

鳴謝:



聯校智能運動 STEM大賽

2021-2022



主辦單位:  Archon

合辦單位:  香港科創協會
HONG KONG TECH-INNO ASSOCIATION

 尼詩培訓中心
Need Incentive Confidence Environment
NICE Training Centre

聯校智能運動 STEM大賽2021- 2022

OBJECTIVE :

- A recent investigation report by related departments indicated that the physical activity of students from primary and secondary schools have been greatly reduced during the epidemic period, and the number of obesity and overweight has increased sharply.
- Students' physical activity is far below the World Health Organization's recommendation that children and youth should accumulate at least daily 60 minutes of moderate to vigorous intensity physical activity.
- The competition aim to encourage students to do more exercise after class to improve their physical fitness and health.
- This competition introduces smart wearable technology, combining cloud services and artificial intelligence. Sports science and STEM learning elements let children enjoy sports with fun and understand related technologies and principles.

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Competition schedule:

Briefing: October 30, 2021 10:00 – 11:30
Registration Date: September 23 - November 8, 2021
Competition Date: November 26, 2021 at 00:00 (start)
December 9, 2021 at 23:59 (end) , 14 days.

Prize-giving Ceremony: January 22, 2022

Group: Primary/Secondary School
Individual/Group

Events: Participating schools can enroll students in individual or/or group events.

Competition equipment:

1. Each participant joining competition scheme 1 will be entitled to an Archon Alive smart watch and a resistance band.
2. Each participant joining competition scheme 2 will use their own Bemoved watch and resistance band from previous Smart competition.

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The competition comprises of three parts:

- a. Physical Activity Competition – Daily 10,000 steps
 - b. Physical Fitness Challenge – Daily challenge
 - c. STEM Sports Science Quiz – Sports science in Fun.
-
- Participants are required to download the ARCHON mobile applications to the IOS/Andriod phone or tablet prior to the start of the competition, log in to student's designated account and connect to the smart watch.

After November 16th, you can download the Video on Basic Operations and Precautions for Smart watch (<https://www.archon.com.hk/zh/聯校智能運動stem大賽2021-2022>)

If student use BEMOVED, can download 《ARCHON APP 安裝及手環配對英文版》。

- During competition, student activity data will be presented in the cloud and calculated by the analytics group rankings system and published on the content management system dashboard page.

Download the Content Management System Movie after November 16 at the website (<https://www.archon.com.hk/zh/聯校智能運動stem大賽2021-2022>)下載《內容使用系統影片》

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1. Physical Activity Competition

- Encourage students to establish a 10,000-step physical activity habit and recognize the physical and health benefits of exercise.
- Participating students are required to log in the AI Sports Family Game and pass the 10 Levels Progressive Physical Activity Competition.



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1. Physical Activity Competition

- Please follow the requirements of <Physical Activity Competition> <Level> for the daily training.
- The training Progress and the Color Bar show the current training completion percentage.
- For example: I walked 269 steps today and completed 3% of the 7000-steps goal.
- When a student reaches the Physical Activity Target, he or she will be automatically level up on the next morning when student open the applications. Student can only **go up one level** a day.
- Press play method to see different levels of Physical activity training Target.



As recommended by the Hong Kong Physical Fitness Association of China (HKPFA), Primary and Secondary schools would have different Physical Activity Target as below:

Level	Primary schools Physical activity Target
1	Achieved 7,000 Steps
2	Achieved 4500M
3	Burn 150 Kcal
4	Achieved 8000 Steps
5	Achieved 5000M
6	Burn 200 Kcal
7	Achieved 9000 Steps
8	Achieved 6000M
9	Achieved 250 Kcal
10	Achieved 10000 Steps

Level	Secondary schools Physical activity Target
1	Achieved 7000 Steps
2	Achieved 5000M
3	Burn 250 Kcal
4	Achieved 8000 Steps
5	Achieved 6000M
6	Burn 300 Kcal
7	Achieved 9000 Steps
8	Achieved 7000M
9	Achieved 350 Kcal
10	Achieved 10000 Steps

***Calorie Unit**

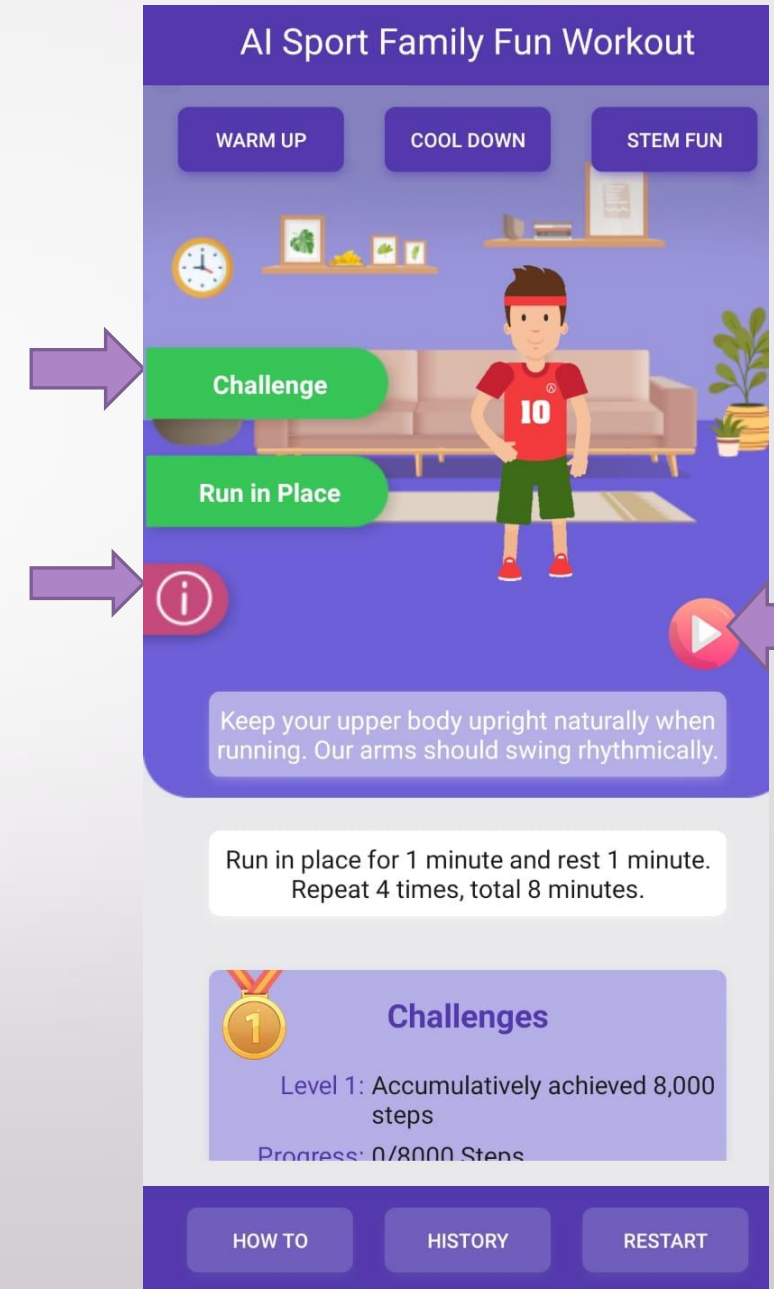
2. Fitness Challenge

- Students enter each level of game can participate in Fitness Challenge, train different parts of the body and increase fun of the game.
- In addition to exercise animations on the first game page, each level of challenge is accompanied by a video in which a professional fitness coach demonstrates the correct actions and postures.
- Students who perform fitness challenges are required to turn on the sport mode on their watch to record changes in heart rate during the challenge (see below sport mode icon on Alive and BEMOVED watch). Perfectly Smart Award will be rated base on this record.

Alive watch
sport mode
icon



Bemoved
watch sport
mode icon



10 Physical Fitness Challenge

Level	Physical Fitness Challenge (Preliminary)
1	Run in place
2	Summo Squat
3	Jumping Double Taps
4	Jump Jack
5	Inch Worm Walk
6	Lateral Walk with Mini Band
7	Jump burpees and push up
8	Bicycle crunch
9	Banded Bicep Curl
10	Banded Tricep Extensions

AI Sport Family Fun Workout

WARM UP

COOL DOWN

STEM FUN



Challenge

Run in Place



Keep your upper body upright naturally when running. Our arms should swing rhythmically.

Run in place for 1 minute and rest 1 minute.
Repeat 4 times, total 8 minutes.



Challenges

Level 1: Accumulatively achieved 8,000 steps

Progress: 0/8000 Steps

HOW TO

HISTORY

RESTART



第一個挑戰項目

原地跑
Run in place

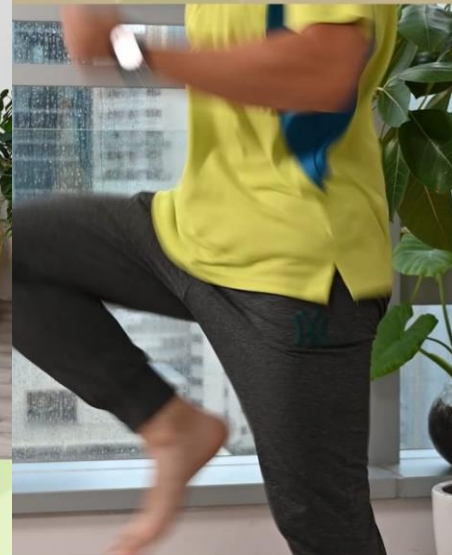


Keep your upper body upright when you run,
let your arms swing rhythmically.
Breath in regular pace.



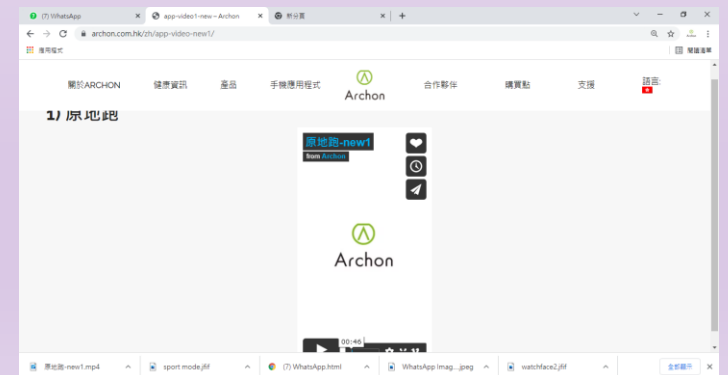
第一個挑戰項目

原地跑
Run in place



an further speed up and increase swing of
both arms. Continue for 30 sec.

- Press the Red Play key to download the demo video clip.
- Gary Lau, coach of Hong Kong Physical Fitness Association of China, demonstrates 10 fitness challenges.
- 10 Videos of all challenges will be placed on the Archon website below link:
<https://www.archon.com.hk/zh/聯校智能運動stem大賽2021-2022>



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Safety guideline for Fitness Challenge

1. Adequate warm-up exercises are required before doing the Fitness challenge, and it is important to have adequate cool-down exercises after Fitness Challenge .
2. Please choose the training intensity, time and number of times that are appropriate to your health and physical condition.
3. If you feel unwell, stop immediately and seek the assistance of your physical education teacher or family member.

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3. STEM Sports Science Quiz

- The STEM chapter 1 to 10 were designed with an aim to arouse students' interest and curiosity in STEM and sport science that will cover sports science, health, physics and mathematics.
- The teaching content is reference from the Supplementary Documents (Secondary 1 to Secondary 3) of the Education Bureau's Science Education Key Learning Area Curriculum Guidelines.
- STEM FUN teaching content and Quiz are adjusted for primary students.
- Students can press the STEM FUN icon at each level and download modules to learn STEM tutorials. Student can then log-in the designated website to participate in the STEM Sports Science Quiz (<https://www.archonwellnesslearning.com.hk/stemfun/>).

挑戰項目 **7** 俯臥撐跳 BURPEE
(訓練項目: 累計完成 10,000 步)

速率、距離和時間

速率 = 距離/時間
單位: 米/秒 (ms^{-1})

1

男子100米短跑的世界紀錄是9.58秒。
是由牙買加飛人保特(Usain Bolt)
在2009年世界田徑100米賽上創造的。

保特是史上最快的跑手，
世界紀錄前三位的成績都是他的。

保特世界紀錄平均速率 = $100 \text{ (米)} / 9.58 \text{ (秒)} = 10.44 \text{ (米/秒)}$
轉化為公里 = $10.44 \text{ (米/秒)} \times 60 \text{ (秒)} \times 60 \text{ (秒)} \div 1000 \text{ 米} = 37.6 \text{ 公里/小時}$
保特這速度 37.6 公里/小時接近一匹馬的奔馳速度。

單車	保特	騎馬	鴕鳥	獵豹
26公里/小時	37.6公里/小時	48公里/小時	70公里/小時	100公里/小時

0 10 20 30 40 50 60 70 80 90 100

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English and Chinese version can be selected at applications



為甚麼保特跑得這麼快？

保特6尺5寸(195厘米)的身高帶來更大的步幅。

保特用約41步來完成100米，平均步距 2.44米，步距很寬吧！

$$\text{平均步距} = 100 / 41 = 2.44 \text{ m}$$

那高個子跑手起跑慢又怎麼辦呢？

保特的高速度及步頻克服了這一點。

1

女子100米短跑的世界紀錄是10.49秒。

試一試計算出這位女運動員的平均速率。

她的平均速率是 _____ (m) / _____ (s) = _____ ms^{-1}



2

假設男子100米短跑世界紀錄保持者的對手，平均步距是2.2米，他要跑多少步才可完成100米賽事？他比世界紀錄保持者要多跑幾步？

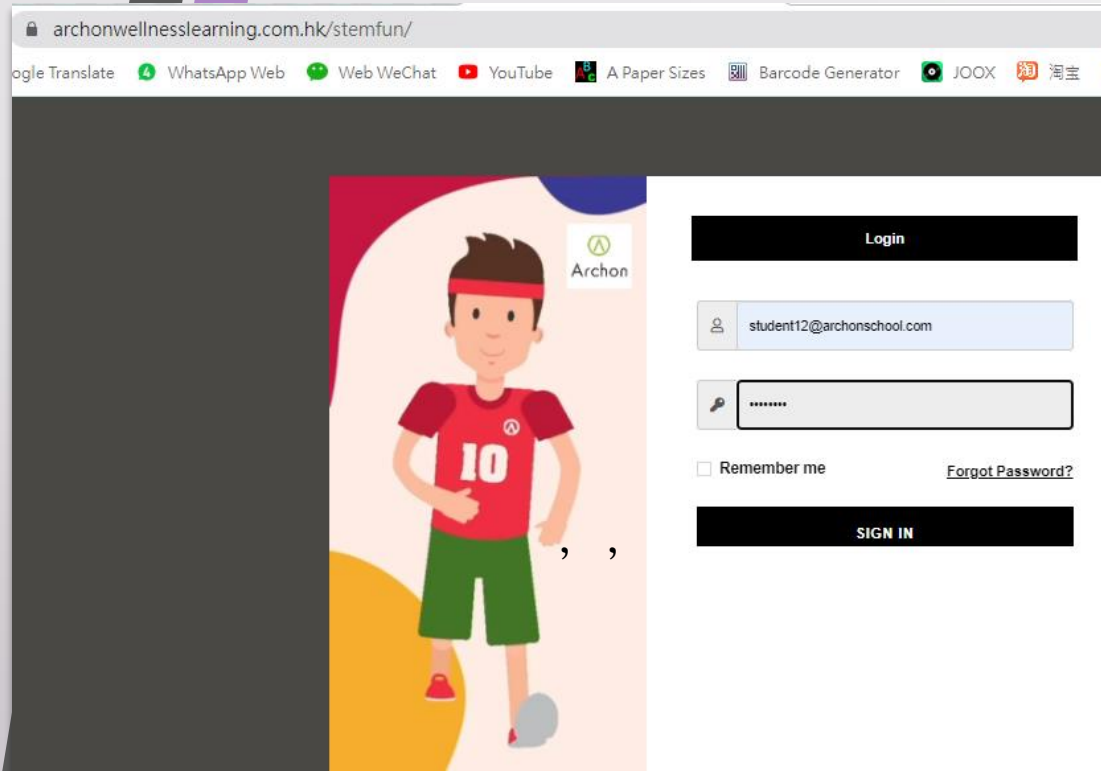
_____ (米) / _____ (米) = _____ 步

他比世界紀錄保持者要多跑 _____ - 41 = _____ 步，才能完成100米賽事。

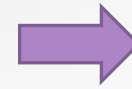


English and Chinese
version can be selected
at applications

How to join STEM FUN Sport Science Quiz ?



1. Visit website
<https://archonwellnesslearning.com.hk/stemfun/>
and use the login ID and password provided by the organizer to start the game ◦



2. Enter game and select Primary or Secondary school group.



3. Student can start from STEM FUN 1 or any level not yet completed by the student. There are total 10 levels of STEM FUN.
4. On the next popup, press "Start" button.

挑戰項目 2 相撲下蹲 SUMO SQUAT

(訓練項目: 累計完成 5,000米)

甚麼是卡路里?

怎樣計算各項運動燃燒的卡路里?

認識卡路里

1. 卡路里是能量的單位。
2. 人體透過食物攝取能量，同時基本代謝，日常活動，運動鍛煉等人體功能和活動是消耗能量的渠道。

要將1公升水溫度升1個卡路里是指1個大卡路里亦即是1千個小卡路里

MET (代謝等值)

3. 代謝等值(MET)常用於估算許多常見活動的強度。在家中踱步相等於2METs；在少於3METs的體能活動屬於低強度活動；多於6METs屬於劇烈強度活動。

活動

靜止狀態		
在家中踱步/慢步行 30分鐘		
快速踱步 15分鐘		
跳繩 15分鐘		
潛水 25分鐘		
踏單車 30分鐘		
足球比賽 45分鐘		
羽毛球比賽 20分鐘		
跳現代舞/健康舞 30分鐘	4.5 - 5.5	中
乒乓球 40分鐘	3.5 - 4	中

(STEM FUN 1 題目1至6 是體驗題，不會用作評分)

1.1) 第一次原地踏步30秒，我的訓練目標為30秒內左右提膝50次。(節奏 每分鐘100下)
In the 1st Run in Place session, my target is to run 50 steps in 30 sec (Pace: 100 steps per minute.)

我的心率是: My heart rate reading is:

完成後，休息30秒。

Once completed, Take 30 second rest.

1.2) 我感覺到:

My Rating of Perceived Exertion

a) 微弱吃力 Light (2級)

STEM FUN 2

卡路里消耗 (千卡) = 代謝等值 (MET) x 運動時間 (min) x 體重 (kg) / 60

Calories Burnt (kcal) = Metabolic Equivalent (MET) x Exercise Duration (min) x Weight (kg) / 60

請找出以下運動的METs 及屬於低、中或劇烈強度?

What is the intensity of below Physical Activities?

2.1) 步行 30分鐘

Walking for 30 minutes

a) 1 - 2 METs 低強度 Low Intensity

b) 4.5 - 5.5 METs 中強度 Moderate Intensity

c) 7 - 8 METs 中強度 Moderate Intensity

5. The screen will display STEM FUN in Chinese and English version. Student can scroll down to start answering STEM FUN QUIZ.

6. STEM FUN 1 1.1-1.6 are exploration questions, not used in counting. All questions from STEM FUN 2 onwards will be used to calculate marks.

2.1) 步行 30分鐘

Walking for 30 minutes

a) 1 - 2 METs 低強度 Low Intensity

b) 4.5 - 5.5 METs 中強度 Moderate Intensity 🏃

c) 7 - 8 METs 中強度 Moderate Intensity

d) 9.5-10.5 METs 劇烈強度 Vigorous Intensity

2 / 4

2.2) 快跑15 分鐘

Jogging for 15 minutes

a) 1 - 2 METs 低強度 Low Intensity

b) 4.5 - 5.5 METs 中強度 Moderate Intensity

c) 7 - 8 METs 中強度 Moderate Intensity 🏃

d) 9.5-10.5 METs 劇烈強度 Vigorous Intensity 🏃

7. Answer all questions, after finish, you can press "Result".

8. Green highlight indicate your answer is correct. Red highlight suggest your answer is incorrect, another green box with correct answer will be highlighted.

9. Your Score summary. You can go to next question or return to STEM FUN main question page to exit.

返回 Back to [STEM FUN](#)

跳到 Go to [STEM FUN3](#)

你的分數是 Your score is: 75%

平均分數是 The average score is: 64%

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STEM FUN

Level	Content	Topic	Supplementary document of curriculum guidance in the field of science education and learning - Science
1	Maximum Heart rate, target heart rate and exercise level	Healthy body	Unit 12 : Healthy body
2	Calories and METs	Energy	Unit 5 : Energy
3	Work Done	Energy	Unit 5 : Energy
4	Mass 、Weight and Gravitational Acceleration	Force	Unit 11 : Force and sport
5	Body Mass Index (BMI)	Healthy Body	Unit 12 : Healthy body
6	Action and Reaction	Force	Unit 11 : Force and sport
7	Speed 、Distance and time	Sport	Unit 11 : Force and sport
8	Exercise special precautions	Healthy Body	Unit 12 : Healthy body
9	Mode of energy and conversation	Energy	Unit 5 : Energy
10	Training different body part	Healthy Body	Unit 12 : Healthy body

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Individual Award Competition Rules (Primary/Secondary School Group) Physical Activity Competition

Individual Award	Competition rules	Prize
Individual Physical Fitness Competition (First/Second/Third)	The fastest individual to complete 10-level physical activity competition, the first, second and third ranked students will win this award.	First-Trophy and certificate Second and Third – certificate
Individual Single-Day Highest Steps Award (First/Second/Third)	The highest number of steps in a single day, the first, second, and third-ranked students will win this award.	First-Trophy and certificate Second and Third – certificate
Individual Highest Daily Average Steps Award (First/Second/Third)	The average steps obtained by dividing the <Accumulated steps> over the competition period by the <total number of participation days>. The first, second, and third-ranked students will win this award. (The minimum number of participation days required is 10)	First-Trophy and certificate Second and Third – certificate
Individual Highest Total Steps Award (First/Second/Third)	Students ranked first, second, and third in the <Accumulated steps> over the competition period will win this award.	First-Trophy and certificate Second and Third – certificate

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Individual Award Competition Rules (Primary/Secondary School Group) Physical Activity Competition

Individual Award	Competition Rules	Prize
Individual 10,000 steps Award	Students achieve an average of 10,000 steps will win this award. (The minimum number of participation days is 10)	10,000 steps Medal and certificate
Student Merit Award	Students completed level 2 or above in the physical activity competition with an average number of steps of 8,000 will win this award. (Excluding Individual 10,000 steps Award winners)	Certificate

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School Individual Award Competition Rules (Primary/Secondary School Group) Physical Activity Competition

School individual Award	Competition Rules	Prize
Individual Highest Total Steps Award	Students ranked first, second, and third within school in <accumulated steps> over the competition period will win this award. The same score can have double First and second award.	Certificate

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Individual Award Competition Rules (Primary/Secondary School Group) Fitness Challenge

Individual Award	Competition Rules	Prize
Perfectly Smart Award	<p>Students successfully completed 10 physical fitness challenges within 14 days and simultaneously passed 10-level physical activity competition.</p> <ol style="list-style-type: none">1. During the physical fitness challenge, students are required to turn on the Sport mode on smart watch to record heart rate changes. The analytics group rankings system will count if there are 10 days record.2. Students are required to complete each level of physical activity competition to enter the next level of physical fitness challenge.	Certificate

STEM FUN Sport Science Quiz

Individual Award	Competition Rules	Prize
STEM FUN No.1	Students successfully completed all STEM FUN Sport science Quiz at designated website.	Certificate

Interschool Group Award Competition Rules (Primary/Secondary School Group) Physical Activity Competition

Interschool Group Award	Competition rules	Prize
Group Physical Fitness Competition (First/Second/Third)	The fastest school to complete 10-level physical activity competition, the first, second and third ranked schools will get the award. (Any team fail to complete level 10 physical activity competition, they will be ranked by the highest number of students completed the 10th level) ◦	First-Trophy and certificate Second and Third – certificate
Group Single-Day Highest Steps Award (First/Second/Third)	The highest <Group Total Steps> in a single day, the first, second, and third-ranked schools will get this award.	First-Trophy and certificate Second and Third – certificate
Group Highest Total Steps Award (First/Second/Third)	Ranked by the sum of all participating students in each school (Accumulated Total steps) over the competition period, the first, second, and third ranked schools will win this award.	First-Trophy and certificate Second and Third – certificate
Group Highest Daily Average Steps Award (First/Second/Third)	The average steps obtained by dividing the <Accumulated Total steps> of all school participants by the <total number of participating days>, the first, second, and third ranked school will win this award.	First-Trophy and certificate Second and Third – certificate

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Interschool Group Award Competition Rules (Primary/Secondary School Group) Physical Activity Competition

Interschool Group Award	Competition Rules	Prize
Group 10000 steps Trophy	The group will win this award if they achieved an average of 10,000 steps over the period.	Trophy and gift pack
Outstanding School Award (Best Ten Primary Schools)	Divide <Accumulated Total steps> of all school participants by the <number of participating students> in each school, the top ten primary schools will receive this award.	Trophy \$1200 Archon Cash coupon and gift pack.
Outstanding School Award (Best Ten Secondary Schools)	Divide <Accumulated Total steps> of all school participants by the <number of participating students> in each school, the top ten secondary schools will receive this award.	Trophy \$1200 Archon Cash coupon and gift pack.
School Merit Award	School with all participating students completed level 2 or above in the physical activity competition or have an average number of steps of 8,000 will be awarded. (Excluding the top ten)	Certificate

Enquiry and Repair Service

The Alive smart watch has one year free maintenance. If you want to arrange any appointments or inquiries, you can call from 9 am to 6 pm during office hours.

Tel : 35250546/62791672/69302725.

Email : info@archon.com.hk

Service hours: Monday to Friday: 9:00 am to 6:00 pm

Except Saturdays, Sundays and public holidays

Or visit <https://www.archon.com.hk/zh/聯校智能運動STEM大賽2021-2022> download video and operation documents.

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Acknowledgement:

