

CANS OF JAM ²

6.02×10^{23}



23rd
OCTOBER



!! Happy Mole day !!



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From the editors

Hello there! One new school year has started, and we are still alive, as you can see, and we are very happy to welcome new pupils in our phyish classes, and new reporters to the magazine!

For this issue, we have decided to follow the tracks of some US scientists and science students, and celebrate Mole Day.

This word, 'mole', has several meanings in English; it can be a small burrowing animal, of the family *Talpidae*, wit velvety, dark fur and forearms specialized for digging; or a breakwater to protect harbours; or again another non-technical word for a naevus (that is a congenital growth or pigmented blemish on the skin)...

But to scientists, it is the basic SI unit of amount of substance, corresponding to as many elements as there are carbon-12 atoms in 0.012 kilogram, that is to say 6.02×10^{23} .

This huge number was turned into a date (23rd October, the 10th month), which has become Mole Day on the other side of the Atlantic Ocean. So here you are : Happy Mole Day to you! Poo-poo-pi-doo...

And when you have finished reading this magazine, have another look at our cover, and find out why there are marshmallows on it, and a lot more interesting facts, by watching this : <http://www.youtube.com/watch?v=1R7NiIum2TI>

Mole Day 2012

by Julien D.



Mole Day is a holiday celebrated by chemists in North America, South Africa and Australia, on **October the 23rd**, between 6:02 AM and 6:02 PM. The date and time refer to **Avogadro's number**, which is $6.02 \times 10^{23} \text{ mol}^{-1}$, defining the number of particles (atoms, or molecules, or ions,...) in one mole of substance. One mole has

a mass (in grams) equal to the atomic mass of the substance. In the U.S. date format, the date is written 6:02 10/23.



Mole Day originated in an article in *The Science Teacher* in the beginning of the 80s. Inspired by this article, Maurice Oehler, now a retired high school chemistry teacher, founded the National Mole Day Foundation (NMDF) on May 15th 1991.

Many high schools around the United States, South Africa, Australia and in Canada celebrate Mole Day as a way to get their students interested in chemistry, with various activities related to chemistry and/or moles.

A scientist who counted : 4- Amedeo Avogadro

by Thomas D.

His whole name was Lorenzo Romano Amedeo Carlo Avogadro. He was born on the 9th of August 1776 in Turin and he died on the 9th of July 1856, at the age of 79, in Turin. He was count of Quaregna and Cerreto, but he was also an Italian physicist and a chemist.

He obtained a degree in law in 1795 and joined the bar of his home town. But his taste for physics and mathematics led him to scientific studies. In 1806, Amedeo Avogadro gave up his job as a jurist to dedicate himself to physics. In 1809, he made a communication to the Royal Academy of Turin; the success of it allowed him to obtain a post of professor at the Royal College of Vercelli. In 1811, he expressed the hypothesis which remains famous under



the name of Avogadro's Law. Basing his work on the atomic theory, Dalton's law and Gay-Lussac's law on the relationships of volumes, he discovered that two equal volumes of different gases, in the same conditions of temperature and pressure, contained an identical number of molecules. So, it became possible to determine the molar mass of a gas from that of the other one.

In 1814, he published a report which dealt with the density of gases. In 1820, the University of Turin created for him a pulpit of physical appearance which he occupied until his death.

The mole

by Loïc P.

A mole is a measurement unit which is used in chemistry. It's an International System unit and its symbol is mol. A mole contains around 6.02×10^{23} particles (atoms, ions, molecules,...), or more generally, *things*. This number is called Avogadro's constant. This unit allows scientists to simplify calculations, but not only : the mole is a packet of a precise number of particles, so it is used for counting when you do experiments. and it allows to pass from a microscopic scale to a macroscopic scale. It is the basis of chemistry and physics.

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Editors' note : For those of you who are readers of the first hour, the following article will maybe sound familiar... But as we welcomed new pupils of 2nde with our famous 'elephant toothpaste' experiment, they wanted to share their first experiment in English with you...

Article of chemistry in English

by Paulin R.



At school, in the chemistry in English class, we have done an experiment.

It was very impressive because there was a lot of foam and steam! The reaction produced heat too.

We did it with specific chemical components : hydrogen peroxide ($\text{H}_2\text{O}_{2(l)}$) and potassium iodide ($\text{K}^+_{(aq)} + \text{I}^-_{(aq)}$), some soap and a drop of food colouring for the colour. The foam made fire burn stronger because the bubbles held oxygen.

Readers' emails (translated and/or corrected by the editors)

Thank you for this, the last issue of this school year!
I wish you very pleasant holidays.

Christiane, from Versailles, 78

Dear ex-teachers !

*Cans of jam*² is as good as before ! I like to read it in the train ! I hope to receive it next year...

As for news, I will be in my third year in September. Electronics is like a hobby now, I have found my way. Once again thank you to Mr Bouichou who encouraged me to go to an engineering school and who believed in me since the beginning.

If you can tell me when the "journées portes ouvertes" are, I would like to go to Langevin and see you !

Have nice holidays ! Without the sun...

Seeya,

Aurélie, from Beauvais, 60

Well, Aurélie, we cannot tell you yet about the 'Open Doors Day', but as soon as we know, you will, too. And we will be happy to see you again!

The editors

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Games' Corner

Quizz : test your knowledge

by Jean C.C.

a- What is the symbol of Sodium?

b- What is 9 460 895 288 762 850 m?

c- What happened on the 20th July, 1969?

d- What is 6.02×10^{23} , and what does it correspond to?

Crosswords

by Josias N.

	1	2	3	4	5	6	7
1	■	■	■	■	■	■	■
2	■	■	■	■	■	■	■
3	■	■	■	■	■	■	■
4	■	■	■	■	■	■	■
5	■	■	■	■	■	■	■
6	■	■	■	■	■	■	■
7	■	■	■	■	■	■	■
8	■	■	■	■	■	■	■
9	■	■	■	■	■	■	■

ACROSS :

2 : a famous internet search engine.

3 : opposite of young.

4 : do that, and you are not exposed.

5 : the organs in which you can find irises.

6 : 2nd famous verb by Descartes.

7 : French bone.

8 : 1st famous verb by Descartes.

9 : indefinite article.

DOWN :

1 : being alive with all the organs functioning regularly and harmoniously.

3 : opposed to evil. Not out.

4 : a musical TV series first shown in the USA in May 2009.

5 : not young anymore. Alright.

7 : you cannot find it because it is...

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Answers to the games

Quizz

a- : Na (from the Latin *Natrium*, a Sodium compound; in German, Danish and Dutch, the word for Sodium is Natrium).

b- : a light year, which is a unit of **distance** (the distance traveled by light in one year).

c- : Avogadro constant; it corresponds to the number of particles in one mole.

d- : the date of the first human step on the Moon.

Crosswords

	1	2	3	4	5	6	7
1			G		O		
2	G	O	O	G	L	E	
3			O	L	D		L
4	H	I	D	E			O
5	E			E	Y	E	S
6	A						T
7	L				O	S	
8	T	H	I	N	K		
9	H		N			A	N

Cans of jam² is a scientific magazine written by the pupils from the European classes of Paul Langevin High School in Beauvais, Oise. It is free, available mainly through internet, and usually published for each school holiday period.

If you want to subscribe and receive an internet copy of *cans of jam²*, all you need to do is send an email entitled '*cans of jam²*, subscription' to didier.galard@ac-amiens.fr, and you will be added to our mailing lists. And that is free as well!!