STEAM 全創號 FRONTIER

Fun Fact

Law of Inertia – The Resistance to Change in Motion



The law of inertia is an important principle in physics. It tells us that if no external force acts on an object, it will keep its original state. That is, something at rest will remain at rest, and something in motion will continue moving without changing on its own.

For example: when a bus suddenly brakes, your body lurches forward because you were originally moving with the bus, and your body tends to stay in motion. Conversely, if the bus suddenly accelerates, you feel your body leaning backward because you were initially at rest, and your body tends to remain at rest. This is how the law of inertia manifests in daily life.

A simple way to remember it: "An object at rest stays at rest, and an object in motion stays in motion, unless acted on by an external force."

中華基督教會基全小學
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科學小知識

慣性定律 — 動者恆動，靜者恆靜



慣性定律是物理學裡的一個重要規則，它告訴我們：物體如果沒有受到外力，就會一直保持原來的狀態。也就是說，靜止的東西會繼續靜止，正在運動的東西會繼續運動，不會自己改變。

舉個例子：當巴士突然煞車時，你的身體會往前衝，因為你原本在跟著巴士一起動，身體想保持「動起來」的狀態；相反地，如果巴士突然加速，你會覺得身體往後倒，因為你原本是靜止的，身體想保持「不動」的樣子。這就是慣性定律在生活中的表現。簡單一句話可以記住：「動者恆動，靜者恆靜，除非有外力改變。」

慣性的秘密－地球在轉，我們卻沒感覺！

我們都知道地球會自轉，那你又知不知道地球自轉得有多快呢？如果你住在赤道附近，你腳下的地表會以時速超過1600公里向東轉。就算在緯度45度，地表仍然會以時速大約1180公里向東轉。那麼為何我們完全感受不到地球轉動時的速度呢？

說到這裡，你有否想過，如果去旅行，飛機升空之後停在半空，等地球自轉到目的地就行了，那不是更省油嗎？如果根據這個邏輯，假設你住沙田要去屯門上學，只要你不斷垂直跳起，大概一分鐘你就到，不用再I go to school by bus了。但我們都知道這樣是不可能的。因為牛頓的慣性定律，你垂直跳起只會落回原地。而地球上方的空氣其實都一樣和地球自轉，如果不是，你將會不斷被時速千多公里的風掌刮。所以飛機升空之後，其實要跟隨地球一起自轉。如果要令飛機相對地心固定，飛機是需要反方向飛行的。即是如果你在赤道上機，飛機是需要以時速超過1600公里向西飛，才可以維持相對地心靜止。但因為燃油效益，民航機一般飛行速度都是低於每小時1000公里。那麼這個方法有沒有省油呢？還沒計算全部城市需要在同一緯度才可以用這個方法呢？



The Secret of Inertia – The Earth Spins, But We Don't Feel It!

We know the Earth rotates. Near the equator, it spins at over 1,600 km/h. Even at 45° latitude, it's still moving at about 1,180 km/h. So why don't we feel it?

You might think: why not just fly up in a plane, hover, and let the Earth spin underneath you to your destination? If that worked, jumping in Sha Tin would land you in Tuen Mun in a minute — no bus needed! But we know that's impossible.

Why? Because of Newton's law of inertia. When you jump, you're already moving with the Earth, so you land right back where you started. The same goes for planes — they move with the Earth and the air around it.

To stay still relative to the Earth's center, a plane would have to fly west at over 1,600 km/h (at the equator). But planes usually fly slower than 1,000 km/h for fuel efficiency. Plus, this only works if cities are on the same latitude. So it's not a practical way to save fuel.



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