Fermi Questions

Fermi Questions are problems that seem impossible to answer at first sight, but with some some assumptions, estimations, and simple arithmetic it is possible to arrive at an answer that is in the right ball park. Often a scientific hypothesis starts with a good Fermi question. We will have lots of practice with this way of thinking.

In your groups work on these questions.

1. How many cells are there in the human body?

2. If the land area of the earth were divided equally among all inhabitants how much land would you get?

3. How many layers of atoms are removed when a car tire rotates once?

Workshop Questions

Work with you neighbors to answer the following questions.

1. Suppose a pea plant with genotype DdPp is crossed with another pea plant with genotype Ddpp. What is the probability of getting a purple dwarf plant?

2. If 5 such crosses are made, what is the probability of getting at least one purple dwarf plant?

Workshop Questions

Work with you neighbors to answer the following questions.

3. Suppose you have a mixture of homozygous and heterozygous tall pea plants, 20% of which are homozygous. If you choose one of these plants at random and cross it with a dwarf pea plant, what is the probability of getting a dwarf in the next generation?
(Hint: draw a tree diagram and calculate the probabilities on each branch using either the laws of probability and Mendel's law of independent assortment.)