

FERMI QUESTIONS

1. **DESCRIPTION:** A “Fermi Question” is a science related question that seeks a fast, rough estimate of a quantity, which is either difficult or impossible to measure directly. For example, the question “How many drops of water are there in Lake Erie?” requires an estimate of the volume of a drop, the volume of Lake Erie from its approximate dimensions and conversion of units to yield an answer. The answers should be an estimate within an order of magnitude recorded in power(s) of ten.

A TEAM OF UP TO: 2

APPROXIMATE TIME: 50 minutes

2. **EVENT PARAMETERS:** Calculators, computers, slide rules, reference sheets, etc., are not allowed. Bring pencils. Teams are allowed to finish before the allotted time: they should hand in their answer sheet, have the time recorded by the event supervisor, and exit the room quietly.



3. **THE COMPETITION:**

- a. Each team will have the same amount of time to answer as many questions as possible.
 - b. All Teams competing in a given time block will be quizzed together and will be given no feedback during the contest.
 - c. One teammate will be designated to serve as the team captain and will indicate on the score sheet the team’s answers.
 - d. All answers are to be written to the correct power of ten (exponent) as follows: For a number in the form $C \times 10^E$, the guide for rounding of the coefficient (C), is: if C is 5 or greater (to 9.99...), round C up to 10. If C is below 5 (and greater than 1), round C down to 1. For example, if the number is 4.99×10^6 , you record 6 as your answer. If it is 5.001×10^3 , the correct power of ten is 4. Responses recorded as 5.001×10^3 on the answer sheet will be marked as incorrect.
 - e. Positive exponents are the default. For negative exponents, the minus (-) sign must be included in the answer. If the number is 1.5×10^{-3} , the correct power of ten is -3.
4. **SCORING:** High score wins. Ties are broken by counting the highest number of answers that receive five (5) points. If the number of 5-point answers is the same, time is used as the second tiebreaker.

If the response is:

Equal to the accepted value
 ± 1 of the accepted value
 ± 2 of the accepted value

It earns:

5 points
 3 points
 1 point

Scoring Example: If the accepted value is seven and the response given is 7; then five (5) points are awarded. A response of 6 or 8 receives three (3) points and a response of 5 or 9 receives one (1) point.

Recommended Resources: All reference and training resources including the **Problem Solving and Technology CD** are available on the Official Science Olympiad Store or Website at <http://www.soinc.org>