PHY117 HS2023

Week 6, Lecture 1

Oct. 24th, 2023

Prof. Ben Kilminster

To avoid confusion, we have 4 ks:

K = Kelvin

k = Boltzmann constant

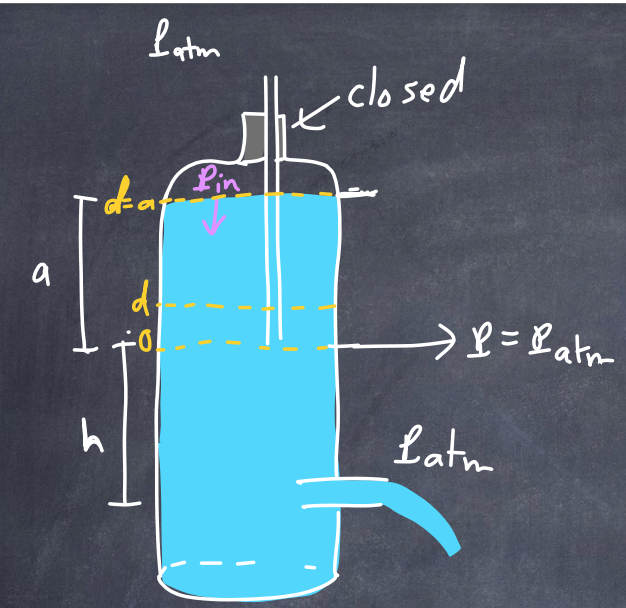
$\mathcal{K}$ = kinetic energy

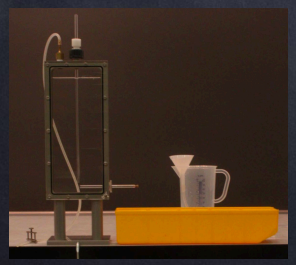
κ = coefficient of thermal conductivity

Thermodynamics – study of temperature, heat, and the exchange of energy. (mechanical work)

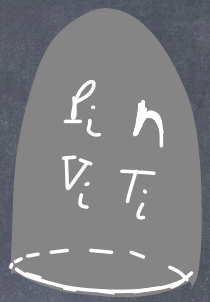
Macroscopic scale: measurable properties:
volume, pressure, temperature.
↓
force/area

Marriotte's bottle :



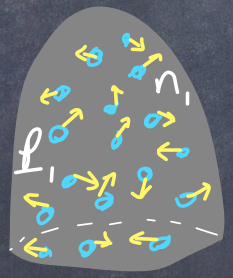


hPa

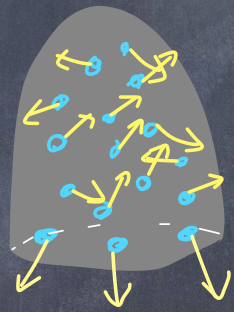


Visually:

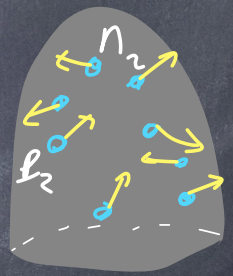
before heating

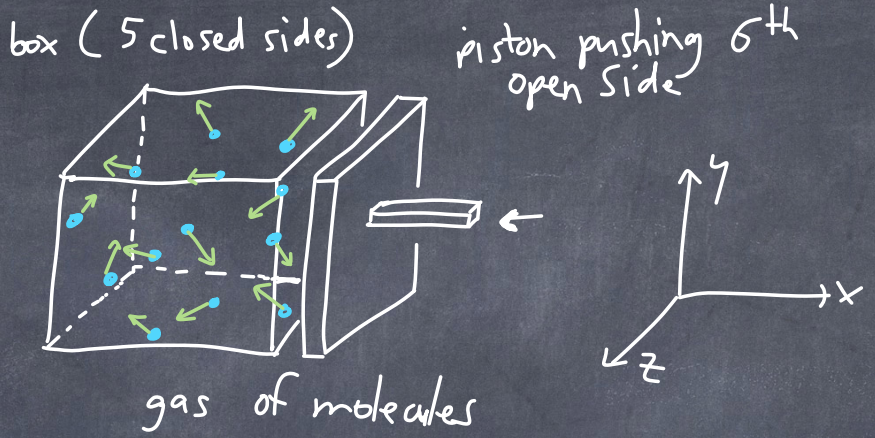


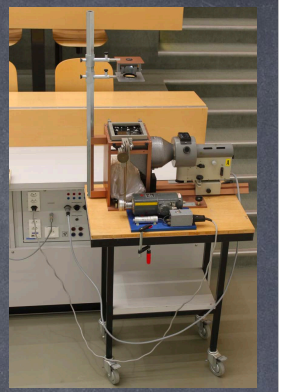
during heating

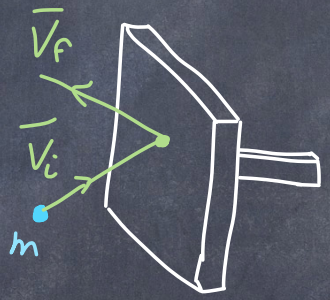


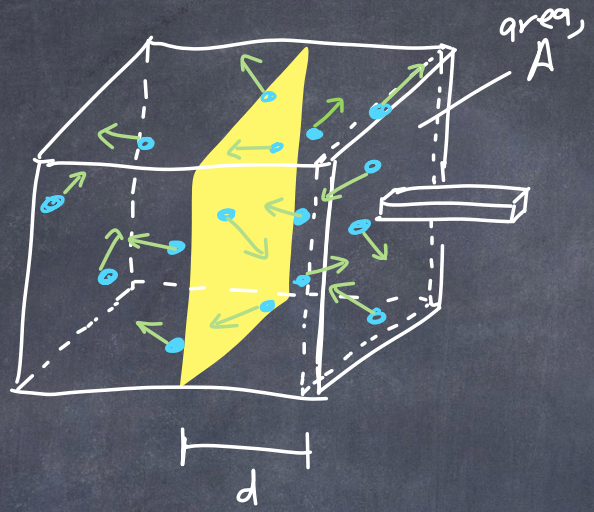
after heating

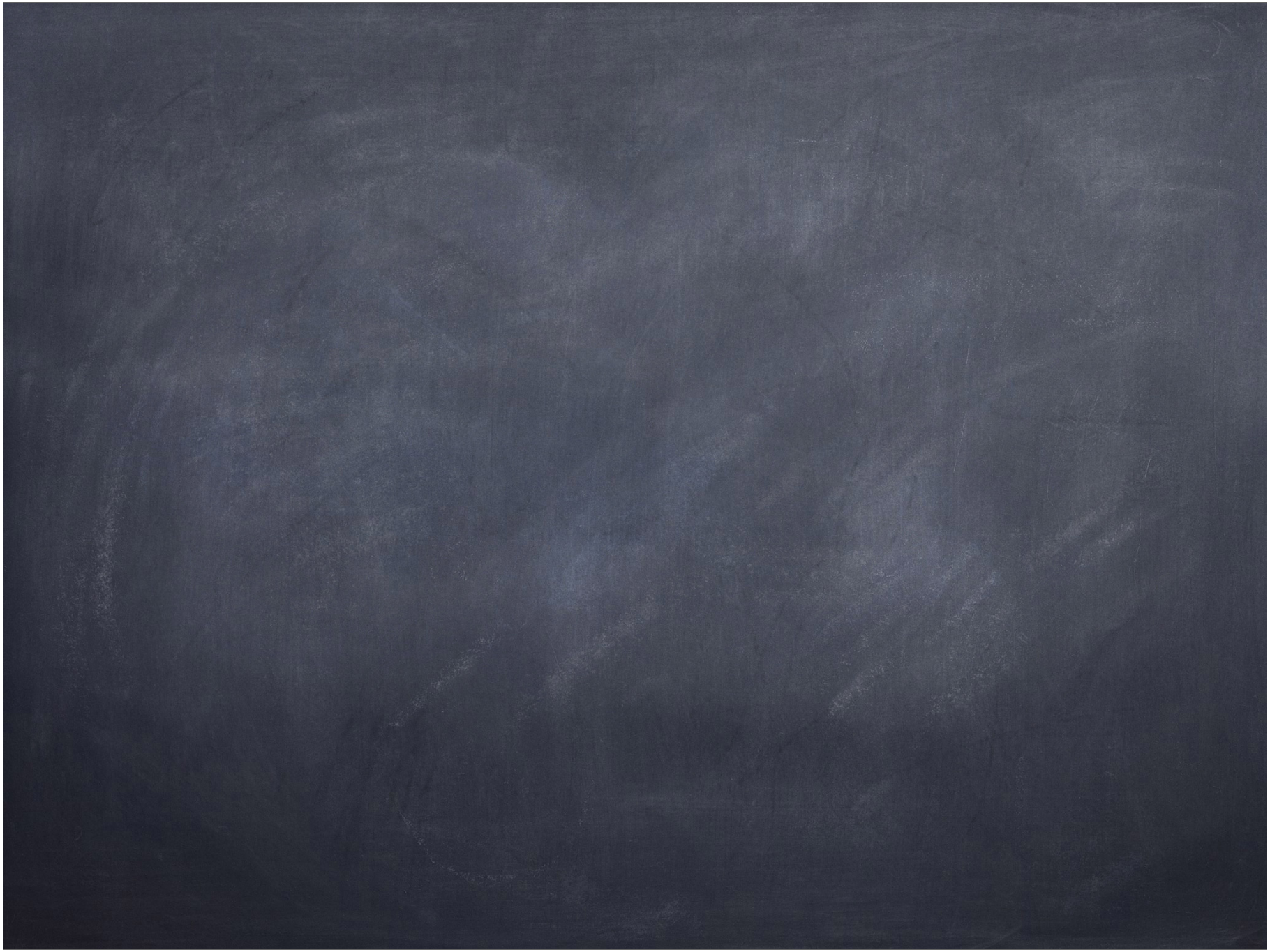


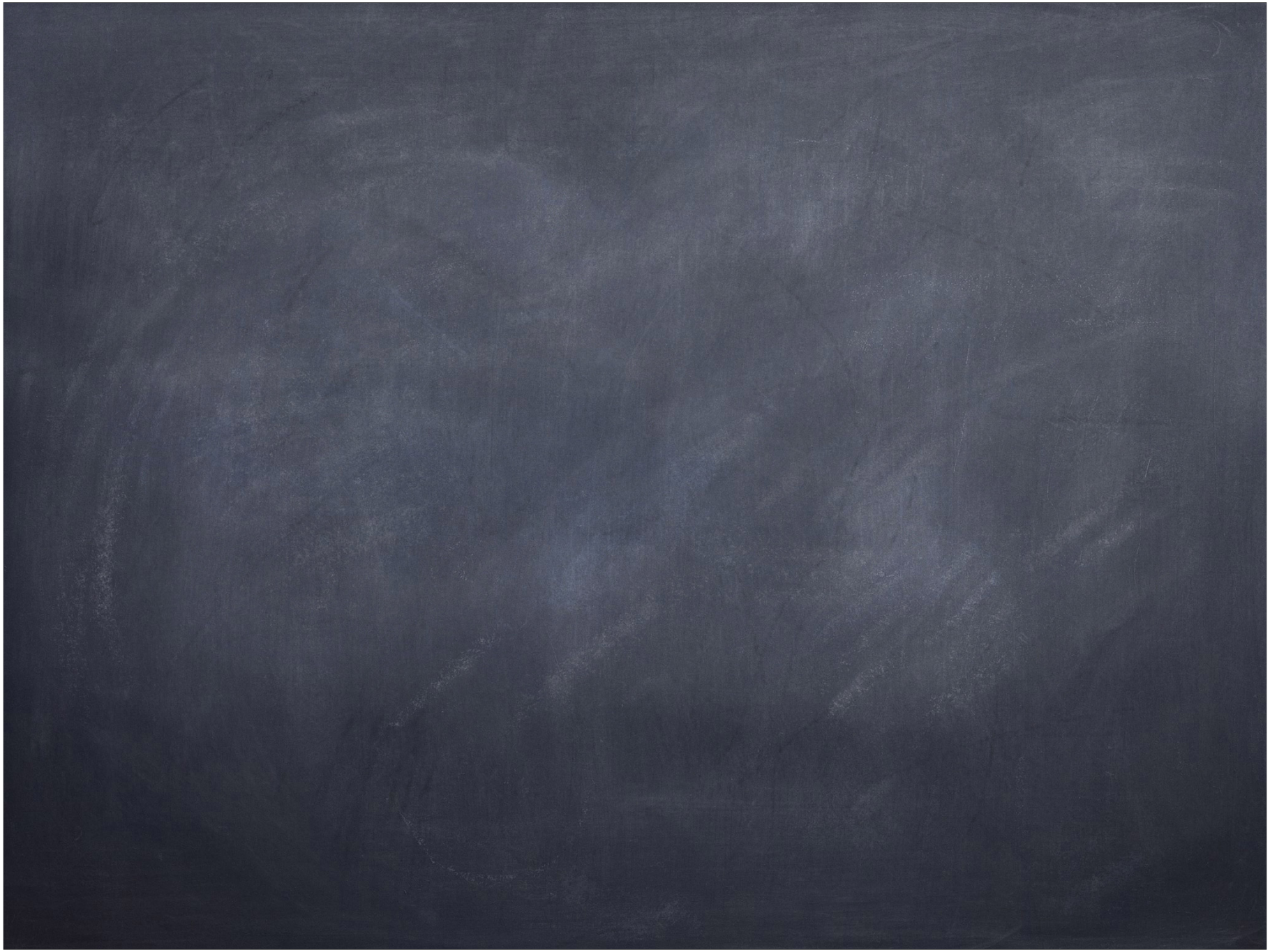

box (5 closed sides)
piston pushing 6th open side
gas of molecules
y
x
z

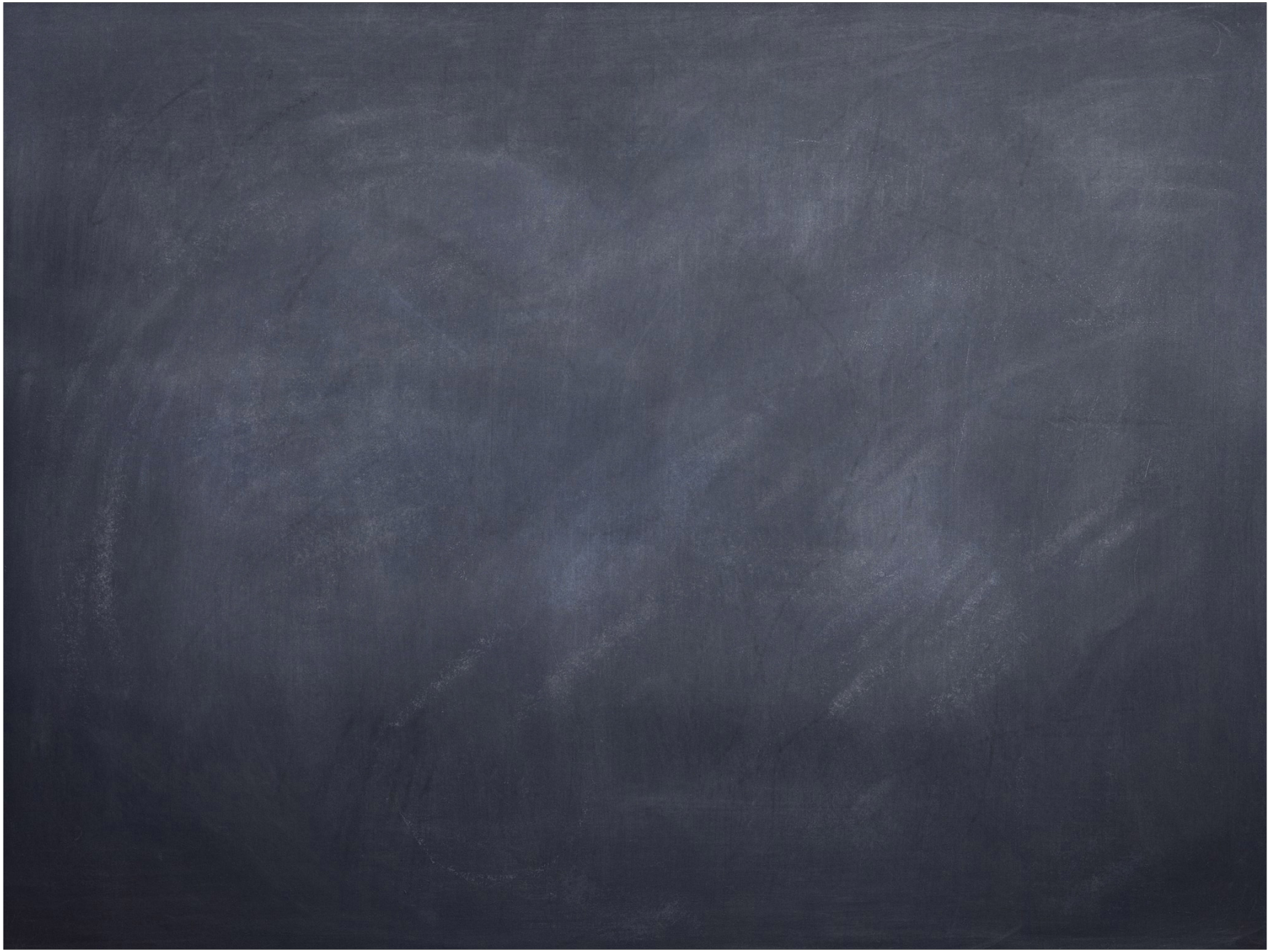


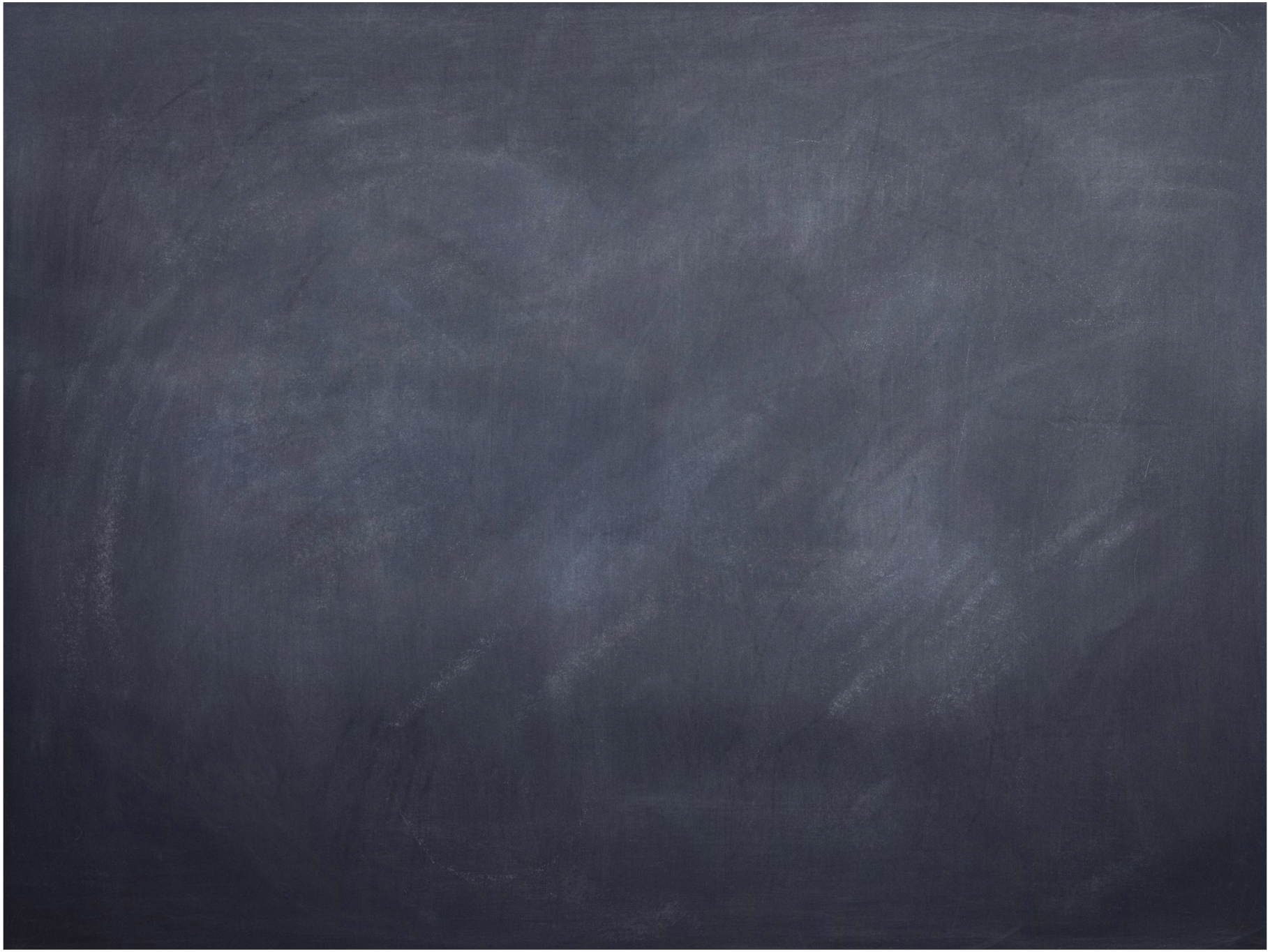

$\bar{V}_f$
$\bar{V}_i$
m

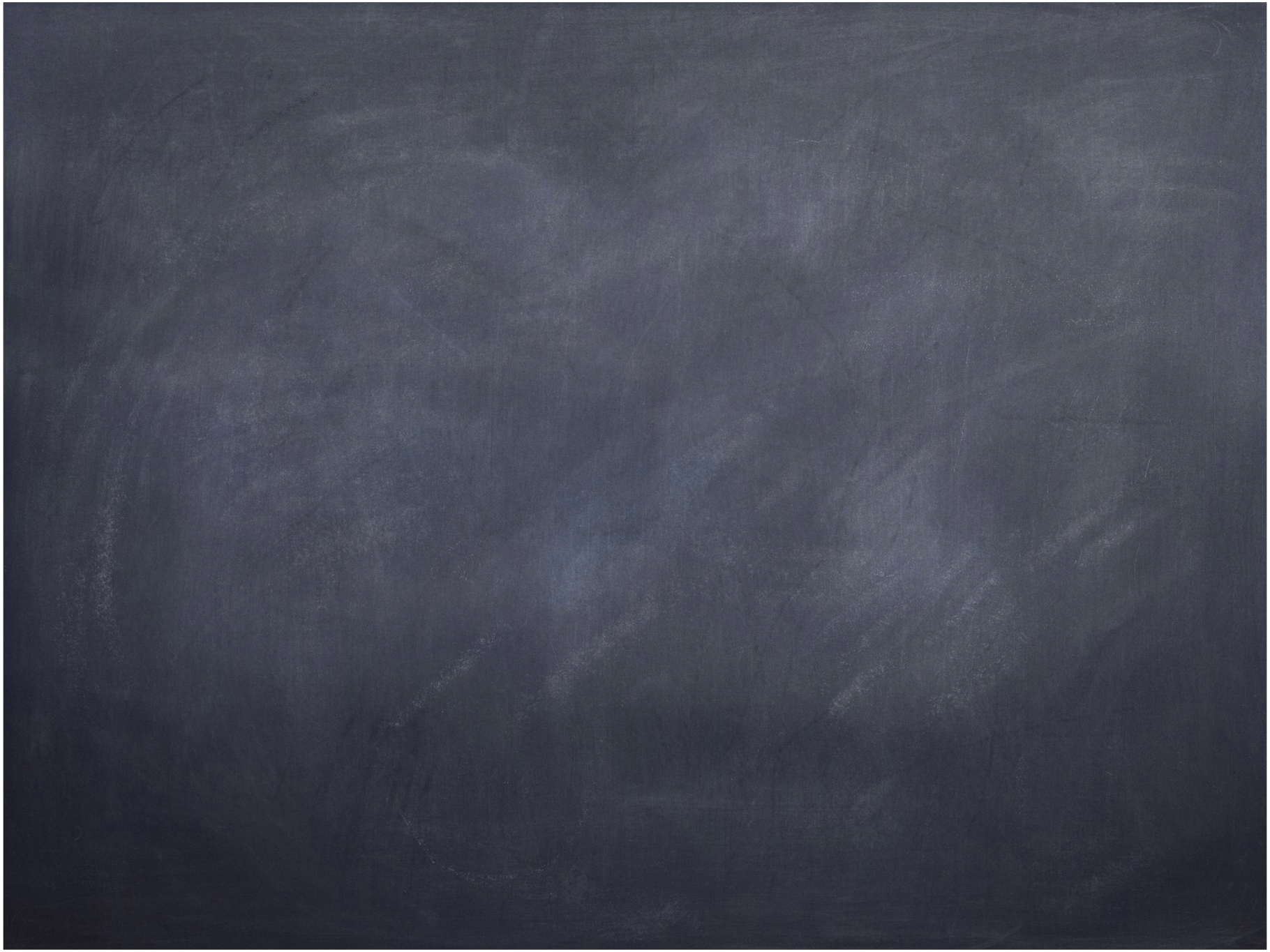

area,
A
d

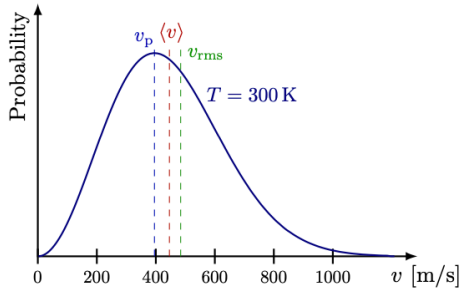




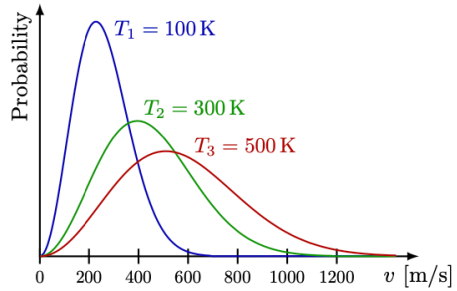






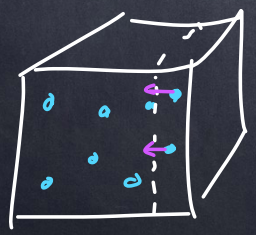


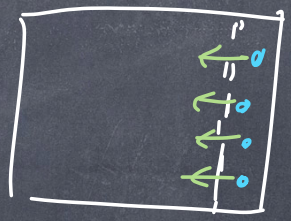
(a) The distribution is asymmetric.

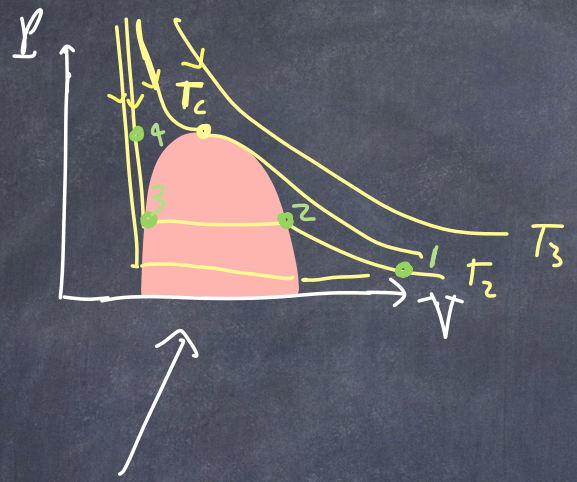


(b) For different temperatures.

Figure 17.4: Maxwell-Boltzmann distribution for oxygen gas O_2 with atomic weight ~ 16 per atom.

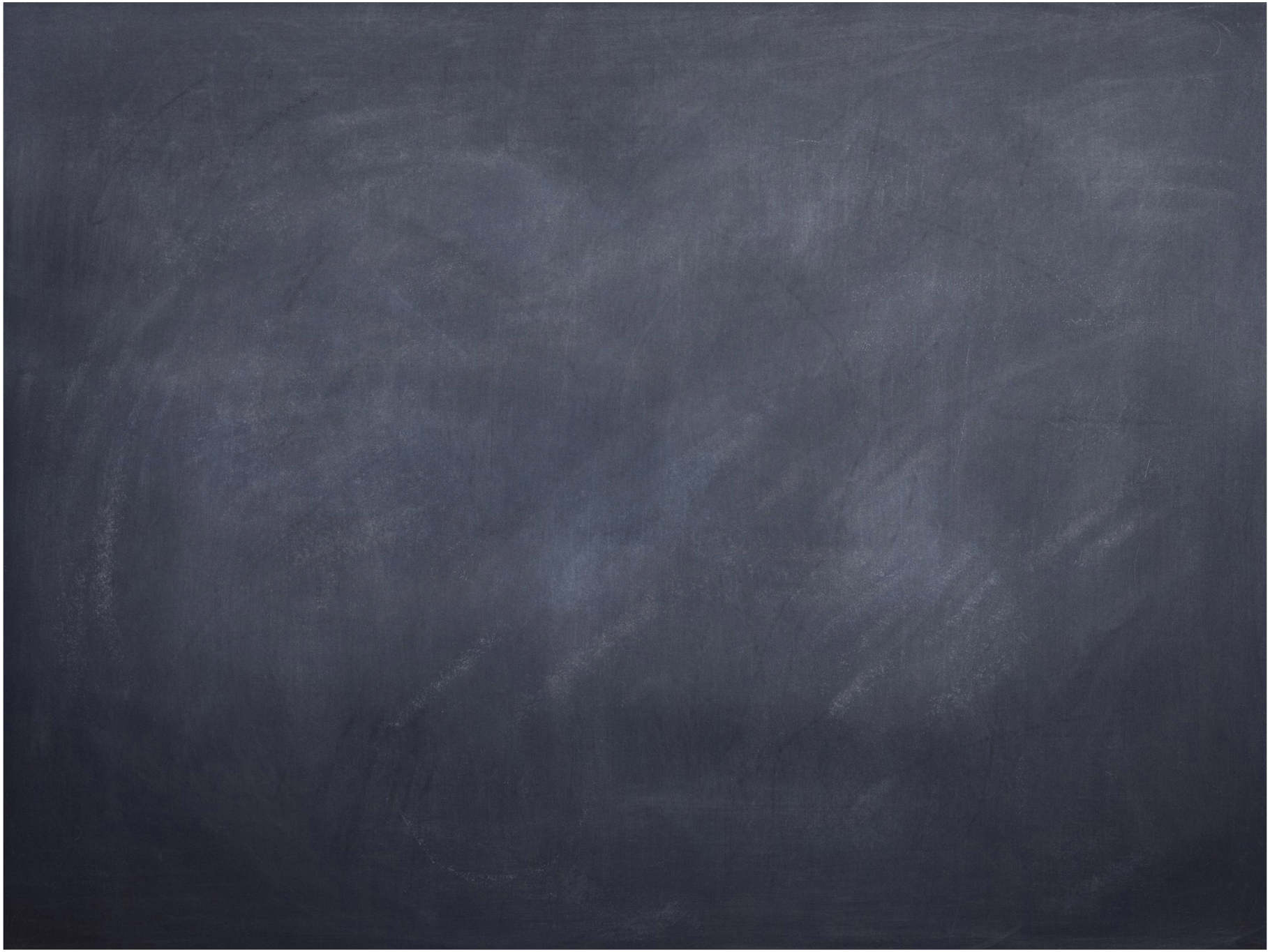


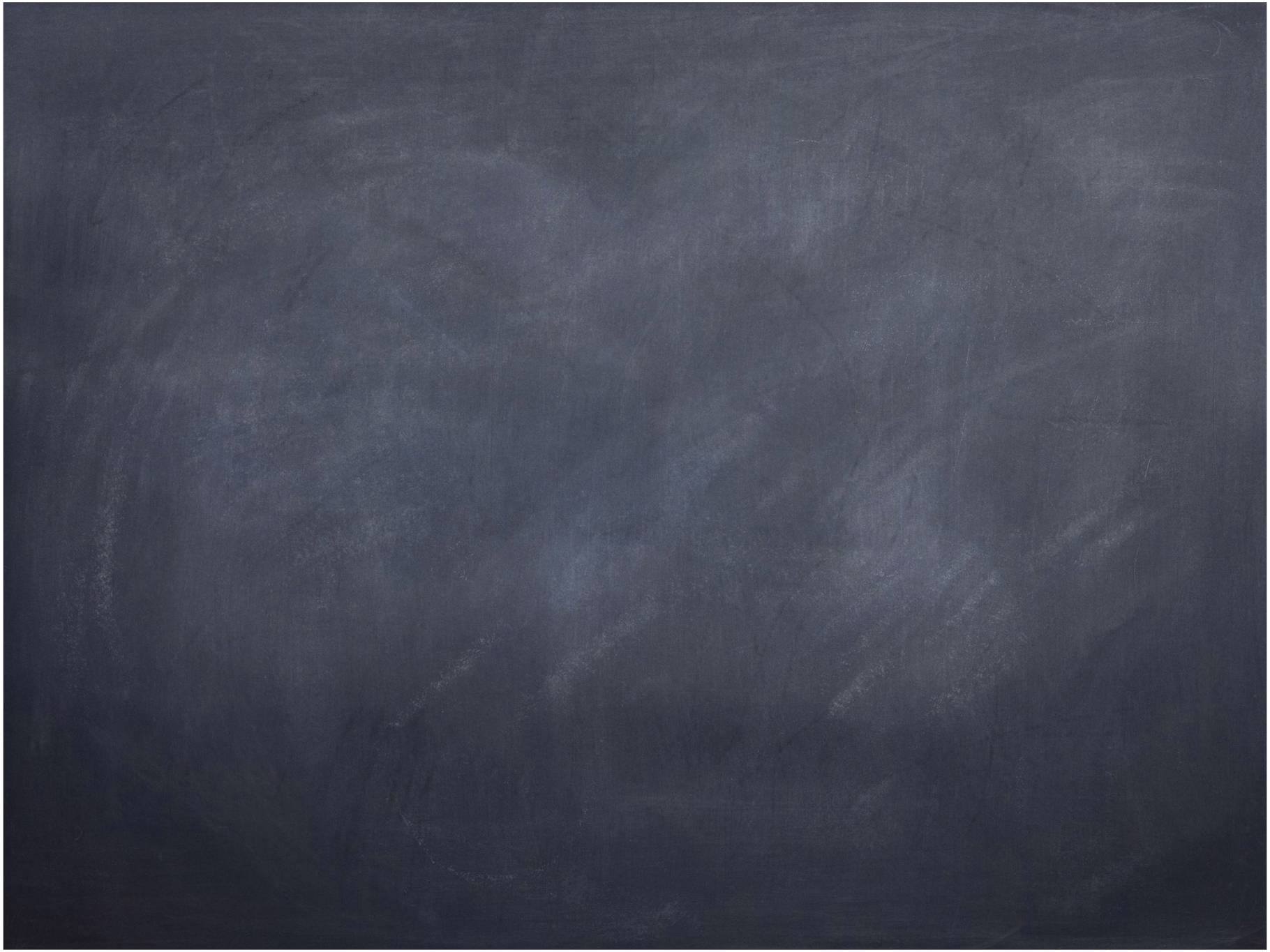


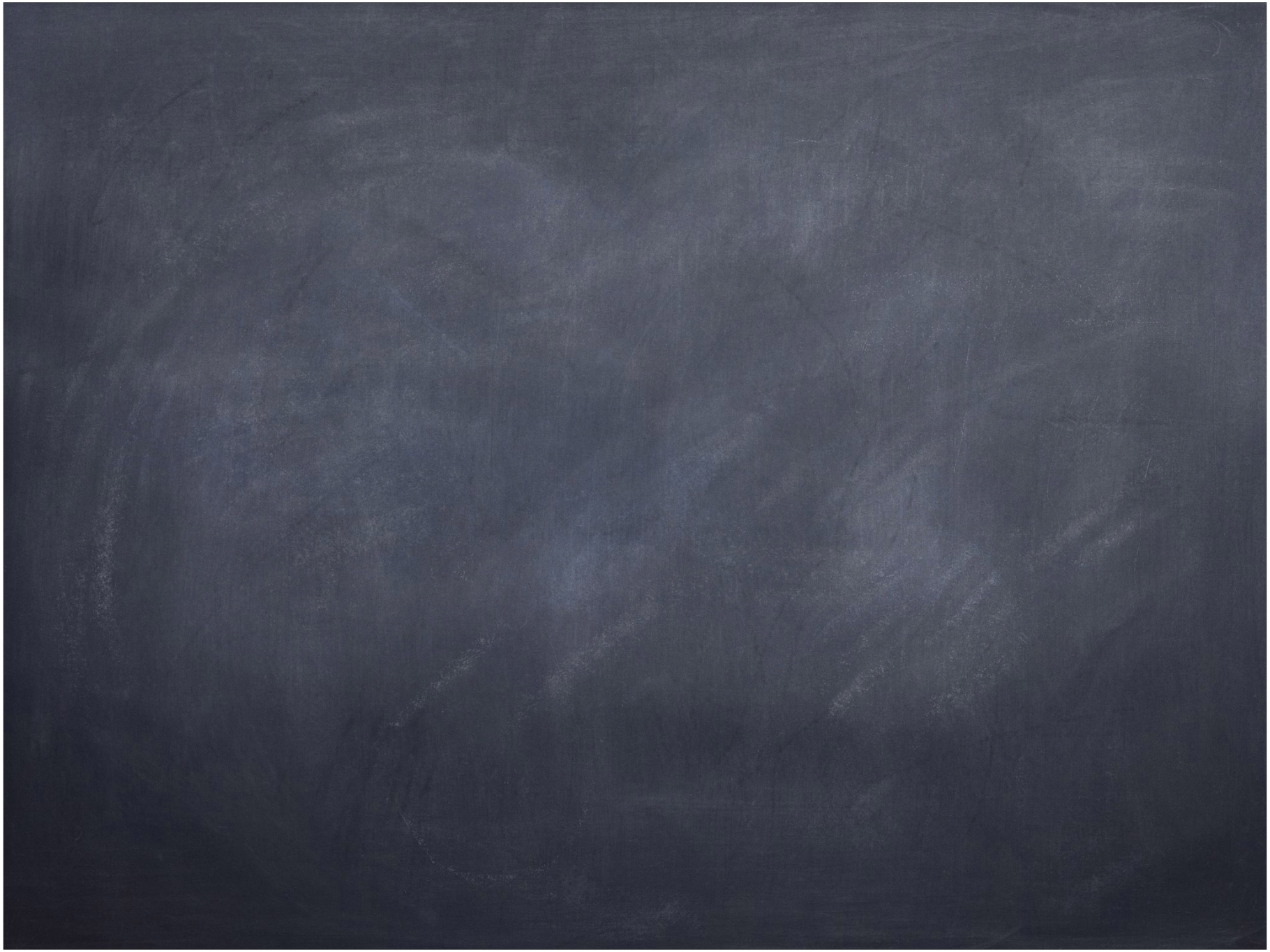


② → ③ :

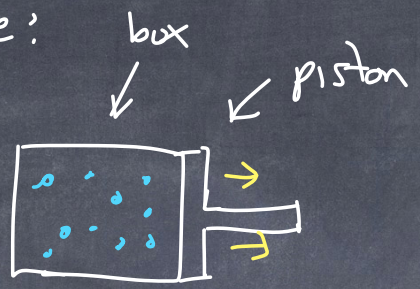
③ → ④ :



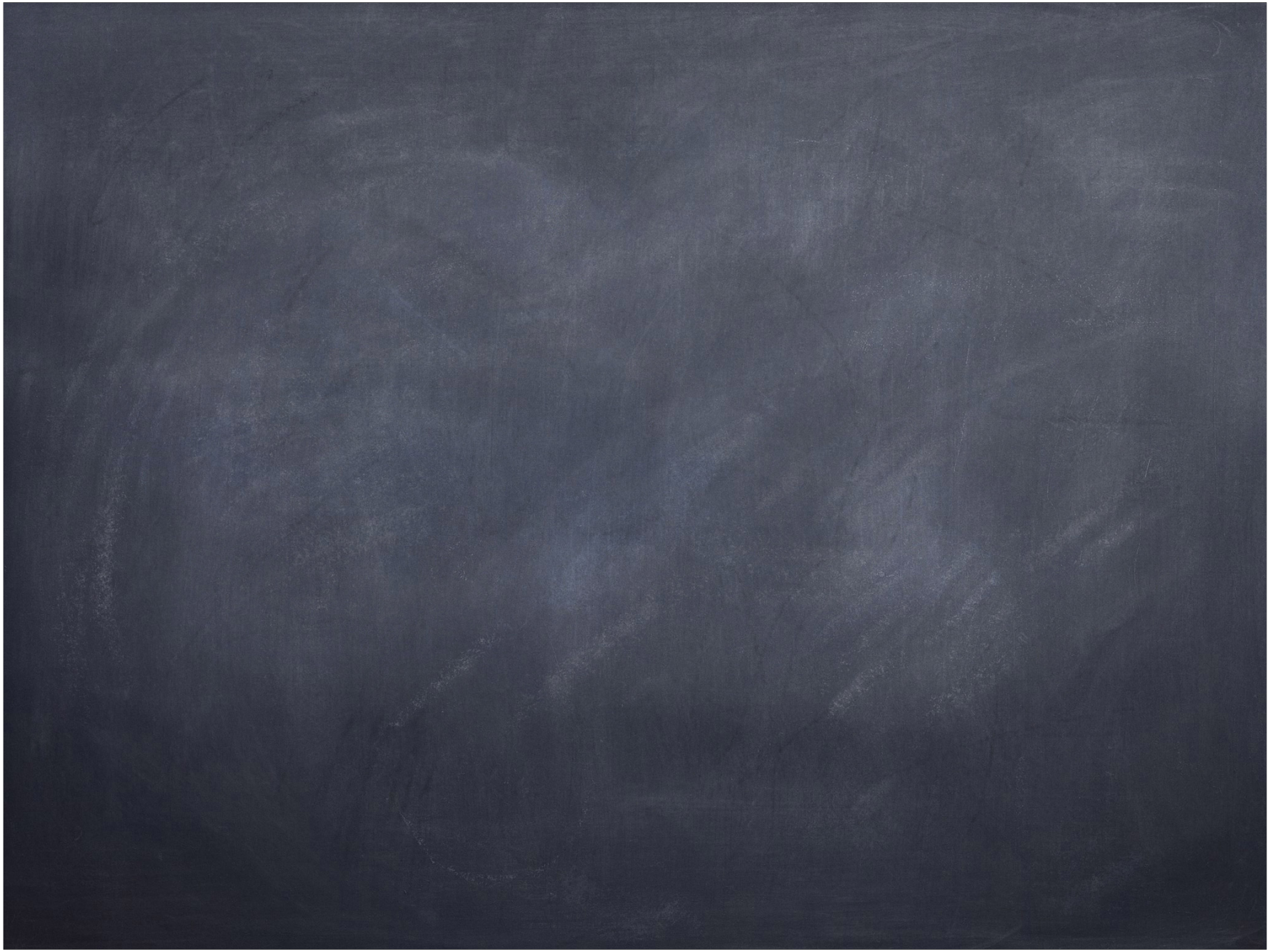




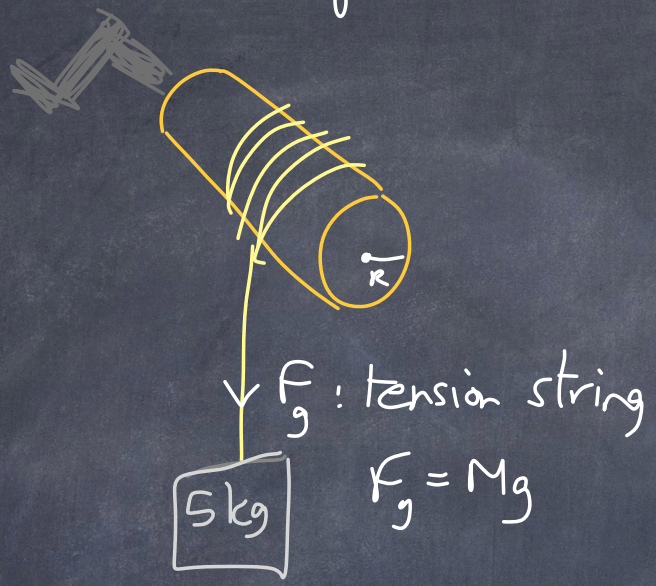
For example:

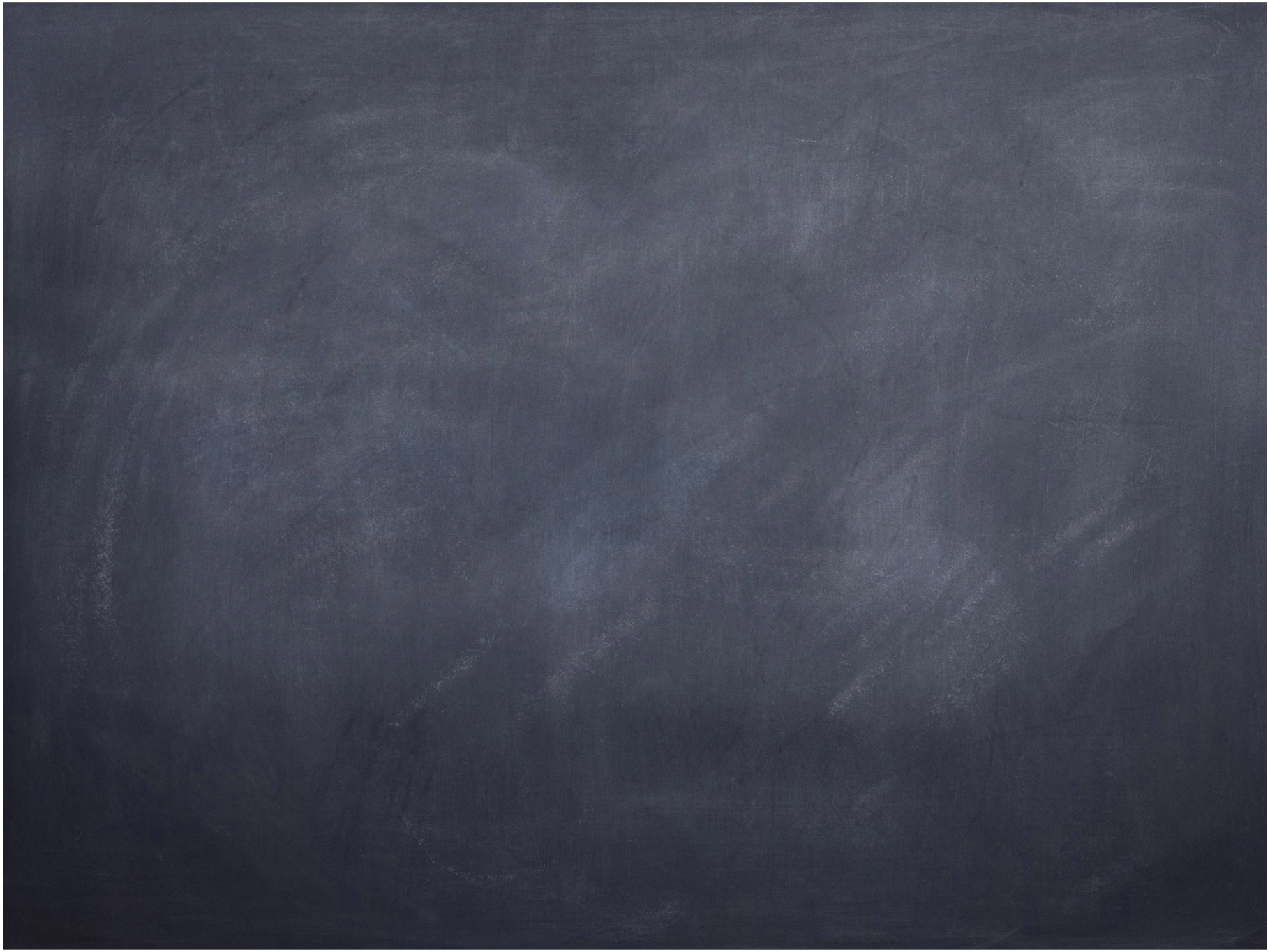


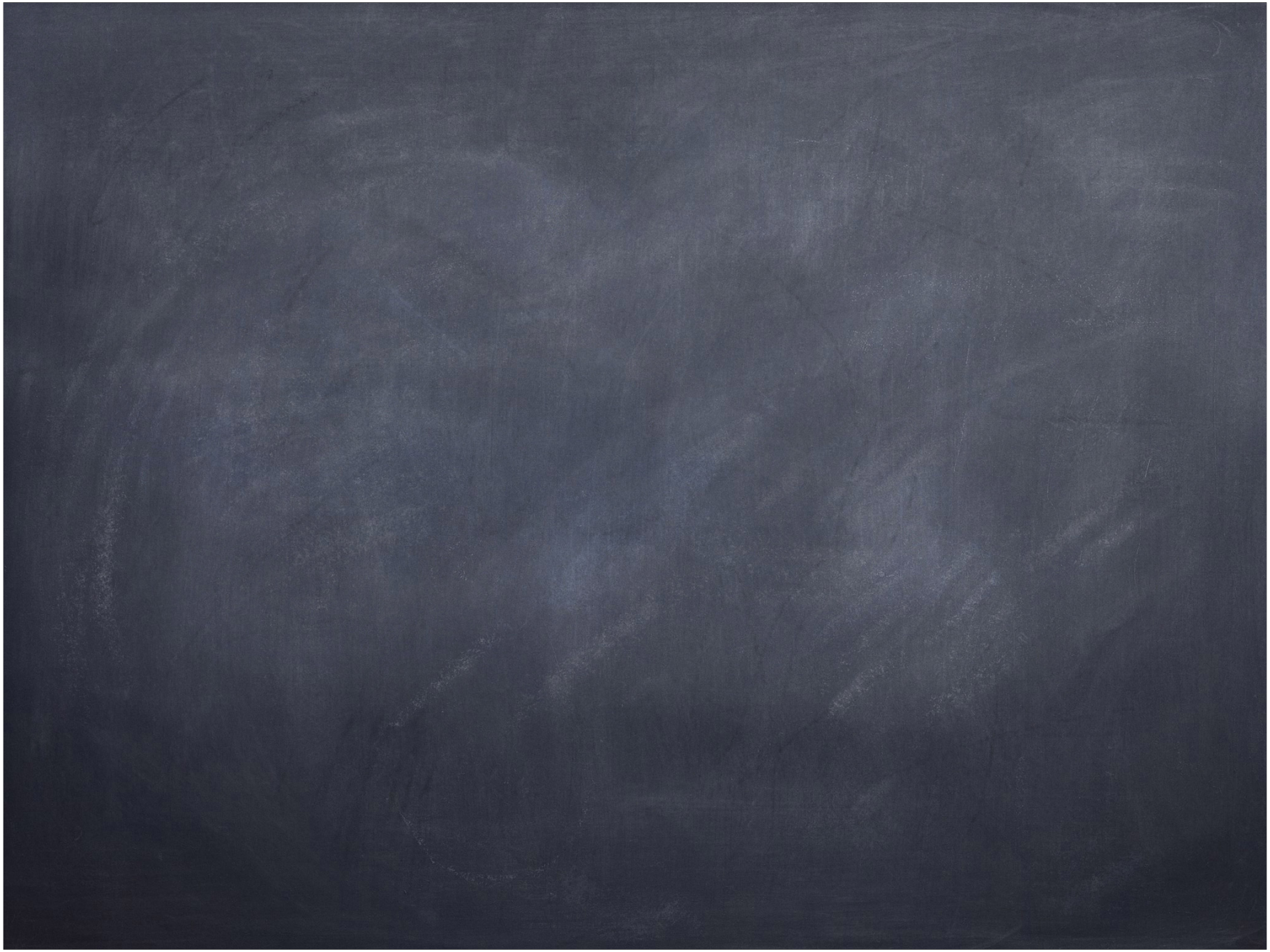
heat
gas

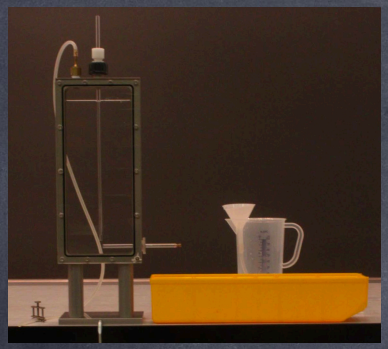


Can we use torque to increase temperature?





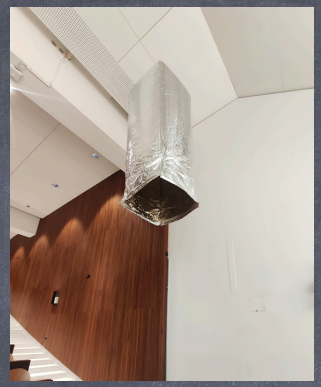




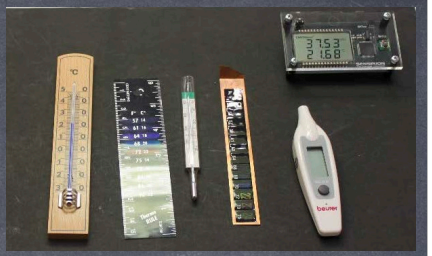
H21

Th57

Th36



Th58

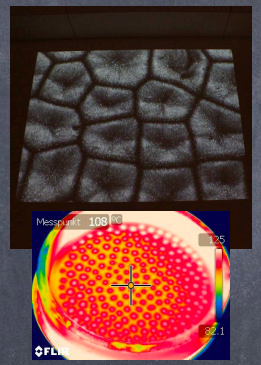


Th12

Th20

Th63

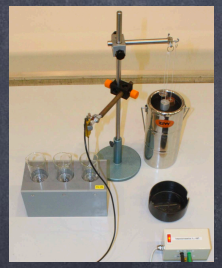
Th54



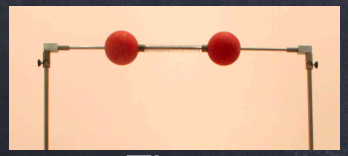
Th35

E12

Th19

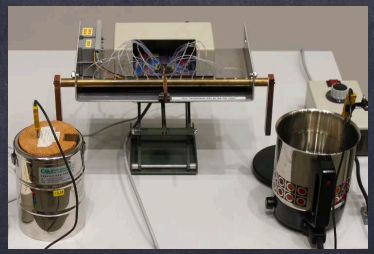


Th28



Th27

Th2



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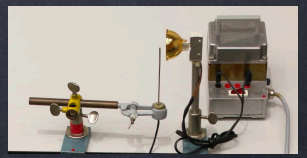

Th48