



Next Engineers: Engineering Academy Unit 4 Student Reflection

STUDENT REFLECTION

Time	Academy unit	Group size	Activity Type
45 min	Unit 4	-	Student Reflection

Activity Description

This activity gives students an opportunity to reflect on their experiences in Unit 4, especially with regard to what they learned completing the engineering design challenge.

Materials

You will need the following materials for this activity:

- A copy of the *Student Handout* for each student

Students will require their *Academy Journals* and a pen or pencil.

Preparation

1. Print out a copy of the *Student Handout* for this Unit 4 Student Reflection for each student. If you do not wish to make printed copies, you can project the questions onto a screen for the group.
2. Step through the activity slowly in your mind imagining how you will arrange the room and how you will direct students during each part of the activity.



NOTES



What to do

1. Have students answer the following questions individually in their *Academy journals*. They can refer back to their copies of the *Engineering Design Process* and *Engineering Habits of Mind* handouts they received in Unit 1 if they need to. Give students about **20 minutes** to answer these questions.
 - a. How has your **perception** of yourself as a future engineer changed since starting the Academy?
 - b. What is the **most surprising** thing you learned during this unit?
 - c. Describe **ONE high** and **ONE low** you have experienced during this unit.
 - d. Divide a page in your journal into two columns.
 - i. In the left column, note a few things you think you did well and/or poorly during the challenge. These can relate to any aspect including teamwork, communication, any of the engineering habits of mind, research, design etc.
 - ii. In the right column, alongside each of the former statements, write down ONE thing you could do/continue to do to improve. Be as specific as you can. What practical steps can you take?
 - e. Rank your **comfort level** with each of the six engineering habits of mind from 1 = least comfortable to 6 = most comfortable. How has your ranking changed from Unit 3?
 - f. How did you and members of your team use the **Problem Finding** engineering habit of mind to help you clarify needs and compare existing solutions? Why was this important?
 - g. How did you and members of your team use the **Systems Thinking** engineering habit of mind to help you recognize the interdependent nature of the parts to the whole? Why was this important?
2. Have students get into their design challenge teams to discuss the following questions. Give them about **25 minutes** for their discussions.
 - a. Discuss with your group what the **Problem Finding** and **Systems Thinking** engineering habits of mind mean to you.
 - b. As a team, how well do you think you practiced the **Problem Finding** engineering habit of mind during this challenge?
 - i. When do you think you looked beyond obvious symptoms and explored deeper underlying issues?
 - ii. When do you think you collected and analyzed feedback to understand the needs and desires of clients?
 - iii. When do you think you applied logical reasoning to connect seemingly disconnected phenomena?
 - iv. How well do you think you spotted differences or inefficiencies in existing solutions?
 - c. What other **actions, skills, or strategies** do you think are important when problem finding in engineering?
 - d. How do you think practicing the **Problem Finding** engineering habit of mind **helped you** in this challenge? What specific benefits can you recall?
 - e. As a team, how well do you think you practiced the **Systems Thinking** engineering habit of mind during this challenge? When do you think you looked beyond individual elements to recognize the interdependencies between them and how they worked together as a whole? When did you recognize the interdependence?
 - f. What other **actions, skills, or strategies** do you think are important when thinking systemically in engineering?



ACADEMY JOURNAL

Require students to write their reflections in their Academy journals. Having to express your thoughts in writing helps you to slow down, focus your attention and think more deeply. It helps make your thinking reasoned and less reactive.

As the philosopher Mortimer Adler said, “the person who says he knows what he thinks but cannot express it usually does not know what he thinks.”

Writing their reflections will help students to form and clarify their thoughts.



- g. How do you think practicing the **Systems Thinking** engineering habit of mind **helped you** in this challenge? What specific benefits can you recall?
- h. How well do you think you **worked as a team**? Think of an instance when you worked well as a team. Why do you think this was the case? Think of an instance when you did not work so well together. Why do you think this was the case?
- i. What do you think you can do to **improve** how well you work as a team?
- j. How well do you think you **managed your time and resources**? Think of an instance when you managed these well. Why do you think this was the case? Think of an instance when you did not manage them so well together. Why do you think this was the case?
- k. What do you think you can do to **improve** how well manage time and resources?
- l. Which of your **assumptions** were challenged during this design challenge?

