Name: _____ Date: _____ Class: _____

Pre-Unit Assessment Answers

Part 1: Subject-Matter Questions

The following free-response questions cover topics you will be learning this semester.

Answer all of the questions to the best of your ability.

1. What is engineering?

   Engineering is the application of science and math knowledge to creatively design, develop and build technology, machines, structures, systems, processes and/or tools for the benefit of people, communities, nations, the environment, the world or for profit (or some combination).

2. Name some types of engineering.

   Aerospace, agricultural, architectural, biomedical, chemical, civil, computer, construction, electrical, environmental, geotechnical, industrial, materials, mechanical, nuclear, petroleum, process, software, structural, transportation, etc.

3. What skills do you think engineers have? From the list below, check the top five characteristics that best describe engineers: **More than five possible correct options. Answers will vary.**

   ___welding skills   ___really good at communication

   ___math skills   ___really good at school

   ___creativity   ___really good at research

   ___teamwork skills   ___really good at running a business

   ___technology skills   ___really good at solving problems

   ___curiosity   ___really good at working with tools

   ___really good at recalling facts   ___know how to drive a train

   ___really good at science

4. What is environmental engineering?

   Environmental engineering is a field of engineering concerned with air, water and land quality. It includes areas such as protecting natural environments, waste management, and public health.

5. What types of problems do environmental engineers solve?

   Environmental engineers solve problems such air pollution, water pollution, how to create safe and effective landfills, recycling, how to protect and treat natural resources such as water, how to protect public health through improving air, water and land quality, and more.

6. What is contamination? Give some examples of contaminants.
   Contamination is an unwanted object or chemical that is present in materials, solutions or environments. An example of a contaminant is unwanted or dangerous bacteria (in water) or chemical particles (in the air).

7. What is remediation? Give some examples of ways to remediate.
   Remediation is the act of removing pollution or contamination from environments or materials. Water remediation can be done through processes such as filtering, reverse osmosis and the use of activated carbon. In some cases, polluted water is pumped from its source, treated and returned to its source during the remediation process.

8. Why are chemical properties important for separating chemicals? List some chemical properties.
   Chemical properties are important for separating chemicals because they determine how chemicals interact, react and bond. Chemical properties such as hydrophobicity and miscibility make a difference in how chemicals either mix together or separate, as well as solubility.

Part 2: General Survey

Please circle the number that best represents how you feel about each of the following statements.
Answers will vary. There are no right or wrong answers to the questions in the table.

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
You must work hard to become an engineer.	1	2	3	4	5
I think I could be an engineer if I tried hard enough.	1	2	3	4	5
I think I can learn the skills necessary to become an engineer.	1	2	3	4	5
I like working on teams to solve problems.	1	2	3	4	5
There is usually only one correct way to solve a science or math problem.	1	2	3	4	5
I usually memorize equations and principles rather than make sense of what I'm learning.	1	2	3	4	5
I don't spend more than five minutes on a problem before giving up or asking for help.	1	2	3	4	5
I am not satisfied until I understand why something works the way it does.	1	2	3	4	5
I think science and math are disconnected.	1	2	3	4	5
I think about science and math in my everyday life.	1	2	3	4	5
Skills used to understand science or math can be helpful in my everyday life.	1	2	3	4	5