



Société Française
de Physique
COMMISSION JEUNES



4TH French Physicists' Tournament

3 & 4 FÉVRIER 2017

École normale supérieure, Paris

Captains' fight

Captains' fight n°2 : Question

Captains' fight n°2 : Question

You have **3 minutes** to answer the following question :

Captains' fight n°2 : Question

You have **3 minutes** to answer the following question :

How many soda cans is it necessary to drink to get as much energy as the supply of a nuclear plant during one year ?

Captains' fight n°2 : Answer

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A standard soda can gives approximately 150 kcal, yielding
(1 cal = 4,18 J)

$$E_{\text{cola}} \simeq 5 \cdot 10^5 \text{ J.}$$

The mean power of a nuclear reactor is 880 MW¹, so the energy produced during one year is

$$E_{\text{nucl}} = 880 \cdot 10^6 \cdot 3600 \cdot 24 \cdot 365 = 2,7 \cdot 10^{16} \text{ J} \quad (1)$$

Hence, one needs

$$N = \frac{E_{\text{nucl}}}{E_{\text{cola}}} = \boxed{5 \cdot 10^{11}} \quad \log_{10} N = 11,7 \quad (2)$$

You want more?

You want more?

Really?

You want more ?

Really ?

Quick : 1min

Question : How many orders of magnitude are there between the highest and lowest artificially obtained temperatures ?

You want more ?

Really ?

Quick : 1min

Question : How many orders of magnitude are there between the highest and lowest artificially obtained temperatures ? **Answer**

You want more ?

Really ?

Quick : 1min

Question : How many orders of magnitude are there between the highest and lowest artificially obtained temperatures ? **Answer**

- ▶ Hottest temperature : quark and gluon plasma at LHC :
 5×10^{12} K
- ▶ Lowest temperature : adiabatic demagnetization : 5×10^{-10} K
- ▶ Thus : 22 orders of magnitude.