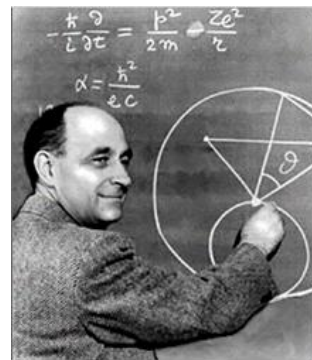


Fermi Problems

Enrico Fermi was an Italian physicist. He was famous for "figuring things out in his head". He was very good at making smart guesses when he didn't know the exact numbers.



Here are some Fermi problems. They are called Fermi problems because you will have to make some smart guesses before you can find an answer.

1. If our entire class lay in a line "head-to-tail", how long would the line be?
2. What is the total weight of all of the students in this middle school?
3. How many hours of TV will the students in this class watch in 2005?
4. How many hours of homework will the students in this class do in 2005?
5. How much Coke (or soft drink) will you drink in your lifetime?
6. How long would it take you to count to 1,000?
7. {As the students are leaving the class at the end of a lesson, start counting "1, 2, 3, 4,". If you see them in the hall later in the day, say something like "97,234, 97,235, ...". When you enter the classroom the next day, say "999,996, 999,997, 999,998, 999,999, 1,000,000. Whew, I did it! I am the first person at MSxxx to count to one million in a single day!". Ask students if this is really possible. (In response to commonly-asked questions: "No, I didn't sleep." "No, I didn't eat. I just counted.")
8. You are stacking nickels. How many are needed to make a stack as tall as you? How much would it cost you to buy all of these nickels?
9. How many times will your heart beat in your lifetime?
10. How many balloons would be needed to completely fill your Math classroom?
11. How much does it cost to feed a dog over it's lifetime?

Here is my favorite Fermi Problem ...

Over your lifetime, how much will you earn for each hour of homework you do?

Assume that a student that does 2 hours of homework per night in middle school and high school will graduate from university, while a student who doesn't do any homework will not graduate from university.

Fact: On average, a university graduate earns about \$15,000 per year more than a person who doesn't graduate from a university.

You might be very surprised at the answer!

Ask the students, working in groups, to make some Fermi problems that they are interested in, and to share them with the class.