

# 思與學

# Impetus

2021-2022



仁愛堂田家炳中學

YAN OI TONG TIN KA PING  
SECONDARY SCHOOL

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*Celebrating the 35th anniversary*

*Achieving our original aspirations;  
nurturing virtues and talents;  
establishing oneself and helping establish others*

回歸初心 · 育德育才 · 修身利他 · 己立立人

**Ms. Ng Kit Yung, Principal**

COVID-19, which started as a global pandemic in early 2020, has remained unabated. The epidemic has affected the world economically, culturally, politically, educationally, and environmentally. The outbreak illustrates that we are living in an era of rapid change - the VUCA world - which is volatile, uncertain, complex and ambiguous. The 21st century is changing rapidly, and the pace of change is accelerated by the rapid advances in technology. In an age of uncertainty, where does education go from here? We believe the way forward is to return to the essence of education; to the care and concern for "people"; to the educational beliefs of our founder Dr Tin Ka Ping; and to the philosophy of the Tin Ka Ping Foundation which is to promote moral education, to popularize Chinese culture and to integrate into the global civilization (促進道德教育、弘揚中華文化、融合世界文明).

Dr Tin Ka Ping devoted himself to education for the 35 years from 1982 to 2018. According to Dr Tin, education is a never-failing business and the foundation for lifelong learning. He hoped to build a school culture embracing traditional Chinese values, including integrity, filial piety, love for family, patriotism, and many other good qualities.

Yan Oi Tong Tin Ka Ping Secondary School is the second secondary school run by Yan Oi Tong and also the second secondary school funded by the Tin Ka Ping Foundation nationwide. Our school was founded in 1987 and has gone through various stages of development, from the foundation and consolidation stage, to diversification and pursuit of excellence, and now to a stage emphasizing encouragement for students to pursue their dreams. In this school year, the school is celebrating its 35th anniversary. In the face of a fast-changing world, it is all the more important for us to uphold the function of education and return to the original mission of our founder Dr Tin.

Nurturing virtues and talents (育德育才) was the mission of Dr Tin, who believed that personal virtues are far more important than talents, and that people with talent but no virtue will harm rather than benefit society. On his 98th birthday in 2018, Dr Tin gave this exhortation to teachers and students - Spreading your wings and fly to your goals; Moral education always comes first among the five aspects of personal development (展翅飛騰。邁向理想。五德並重。德育為先). Bearing this in mind, we emphasize building up virtues within our students while encouraging them to chase their dreams.

As a training ground for human resources, the school has three main drives for character and values education: enabling students to develop a positive outlook on life; encouraging a commitment to society; and instilling a sense of nationalism and Hong Kong sentiment with an international perspective. The school motto 'After establishing yourself, help establish others' (己立立人), is an encouragement not only to students, but also to principals and teachers. We hope that teachers and students will strive to pass on the school spirit - In establishing ourselves, we are able to reach out to others and make a difference to ourselves and to society.

Character education is founded in the family, enlightened in the school and put into practice in the community. It is hoped that families, schools and the community will work together to maximize the effectiveness of character education.





6A (2021 S6 Graduate)  
Ms. Cheng Ka Yiu 鄭嘉瑤

Scored 29 points in her Best 5 subjects and Attained 5\*\* in Biology, 5\* in Chemistry and Physics in 2021 HKDSE Examination

Now studying Bachelor of Science in Physiotherapy,  
The Hong Kong Polytechnic University

## 有目標 有興趣 才能持之以恆

我一直都對自己的將來感到迷惘，身邊的朋友都有想讀的學科、想做的職業，向着目標進發，但自己卻懵懵懂懂的，一直只見步行步。

直到疫症在全球爆發，各地醫護人員即使冒著感染肺炎的風險，仍然緊守崗位，恪守專業，站在最前線與疫症對抗。這樣偉大無私的行為令人動容。在我看來，救傷扶危不只是一份工作，而是醫護人員的使命。那時我便確定了自己的目標，希望能修讀與醫療相關的學科，望能將學到的專業知識救治傷患，回饋社會。

對，有目標、有興趣，學習才能持之以恆。

小時候，我便喜歡閱讀一些有關科學的書和影片，例如<宇宙中的星體是如何運行的>、<植物是如何做光合作用的>、<我們為甚麼會看到顏色>等等。這些現象背後的原理非常有趣、毫不乏味。我尤其喜歡生物科，人體的構造十分奧妙、大自然與生物之間息息相關，互相影響卻又維持住一種微妙的平衡，非常引人入勝。

自然而然，高中我成了一個理科生。透徹理解科學理論，當然是學習上不可或缺的一環。但忽視操練題目和掌握考試技巧，仍是不足。這樣說可能會顯得有點功利，可是學習本來就是需要反覆溫習、反覆應用，才能熟能生巧，鞏固所學。在應試前一年，我便開始做歷屆公開試考卷，並且自己對答案。牢記一些重點字眼或答題順序。因此，理解和練習都是學習和考試中的重要一環。



6A (2021 S6 Graduate)  
Mr. Leung Ho Yee 梁浩義

Scored 31 points in his Best 5 subjects and Attained 5\*\* in Mathematics (Compulsory Part), 5\* in Mathematics (Extended Part Module 2), Biology, Chemistry and Physics in 2021 HKDSE Examination

Now studying Bachelor of Science in Physiotherapy,  
The Hong Kong Polytechnic University

## 方法正確 才可例不虛發

很慶幸可以和同學分享我的學習心得，希望有助各位事半功倍，在文憑試獲得理想成績。

「成功乃成功之母。」正面情緒有助發展成情感記憶，令知識變得更穩固。至於如何建立正面情緒，我建議先定立階段式的目標，盡量將目標設在可行的範圍，然後才不斷提高難度。以我做中文卷三(綜合卷)為例，本來我每次整合拓展14分只會得3-4分，全卷亦只有30分，即使老師要求我不斷重寫亦沒有進步。於是我決定先不要盲目地寫，反而花一兩天的時間參考所有曾經做過的試題，找出上品文章的共同特點，和上下品文章的差別。找出得分的潛規則後，我嘗試按照理解重新改正，幸好找對了「方程式」，終於把成績提升至9-10分。本來我十分害怕做綜合卷，一小步一小步的前進令我相信自己的能力。往後每一次綜合卷練習，我會要求自己比上次進步10分，結果我由30分提升至至60分，最終更在模擬試獲得76分。因此，我敢信只要過程中能夠不斷找到達成目標的成就感，便可大大提升學習效能。

固然，每一科的溫習方法截然不同，我們不能一概而論。但整體上有一個方向給大家參考，就是將輸入和輸出的比例盡量設成為3:7。輸入是指把書本、筆記上的知識溫故知新，而輸出自然是操練試卷、或者是用讀寫的方法把知識應用。不要過多操練試卷，因為會令有關課本知識的記憶不全面，亦不要過於集中背誦筆記，因為重複看同一資訊會令腦部疲倦，導致習效率降低。簡言之，學而時習之，也要學思並重。

當然，「獨學而無友，則孤陋而寡聞」尋找學習夥伴亦是重要一環，特別對於講求背誦的卷別。例如，中文卷二的議論文題型需要大量人物和事件作論據說明，而我和一位朋友特地相約每晚與對方說一個人物故事。這方法不但能為彼此提供習動力，更可以透過朋友協助找出自己遺漏未背的地方。

我想忠告各位學弟學妹，不想放榜那一天後悔的話，請毅然戒掉手機癮。手機每天會向你灌輸大量不重要的資訊，很容易支配你的思想，從而取代腦中的重要記憶，同時會影響生活質素(當然包括睡眠質素)。我在文憑試一年前決定刪除所有手機遊戲，只允許自己每天有一小時使用社交媒體。

最後，容我分享一些小癖好。除了早上早起，我會於午飯後小睡至少15分鐘，這有助血液循環。當感到沉悶的時候，我會讓自己望遠、放空、發呆，發呆片刻真的能夠調整思緒，增加創意。

只有作息合宜，才能厚積薄發；找到正確方法，才可例不虛發。





6B (2021 S6 Graduate)  
Ms. Kung Kam Chin 龔錦芊

Scored 30 points in her Best 5 subjects and Attained 5\*\* in Chinese Language and History, 5\* in English in 2021 HKDSE Examination

Now studying Bachelor of Finance in Asset Management and Private Banking, The University of Hong Kong

## DSE是一門玄學？

DSE開考前，你總會毫無頭緒，開始東找找影片，西看看社交媒體上的博客分享——最後，你會發現，你看了那麼多也只是尋求心理安慰罷了，好像懂了點東西，又似乎沒學到什麼。哈！這就是為什麼我說，DSE是一門玄學？

### 中國語文

說實話，中國語文絕對是我在放榜當天最大的驚喜——原本想著有個5便夠用，但感謝考评局給我添了兩顆星。開始我還以為是寫作拿了5\*\*為我拉了分，想不到卻是平時最差的閱讀卷！要問我閱讀理解有什麼應試技巧，恐怕只能告訴你多做做好事（開玩笑）。說實話，多看看範文，多看看字詞解釋及長問答（補習筆記或是參考書都可以）便摸到答題套路了。

至於寫作，記住別離題（在學校考試我次次都離題）！手感來了，你的靈感就來了！（別問我為什麼，答案就是個「玄」字）當然，看一些速成小故事或佳作（靈感來源！），移花接木，玄妙地改變一下，套進不同題目裡去。

### 英國語文

技巧再多也要有點底！卷一和卷三尤其重視英語基礎能力。

補習社學到的技巧固然有些幫助，但不要盲目記住技巧公式，要基於自己的底子和情況去選一些有用的技巧套用。卷二寫比較容易找到套路，Part A多聯繫現實生活（如時事），其他就真的看自己造化啦！



與其盲目鑽研過多的技巧，不如於初中多提升一下自己的英語基礎能力吧！

### 理科

至於數學、M2、化學和生物，大家還是理解完概念後就去刷題吧！題海戰術絕對是應付理科的不二法門！記住，做錯的題目要記下自己混淆了的概念，寫在書上知識點的附近，這樣下次再溫書就萬無一失！說真的，當你做到一定的題量，你就會發現知識已經融入到你的意識裡——也就是說，你應該可以達到不用溫書也能馬上做卷子的程度（除了特別細微的知識點外）！

### 歷史

在眾人的刻板印象中，讀歷史科要背大量資料，然而，DSE考的不只是背誦能力，而是你是以掌握了套路，以及有邏輯地將資料整理展示。經過我反覆試驗，總結了一個有些冒險但在我身上萬試萬靈的方法，大家不妨試試是否適合自己！由於我有補習，有每一課題的大量DBQ、Essay的問題及答案（沒有補習的同學也可以購買老師推薦的參考書），而這，就是我飢的秘密武器！考試前我並不會看課本或是課堂筆記，而是反覆看DBQ及我所謂「tip」的Essay題目（通常是重點題型或是大包圍題目），看多幾次你就會發現常用的論據以及論證方法，考試時便能得心應手。要知道，歷史並不是考核你能背下多少東西，而是如何運用論據合理證明你的觀點。熟能生巧，最後你會發現真正常用的論據不過就是那幾個，作答時分分鐘還會覺得「怎麼又是它，我就快用到厭了！」，這個時候你就成功了！

看再多的學習心得，無非就是找些靈感，幫助自己摸清最適合自己的學習方法、在自己身上最有效率的學習軌跡。

記住，千里之行，始於足下。

DSE是一門玄學？平時不燒香，臨急才要抱佛腳。





connect my favorite subjects with the less interesting subjects. A typical example was I combined Chemistry (the subject I fell in love with) with Geography. I tried to connect rusting in Geography with some redox equations. It was a surprise to me that my academic results improved tremendously. I strongly recommend this method to fellow students who are struggling with subjects that they find boring. The trick is to merge some interesting concepts with some less interesting topics. Try it!

At Form 4, I faced new learning difficulties and at some point lost direction. I noticed that the previous "Hard Study Method"(rote learning) no longer applied. Now I had to study a subject thoroughly by grasping some very difficult concepts. My first Physics test in Form 4 was a total disaster. I could not understand the concepts in Heat and Gas, known as the most difficult chapter in DSE syllabus. I realized it was time to change my studying method. I bought comprehensive exercises like Physics 1000 to practice and study thoroughly the basic concepts. My goal was to practice 20 questions a day. When I first began, it was a tough goal to achieve. But after a month, I found those questions manageable and actually became quite easy. I think the key to studying science subjects is like constructing a building. We need to practice and "Practice Makes Perfect".

At Form 5 and 6, I had no other target but to brace myself for DSE. The outbreak of Covid-19, however, forced every student to face a new normal. We needed to stay at home. School was suspended. We seemed to be lost. At that time, I kept reminding myself to continue to work hard to achieve my ultimate goal. For example, I began to study different subjects right after I woke up. I took a rest at lunch and studied again in the afternoon. I felt I was embedded in a loop forever. I was even emotionally drained at some point. I would suggest fellow students to devise a schedule well to strike a balance between study and rest to maintain sanity. The road to DSE is a long one and we must take rest at times otherwise we will be exhausted and could not reach the destination. Extra stress was created by the suspension of school as no more tests or examinations were held. I began to worry about my own academic progress so much so that I would become scared that my classmates would perform better than me. I had to concentrate my efforts on doing different mock examination papers and past papers to allay my fears. I did about 100 mock papers in Physics and Chemistry. I guessed my efforts paid off as I attained 5\* in both subjects. Again, "Practice Makes Perfect".

Looking back, Form 6 was like the final lap of a marathon. I ran towards my destination with my goal achieved. I certainly faced many obstacles during the journey but I never gave up. Now I am slowing down my pace, sharing my experience with fellow runners and wishing you all the best!



**6A (2021 S6 Graduate)**  
**Mr. Leung Ho Ching 梁皓程**

Scored 29 points in his Best 5 subjects and Attained 5\* in Mathematics (Compulsory Part), Mathematics (Extended Part Module 2), Chemistry and Physics in 2021 HKDSE Examination

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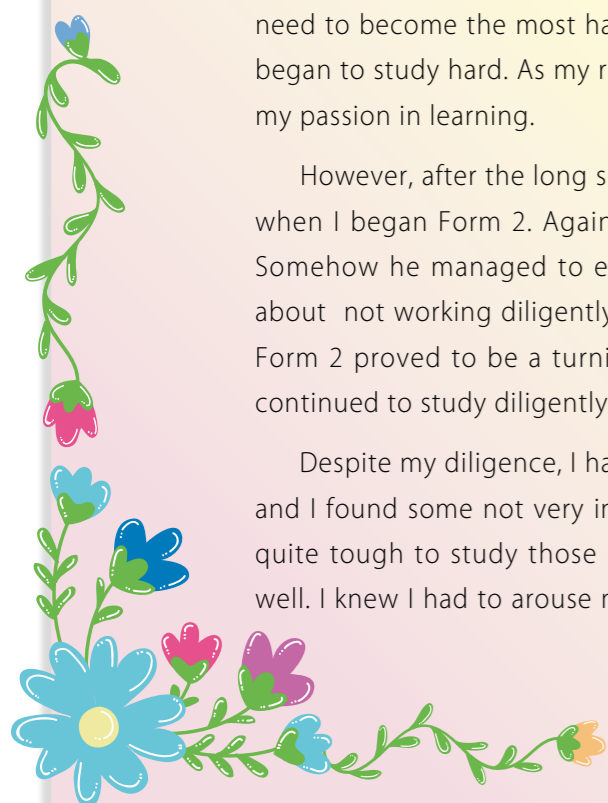
## Running hard, running smart

I am honored to be given the chance to share my learning experience with TKP fellow students. I owe my relatively good HKDSE results to the support of the school, teachers and schoolmates.

My Form 1 class teacher, Mr. Tam, is the first person I have to thank for. In my first year in secondary school, it took me quite some time to adapt to the new learning environment: new teachers, new schoolmates and new subjects. The teaching medium for some subjects switched from Chinese to English also caused me a lot of stress. My academic results were quite bad at the time and I seemed to lose passion in learning. It was Mr. Tam who kept reminding us that "although we are not the smartest class, we need to become the most hardworking class". His constant reminder finally sank in and I began to study hard. As my results improved, I gained a sense of fulfillment and rekindled my passion in learning.

However, after the long summer holidays, I lost all steam and went back to my old self when I began Form 2. Again, it was Mr. Tam who spotted and helped rectify my situation. Somehow he managed to etch his reminder into my mind. I even cried as I felt guilty about not working diligently. Finally, I got a huge advancement on my academic results. Form 2 proved to be a turning point in my academic years as I never looked back and continued to study diligently.

Despite my diligence, I had a rather stressful year in Form 3. There were many subjects and I found some not very interesting such as History, Economics and Geography. It was quite tough to study those subjects well. As a result, my academic results were not so well. I knew I had to arouse my interest in those subjects to improve my results. I tried to



## Innovative Chemistry STEM Programme @ CUHK

5A Peggy Li and 5B Anna Yuen

### Chemistry in Life

In this summer holiday, we joined the innovative Chemistry STEM programme organized by the Chinese University of Hong Kong which is the most inspiring experience that we have ever participated in. The theme of this course was related to disease-fighting. We explored the application of chemistry in disease control and prevention such as what masks are made up of and components of hand sanitizer.



Contrary to our expectations, we could not understand all the contents in the lecture classes as some of the theories mentioned like polymers and spectroscopy are not yet taught in Form 4. We tried our best to overcome this obstacle by discussing it with our groupmates and asking lecturers during the break time although we were a bit confused. Apart from lectures, novel experiments were also conducted in groups which made us feel inspired. We prepared hand gel sanitizers and bleach solutions using an electrochemical approach in those experiments. One special thing that should be mentioned is that much big-budget and technical equipment which would not be placed in secondary school was used in the experiments. With this, we learnt many professional ways to recognize different substances.



## Innovative Chemistry STEM Programme @ CUHK

I will never forget how exciting it was to analyse the components in commercial face masks using infrared spectroscopy. It was a once-in-a-lifetime opportunity!

Because of the pandemic, we could only learn on ZOOM. Even in face-to-face chemistry lessons, we rarely performed experiments due to short lessons and hygiene risks. Fortunately, there were many chances to perform experiments during the summer course. We only knew about titration in textbooks but we could finally try it in the programme! Compared to learning by imagination, it is better to conduct experiments because this leaves a deeper impression on the topics and enhances our learning as each step is carried out in detail.

The most memorable experience we encountered was stepping out of our comfort zone and meeting new friends from other schools. We even got the chance to meet university students who are studying chemistry at CUHK. The university organized a "CU hunt and lunchtime" event which was a delight because we got to spend time with our new and old friends in a novel environment! Their warm welcome has certainly piqued our interest in entering this university and university life.

We thought we were blessed to have the chance to have such a learning experience during the 'nightmare' pandemic Covid-19 had become. Even amidst such adversity, we were able to continue to learn and grow. We may not be able to join similar courses in the future anymore as we will get busy as a beaver in Form 5. That is why I cherish this special experience so greatly.

After joining this programme, we have not only deepened our knowledge in chemistry but also have a larger interest in choosing a chemistry programme in our further studies. We got lots of information about the admission of CUHK chemistry which makes us clearer to what we exactly need to do in an attempt to be admitted to the university.



## Indoor Air Quality STEAM Workshop

The school invited an educational services provider to hold a STEAM workshop for some of the S3 Science Elite students. They made an indoor air quality (IAQ) monitoring system with Arduino. During the course, they practised the basic programming language of Arduino (C++) and also the scientific background of air quality measurement.



### 2A Tracy Chan

I participated in a STEM course and it was fantastic. We were able to learn through different skills like building a robot and inserting codes. By the end of the course, we built a small indoor air quality sensor, which can detect current temperature, humidity, and the amount of dust.

During the lessons, the teacher first introduced different components of the sensor and the app that we used for inserting codes. Afterward, we started to build the sensor. The instructions were separated into 8 parts and we have to follow them step by step. We attached different wires, lightbulbs, and sensors to the Arduino computer board. Once the sensor is done, we type in a series of codes on a computer to give commands to the sensor. Finally, the sensor started working, and all the data was shown on the computer. If we connect the sensor to our phone, it can even tell us the surrounding air quality in nowhere.

First I thought building robots and typing codes would be tedious. However, I ate my words at the end of the lessons as I enjoyed them so much! The teacher made clear instructions and guided us through difficult parts. Sometimes we need to be very cautious while connecting some of the wires as they are brittle. Apart from that, I've learned how to give commands to a computer to make a robot work by itself. Also, I have to say the computer board really blows my mind. Literally, I have no idea how a small board can run so many things simultaneously! Joining this course made me start to think more about how computers work and how humans communicate with computers. Definitely gained my interest in STEM!



## Indoor Air Quality STEAM Workshop

### 2A Pency Cheung

The STEM course I joined in July was to make Indoor Air Quality (IAQ) sensors. Firstly, what is an Indoor Air Quality sensor? An IAQ sensor is an apparatus that can detect pollutants in the air. The main indoor air pollutants include carbon dioxide, ozone, formaldehyde, environmental tobacco smoke (caused by smoking). These air pollutants are harmful to our health. They may cause irritation to the eyes and respiratory system and even lung damage.

The IAQ sensors were formed by sensors, processors, and effectors. The IAQ sensor we made this time was just a simple IAQ sensor. It can just detect the temperature and humidity. We have used many different materials to make the sensors, such as boards and electric wires. We have to connect the wires precisely. Then, we also try to make a closed circuit to light a bulb. If the temperature is higher than 30 degrees Celsius, the light bulb will turn on. Besides these, we also have to connect the sensor to the computer and write programs to "tell" it what's to do. After connecting everything together, the temperature and the humidity will be detected by the sensor and the data will be shown on the computer.

In this activity, I have learned so much extracurricular knowledge of Science and Computer Literacy. I can utilize the knowledge that I have learned in my Science lessons. And this course also increases my interest in computer science. I am glad that I have a chance to attend this course.



## iGEM in 2020 – 2021



The logo of our iGEM 20-21 project



The promotion poster of our project

Our molecular and synthetic biology research team (MSBRT) has formed a joint school team (HKJSS) with Po Leung Kuk Celine Ho Yam Tong Secondary School, Pentecostal School, and Madam Lau Kam Lung Secondary School of MFBM to participate in the 2021 International Genetically Engineered Machine (iGEM) competition.

iGEM is the largest and most renowned synthetic biology competition in the world. The teams are required to carry out a year-long science research project that aims to use synthetic biology to solve a daily life problem. More than 350 teams from 40 countries join the competition every year.

Our research project this year is to find a solution to tackle the Aflatoxin B1 (AFB1) contamination problem in food. AFB1 is a highly potent carcinogenic compound that leads to liver cancer and liver failure. According to the World Health Organization (WHO, 2018), about 5 billion people in the world are at risk of AFB exposure, and 80% of them will develop AFB-related cancer. In Hong Kong, the Consumer Council's report in 2020 showed that about 24% of popular dried spices in Hong Kong were contaminated by AFB. Furthermore, due to the humid weather in Hong Kong, foods are highly susceptible to AFB-secreting fungi infections if the storage condition is not suitable. Therefore, the team aims to create a probiotic E. coli that has a high efficiency to secrete engineered AFB detoxifying enzymes in order to tackle this local problem faced by our society.

The team members have worked on this project for 14 months even during the pandemic and school suspension. The team is now at the final stage of preparation, and they will virtually present their findings to the audience around the globe in early November and compete for the awards. Let's wish them good luck!

## iGEM in 2020 – 2021



Making a bacterial culturing spreader

### 4A Tina Kwok

Being interested in biology, I joined our molecular and synthetic biology research team as well as a project called iGEM last year! Let me briefly talk about what our project is about.

Research has shown that the contamination of crops caused by Aflatoxin B1 (AFB1) is a carcinogen affecting at least 25% of crops right now. In this project, our team aims to find a way to solve this severe problem. Since last year, we have done lots of research on different databases and read piles of academic papers. We found that laccase can degrade AFB1 efficiently. We decided to reduce the amount of AFB1 by a synthesized E.coli which can express laccase, a degradative enzyme for AFB1. We have to redesign the DNA sequence and find the most efficient one to degrade AFB1, which is definitely a challenge to all of us.

What have we done? We tried gel electrophoresis, and in the process, the mixture of DNA is separated. Apart from this, we also did something fun! We made drawings on agar plates by E.coli as well! But if somebody asked me, what the most impressive part of this project is, I would say that it is having an interview with Professor Lam in CUHK! From Professor Lam, I acquired valuable ideas not only about science but also about learning and life. This interview reminded me that the knowledge I have right now is only a drop in the ocean and I have to work harder and keep modest towards learning.

Fortunately, I have gotten different skills and knowledge that will help me with my studies and teamwork in the future! We did so many experiments, and also practiced lots of different technical skills which really broadened my horizons on an entirely new level.

I took lots of time to think about what I want from this project and now I know that I want to learn more about biology, and do more in the world as opposed to just reading from textbooks. One day, I can turn my idea into a new project, and design an experiment for it. I gained insight on what synthetic biology and genetic engineering entails. They can be used to solve many environmental problems, and problems we meet in daily life. Perhaps one day I can change the world for the better!



Learning bacterial culture and handling techniques

1. World Health Organization (2018). Aflatoxins Fact Sheet. *Department of Food Safety and Zoonoses*. Retrieved October 4, 2021, from [https://www.who.int/foodsafety/FSDigest\\_Aflatoxins\\_EN.pdf](https://www.who.int/foodsafety/FSDigest_Aflatoxins_EN.pdf).



## iGEM in 2020 – 2021

### 4A Kwok Ming Sze

Attracted by the theme of biotechnology, I decided to join the iGEM team, our school's molecular and synthetic biology research team, when I was in Form 3. The opportunity has given me a brand new perspective on bioengineering. I have done numerous things during the past year that I never could have imagined having a shot at experiencing.

I learned a lot about agriculture and biotechnology. For instance, I used E. coli to draw on a plate that was used to cultivate bacteria that could be used to transform plants. I can still clearly remember one of our teammates streaking an image of Doraemon with the bacteria! Another memorable moment was when we tried gel electrophoresis, which is a method used to separate DNA according to molecular size. It was exciting and nerve-wracking at the same time because throughout the process of all these experiments, you need to be extremely careful. One tiny mistake can ruin your entire experiment instantly!

However, with no doubt, the highlight of my experience was when I got to interview Professor Lam at the Chinese University of Hong Kong. It was a precious opportunity for us. I realized how little I knew about the world and it motivated me to push myself to learn more. Hearing from Professor Lam's trials and tribulations also gave me insight on how to face various difficulties.

Our project this year is about the degradation of aflatoxin, a carcinogenic toxin that causes liver damage or even liver cancer when it is ingested into the human body. We are now planning to modify the sequence of E. coli genetically as it can effectively degrade aflatoxin. Through this project, I gained a better understanding of synthetic biology and genetic engineering and found out that bioengineering is not as farfetched as one may think since it is actually at every corner of our daily life.

Looking forward, I hope that I can turn the knowledge I have learned from last year into something practical -- not only store in my mind but actually apply it in our project. Using my own power to solve some serious problem in this world and change the world for the better, kind of like what we have contributed to this year, is greatly inspiring, is it not? I wholeheartedly wish that I can lend a hand to such honorable acts and I can't wait to see the moment when my expectations come true!



**Professor Lam Hon Ming giving feedback and opinion on our project and experimental designs**



**The interview with Prof. Lam was done by us together with our fellow teammates from Madam Lau Kam Lung Secondary School of MFBM**

**Interviewing Professor Lam Hon Ming at CUHK**

## iGEM in 2020 – 2021

### 5A Issac Ng

## Can bacteria bring advantages to humans?

I was very suspicious of using bacteria to help humans when the teacher introduced the iGEM competition to me. Therefore, with the teacher's invitation, I joined the MSBRT of our school and the Hong Kong Joint-Secondary School iGEM team (HKJSS) with curiosity and wanted to figure out how to use bacteria to help us.



**The introductory video to our project that posted on the iGEM website**

Our first mission in the HKJSS was to write a review of the previous project done by HKJSS in 2019. I found that they genetically modified bacteria to a copper absorbent in aquaponics to solve water pollution not only in Hong Kong but also in the world. Their works surprised me and showed the bright future of synthetic biology. It prompted me to put effort into biotechnology to solve worldwide issues.

Then, we were asked to think of a topic for our project. We shared our ideas actively, such as testing blood glucose and removing stench among many others. Finally, teachers chose a topic which was about detoxifying aflatoxin

B1, a carcinogenic substance usually found in nuts, and we needed to genetically synthesize a probiotic bacteria, E.coli Nissle 1917, to produce laccase or FDR-A to degrade AFB1 on food.

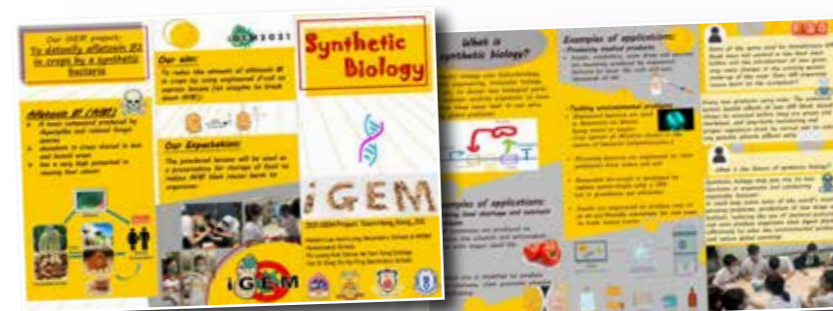
We became busy after setting up the target. On one hand, we needed to learn experimental techniques and knowledge of synthetic biology. On the other hand, we started to prepare for the iGEM competition. We recorded a video to introduce our project to the iGEM headquarters while I was one of the presenters in the video.

Besides recording video, since there were many different laccase genes, we reviewed a plethora of research and information on laccase to identify the laccase with the highest efficiency in degrading aflatoxin B1. Then, we extracted the sequence of the laccase and also a promoter, ribosome binding site, and terminator of the gene from NCBI to arrange a suitable gene fragment to clone into the expression vector. Although I felt tired sometimes, I was proud to be involved in the project.

As the project went on, we needed professional advice to improve it. Therefore, we invited professor Lam Hon Ming to an interview about our project. I was nervous and stammered when speaking to him because I had never talked to a professor face-to-face before. However, he was so kind to appreciate our work, and gave many useful suggestions toward our project. As our testing method of AFB1 was semi-quantitative, he advised us to use fractional distillation to find the approximate concentration of AFB1 solution. In addition, he suggested looking for how other researchers synthesized E.coli to make it secrete enzymes so we could ensure that laccase would be secreted.

When we asked about his life, he was willing to share his experiences in research, such as his motivation for studying soybeans, difficulties in research, and expectations of synthetic biology. I felt comfortable during the meeting and became more and more respectful of Professor Lam. His bravery and persistence to improve agriculture worldwide really impressed me and motivated me to dedicate myself to science to help the world.

Not only has the iGEM competition helped me learn about synthetic biology, but it also provides me an opportunity to learn how we can change the world through science. It is one of the most unforgettable experiences in my life.



**The promotion leaflets of our project**





# 中一、中二學術及活動獎勵計劃 Inter-class Academic & Activity competition

配合學校「重禮貌 明責任 勤學習」，課外活動組與中一、中二級會合作，結合校內不同學科活動，推行A&A獎勵計劃。期望藉班際比賽推動團結上進的班風，建立良好的核心素養。

## 目的

- 在良性競爭中求進
- 班級經營、團結班本
- 學生對班建立投入感及歸屬感



計計「一蚊五毫」

記憶紙牌起高樓

## 中二級腦考競技

動動腦筋，眼明手快，合作完成不同項目



# 中一、中二學術及活動獎勵計劃 Inter-class Academic & Activity competition



## 中一、中二 歷奇建班風

經歷勝與敗，同喜同甘同苦，你們是我的伙伴



## 學科比賽



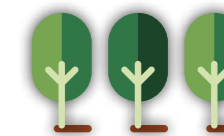
## 仁愛堂田家炳中學 X 仁人行動 「滿竹天地」竹藝體驗工作坊



藉著是次工作坊，學生透過搭棚傳統工藝，領略竹的環保效益和生活應用。掌握搭棚基本技巧後，在工作坊中實行三自（自主學習，自我挑戰，自主成長）一包（包你成功）三互（互相學習、互相支持、互相讚美），挑戰學生的創造力和團隊合作，並在校園內建設以竹製作的小建設，供校內師生使用。



## 仁愛堂田家炳中學 X 仁人行動 「滿竹天地」竹藝體驗工作坊



### 1A鍾凱妍

在整個活動中，我們設計了草圖，用竹籤製作了迷你3D模型，從鋸竹到紮竹，每個步驟都花了很多心機才能完成。尤其是鋸竹的環節，要在烈日當空下進行，實在不容易，但當同學與班主任及導師同心協力把一張又一張長椅紮出來，一切也值了！



### 1C鄭潔



這是一次有趣且富有意義的活動。從設計草圖到著手搭建，從一根根竹竿到實用美觀的竹製品，從零基礎到逐漸上手……，既促進了同學間的團隊精神，亦加深了我們對傳統技藝的瞭解，更讓我體會到了竹藝的樂趣。

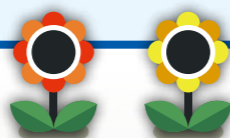


## Soybean Cultivation Programme

The STEAM@Soybean Project is organized and hosted by Professor Lam Hon Ming from the Chinese University of Hong Kong. This project is aimed at promoting STEAM education in secondary schools through investigations of soybean cultivation. The project not only builds on the expertise of university scientists, educators, and secondary teachers but also integrates frontier soybean research with STEM technology and teaching models. (Homepage: Steam@Soybean)

Our students planted their soybeans in March 2021 and they had to take care of their plants for three months until the beans were ready for harvest. During the cultivation stage at school, the students learned the techniques of cultivation, scientific knowledge of leguminous plant development, and they will carry out molecular studies on the beans grew by themselves in the future. The students will also have the opportunity to join the workshops, seminars, and visits organized by Professor Lam and CUHK later.

### 4D Rosanne Lee



The soybean cultivation project was a deeply meaningful experience for me. Have you ever wondered about planting a bean that could possibly make you the savior of the world? That is the awe I felt when I undertook this endeavor. If you have the chance to participate in this project, you may be one who saves billions of lives. Imagine mixing a drought resistance plant and a halophyte (a plant that can grow at high levels of soil salinity), resulting in the creation of a new cultivar that contains both of their characteristics. With that new creature, we may create a life-saving opportunity for people who live in places like Pakistan that are currently affected by droughts.

Last year I paired up with my classmate to plant different kinds of beans. Those we received were some black beans and some green beans. We then attended a simple lesson that taught the basic information about this project, like the concept of plants' reproduction system, ways of cultivation, and more about the beans' family. After that, we set up a schedule to distribute our work. I was designated to buy a pot, soil, and fertilizer. With those materials, we were able to start growing the seeds. We chose a perfect spot on the rooftop which had plenty of sunlight. We also covered the pot with a basket that has holes on it to prevent birds from eating our beans. Moreover, we designed a method that can help us automatically water out plants with a plastic bottle and some ropes. By this procedure, we were able to counter the hot weather which could have dried up the plants overnight.

Walking up the stairs to check on the plant every day was physically demanding for me yet somehow I learned to adapt and managed to deal with this problem after a month or two. It was disheartening to see that our plants had died several times and we needed to plant them again and again. Through perseverance everything eventually went the way we wanted it to and our final plant grew quite vigorously. I thought that planting a bean was easy but boy was I wrong.

Planting requires more time and energy than I had ever imagined. Nonetheless, I had no regrets joining this program and it taught me important life lessons that I will always remember.



*The growth condition, e.g. height, number of branches, were measured weekly to observe the growth of the soybeans.*



*The "watering system" that we set up to prevent the plants from dehydration during holidays*

## Soybean Cultivation Programme

### 5A Chung Ho Ying



#### My journey tending soybean plants

I took care of soybean plants throughout their development for about four months, as part of the Soybean Cultivation Project. During this course, I had to observe change in the physiology of the plant and meticulously record the changes I saw. I have learned so much about plant biology during the cultivation and experimentation in general

#### Plants are not as simple as you think

To nurture a soybean plant, we must learn about its characteristics. It is a vascular plant which means that it has cells that can transport nutrients throughout the organism. This allows it to survive in more variable environments than non-vascular plants like mosses. It is also an annual plant so it finishes its life cycle within one year and then dies. There are nine main stages of its life cycle – which get quite technical but one that is quite memorable for me is emergence stage (VE) where the "baby" cotyledon leaves are pulled out in the the soil surface and the subsequent stage (VC) in which the first pair of single leaves unroll and begin to photosynthesize. It was surprising to learn that after the pods develop, the plant would begin to wither. Plants are a lot more complex than I imagined! I still have a lot to learn about plants and will do so this year in my biology lessons.

#### Difficulties that we faced

School suspension was a limiting factor for us. At first, we invented different set-ups to water the plants automatically, such as reversing a water bottle and placing part of it into the soil where the bottle cap had some small holes to let the water out. Sadly, our invention failed. As a result, our group planned to take turns to go back to school to water the soybean in order to provide enough water for the plant.

We also encountered poor weather on occasion. Even though we were not able to go back to school sometimes we were able to avoid having the roots being soaked by sheltering our soybean plants. Due to phototaxis, the plant would tilt to face the sunshine. Therefore, we had to put the plant in the opposite direction to resist the collapse. I was also suggested to use chopsticks to tie and support the stem of the plant. Our method was reliable because after that, everything went smoothly and we were successful. We kept watering frequently and waited for the collection of beans.

#### A noble deed

Participating in this activity was beneficial. The aim was to cross over the assortment to see whether it can increase the genetic variation. If so, the beans can be planted under unfavorable environments, like drought, in other countries. Hoping that the cultivation can help others, we are looking forward to joining such kind of meaningful activity again.

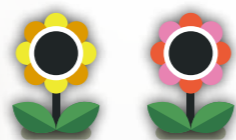


*The soybean plant blossomed one month after seeding. The pods will be formed 2 months later.*



## Soybean Cultivation Programme

5D Cloris Hong



### A Fruitful Experience with a Not-so-conventional Fruit



*We did investigations to see how different factors (e.g. light) would affect the growth of their plants*

After joining the soybean cultivation program in Form 4, I have been cultivating two different types of soybeans. Basically, this means potting and watering the plants. We also had to record details about the plants' growth, such as their height and the quantity of leaves. This may sound like a piece of cake but there were turbulent times in which we had to think outside-the-box to overcome. It has been a fruitful project though because we grew from those experiences and learned the importance of teamwork and modeling off of others who have succeeded when it comes to overcoming those difficult hurdles.

Unlike some laboratory practicals that are pre-planned out for us in school, we had to carefully troubleshoot and modify our methods when we encountered an issue. This happened early on when one of the soybean plants died soon after it was potted. It was up to us to figure out why it happened and how it could be fixed. We deliberated and deduced that it may have happened due

to the type of the soil so repotted the plant in another type. Much to our delight, we succeeded and felt very proud of our effort.

The unpredictable weather was also one of our challenges. It often rained and each time it did so heavily, we had to frantically shelter the plants under a canopy to protect it or risk flooding our plants and consequently, depriving it of essential nutrients. However, the plants had to be moved back out in the open to absorb sunlight when the rain went away. This was quite troublesome as rain was frequent. Ultimately, our persistence paid off.

Watering our plants every day became difficult because it was not convenient to go to school every day. The Covid-19 pandemic only worsened the situation as there were times in which we were not able to go to school. We had to think of clever ways to solve the problem and ended up using our knowledge of physics and chemistry to bring water into the soil via osmosis by tying a rope from the tip of a punctured water bottle and leaving the other end right above the soil. From this method, the soil could stay moist even in our absence.

Overall, this project was a valuable learning experience. Not only have I learned more about plant physiology and cultivation but the experience has also tested my wits and challenged me to use the ideas and concepts I have come across in school. The lessons I have learned will surely help in improving the way I work in terms of problem-solving and efficiency.



*A photo showing the root nodules of the soybeans. This is the first time the students could observe the real root nodule of a legume plant.*

## Competition Awards in 2020 – 2021



中一

### 中一級中文科「小作家擂台」寫作比賽

入選比賽「三連霸」：莫亦妍

入選兩屆比賽：陳韻淇、張晶瑩、鄭潔、張忻悅

入選一屆比賽：李家而、廖文鏗、溫凱霖、何卓羲、  
熊范穎、梁豐、陳嘉灝、邱樂燊、  
余鎧汶



中一級中文科「小作家擂台」寫作比賽

中二

### 中二級編程比賽

冠軍：郭璟融

亞軍：施哲喻

季軍：張智彥

優異獎：何澤泓、歐陽逸泰、譚海銘、鄧樂陶、  
魏廷駿、劉宇軒、黃家禾



2021 Science Assessment Test

### 2021 Science Assessment Test (organized by Hong Kong Association for Science and Mathematics Education)

Gold Award：朱嘉儀、陳嘉傲、唐為雷

中三

### Outstanding Student Award (organized by Tuen Mun District Secondary School Heads Association)

Outstanding Student Award：許志美



International Competitions and Assessments for Schools - English

### 2021 Science Assessment Test (organized by Hong Kong Association for Science and Mathematics Education)

Diamond Award：陳樂賢、李樂琛、羅泳宜

Gold Award：許志美

### International Competitions and Assessments for Schools – English

Distinction：許志美、郭焯嵐





# Competition Awards in 2020 – 2021

## 中四

AI Challenge x Slope Safety – AI Workshop and Competition (organized by Civil Engineering and Development Department, HKSAR)

**Champion** : 李學軒、林弘燁、洪芊穗、彭祖希、何麗君



AI Challenge x Slope Safety - AI Workshop and Competition

2021 National Youth Drone Challenge (Hong Kong region) – 3D Maze Escape Challenge (organized by ASK Idea (Hong Kong) Limited)

**Second Runner up** : 區梓健、林弘燁、李學軒

2021 National Youth Drone Challenge (Hong Kong region) – Drone Swarm Obstacle Coding Challenge (organized by ASK Idea (Hong Kong) Limited)

**Merit Award** : 區梓健、林弘燁、李學軒



2021 National Youth Drone Challenge (Hong Kong region)



## 中五

Yan Oi Tong Tin Ka Ping Secondary School Outstanding Student Award

**Outstanding Student Leader** : 黃天樂

Hong Kong Secondary Schools Software Development Invitational Contest 2020 (organized by Hong Kong Association for Computer Education)

**Silver Medal (Junior Group)** : 錢嘉兒、陳德康

Certified Software Professional 2020 (organized by China Computer Federation)

**Second Place Medal (Junior Group)** : 錢嘉兒、陳德康

Hong Kong Olympiad in Informatics 2020/21

**Bronze Medal (Junior Group)** : 陳德康

## Hong Kong School Drama Festival 2020/21

**Award of Outstanding Cooperation** :

中二 陳晞濤、黃佩儀、陳紫晴

中四 李科諭、彭煒汶

中五 李卓盈、楊曉桐、馬友怡、周子滢、呂希瑤、蘇羨貽、陳曉萱

**Award of Outstanding Performer** :

中五 馬友怡



Hong Kong School Drama Festival 2020/21