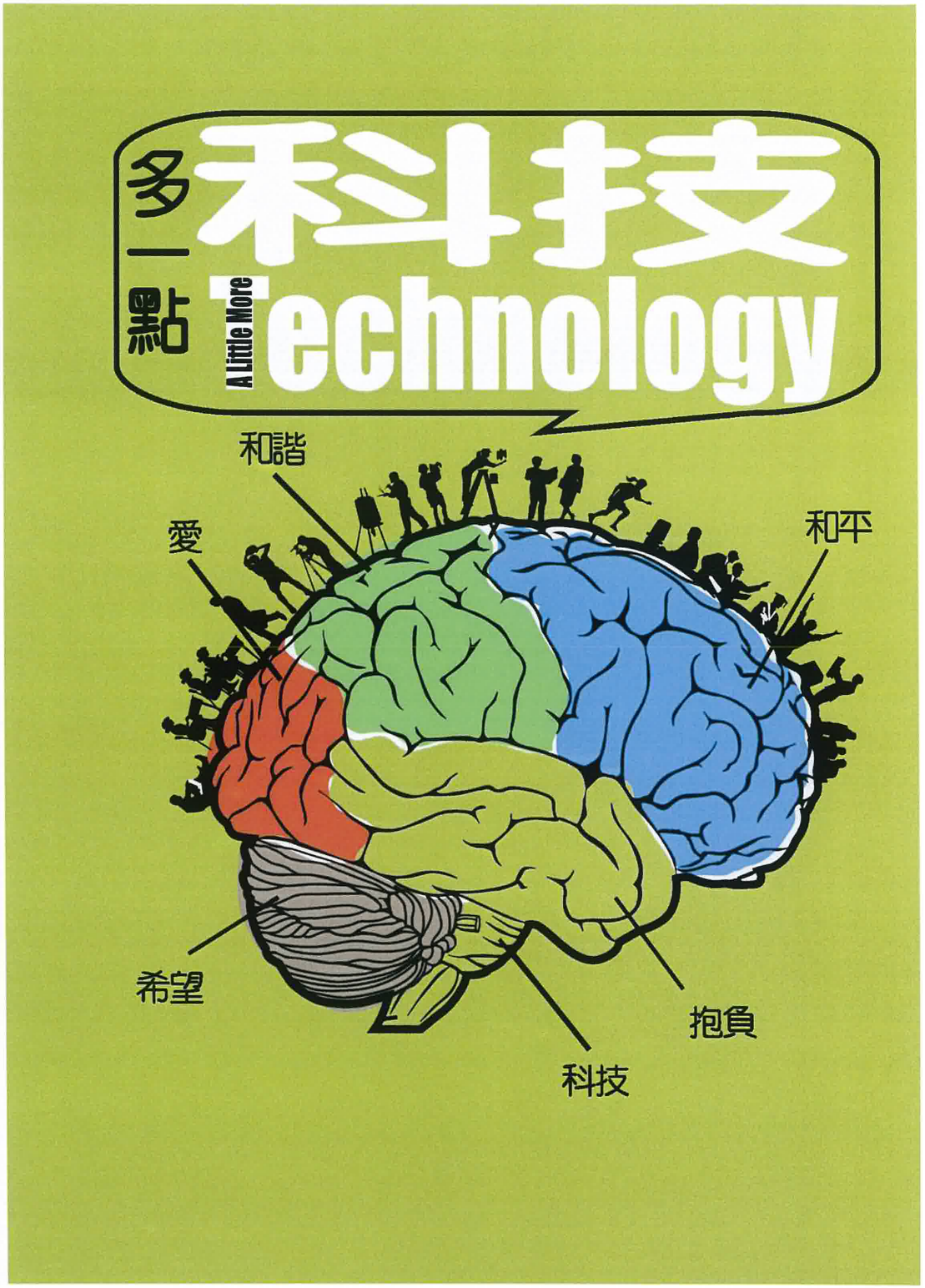
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Acid Rain

5M Kwok Wan Yi

Acid rain is rainwater with pH values lower than 5.7. Sulphur dioxide and nitrogen dioxide are responsible for acid rain. Lots of human activities produce these two gases and facilitate the formation of acid rain.

Humans burn fuels to get energy. However, most fuels contain sulphur. When sulphur is burnt, sulphur dioxide is given off into the air. Sulphur dioxide is an acidic gas. It dissolves in rainwater to form sulphurous acid and further react with oxygen to produce sulphuric acid. Thus, forming acid rain.

Due to the combined action of high temperatures and electric sparks in motor vehicle engines, electric power stations, incinerators and factories, a little atmospheric nitrogen and oxygen react to form nitrogen monoxide which further react with oxygen to form nitrogen dioxide. Nitrogen dioxide is an acidic gas. It dissolves in rainwater to form nitric acid and nitrous acid. Thus, forming acid rain, as well.

The formation of acid rain can be reduced in various ways. Using fuels of low sulphur content can reduce the emission of sulphur dioxide when burning the fuels. Using scrubbers can remove sulphur dioxide. They are sprayed by jets of limewater before they come out of the chimneys. The limewater dissolves soluble acidic sulphur dioxide. Fitting catalytic converters in motor vehicles can turn poisonous nitrogen oxides to harmless nitrogen. Burning less fossil fuels and using alternative energy sources, such as solar power and hydroelectric power, can reduce the formation of sulphur dioxide and nitrogen dioxide, also the formation of acid rain.

Feedback from Mr. Chan Ka Kit:

Good organization. Firstly, she explains the causes of the formation of acid rain, and then suggests effective ways to improve the entire situation with sufficient elaboration.?

Environmental protection is a daily issue, may we all try our utmost to think about what we can do in our everyday life to save our planet.

Rust remover: principle and precaution when using rust remover

4M Kwong Hiu Ching

Rusting is a serious problem in the world. It damages buildings and motor vehicles that are made of iron. Theoretically, iron is attacked by water and oxygen in the rusting process. Through a series of chemical reaction, hydrated form of iron(III) oxide (2Fe2O3 nH2O) is formed. The equation of the rusting process is shown below:

$$4Fe + 2nH2O + 3O2 \rightarrow 2Fe2O3\ nH2O$$

In order to solve this problem, scientists invent a chemical called rusting remover. Rust removers usually contain acid of high concentration. The acid can react with the rust (hydrated iron(III)oxide). With this chemical reaction, the rust can be converted to a water soluble substance which can be washed away easily.

However, when using rust removers, users must follow the instructions in using rust removers as they are corrosive and can irritate skin. Users should wear gloves when handling it. Once it stains on a user's skin, the user must wash the affected area under running water. If you want to dilute the rust remover, users should pour a small amount of rust remover to a large amount of water as the concentrated acid may splash out and hurt users. On the other hand, it should also be kept out of children as it contains acid of high concentration. Rust removers should not be swallowed because it is harmful. Last but not the least, users should also avoid using containers made of marbles, limestone and/or metal. This is because the metal, marbles or limestone surface will be attacked by the acid of the rust remover.

In conclusion, although rust removers can remove rust, accidents may occur if users do not follow the instructions carefully.

Feedback from 1S Mandeep Singh

This is a well-written piece as it tells us the benefits of rust removers and how to use them properly. We should also keep them away from children as they can be dangerous if used wrongly. Rust removers are very useful. It's great how science can work towards our needs.

Science

3S Tsang Hau Sim

What is science? I always doubt whether we actually know its exact meaning before we start our lesson. I used to think it is the knowledge of nature, but it is far too simple. Science is not just about nature. It is also about the curiosity and the determination towards discovery and exploration. It can be the observation or the investigation done through certain ways and methods. It can be the answer towards a question or a question that is searching for an unexpected truth. As scientific knowledge and the areas for exploration are unlimited, for which we can't say we know everything about the nature, the world and the universe, there are still a lot for us to deal with and to find out the answers to. Therefore, I say there isn't an exact meaning of science. Despite that, we should always bear in mind that there is always a question needed before we start our mission. Why? It's because science is how we find out the answers to what we consider as a mystery and worth discovering. Also, it will not be called science if there aren't questions.

Over generations, things are being continuously discovered and tried in this world. And some people ask, "Why is science so important? What's so special about that" So what's the reason? It's simple. We are surrounded by science. We encounter science everyday. We use its knowledge or theorem everyday. We are living with science as well as in science. When you purchase things in a store, you will count the price to pay by using mathematical calculations. Mathematics is also one of the corresponding areas to Science. When you turn on the light, the light bulb that lights your way in the darkness is an invention which would never have been created without the existence of science. When we are sick and visit the doctor, the medicine we are given are chemicals related to science. We are humans. We are creatures - part of nature, and that is also about science! So how can you ask why science is so important? We've invented things that make us live a better life and equipment that allow us to see things we've never expected. We've found out the answers to our life and we live in what we've created. If there hasn't been science, we would never have lived for so many generations. The human world would never have continued till now. That's why we have to learn science.

For there's always an answer beyond the question, there's always truth beyond the answer. Learning to question and find out the answer is the simplest attitude required for science. I used to doubt what if the theorems or the answers found by the scientists in the past are all wrong. And that's actually why we need to carry out the exploration by ourselves. We've got to prove something we doubt and that's how more and more accurate theorems and improvements are made. We live on a planet called Earth, but is that all? Maybe the space isn't limited and that there is another universe beyond the space. However, do we know that? No, we do not even have any proof. That's why we are continuously learning and searching for answers, for evidence, for proof... . We question and we think. Humans are amazing organisms. Despite appearing so small inside a planet that might be just a small dust comparing to the universe, we still keep on trying and learning. It's what should be appreciated.

One day I believe everyone will learn to realize without science, our destiny will have an even more serious control over us. People die every minute, by illness, virus or disasters. We may not be able to change our fate but science does lend a helping hand. We learn to predict when there is an earthquake, hence escaping and running away. We even learn to cure serious illnesses and keep on living. We change our lives by the discoveries and the explorations we have made. We make ourselves live. Therefore, we should always bear in mind that science is extremely important and the way that we are able to change one's fate is something special about it.

Feedback from Mr. Chu Kit Yan:

We are glad that students can think about the nature of Science and the importance of scientific inquiry. By searching for answers with scientific methods, we obtain the truth. When we better understand our world, we eventually better understand ourselves.

The Magic '5'

2N Tang Siu Hei

Do you feel bored having Mathematics lessons especially when you have to do a lot of calculations?

I don't think so as I discovered a very interesting phenomenon about the square of some simple numbers with the unit digit '5'.

Let's look at the following examples:

52 = 25	0 x 1 x 100 + 25 = 0 + 25 = 25
152= 225	1 x 2 x 100 + 25 = 200 + 25 = 225
252 = 625	2 x 3 x 100 + 25 = 600 + 25 = 625
352 = 1225	3 x 4 x 100 + 25 = 1200 + 25 = 1225
452 = 2025	4 x 5 x 100 + 25 = 2000 + 25 = 2025
552 = 3025	5 x 6 x 100 + 25 = 3000 + 25 = 3025
...	
1052 = 11025	10 x 11 x 100 + 25 = 11025

Can you generalize some special patterns from the above examples? No? Never mind. Let me explain to you.

In general, for any positive integer n,
$[(n \times 10) + 5]2 = (n)(n + 1)(100) + 25$

Now, let's use the above formula to find the answer of 152.

$152 = [(1 \times 10) + 5]2 = (1)(1 + 1)(100)+25$
$= 200+25$
$= 225$

How about 1052 ?

$1052 = [(10 \times 10) + 5]2 = (10)(10 + 1)(100)+25$
$= 11000 + 25$
$= 11025$

You can simply calculate the square of some small numbers that are ending in five in your head, such as 52, 152 or 252. However, once you know this method, you can use the equation to calculate the square of other bigger numbers with the unit digit '5' without the use of calculators.

Let's look at one more example.

$6052 = [(60 \times 10) + 5]2$
$= (60)(60 + 1)(100) + 25$
$= 366000 + 25$
$= 366025$

There are many special things you can find in Mathematics if you pay attention to it. Though this formula may not be applied to very complicated numbers with the unit digit '5', I still hope that it may be useful for you in simplifying the calculation process.

Feedback from Ms. Cheng Po Shan:
Thanks for sharing such an interesting finding in Mathematics. Tim has a good observation on the patterns obtained from the calculations. Also, he has a good attitude towards Mathematics - he paid effort to make calculations easier. I hope Tim can keep this attitude and share more with us.

Our Dream Comes True - Shenzhou 7

2M Yan Chi Kit

Our dream to travel in space has finally come true! Shenzhou 7 (神舟七號) the third Chinese manned spaceflight mission has successfully carried three crewmembers to the space on September 25, 2008. Shenzhou 7 was launched by Long March 2F (CZ-2F) launch vehicle from Jiuuan Space Center (酒泉太空中心). The mission was scheduled to last three days, after which the craft would land in Inner Mongolia on September 28, 2008. During the flight, an extra-vehicular activity (EVA) was carried out by Zhai Zhigang and Liw Boming, making China the third country to have conducted an EVA, after Russia and the United States. This time, I believe China has jumped a big leap forward because NASA (National Aeronautics and Space Administration) has said that they may co-operate with China in space missions later.

Let me tell you something about Shenzhou 7 in detail. The Long March rocket launched the Shenzhou 7 into an initial elliptical orbit of 200 x 300 km inclined at 42.4 degrees on September 25, 2008. About seven hours later the spacecraft raised its orbit to a more circular orbit of 330 x 336 km. This time, China used the EVA spacesuit. One of the spacesuits is made and developed by the Chinese called Feitian for the extravehicular activity (EVA). Some of the designs of the Feitian spacesuit are borrowed from the Russian Orlan-M spacesuit. The designs are similar in shape and volume. They are designed for spacewalks which can last for seven hours. They also provide oxygen and allow for the excretion of bodily waste. Let's glorify the advancement of technology! In the near future, walking in space is just like walking on Earth.

When I heard the news that Shenzhou 7 had already landed on Inner Mongolia successfully, I felt a sense pride. I was also thrilled to know that the spacewalk of the Chinese space crew was also a success. This time Shenzhou 7 has released a miniaturized satellite during the mission on September 27 at 19:24, after Zhai returned to the spacecraft. The satellite was a cube of about 40cm long with a mass of 40kg, which carried boost devices and two 150-megapixel stereo cameras. The technical goals of the miniaturized satellite included tasks such as to test the mini-satellite technology, to observe and monitor the spacecraft and to test the tracking and approaching technology used for space rendezvous and docking.

I am very proud of being a Chinese. It's extremely amazing that Chinese astronauts actually travelled in space. I am looking for forward to seeing Shenzhou 8, 9, 10 ... to be launched to into space.

(Source: http://en.wikipedia.org/wiki/Shenzhou_7)

Feedback from 1S Mohnish Ramesh:

The Chinese rocket has finally taken off. I find that very amazing. I have always been interested in being an astronaut. I really like the EVA suits as it allows you to walk in space! I also like the details put in this article. I was really impressed by the formula and details. I hope the next rocket launches soon!

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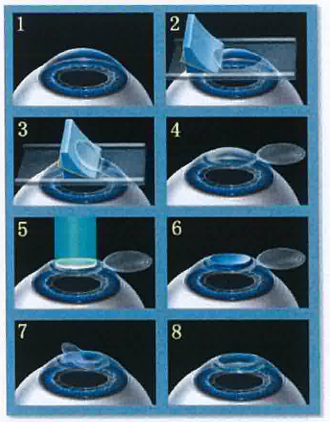
LASIK - A Scary Eye-surgery

2M Yan Chi Kit

Have you ever heard of the correction of eye defects by laser - LASIK (Laser-Assisted in Situ Keratomileusis)? LASIK is a surgery which can correct short-sightedness, long-sightedness and Astigmatism. The working principle, which is quite scary, is to apply a laser beam to change the shape of the cornea so that light can be focused correctly onto the retina. Why do I say that it is scary? You can type LASIK eye surgery on Youtube and you may see some clips which show the cornea being cut off. A lot of blood comes out during the surgery! The scariest and bloodiest part is that the doctors cut a thin flap from your cornea, although you cannot see the laser beam clearly. If you insist watching the eye-surgery video clips, please make sure you are finished with your meal. Otherwise, you may not be able to eat any food later.



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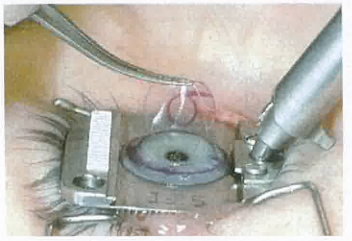

(The scariest and bloodiest part is that the doctors cut a thin flap from your cornea.)

Feedback from Mr. Chan Chi Chung:

Thank god that I don't have any eye defects so far and thank you for sharing with me the information about LASIK which sounds really scary to me.

For those who plan to undergo LASIK, please think carefully before you do so. And for those who are as lucky as I am, please try your best to protect your eyes. Although some defects can be fixed, trust me, you don't really want to take the risk!

A method of quick multiplication (2 digits - 2 digits)

2J Lee Kam Tin

Sometimes, when we multiply two 2-digit numbers like 15 x 21, 27 x 23, and 36 x 98, we can get the answer in a second if we have a calculator. However, if we don't have a calculator on hand, what shall we do? Let's use the traditional method - paper and pencil. Maybe you would think that takes time - seconds if you are fast, but most of us may take at least 30 seconds to finish it.

So, let me introduce to you a new method that may give you a new experience in multiplication.

Now, let's take 12 x 34 as an example.
First, multiply the tens digits (i.e. 1 and 3) together with 100. We shall get 300. Then, cross multiply the tens digit and the unit digit of the two numbers and find the sum of their products (i.e. 4+6 = 10). Thirdly, multiply the sum with 10 (i.e. 100). Fourthly, multiply the unit digits (i.e. 2 x 4 = 8).
Lastly, sum up the above results (300+100+8=408), and we will get 408.

Now check the result.
(Using the traditional method)
12 x 34
=360+48
=408

(Using the new method)
12 x 34
=1 x 3 x 100+(1 x 4+2 x 3) x 10+2 x 4
=300+100+8
=408

Therefore, the method is correct!

Second example:
36 x 98 (Traditional method)
=288+3240
=3528
36 x 98 (New method)
=2700+ (54+24)10+48
=2700+780+48
=3528

As a result, when the two numbers are very big, we may use the new method to do the calculation. However, you must remember the formula.

Why can we do the multiplication like this?
I will show you the proof below.
Let (10a+b)(10c+d)=products
(10a+b)(10c+d)
=100ac+10(bc+ad) +bd=products

Therefore the product from (10a+b)(10c+d) can be expanded as 100ac+10 (bc+ad) +bd. [Notes: (10a+b) (or (10c+d)) is the general term of a 2-digit number]

I hope you this simple method that makes calculation easier.

Feedback from Mr. Yiu Kwok Wai:
It's a very interesting method. Mathematics trains a person's logical thinking. It seems that you really have talent in Mathematics. You did a great job!

Fermentation by Yeast

1N Choi Tsz Lok

When there is no oxygen, carbohydrate is converted into wine by yeasts. This is called Fermentation. Yeasts are microorganisms. To many people, yeasts are bacteria. In fact, they belong to the Kingdom Fungi.
We can ferment the grapes to make red wine with following the steps:
1. Crush the red grapes by the pestle and mortar.
2. Put the red grapes into a glass bottle.
3. Close the cap of the glass bottle.
4. After 3 days, red liquid will be seen.

You may notice that we have not added any yeast in the bottle. In fact, the yeasts are already on the surface of the grapes. Moreover, we need to crush the red grapes into pieces in order to get more juice for yeast to ferment. Lastly, remember to close the cap; otherwise an air-free environment cannot be created for fermentation. After 3 days, you will see some red liquid and smell the alcohol. This is the red wine!

If you want to make white wine, you may use the green grapes. If you want to make the rice wine, you may use the rice for fermentation. It is easy to do fermentation! We all can try it!

Feedback from Ms. Ho Oi Shan:
To many people, yeasts are bacteria, which not many would favour of. However, if we make good use of them, they'll turn into delicious wine, which is good for our health. Same in our life, little flaws can always turn into strengths as long as we make good use of them!