The FLEET Engineering Awards

Middle School | Standard(s): MS-PS2-2; MS-ETS-1-1, 1-2, 1-3, 1-4 | Topic: Completing Search and Rescue challenges and celebrating each other. | Developed by: ASNE With materials from NOAA

Overview: Students will complete a Search and Rescue mission (10-20 minutes), to begin the Awards and then celebrate their engineering successes (25-70 minutes).

Sample Lesson Flow

🎉 Final attempt at high score in FLEET search and rescue mission (20 min), final celebration (25 min).
🎉 Final attempts at high score in FLEET search and rescue mission (45 min), final celebration (45 min).

Prior Student Knowledge Required:
- Engineering design process

Student Learning Objective:
- Excite students to continue to see themselves as science and engineers.

Materials:
- Computers set up with FLEET
- Awards for students’ engineering qualities and successes
- (Optional, Step #2 😊) Technology to play YouTube video
- (Optional, Step #6 🎬) paper plates and art supplies to make awards

LESSON PLAN – (5-E Model)

Welcome and FLEET time

1. Students know that today is a celebration, and welcome them to the ceremonies.
2. (Optional) If your class responds well to a video introduction, this three-minute clip is a worthwhile reminder of why Search and Rescue is so important and describes some of the scientists that work behind the scenes to make these rescues possible: https://youtu.be/xNQt4QIvV64?t=1m3s 😊
3. Let students compete in the Search and Rescue mission for some time. This mission combines all their knowledge from the videos, activities and tests in the Speed and Maneuverability Tests. You can remind them of these experiences so they can actively draw on that knowledge.
4. Give students a 10-minute warning about when they should wrap up. As students complete a mission in this time window, encourage them to look over the shoulders of students that are still playing.

Award ceremony

5. There are many ways to do this (a few are listed below). These materials have two goals: 1) improve students’ knowledge and skills, 2) allow students to see themselves as scientists and engineers. Ensure that your award ceremony addresses Goal #2 in a way that makes sense to your students.
6. Superlatives through STEAM option: 😊
   a. Create a list of awards, one for each student
   b. Students will create the awards for you. Assign each award to a student that did not win that award. This student has the task of creating an award that shows that idea.
   c. Give students about 10 minutes to create the award they are supposed to design.
   d. Bring the class together, ask each student to come up and describe their thought process in creating the award, then announce who won the award, and then take a picture of the students giving the award to the student.
   e. Some ideas to help you get started on a list of superlatives. These are tied to NASA’s design process, but you should modify the design process as needed:
List of Some Possible Awards

| Master Engineer of Ask process | Best Unique Thought |
| Master Engineer of Imagine process | Best Engineer – Speed |
| Master Engineer - Planning process | Best Engineer – Maneuverability |
| Master Engineer – Creating | Esteemed Scientist – Best Application of Newton’s First Law |
| Master Engineer – Experiment | Most Valuable Contribution of Applying Newton’s Second Law |
| Master Engineer - Improve | Most Unique Discovery |
| Head Engineer – Process overseer | Most Imaginative Solution |
| FLEET Captain | Most Dedicated Problem Solver |
| Admiral of FLEET | Eureka! Best Discovery |

7. Video game award show!
   a. Unveil the leaderboard that averages the high scores for each mission/weather condition that the students completed. You can award medals for 1st, 2nd and 3rd place or unveil a top 5 or top 10 final standings.
   b. It would be great to have top 5s in a few different categories (implementing the engineering process, creating unique solutions to design challenges, etc.) so that students know they had strengths in some of the engineering areas.

8. The Finals
   a. If your class is good-natured and competitive, you may choose to have a final competition led by the top 3 or 4 scorers in the Search and Rescue mission. These students will compete in the AUV Recovery mission. Other students may choose to help them modify their ship designs for success. Students not interested in the Finals competition initially could design the awards (sash, crown, trophy, etc.) given to the winner and runner ups.
   b. Note: If you had students working in teams throughout this Club, you could modify Step 8a and have a final competition amongst the teams using the AUV Recovery mission.

9. Please post your award ceremony results to the FLEET Forum (http://www.navalengineers.org/Membership/Forum) under “FLEET Awards”.

Additional Resources

A. If you want more celebration ideas, be sure to check the FLEET Forum (http://www.navalengineers.org/Membership/Forum). During this initial roll out, feel free to use that space to list your ideas as a safe space to try out ideas amongst other educators thinking about the same issues.