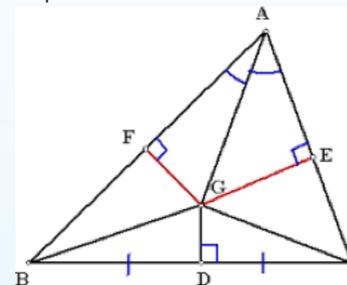


## 4

SCIENTIFIC  
INNOVATIONSMath Crisis:  
Are the things we have learnt correct?

## 1S Liu Kwan Chak

We all learnt basic geometry in junior forms: points, lines, planes, ... But are these things we have learnt correct? Recently, I have read a book about Euclid's Geometry. There's an interesting proof about isosceles triangle. It proves that all triangles are isosceles, which I think is impossible. Here is the proof:



For any  $\triangle ABC$ , Draw the angle bisector of  $\angle BAC$  and the perpendicular bisector of the side  $BC$  meet at point  $G$ . Join  $GB$  and  $GC$ . Drop perpendicular lines  $GE$  and  $GF$  to the lines  $AC$  and  $AB$  from  $G$  respectively.

$BD = DC$ (given)	$BG = GC$ (corr. sides, $\cong$ $\triangle$ s in (1))
$\angle BDG = \angle CDG$ (given)	$GF = GE$ (corr. sides, $\cong$ $\triangle$ s in (2))
$GD = GD$ (common)	$\angle GFB = \angle GEC$ (given)
$\triangle BDG \cong \triangle CDG$ (SAS) ... (1)	$\triangle GFB \cong \triangle GEC$ (RHS) ... (3)
$\angle FAG = \angle EAG$ (given)	$AF = AE$ (corr. sides, $\cong$ $\triangle$ s in (2))
$\angle AFG = \angle AEG$ (given)	$FB = EC$ (corr. sides, $\cong$ $\triangle$ s in (3))
$AG = AG$ (common)	$AB = AF + FB = AE + EC = AC$
$\triangle AFG \cong \triangle AEG$ (AAS) ... (2)	

$\therefore \triangle ABC$  is isosceles!

Same as you guys, I couldn't believe it is correct after I read this proof. However, I couldn't find the mistake of the proof before reading the answer. Do you know where and what the error is in this proof?

Hint: There is a mistake in the picture.

**Feedback from Miss Cheung Ka Yin:**

This is really an interesting proof. I'm glad that you have extended your reading on geometric proof. It is common that we usually make mistakes in proof because we start with a wrong assumption. In the case you mentioned above, the angle bisector of  $\angle BAC$  and the perpendicular bisector of  $BC$  may not meet at the same point  $G$  for all kinds of triangles.

# The Next Invention

## 1N Fung Fanny

Science is a basic and fundamental thing in human life, and has always been. Lamps, elevators, bicycles, phones, cars are all examples of inventions that science has brought us. I will be choosing to focus on the environment, and the next invention, will be a reset button.

Yes, a reset button, to reset the damage we have caused to the Earth. Air pollution, water pollution, endangered species, with a push of the reset button, what you want to reset will be reset. Although it may be humanly impossible, it is still nice to fantasize of what the world would be like before human destruction.

This button will be red, welcoming and also portable. To build the button we will need to tinker with time, and many other complicated things like the laws of nature. Despite the difficult building process, the reset button will only have benefits. With the button, we will be able to make things go back to the way they were, without affecting present time, unlike the time machines you see in cartoons.

If you think about it, the world is always resetting itself, so there will not be any changes or disruption in its balance or the circle of life. We humans are the reason that the Earth cannot reset itself, thus causing problems of pollution and the extinction of species.

In conclusion, we shouldn't get in the way of the Earth resetting itself, unless someone actually invents the reset button I mentioned before.

### Feedback from 1N Tang Hui Chun:

This reset button is very interesting. Too bad that once someone presses it, the whole world we once love and hate will disappear.

# The Next Invention

## 1N Tang Hui Chun

Science has led to a lot of progress over the years, from paper to computers, from planes to drones. The scientific research of humans has led us to an age of technology. But the invention that attracts the most is mobile phones. They have created a new way to play, communicate and even work. So what if I created another tool with the same perks as mobile phones, but with new functions that could revolutionize the way we communicate? Maybe our new tool for communicating could be a disc which can input games, documents or even money!

This disc could be the key to revolutionizing the future. It could be as thin as a piece of paper, big as a cup lid and it could hold more than billions of documents in it. With it we could use it to communicate with people almost everywhere, even in space! As long as there are satellites, we could communicate with people on Mars! (Assume people are living on Mars)

It has so many benefits that I can only list a few! It is as light as a feather, has a long battery span and has a state-of-the-art self-destruct system which destroys instantly if it falls on the wrong hands!

In conclusion, if we use this piece of technology and do it for good, we can change the world!

### Feedback from 1N Fanny Fung:

This disc you described sounds like a really cool gadget, especially the self-destruct function. Also, you used a wide range of impressive vocabulary! Nicely written!

## Can the time machine save our planet?

2J Leung Chi Fung

If there was really a time machine like the one from Doraemon, what would you do with it? How would you make use of it? Would you go back in time to correct the mistakes that you have made?

If I had this time machine, I would use it to help save and protect our environment. I would travel to the future so I can understand the situation of our precious planet and see what needs to be done in the present so that we won't see it happening in the future. I would also see if any natural disasters would occur.

If I could look into the future, I would take photos to warn people in the present day about problems that will happen to Earth in the hope that we could avoid it and put a stop to problems that are destroying our environment.

I personally think that building a time machine can be used to make Earth a better place. What do you think?

### Feedback from 1V Tse Yan Chau:

If I were you, I would also like to have a time machine! I would also go to the future and check it out since I can use new technology and bring it to the present. How cool would it be to be able to bring super advanced technology from the future and use it in the present? I think it is thoughtful of you to consider using a time machine to save the planet and protect our environment. Maybe allowing people to get a glimpse of how the future will be like if we continue to ignore the environmental problems will help us realise that we need to take action as soon as possible.

## A gentleman gives you a time machine. Where in time would you like to go?

### Will you stay in the present or go back to the past?

2J Yiu Choi Lam

Awarded in the Biliteracy and Trilingualism Composition and Speech Competition

It is midnight but I am still writing on my notebook. No, I am not doing my homework. I am writing my travel experience of 'this month'. I am really excited after the journey. I just can't wait to jot them down!

A month ago, a gentleman in a big hat gave me a time machine when I was at home alone. I was suspicious, but curious at the same time. The gentleman claimed that I could travel to any time, for one day to a century but I would spend only one month in real time. That was a good deal. I tried the time machine immediately.

I selected the Three Kingdom Dynasty in China to travel to. I have been interested in this dynasty since I was a junior primary student. Soon, I found myself standing in a grand palace. I guessed it was the Luo Yang City. I saw the young king sitting on the throne on the stage. All the ancient officers were kneeling down before him. I was surprised that no one could see me! I could travel without difficulties as I was invisible.

I followed the armies and sketched their armors and weapons. This was precious information. I also drew many sketches about the wars. I saw many famous generals like Guan Yu, Cao Cao, Zhou Yu and Zhu Ge Liang. Out of my expectation, they didn't wear luxurious clothes. They were just dressed like normal soldiers. However, they were really brilliant. They trained their armies well. I drew pictures of their appearances, too.

I travelled for about twenty years in Three Kingdom Dynasty because I had got many things to learn and see. After I came back to 2015, I checked the calendar and I really just spent a month. I didn't stay there forever because I have met my target for this trip. Furthermore, I missed my family. Home is the best place!

Now, I am going to sleep. Tomorrow, I will have my lessons at school again.

### Feedback from 2V Lee Man Ting Matilda:

It is an imaginative story. I believe that many of us would like to have a time machine – which allows us to go wherever, whenever. If I had a time machine, I would choose to go back to my childhood to see how happy my life was.

## Chemistry in Hand warmer

4V Wan Tsz Yung

We often use hand warmers in the winter. However, have you ever thought of why the hand warmers can generate heat by just simply opening the package? In fact, it is due to a chemical reaction called rusting. Rusting refers to the corrosion of iron which is commonly found in our daily life. For instance, reddish brown solid found on corroded iron water pipes is rust.

Iron rusts in the presence of oxygen and water. Rusting is a heat releasing process. However, it is a slow chemical process. We do not feel an iron object releases heat when it rusts. You may then curious about why a hand warmer can provide certain amount of heat and let us feel warm. Actually, we can speed up the rate of rusting by different means.

Now, you may take a look at the ingredients listed on a hand warmer packaging. A hand warmer commonly contains iron powder, sodium chloride salt and activated carbon. When the hand warmer is removed from the outer packaging, oxygen and water in the air pass through the permeable cover and reacts with the iron powder. The activated carbon holds water for the reaction. At the same time, iron powder inside the hand warmer provides larger surface area that can speed up the reaction and sodium chloride salt can also speed up the rate of rusting. Therefore, certain amount of heat can be generated in the hand warmer. For me, hand warmer is such a good product as it can keep my hands warm during the freezing winter. How about you?

### Feedback from Dr. Tang Wing Suen:

Rusting is usually regarded as an undesirable process. People apply different methods to prevent iron objects from rusting. This article shares how rusting can be used for generating heat in hand warmers. There is another kind of hand warmers which contains sodium acetate solution. You may try to explore the working principle of this reusable hand warmer used too!

## How will our lives be changed in ten years?

4V Wan Tsz Yung

Ten years from now, the world will surely be a better place to live in as people are always looking for new ways to improve their life. There must be significant changes in the community that we live in and the technology that we use. Here's what I look ahead to in the coming ten years.

In the future, uniqueness of our city may be sacrificed because too much emphasis is placed on boosting our economy. With better economy, more job opportunities will be provided. In general, focusing on economic development may help to improve residents' quality of life. On the contrary, if the government does not place culture as a priority in the future, more places filled with memories and uniqueness will disappear. Let me give you an example. Cha Chaan Teng is a place which I always dine in at weekends. I do not only enjoy the quality food with its reasonable price, but also the conversation with my neighbors. However, they are now replaced by chain restaurants. The reason for it is the skyrocketing rent which is not affordable for family-owned and small business. Without a doubt, the government should definitely take into consideration whether these memorable places should be torn down when they are in a dilemma of boosting the economy or preserving local culture.

Besides sacrificing the culture, there will also be improvements on medical development. For years, nanotechnology has presented the possibility of using nanotech devices in treating diseases. In the future, Nanorobots in the bloodstream which can intervene even before the disease appears may be invented. They can keep tissues safely oxygenated after a heart attack, specifically targeting at cancer cells, or remove platelets. I am sure more lives can be saved with this invention. Yet with the help of advanced medical techniques, humans may over rely on them and be less health – conscious. When they are no longer aware of leading a healthy lifestyle, their health will inevitably be worsened.

Having our lives improved is definitely something we all are going after. However, there are two sides to every coin. While we are taking advantage of the changes we are making, we should never neglect the possible dangers they will also bring us. So how do you see the changes to yourself and your society ten years from now?

### Feedback from 4V Choy Yi Ting:

On one hand, many people nowadays are dedicated to preserving places that might disappear due to technological and economic development. On the other hand, the economic growth does bring benefits to citizens like providing job opportunities which can help people get rid of poverty. Achieving a balance between preserving small business and developing the community should be the most ideal situation. Yet, is this really possible?

## Do you know playing video games has become a craze among teenagers nowadays?

### 3N Fung Ho Fung

Do you know playing video games has become a craze among teenagers nowadays? As information technology is very well-developed nowadays, people all around the world can easily download games from the Internet to their mobile phones. As a result, almost everyone has experiences of playing video games. Some people even play the games for hours every day. This article will inform you some advantages and disadvantages of playing video games.

The benefits of playing video games are obvious. Firstly, playing these games brings us excitement and thus reduces our stress. Most of the games contain content of fighting scenes, During the games, there are strong visual and sound effects such as the visual effect of fire in the fight and sound effect of stabbing effect. This makes the games more thrilling. Hence, we will be attracted by the games and the games will cut down on our stress due to large amount of homework for a short period.

Moreover, playing video games enhances our alertness. In most video games, the player has to react quickly in order to win the game. For instance, the player needs to respond immediately to prevent himself/herself from being killed by his/her opponent. Therefore, after frequent training by playing video games, our fingers will be more flexible.

On the other hand, there are several disadvantages to playing video games, especially when a person is addicted to it. To begin with, playing video games constantly for a long period of time will cause various types of visual and physical health problems. When we play video games, we look at the screen at a short distance. Consequently, our eyes contract and our lens become thicker. If we keep on playing it for a long time, we are likely to suffer from myopia. In addition, heavy myopia is very dangerous as it may

lead to visual impairment. So, playing video games is harmful to our eyes in the long run. For physical health aspect, being addicted to video games may result in adequate physical exercises and overweight. We can't resist playing video games as we think this is much more interesting than other activities, so we will not be willing to give up this habit. Time spent on physical exercises will then reduce. Hence, we will not be able to burn away excess fat in our body and causes overweight. This may also lead to other health problems such as diabetes and heart disease.

Moreover, getting addicted to playing video games may also result in undesirable academic results. As we are addicted to video games, time spent on doing homework and revision will decrease and hence lead to a drop in academic results. This will also result in poor self-esteem as we are unsatisfied with the result. This destroys our self-confidence and worsens our mental health as well.

All in all, the best way to entertain ourselves is to relax ourselves in different aspects such as reading books and doing physical exercises rather than spending hours on playing video games. This is an important key to good health and personal development as Ralph Waldo Emerson says "The first wealth is health".

#### **Feedback from Miss Teresa Lam:**

Quite a lot of people are addicted to various kinds of video games. They suffer from different kinds of health and social problems consequently. Indeed, it is not easy to get away from it once people are addicted. I sincerely hope your essay can be read by them and everybody can manage their time properly and have a healthier lifestyle.

## With the advancement in technology, will human beings progress? Or regress?

### 4V Ip Hong Kiu

Think about the first spark of electricity. Think about the invention of steam engines. Throughout human history, technology has created lots of improvements in our lives and helped us alleviate our busy workload in this hustling life. Have you ever wondered how much further human beings can go? But is going further better? Or would sometimes going further lead to us falling backwards? As I am a lazy person and there is nothing more in this world that I would like to see than two inventions in ten years, electronic limbs and nano-food.

Walking is one of the most basic actions that human beings conduct daily. But what if you could move without having to move a muscle? As a student, I have to rush to school every day, so it will definitely be useful for me to have this innovative technology. In ten years, I predict that there are electronic limbs invented. The electronic limbs will be placed on your legs and make you stand upright. Thus we can move without moving a muscle, literally. Walking using our own muscles will thus become obsolete.

Another basic live action we conduct daily is eating. Have you seen that scene in the movie where people rush to work or school with a half-chewed bun in their mouths? Seeing this situation, I hope that scientists would develop nano-food. Nano food are pills that only requires you to swallow. Once the nano-food touches your saliva, it will start dissolving so it is automatically digestible. Chewing is no longer needed.

These technology advancements can surely progress our lives, however the electronic limbs and nano-food may bring forth some side effects.

As the nano-food becomes prevalent to us, we will only swallow food. As time goes on, the teeth of our coming generations will

start to fall off as we don't need to bite when we are "eating", and teeth will be regarded as useless.

Due to the fact that everyone is using electronic limbs, we no longer need to walk with muscle contraction, and our muscles tissue may start to peel off from the bones as we forget how to walk. At last, all humans' foot limbs will become just bones.

But the scariest part is that we humans may be indifferent to the falling off of our tooth and the peeling off of our muscle tissue because we all think that they are useless. We lose all the things we are having. There is no denying that technology can make our lives become more convenient and progressing, but when we are too obsessed with the advancement of technology, we may become disabled. Of course I am not saying that technology advancement should be stopped. But I think that while we are holding on to technology as a crutch, we too should be aware not to have the advancement in technology cause deterioration in our society.

### Feedback from 4S Lam Fong Yu:

The inventions suggested are innovative. I would like to try having electronic limbs to replace my legs which would allow me to move faster. It is a great invention for the elderly and the disabled.

# In the Sun or Before the Screen?

5J Chu Sing Ip

As technology advances, virtual sports have revolutionised the way people play sports. While some long for the exhilaration and exhaustion after doing real sports, I am inclined to believe that virtual sports are more ideal for our hectic and fast-paced lives. Have you ever imagined how beneficial virtual sports are in terms of helping us minimise costs, break all time and space constraints, and most crucially, prevent us from being injured?

An obvious reason for my indulgence in virtual sports lies in its money-saving effect. Imagine we were all ice-skiing lovers who dreamt of travelling to Korea and enjoying the authentic snowy atmosphere. But the reality is that: can we all afford a two-way air ticket to Korea, let alone the costs of accommodation and other expenses? On the contrary, a Wii console can bring the simulation of skiing and layers of ice to real life. Want to ski when you are off work? Or when you are with your friends? Totally up to you. What is required is simply a game console and a few game discs – half the price of an air ticket and can bring you endless enjoyment! Still craving and envisaging a trip to Korea? That's just totally off the balance sheet.

What's more crucial than preventing unnecessary expenditures would be how virtual sports break all space constraints in a cramped city like Hong Kong. In the face of the insufficiency of sports stadiums and recreational areas, how can we quench our thirst for outdoor activities such as basketball, jogging or table tennis? Virtual sports come in useful when it comes to compensating for the inadequate amount of sports facilities. Just with a remote control, you can transform into a professional tennis player, bowling addict, and whoever you aspire to be irrespective of the space factors. Wouldn't it be ideal for everyone to devote themselves equally to virtual sports?

Did you ever get your parade rained on when you wanted to go out for sports? In fact, quite a lot of sports activities are confined by the weather condition. Swimming is not allowed when there is a thunderstorm warning signal. Running becomes extra-painstaking when it's raining outside. Under such circumstances, virtual sports are such good aid in conducting sports activities given that it provides us with chances to carry out sports regardless of any rain, typhoon or lightning outside!

Indeed, it strikes some sports lovers as a huge concern that virtual sports are never comparable to their real counterparts as the joy and genuineness of carrying out sports are reduced. Well, isn't it just a "you win some and lose some" trade? I myself take convenience over how realistic I feel when doing sports. Indeed a fair trade-off, isn't it? More importantly, playing real sports implies potential dangers if we don't attend to the details like the correct posture. On the other hand, virtual sports require minimal movements and thus can reduce the possibility of us getting injured: basic hand and waist movements, jumping up and down – that's all about virtual sports!

At first glance, it may seem like virtual sports are nowhere near its real counterparts. But when we take all these irreplaceable merits into account, shouldn't virtual sports be appreciated and advocated just as much as real sports are?

## Feedback from Miss Tin Ka Wai:

Kelvin has put forward some creative and persuasive arguments in this writing. I used to prefer real sports but now, having understood the various benefits that virtual sports bring to us, I will definitely try them out sometime!

## Nuclear deterrence: the lingering shadow of war

### 5N Cheung Agnon Ngai Ron

Picture this, a battlefield, the smell of gunpowder lingers in the air, bodies of soldiers who have dedicated themselves to their country strewn across the land and the sounds of gunshots crackle in the distance. Is this too upsetting for you? Well then, how about this. Instead, the scent of lush grass blows towards you, an overgrown landscape in view and the noise of a calm wind breezes through. Is this a peaceful scenario? In many of your minds, the answer is a definite YES. Despite that, a shadow creeps upon this false figment of peace.

So, what may that shadow be? Ladies and gentlemen that is the topic of my speech for this evening. Nuclear deterrence. Originally a phenomenon that occurred in the cold war between Russia and America, the deterrence theory suggests that nuclear weapons are intended to dissuade other countries from attacking their nuclear arsenal. In Layman's terms this means that a country with nuclear weapons at its disposal can counteract another country that also has a nuclear artillery into not attacking it. From here, a stalemate occurs and war is brought to an abrupt halt.

Nuclear deterrence can bring forth two nations to usher in an era of peace together, with both parties unable to engage in conflict with each other, what other way is there than to settle things in a more refined manner like civilized people. Take negotiations as an example, maybe both countries have the same viewpoints on certain things and have more in common than they thought, maybe the reason they started fighting in the first place was that they got off on the wrong foot. By finding a compromise with one another, surely the times of turmoil will end and it will bring about the start of tranquility between two nations and thus peace can be achieved.

However, the absence of conflict may not mean the beginning of harmony. A concern I've taken into account is that the end of fighting between two countries may not mean the end of hostility towards each other. Tensions can be high on both sides and all it takes is a spark to start a fire, one wrong move on one end may lead to the loss of thousands of lives on the other. So, while the times of battle may be brought to an end through deterrence, the residents of a country may be living in fear of the thought that bloodshed can still occur if the relationships of two states become too sour to bear.

To sum up, while conflict can be avoided with the theory of deterrence, the hostilities that remain towards one another may lead to dire consequences, proving that peace is not just the absence of war. If two parties can take measures to soothe their relationship. Then the ideal outcome of peace can be obtained.

### Feedback from 5J Wong Jun Fung Brandon:

The piece started with chaotic scenes from the battlefield as if the audience were actually part of the war. Even if you had not been in a war zone before, the writer clearly depicted the psychological fear of a nuclear war to the audience and reminded them of the phantom conflict that ended just decades ago. In fact, the lingering shadow from nukes is making me cringe right now!

## A letter to the editor discussing the rising number of recent traffic accidents

**5N Singh Baljoet**

Dear Editor,

I am writing in regards to the surge in the number of traffic accidents in Sai Kung district. Road safety has become the buzzwords in the quiet neighbourhood after a few horrific fatal accidents. In my opinion, these unfortunate events are results of three factors: lack of traffic CCTV, the shortage of police petrol on roads and the deterioration of road conditions.

To start off, I would like to point out the problem of lack of traffic CCTV by using a recent incident involving a motorcyclist. Last Sunday, a truck driver who claimed to be late for work hit a motorbike which killed the motorcyclist on the spot. The truck driver was found speeding as evident with the long tire marks left on the road as a result of prolong braking. Speeding is prevalent in the area and it is encouraged by the lack of police monitoring with CCTVs. It is believed that with more CCTVs installed on roads, speeding of drivers can be reduce and prevented.

Secondly, as a resident of Sai Kung, hardly can I spot a traffic police officer on petrol. We can seldom see the presence of police in the neighbourhood. I understand that Sai Kung is considered a quiet district which is remote from the hustling and bustling of the central business district. However, what drives people to live here should not be an excuse to drive police officer away. Noticeable presence of the police should be able to deter reckless driving behaviour, and hence curb traffic accidents.

Sai Kung is considered one of the most scenic districts in Hong Kong with its close proximity to our national park, but we should also keep in mind that it is also one of the oldest in the territory. With the rise in the number of residents in the community, the

usage of roads has also increased. Higher usage leads to wears and tears of the surface. It is not surprising to see holes or bald spots on the roads in Sai Kung. Needless to say, these holes on the roads are like traps for cars, which can cause serious road accidents. Authorities concerned should pay more attention to the conditions of the roads to prevent accidents.

Taking all the aspects into account, road safety is of paramount importance to all residents in Sai Kung. Not only should more CCTVs be installed, but more police presence should be implemented to alleviate the problem. In addition, the government should consider improvement projects for our desperately needed roads. I urge the relevant government parties to take immediate action now.

Yours faithfully,  
Chris Wong

### **Feedback from Mr. Tang Ho Man:**

Baljoet, it is rare for a young gentleman like yourself to have such in depth understanding of your own neighbourhood. Road safety is indeed a burning issue for local residents. I can go as far as to say it is a life threatening problem for some. I hope your suggestions will be considered seriously by related parties.