not finish the Sudoku, so keep on going through step one and two and you may find the answer properly. If you get stuck, try to check your work to see if there are any mistakes. Don't give up if you can't finish it! Good luck!

This is a Sudoku from www.websudoku.com, if you are interested in Sudoku, you can go to this site. There are four different levels for you to choose. Try your best to finish the "Evil" level Sudoku. It is the hardest Sudoku in that web, but actually it is not so difficult. The example of this explanation is the "hard" level. If you want to check your answer, you can go to www.sudoku-solver.com to download a Sudoku solver to check the answer.

Answer:

If you want to solve the Sudoku faster, I think you should do more Sudoku and practice more. Everyone can solve the Sudoku very quickly.
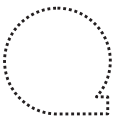
Teacher's feedback: Miss Cheng

Sudoku is a very popular puzzle in the world. Tom and Andy shared the tactics they used for solving Sudoku. I hope the strategies they suggested would encourage more people to try Sudoku.

Mathematics: Mark Six ....

Tse Kin Fai, Yip Chun Hong (1 Jupiter)

The Mark Six Lottery began in 1975. Initially a 6 out of 14 game, now, a 6 out of 49 game held three times a week.

The Mark Six in Hong Kong is popular, and it is also a problem about probability. If anyone wants to be rich by only betting in Mark Six, I can tell you that it is only possible if you are extremely lucky. I have calculated that the probability to win the first prize equals to $\frac{1}{49! \div 43! \div 6!} = \frac{1}{13983816}$ This means that there is only one in 13983816 chances to win the first prize.

Also, there is another question. The question is that how many draws are needed to draw seven consecutive numbers. We have finished the calculation and found that we need to have 2045252. First, we know that there are 49 numbers in Mark Six. If each draw draws out 7 numbers, then 42 numbers won't be drawn. Therefore, we get this formula. This means there are 49! $49! \div 7! \div 42! = 85900584$ different draws in Mark Six. Because there are 42 different combinations of consecutive numbers in Mark Six, the probability of picking out one of them will be $\frac{1 \times 42}{85900584} = \frac{1}{2045252}$.

If we need to draw one of them out in Mark Six, we need to wait for at least 13050 years to see it if the Mark Six is still held on Tuesdays, Thursdays and Saturdays. However, I don't think there will be Mark Six after ten thousand years.

So I suggest you not to buy these silly numbers. Also, gambling is not a good way to give out your money. If you want to donate your money, please bring your money to the charity instead of choosing the Mark Six. At last, 'don't gamble your life away'.
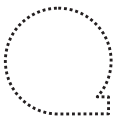
Teacher's feedback: Miss J. Cheung

This topic is quite complicated, but Andy and Tom have showed their effort in explaining the mechanism logically. They provide positive advice towards gambling in a scientific way.

Mathematics: Keep It Secret ....

Li Chun Hei, Lau Wai Kin (2 Venus)

Do you know what the two sentences below are talking about?

1. KYRFCKYRGAQ   GQ   DSL

2. 13 19 ,3 8 5 14 7, 9 19 , 19 13 1 18 20

These are the codes. Do you know what the codes above say?

Codes are used in the past. They are mainly used to send some important messages, especially during the wars. We cannot let the other side know what we are talking about, then we use codes. For each code, it has its own pattern and so do the codes above. When we can discover its pattern, we will know the meaning of the codes. We will now take the above codes as examples to tell you what codes are.

For the first code, we can see its pattern in this way:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
C D E F G H I J K L M N O P Q R S T U V W X Y Z A B

Then we can get the code: KYRFCKYRGAQ   GQ   DSL
                          MATHEMATICS   IS   FUN

For the second code, we can see its pattern in this way:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

Then we can get the code:

13 19 ,3 8   5 14 7, 9 19 ,19 13 1 18 20
M   S ,C H E NG, I S , S   M A R T

Everyone can get your message easily if they can get the pattern of your code. So the people in the past used the method invented by Emperor Augustus to code their messages. They got a stick and used a strip of paper to spiral through it. Then they wrote the message on the paper. Afterwards they sent the paper to the others. Even if someone got the paper, he/she would not get the message without a stick with the same cross section.

For example, if the encoded message is:

YAGO   EUGT ' O   VOPEDR   IDJZOOENESE

Then when we spiral through this message round the stick, we can get the message as in the picture below.
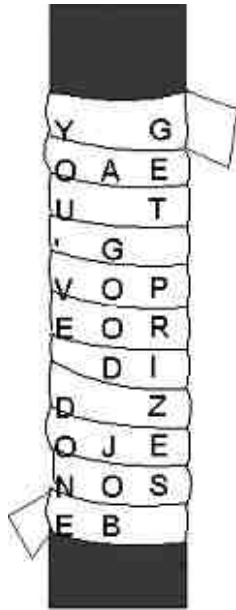
You've done a good job get prizes

However, this is only for the past. We've discovered a way to decode the message even if we do not have a stick.

P TOLI AOLWNES U CNFOGOL ULKNEUDGKAE

For the code above, can you get the message without a stick?

See the solution below:

When a strip paper is wrapped around a stick, the uniform cross section does not change. Then we can assume the size of each unit is the same. So the number of units in each line will be the same. Then we can assume that the units on each line are 3 units, 4 units etc. We can try to group the link of code into 3 or 4 units. After that, we put the groups of code in order horizontally. We can then read the message.

We can take the code above as an example:

P TOLI AOLWNES U CNFOGOL ULKNEUDGKAE

Then we put it into the group of 3 units

 1   2   3   4   5   6   7   8   9   10   11   12
P TOLI AOLWNES U CNFOGOL ULKNEUDGKAE

After that, we put the groups of codes in order horizontally.

1 P T
2 O L I
3   AO
4 LWN
5 E S
6 U C
7 NF O
8 GO L
9   U L
10 KN E
11 UD G
12 KA E

Then we can read that the code is:

Po Leung Kuk Laws Foundation College

Codes were very useful in the past but people do not use them to send messages nowadays because the technology has improved. However, we can still have fun with it. For some very important messages, codes may still be used to prevent others from getting the message.

References
Rob Eastaway and Jeremy Wyndham, Why do buses come in threes? (John Wiley & Sons, Inc, 1998), 63-65.
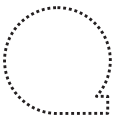
Teacher's feedback: Miss J. Cheung

Alex and Charles showed that coding is an interesting topic to study. The decoding method they suggested is amazing. I am glad to see that they used a critical mind to investigate ancient coding method.

NeuroScience: Doing physical exercise has no indication on learning and memory enhancement in children aged 13-15 ....

Ho Hon Leung, So Cheuk Yiu, Ma Ka Him (2 Pluto)

Some studies have reported that doing physical exercise regularly has positive effects on neurocognitive and neuropsychological functions. Yet, few studies have indicated how doing physical exercise can enhance learning and memory in adolescents. The objective of the present study is to identify the effect of performing physical exercise on learning and memory in young school-learners. Our study was conducted in a secondary school in Hong Kong. Views about habits to do physical exercises from 97 students aged 13-15 were collected. The memory and learning ability of these students were assessed with Hong Kong List Learning Test (HKLLT) produced by Department of Psychology, The Chinese University of Hong Kong. The HKLLT is a modified version of the California Verbal Learning Test. Results showed that four groups of the students (total time to do physical exercise per day: <15, 15-30, >30-60 and >60 minutes) did not have significant differences in the learning slope, short and long recalls of the HKLLT (see the figure below). These results suggest that doing physical exercise has no significant effect or is not a key element on learning and memory enhancement in adolescents.

The above findings will be published as a conference abstract in the 36th Annual Meeting of Society for Neuroscience (http//www.sfn.org).
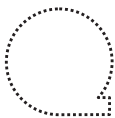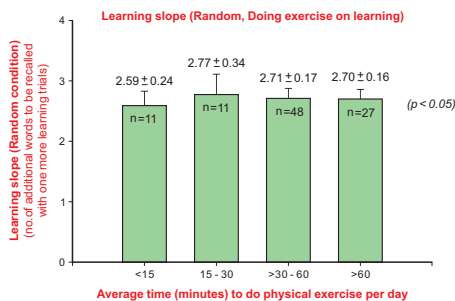
Teacher's feedback: Mr. Cheng

Our students have a great interest in neuroscience. They have put in a lot of effort and time for producing this report. I am sure the findings would aid the development of neuroscience and our students' scientific mind.
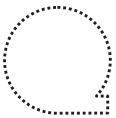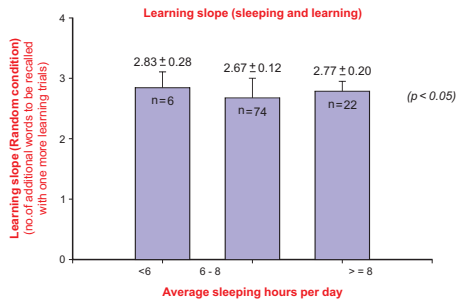
NeuroScience: Increment of sleeping time does not imply enhancement on memory and learning in adolescents ....

Sum Chu Man, Lui Brian, Chan Weng Hong, Sy Lok Him
(2 Jupiter and 2 Pluto)

Sleep deprivation has been reported to decrease some cognitive performances. Adolescents are advised to sleep adequately in order to have better cognitive and physical development. Children aged 13-15 are suggested to achieve more than 8 or even 9 hours per day for sleep. Yet, nowadays, an increasing number of young people do not have sufficient sleeping time, which has been considered to affect their memory as well as learning effectiveness in daily schooling. To study the effect of sleeping hours on memory and learning performances, a hundred and three students aged 13-15 were interviewed about their sleeping habits. Their memory and learning ability were assessed with Hong Kong List Learning Test (HKLLT) produced by Department of Psychology, The Chinese University of Hong Kong. The HKLLT is a modified version of the California Verbal Learning Test. Our results showed that three groups of students (average daily sleeping hours: <6, 6-8 or >8) did not have significant differences in the learning slope, short and long recalls of the HKLLT (see the figure below). The results suggest that increment of sleeping hours does not show significant enhancement on memory and learning in adolescents.

The above findings will be published as a conference abstract in the 36th Annual Meeting of Society for Neuroscience (http//www.sfn.org).

Learning slope (sleeping and learning)

Learning slope (Random condition) (no. of additional words to be recalled with one more learning trials)

2.83 ± 0.28 n=6 2.67 ± 0.12 n=74 2.77 ± 0.20 n=22   *(p < 0.05)*

Average sleeping hours per day: <6   6 - 8   > = 8

Student's feedback: 2P Ho Hon Leung

After reading this article, I learnt that even though sleeping doesn't enhancement on memory, it is still very important because it can help change the short term memory to the long term memory. Therefore, if we want to retain what we have learnt during our lessons, we should get enough rest and have good quality sleep.

Science: Biological Science Club ....

Leung Hoi Huen (1 Jupiter)

I am a member of the Biological Science Club and I am very proud of it because the club does not only broaden my horizon in the field of science, but it also provides valuable chances for its members to do lots of experiments.

There are three projects in progress in the Biological Science Club. They are Marine Biology, Ecology and Plant Physiology. After discussing with the group members, I have chosen Marine Biology because I like marine life very much. There are several things related to fish for us to do. We need to observe and record the habits of fish. We also need to find out what environmental conditions are the most suitable for fish to live in. Finally, we try to put different kinds of fish and marine life together to study the food chain.

Once, when we cleaned the aquarium, we found that there were many worms buried under the sands. Mr. Leung, the lab technician, told us that we could put them into a beaker that contained alcohol to kill those worms. After we did so, all the worms died and it was very horrible. After cleaning the aquarium, we bought several small fish and put them in it. We needed to feed and record them every day. Now, the fish are swimming happily in the clean aquarium.

Besides that, I had another interesting and exciting experiment. It was the dissection of a pig's heart. The circulatory system consists of blood, blood vessels and heart. We studied the structures of the heart by dissecting the pig's heart which is very similar to the human's heart. The heart is divided into two halves by a septum. We can tell which side is left or right by touching them because the left heart muscle is harder and thicker than that of the right hand side. Then we needed to identify the blood vessels. There are four major blood vessels connected to the heart and other organs. They are aorta, pulmonary veins, vena cava and pulmonary artery. How can we identify them? It is very interesting and easy. We can just simply run water slowly into each of the four major blood vessels in turn and observe where the water comes out, and then we can identify them.

It is an interesting experiment for me and it is a good chance for me to learn more about science too. I hope everybody will like science and join the activities of the Biological Science Club.
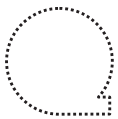
Teacher's feedback: Mr. Tang

It is good that Karen has a great interest in science and it is also a golden opportunity that she can join a club with her real interest. She made a very detailed description on the experiments that she has done. I can even feel the excitement she had in doing the experiments. Wonderful! Keep it up!

Home Economics: Traditional Hong Kong Snacks ....

Cheuk Sze Wing, Chui Ka Li, Leung Wing Yiu,
Tse Hong Kiu, Lee Chi Kwan, Lee Pui Ki (2 Saturn)

Snacks play an important role in Hong Kong. People here love them very much and many of them originated in Hong Kong. Nowadays, some of them have been modified to various kinds of snacks in order to meet the needs of the market. Now, we are going to introduce some to you.

Pot Clay Pudding 砵仔糕

It is made of glutinous rice flour, sugar & red beans, made to a batter and steamed in small clay pots. When served, we use skewers to pick them out of the pot. Usually there are two colours yellow and white. Yellow comes from the sugarance while white is just white sugar.

Fake Shark's Fin Soup 碗仔翅

It was found in vogue in the 80's Temple Street. At that time, the gap between the rich and the poor was serious. The poor made this by bean or sweet potato starch noodles with hashed meat, shiitake mushroom and soy sauce, which looked like the real shark's fin soup that the rich had. This could satisfy the poor people.

Egg Puff 雞蛋仔

This is made of flour, egg and sugar. The batter is put into a honeycomb-like tray and is grilled until done. The golden yellow colour is attractive and the