

Yale Physics Olympics

Team Name _____

Fermi Quiz

Aim: To estimate the values of various quantities.

Materials: None - except an imaginative, innovative mind. Use of electronic devices is seriously frowned upon for this event.

Method: Provide the power of 10 that best answers the question by combining quantities you already know. Question #15 will be a tiebreaker for all events and will not be scored unless there is a tie.

Conditions: The answers must be entered using the units specified. **WRITE CLEARLY!**

Ranking: Each question's score will be the difference between the correct answer and your answer. A penalty applies for leaving answers blank, so take your best guess if you can't calculate an answer or don't have time.

1) How many pennies would it take to cover the surface of the moon?

Answer: 10 pennies

2) How many electrons are there in a 2 carat diamond? (1 carat = 200 mg)

Answer: 10 electrons

3) If you hear thunder 10 seconds after seeing a lightning bolt, how many months will it take a snail to reach the spot that it hit?

Answer: 10 months

4) How much horsepower is emitted by the sun?

Answer: 10 hp

5) If you draw 12 cards from a standard deck of playing cards, what is the probability that every card will be a face card?

Answer: 10

6) How many grains of sand would you need to completely fill in the Earth's oceans?
Answer: 10 grains

7) How many McDonald's French Fries are consumed every year?
Answer: 10 fries

8) How many bananas would it take to outline the perimeter of Connecticut?
Answer: 10 bananas

9) If you made a string out of all of the hairs on Superman's head, what fraction of the distance to Hartford would it stretch?
Answer: 10

10) How much does a single M&M weigh in units of elephants?
Answer: 10 elephants

11) How many English letters appear in an average New York Times newspaper?
Answer: 10 letters

12) How many light-years does a soccer player run during an average soccer game?
Answer: 10 light-y

13) How many centuries has the world spent watching Gangnam Style on YouTube?
Answer: 10 centuries

14) How many seconds would it take to download the information stored on all of the world's hard drives, assuming you download at a rate of 1 MB/s?
Answer: 10 s

15) **TIEBREAKER:** How marshmallows need to be burned to power the city of Las Vegas for a year?
Answer: 10 marshmallows