EVENT 1: FERMI QUESTIONS

(As of 9/30/11)

OBJECTIVE: To estimate the order of magnitude of a quantity that is difficult or impossible to measure.

RULES:

a. Each team will be provided with a list of ten Fermi Questions.
b. Each team will have 30 minutes in which to answer these questions.
c. Each team will submit a single set of answers.
d. All answers must be recorded in order of magnitude format (i.e., 10^4 not 3×10^4, 10^6 not 7×10^5).
e. No electronic devices (cell phones, iPods/iPads, calculators, netbooks, computers, etc.) or preprinted references material shall be permitted to be used during the event.

COMPETITION AND SCORING:

Ten points will be awarded for each correct answer (correct order of magnitude). There will be 1 point off for each order of magnitude difference from the accepted order of magnitude. No answer will score less than zero.

Sample Fermi Questions:

1. How much land area (in square meters) is found on earth? (Answer is 10^{14})

2. How many revolutions will a 14-inch tire make during a crossing of the continental United States? (Answer is 10^6)

3. How many liters of air does an adult inhale in a 24-hour day? (Answer is 10^4)

4. How many square meters of turf (real or artificial) are there in a National Football League Stadium? (Answer is 10^4)

5. An automobile travels 100,000 km before the tire tread wears out. What thickness of rubber wears off the tire each revolution of the wheel? Please express your answer in centimeters. (Answer is 10^{-8})

Updates to the rules will be posted on the NJAAPT web site at www.njaapt.org. Additionally, frequently asked questions with answer will be available by e-mailing John_Valente@mast.mcvsd.org. It is your team's responsibility to keep the team updated about changes and clarifications to the rules.