

香港科學館·專題展覽 HONG KONG SCIENCE MUSEUM · SPECIAL EXHIBITION

冬季 冰運會 WINTER GAMES

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趣味習作
Activity Sheet

主辦
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① 冰運 小知識 Facts about Winter Sports

參觀展覽後，你應該對冬季運動的認識加深了。請填上正確的答案以完成下列句子。

After visiting the exhibition, you should know more about winter sports.

Can you complete the following sentences by filling in the correct answers?

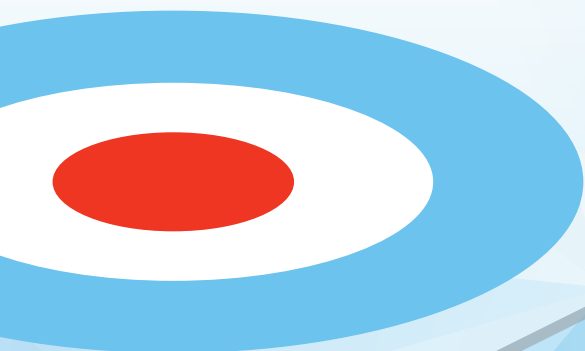


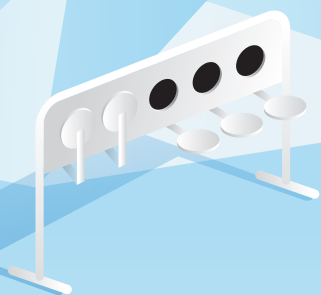
如果使用正確的技巧擊打冰球，它可以以
高達每小時 _____ 公里的速度飛馳。

An ice hockey puck can fly at a speed of
up to _____ km/h if it is hit
with the right technique.

冰壺賽道中的欄線與圓心的距離有 _____ 米。

The distance between the hog line and the
button of the curling track is _____ m.





冬季兩項中，臥姿射擊的標靶直徑為 _____ 毫米，
而立姿射擊的標靶直徑為 _____ 毫米。

In a biathlon race, the target diameter for prone shot is
_____ mm and that for standing shot is _____ mm.

起點：高度1665米
Start: 1665m in altitude

捕鼠器
Mousetrap

終點：高度805米
Finish: 805m in altitude

奧地利著名的高山速降賽道其中一段斜坡
「捕鼠器」的坡度為 _____ 度。

The 'mousetrap', part of the famous
downhill skiing course in Austria,
has an inclination of _____ degrees.

跳台滑雪運動員於空中飛躍時會形成一個
_____ 而 _____ 的表面以提升升力，
增加在空中飛行的距離。

During flight, a ski jumper can maximise the lift to
glide further through the air by forming
a _____ and _____ surface.



花樣滑冰中旋轉的轉速可以
超過每小時 _____ 公里。

The speed of a spin in figure skating can
reach more than _____ km/h.



知多一點點
More to learn



運動員靠腦部與身體各部分複雜的協調來維持身體平衡，其中一個是位於內耳的前庭器官，負責感應重力和頭部的位置以維持身體平衡。

Athletes balance their body by complex coordination between the brain and various organs. One of these organs is the vestibular organ located in the inner ear. It senses gravity and the head position to help us maintain balance.

② 冰運

配件·眼罩

Winter Sports Accessories · Goggles

有些冬季運動項目是在戶外進行的，我們都會見到運動員戴上眼罩。你知道眼罩濾鏡的種類嗎？

Some winter sports are played outdoors, such as biathlon and ski jumping. We usually see athletes wear goggles during competition.

Do you know the types of filter lenses used in goggles?

色彩濾鏡

Colour Filter



_____ 容易散射，物件反光會令我們較難看清楚它。

_____ 濾鏡可減少進入眼睛的 _____，減少反射。

_____ light rays scatter easily. The glare produced by reflected light rays makes it difficult to see clearly.

A _____ filter reduces the amount of _____ light rays entering the eyes. Therefore, you can see much clearly by reducing the reflected rays into your eyes.

潔白的冰雪可有效 _____ 紫外線。太陽強烈的紫外線輻射可以導致 _____，一種因角膜發炎而引起的短暫失明。紫外線濾鏡可以 _____ 被反射進眼內的紫外線輻射。

Clean white snow _____ UV-radiation effectively. Strong UV-radiation from the sun can cause _____, an inflammation of the cornea resulting in temporary vision loss. A UV filter helps _____ the amount of UV-radiation entering the eyes.

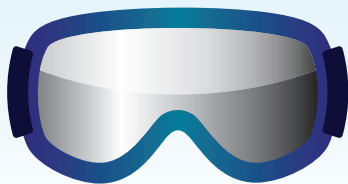
紫外線濾鏡

UV Filter





偏光濾鏡 Polarised Filter



由 _____ 或 _____ 反射的光線是水平偏振的，會引致反光。
偏光濾鏡雖不能 _____ 雙眼，但可以消除反光。

Light reflecting from the _____ or _____ surface is horizontally polarised, causing reflexes or glare from snow. The polariser does not _____ your eyes but helps remove the reflexes.

知多一點點 More to learn



滑雪者在不同的天氣狀況下會用不同顏色深淺的濾鏡，讓可見光有不同程度的穿透度，從而在雪地環境下看得更清楚。加上不同塗層更可以提高眼罩的耐用性，例如防刮和防霧塗層。

Depending on the weather conditions, skiers use lens tints of different degrees of visible light transmission so that they can see clearly. Different coatings are also applied to the lens to further improve its durability, for example, anti-scratch coating and anti-fog coating.



3 冰運

配件·冰鞋

Winter Sports

Accessories·Ice Skates

花樣滑冰、冰球和速度滑冰的運動員都需要在冰上流暢地滑行，但三項運動所使用的冰鞋都因各自的運動特色而有不同，你能把以下冰鞋和其描述配對一起嗎？

Athletes of figure skating, ice hockey and speed skating are required to move on ice smoothly. The ice skates of these three sports are quite different owing to the respective features of the sports. Can you match the following ice skates to the corresponding description?



A 花樣滑冰
Figure skating



B 速度滑冰
Speed skating



C 冰球
Ice hockey



冰刀與鞋的長度相約，冰鞋有保護跟腱的設計，而且物料較強韌，可保護足部抵受強烈的撞擊。

The blade has approximately the same length as the boot. The skate has a tendon guard. The tough material of the boot can protect the foot of the player against strong collisions.



冰刀比鞋長，鞋頭以鉸鏈連接着窄且平的冰刀，這樣可以延長冰刀與冰面的接觸時間，延長滑行距離。

The blade of is much longer than the boot. The boot is connected to the thin, flat blade through a hinge. This helps increase the time of contact between the blade and the ice for greater sliding distance.



冰刀的長度比鞋稍長，前端有刀齒，用於跳躍、步法及旋轉。冰刀中間有溝槽，使冰刀有兩條刀刃，可以讓它更有力抓住冰面以及更流暢地在冰上滑行。

The length of the blade is slightly longer than the boot. There is a toe pick on the front of the blade for jumps, footwork and spins. There is a hollow section in the middle of the blade that gives two edges for greater grip and smoother sliding motion on ice.

4 快速 旋轉吧!! Spin Faster!!

花樣滑冰運動員在冰上旋轉時牽涉到角動量 (L)，
而角動量是與物件的慣性力矩 (I) 和角速度 (ω) 有關。

The spinning of a figure skater on ice involves the concept
of angular momentum (L), which is related to the moment of
inertia (I) and angular velocity (ω) of a body.

角動量慣、性力矩和角速度的關係可以表示為：

The relationship among angular momentum, moment
of inertia and angular velocity can be expressed as :



除非有外力施加於旋轉中的物件，否則角動量不變。
Angular momentum of a rotating body does not change
unless acted upon by an external torque.

以下兩個滑冰者誰轉得較快？把正確答案圈出來。

Which of the following skaters spins faster? Circle the correct answers.

向外延伸手臂和大腿會令慣性力矩 增加 / 減少，
因此角速度會 上升 / 下降，滑冰者轉得較 快 / 慢。



Extending arms and legs outwards increases / decreases moment of inertia.

Thus, angular velocity is larger / smaller and the skater spins faster / slower.



將手臂收向身體會令慣性力矩 增加 / 減少，
因此角速度會 上升 / 下降，滑冰者轉得較 快 / 慢。

Holding arms inwards increases / decreases moment of inertia.

Thus, angular velocity is larger / smaller and
the skater spins faster / slower.



5 快速 滑行吧!! *Ski Faster!!*

速度是很多冬季運動項目的關鍵，摩擦力和空氣阻力都是達到高速的主要阻礙。請指出以下滑雪運動員如何使她的速度達到最高。

Speed is a key element in many winter sports competitions. Friction and air resistance are the major obstacles to high speed. Please indicate how the skier below can maximise her speed.

比賽衣物的物料和頭盔都可以減低 _____。

The clothing material and helmet should help
reduce _____.



運動員 _____ 的姿勢可以減少迎風的面積和使身體表面的氣流保持 _____。

The _____ posture of the skier reduces frontal area and maintains _____ air flow over the body.

在滑雪板塗上 _____ 可以於滑雪時減低 _____。

_____ is applied on the skis to reduce _____ during skiing.



以下哪些是競速運動項目？把它們圈出來吧！

Which of the following disciplines are competitions of speed? Circle them!



想一想 ...
Think about it ...



世界各地很多地方都不會下雪，你知道這些地方的滑雪運動員怎樣在沒有雪的環境練習嗎？

Many places do not have snow throughout the year. Do you know how the skiers of these countries practice in a snowless environment?

