A PERIODIC MOLE EXPLAINER

# What is a mole?

The chemist's counting word, explained with eggs.

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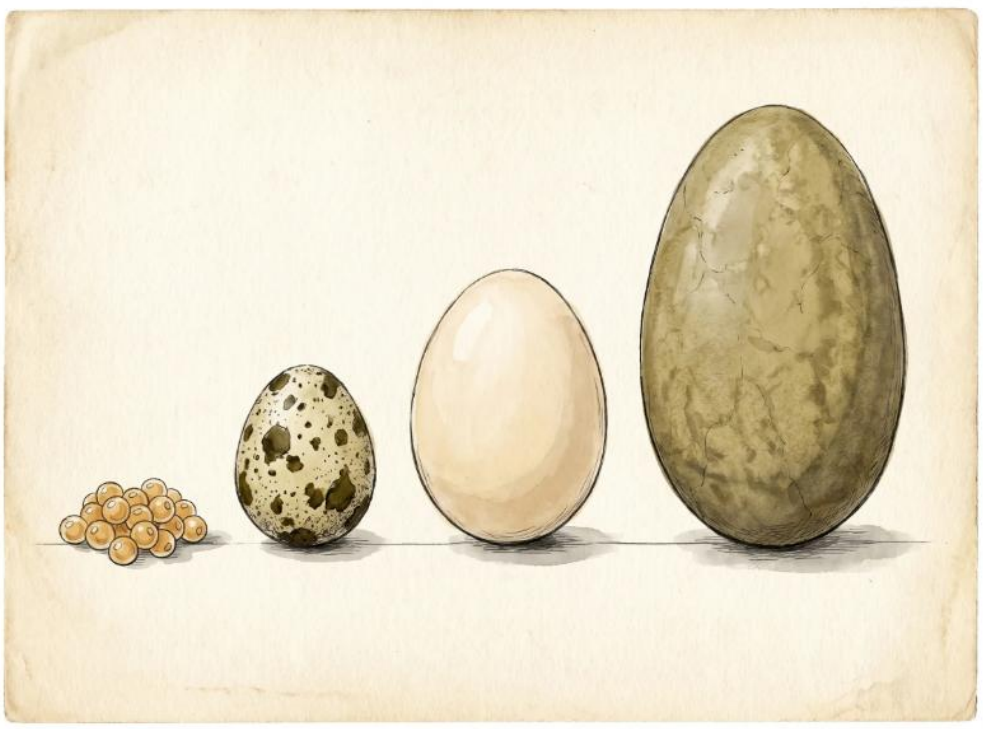
A dozen always means twelve, whatever you're counting. A mole is the same idea, just an enormous count. Like a dozen, it says nothing about weight.

$$1 \text{ mole} = 6.022 \times 10^{23}$$

## Eggs don't all weigh the same. Neither do atoms.



FISH ROE
Hydrogen (H)
≈ 1 g / mole

QUAIL EGG
Carbon (C)
≈ 12 g / mole

HEN EGG
Oxygen (O)
≈ 16 g / mole

PTEROSAUR EGG
Lead (Pb)
≈ 207 g / mole

Same count, different weight. A mole of hydrogen weighs about 1 gram; a mole of oxygen, about 16. That weight of one mole is its **molar mass**, the number printed on every square of the periodic table.

$$2\ H\ (2\ g) + O\ (16\ g) \rightarrow H_2O\ (18\ g)$$

Build water and the grams add up. Atoms rearrange; nothing is lost. That is conservation of mass.

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## A mole counts particles. It doesn't weigh them.

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