>• Respecting all questions</li><li>• In class discussions are great as well as demonstrations to demonstrate complex ideas in class</li><li>• Doing field trips</li><li>• Experiments on ELMO</li></ul>
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Question / Instructor Frequency	Instructor			Comparison Group Descriptions			
	Enrollment : 26			NATS Fall and Spring Lecture, Seminars, Colloquia Lower Division Undergraduate			
	Response: 25 (96%)			Comp Group 1: NATSALL0 5 or more enrolled Sections: 422 Enrollment: 54,509		Comp Group 2: NATSALLM medium class, 20-39 enrolled Sections: 39 Enrollment: 1,187	
	Mean	St. Dev.	95% CI	Mean	95% CI	Mean	95% CI
1. Overall rating of teaching effectiveness <i>almost always effective</i> 16 64% <i>usually effective</i> 7 28% <i>sometimes effective</i> 2 8% <i>rarely effective</i> 0 0% <i>almost never effective</i> 0 0%	4.6	0.65	4.30- 4.82	3.9	3.90 - 4.00	3.7	3.52 - 3.92
2. Overall rating of the course <i>one of the best</i> 13 52% <i>better than average</i> 8 32% <i>about average</i> 4 16% <i>worse than average</i> 0 0% <i>one of the worst</i> 0 0%	4.4	0.76	4.06- 4.66	3.6	3.54 - 3.64	3.4	3.24 - 3.57
3. Amount learned <i>an exceptional amount</i> 11 44% <i>more than usual</i> 9 36% <i>about as much as usual</i> 5 20% <i>less than usual</i> 0 0% <i>almost nothing</i> 0 0%	4.2	0.78	3.93- 4.55	3.7	3.61 - 3.70	3.5	3.34 - 3.64
4. Overall instructor comparison <i>one of the most effective</i> 15 60% <i>more effective than most</i> 7 28% <i>about as effective as most</i> 2 8% <i>less effective than most</i> 1 4% <i>one of the least effective</i> 0 0%	4.4	0.82	4.11- 4.77	3.6	3.55 - 3.66	3.3	3.06 - 3.48
5. Usefulness of the in-class activities <i>almost always useful</i> 12 48% <i>usually useful</i> 11 44% <i>sometimes useful</i> 2 8% <i>rarely useful</i> 0 0% <i>almost never useful</i> 0 0%	4.4	0.65	4.14- 4.66	3.8	3.80 - 3.89	3.6	3.43 - 3.78
6. Usefulness of the outside assignments <i>almost always useful</i> 10 40% <i>usually useful</i> 11 44% <i>sometimes useful</i> 4 16% <i>rarely useful</i> 0 0% <i>almost never useful</i> 0 0%	4.2	0.72	3.95- 4.53	3.7	3.65 - 3.72	3.7	3.58 - 3.84
7. Usefulness of course materials (new question) <i>almost always useful</i> 11 44% <i>usually useful</i> 9 36% <i>sometimes useful</i> 4 16% <i>rarely useful</i> 1 4% <i>almost never useful</i> 0 0%	4.2	0.87	3.85- 4.55	3.8	3.74 - 3.82	3.8	3.71 - 3.99
8. Students treated with respect <i>strongly agree</i> 23 92% <i>agree</i> 2 8% <i>uncertain</i> 0 0% <i>disagree</i> 0 0% <i>strongly disagree</i> 0 0%	4.9	0.28	4.81- 5.00	4.5	4.44 - 4.50	4.4	4.33 - 4.55
9. Difficulty level of the course (new order) <i>extremely difficult</i> 1 4% <i>more difficult than average</i> 17 68% <i>about average</i> 7 28% <i>easier than average</i> 0 0% <i>extremely easy</i> 0 0%	3.8	0.52	3.55- 3.97	3.4	3.35 - 3.42	3.3	3.21 - 3.43
10. Value of time spent on course <i>almost all valuable</i> 10 40% <i>more than half valuable</i> 12 48% <i>about half valuable</i> 2 8% <i>less than half valuable</i> 1 4% <i>almost none valuable</i> 0 0%	4.2	0.78	3.93- 4.55	3.7	3.67 - 3.76	3.6	3.39 - 3.73



EVANS, MICHAEL N	074	NATS 101-017 LEC	37341-01	31
What did you especially like about this course?		What suggestions would you make to improve this course?		
This was an exceptional course with a great teacher - it was really worthwhile and it applied to everyday life. Great Professor.				

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EVANS, MICHAEL N	074	NATS 101-017 LEC	37341-01	31
What did you especially like about this course?		What suggestions would you make to improve this course?		
The instructor is passionate about his subject & his students, I was made aware of global issues.		Focus more on concepts and less on details.		

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EVANS, MICHAEL N	074	NATS 101-017 LEC	37341-01	31
What did you especially like about this course?		What suggestions would you make to improve this course?		
Good teacher, nice, intelligent. Well-organized content		Use of more multimedia		

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EVANS, MICHAEL N	074	NATS 101-017 LEC	37341-01	31
What did you especially like about this course?		What suggestions would you make to improve this course?		
I liked that the professor used a lot of real life examples to prove his point.		Sometimes there was too much information to grasp in such a little time.		

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EVANS, MICHAEL N	074	NATS 101-017 LEC	37341-01	31
What did you especially like about this course?		What suggestions would you make to improve this course?		
lectures interesting, useful demos & activities		Readings: Review them more or give answers to questions		

Take 15 minutes to answer the following 5 questions.

1. Use the following graph to answer this question.

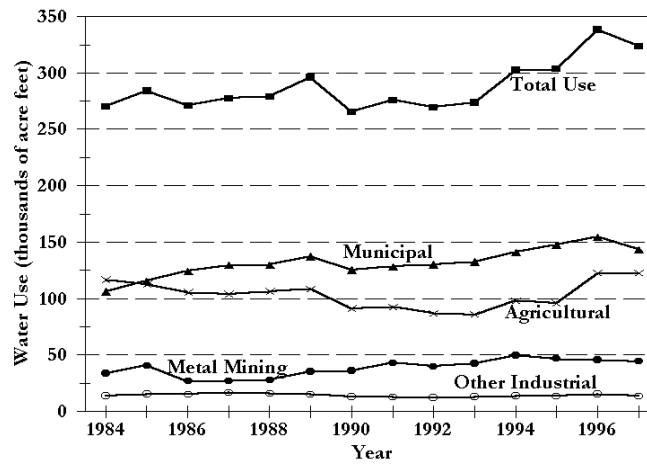


Figure 1: Water use in the Tucson Basin by sector, 1984-1997

Approximately what fraction of total water use in 1995 was for municipal purposes? Is this fraction larger or smaller than the fraction used for municipal purposes in 1984?

2. Evaluate the following expressions (No calculator needed, answers in scientific notation are okay):

(a)  $10^4 \times 10^3 =$

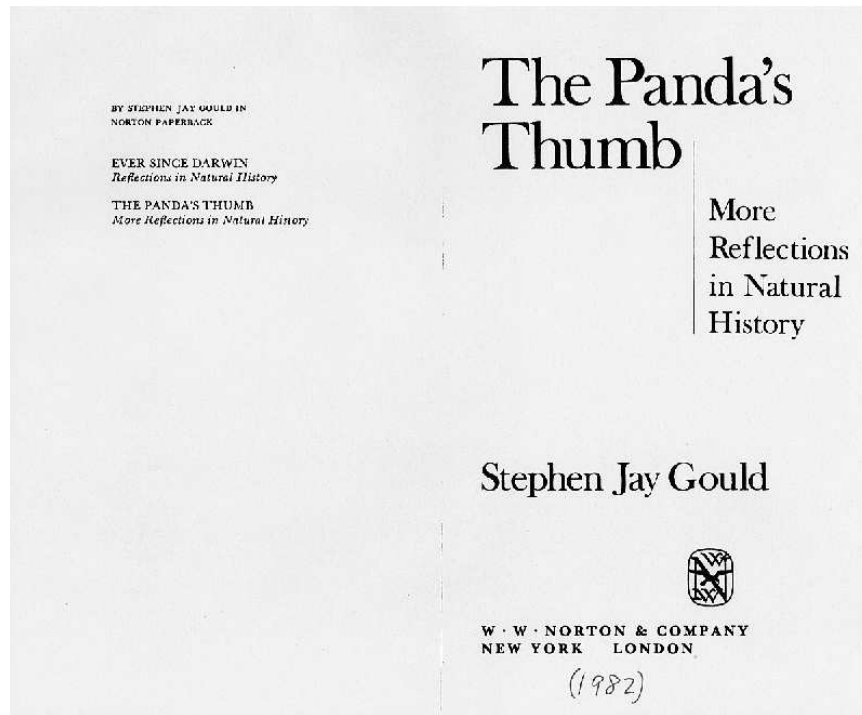
(b)  $(10^4)^3 =$

(c)  $e^{\ln(65)} =$

(d)  $\frac{\frac{5}{6}}{\frac{1}{12}} =$

(OVER)

3. Give a complete bibliographical citation for the book whose title page is reproduced below.



4. A referencing mistake has been made somewhere in this assessment. What is it?

5. Sketch a *systems diagram* showing how the issues **Water Resources**, **Biodiversity**, **Climate Change**, and **Population Dynamics** are tied together. Draw arrows to represent connections; over the arrows, write a few words describing the process by which one issue is linked to another, and how. For instance, Population dynamics negatively impact Biodiversity by the process of deforestation, e.g. 

Population Dynamics
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 $\xrightarrow{\text{deforestation}}$ 

Biodiversity
--------------

.

Fresh Water Resources

Biodiversity

Climate Change

Population Dynamics

Post-Course Assessment  
Nats 101 Section 17H

Take 10 minutes to answer the following 5 questions, for 10 points of demo extra credit.

1. Use the following graph to answer this question.

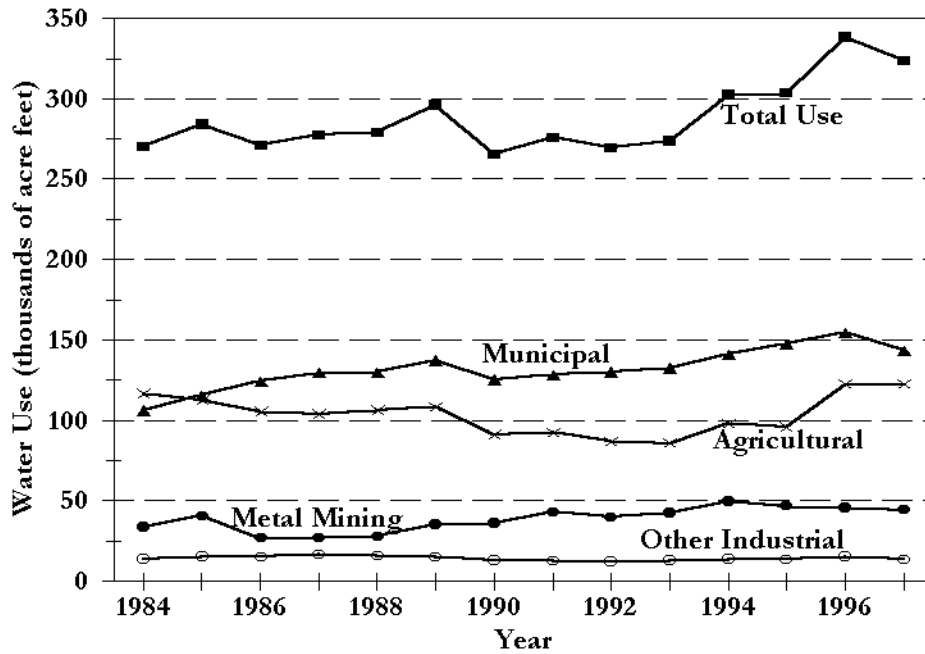


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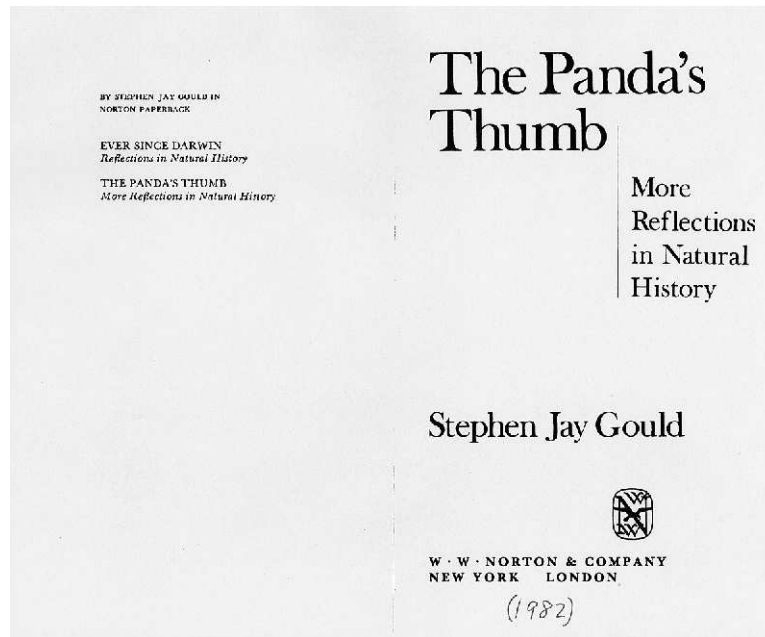
(b)  $(10^4)^3 =$

(c)  $e^{\ln(65)} =$

(d)  $\frac{e^{\frac{5}{12}}}{12} =$



3. Give a complete bibliographical citation for the book whose title page is reproduced below.



4. A referencing mistake has been made somewhere in this assessment. What is it?

5. On a scale of 1 (none/little) to 5 (lots), how much progress have you made toward the following goals, as a result of having taken this class?

(a) Form and defend opinions on current controversies in global change science.

1            2            3            4            5

(b) Apply a small set of scientific concepts to solve problems in unfamiliar contexts.

1            2            3            4            5

(c) Make inferences based on scientific observations.

1            2            3            4            5

(d) Make a clear and concise argument, based on carefully-referenced facts and logic, within a 2 page essay.

1            2            3            4            5

(e) Approximate solutions to quantitative problems using "order-of-magnitude" estimation techniques.

1            2            3            4            5

(f) Interpret data presented in graphs and figures.

1            2            3            4            5

