



The

WONDER WEEKLY



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Published by the Peter Underwood Centre

June 29, 2020

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Science helps swim ace to strike gold

SPORT science is helping Tasmanian swimming star Ariarne Titmus achieve her goals.

The 19-year-old from Launceston, who won two gold medals at the World Championships in South Korea last year, said:

"I have worked particularly closely with a biomechanist on my technique and this has been vital in my improvement."

Sport biomechanics is the study of how all parts of the body work together to produce movement.

Ariarne said a biomechanist takes video footage of her training swims, which is then watched back in slow motion.

"We slow it right down so I can really take a good look at my stroke and figure out what I can fix to make me faster," she said.

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SUCCESS: Ariane Titmus wins the gold medal in the 400-metres freestyle at the 2019 World Championships in Gwangju, South Korea. Ariarne was also part of Australia's 4 x 200m freestyle relay team which won gold and set a new world record. Pictures: Delly Carr and Swimming Australia.

Our world champ's inspiring message:

REACH FOR THE STARS

TASMANIA'S world champion swimmer Ariarne Titmus encourages young people to search for their passion in life.

"I am so blessed to be able to do something I love the most every day," Ariarne told *The Wonder Weekly*.

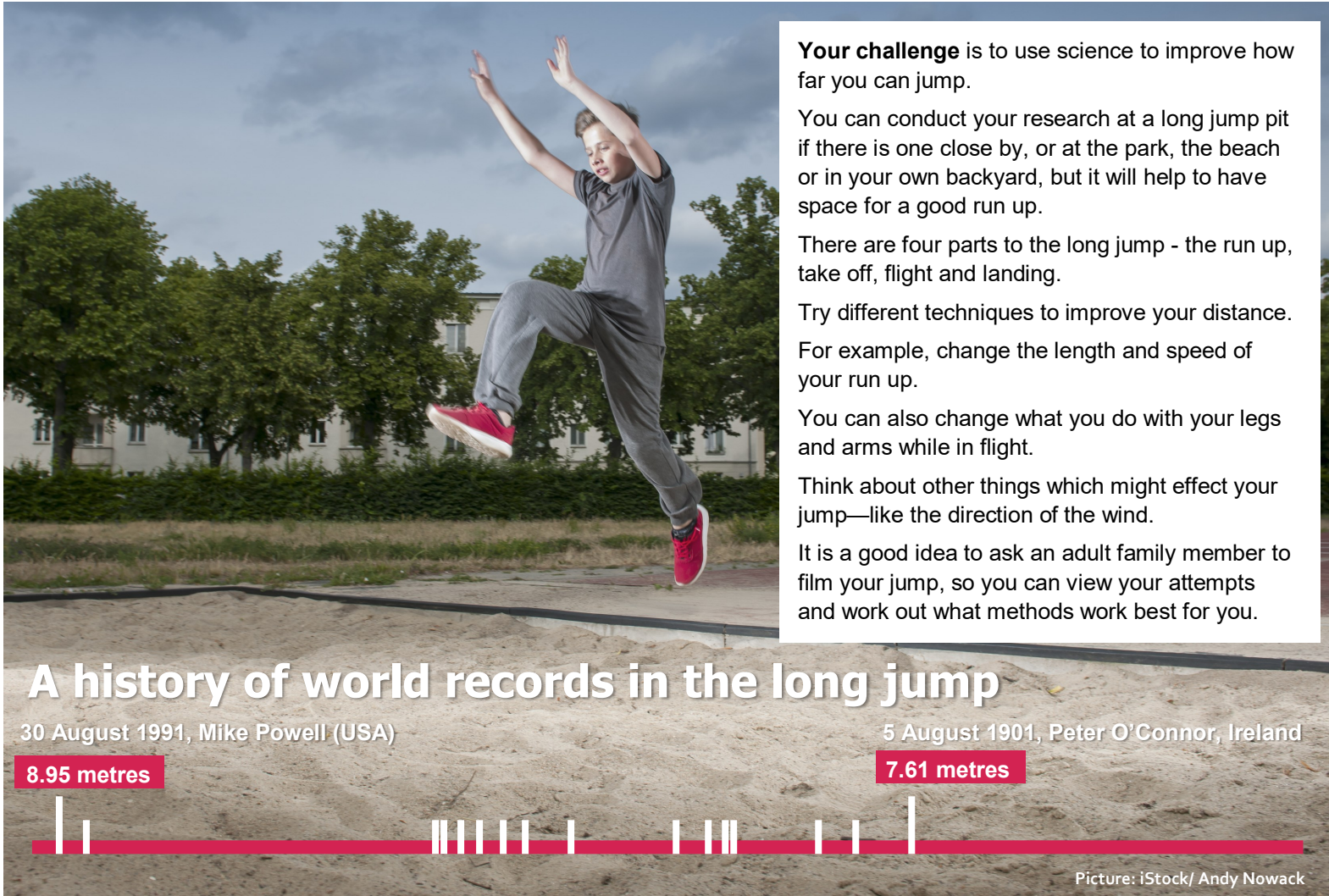
"Although I work hard, I never look at swimming as my job."

Ariarne said following her passion had not always been easy, but the rewards were well worth the effort.

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"Education perhaps more than anything else is a passport to a better life." - Peter Underwood AC

Setting the record straight



Your challenge is to use science to improve how far you can jump.

You can conduct your research at a long jump pit if there is one close by, or at the park, the beach or in your own backyard, but it will help to have space for a good run up.

There are four parts to the long jump - the run up, take off, flight and landing.

Try different techniques to improve your distance. For example, change the length and speed of your run up.

You can also change what you do with your legs and arms while in flight.

Think about other things which might effect your jump—like the direction of the wind.

It is a good idea to ask an adult family member to film your jump, so you can view your attempts and work out what methods work best for you.

A history of world records in the long jump

30 August 1991, Mike Powell (USA)

8.95 metres

5 August 1901, Peter O'Connor, Ireland

7.61 metres

Picture: iStock/ Andy Nowack

THE long jump is an example of how sporting performance improves over time.

When Peter O'Connor, from Ireland, set a world record of 7.61 metres in 1901, he probably would have laughed at the idea of someone jumping more than one metre farther.

Mike Powell from the US has held the world record for the longest jump since August 30, 1991 with a leap of 8.95 metres.

O'Connor's record was broken almost 20 years later, and since then a new world mark has been set 14 times.

Usually these new records were slight improvements of a few centimetres on the old ones.

But on October 18, 1968, Bob Beaman from the USA jumped 8.90 metres, and broke the old record by an incredible 55 centimetres.

Beaman was definitely a great athlete, but his record jump was made in the Olympic Games in Mexico City at high altitude (the height above sea level).

A lot of world records in athletics and other sports were set at these Games because at high altitude the air is thinner.

Therefore athletes experienced less air resistance, which enabled them to run faster and jump higher and farther.

Think about when you ride a bike into a strong wind.

But high altitude is not an advantage in all events.

For middle and longer distance events (beyond 1500-metres) in athletics, high altitude is actually a disadvantage.

This is because lower air pressure also means less oxygen.

The muscles in our bodies

contain reserves of energy that can be used for a short time.

This is called anaerobic energy.

When more energy (aerobic energy) is needed, oxygen is required.

Kenyan runner Neftali Temu winning time in the 10,000m at the Mexico Olympics, was 1 minute, 48 seconds slower than Australian Ron Clarke's then world record.

Since the 1968 Games, the impact of high altitude on the supply of oxygen to the body has been heavily researched by sport scientists.

Science helping swim ace

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"Having access to these finer details makes all the difference when you are trying to find the slightest improvements."

Another sport scientist works with Ariarne on her recovery from training and making the best use of her body's energy.

Other things such as diet, sleep, and mental preparation, are also important.

We know that sporting performance has improved a lot over time - you only have to look at times in sports like swimming.

Ariarne's winning time for the 400-metres freestyle at last year's World Championships was 3 minutes 58.76 seconds.

The world record in 1919 was 6 minutes 30.2 seconds.

It is hard to know how important sport science has been in improving performance, but it has certainly played a role, along with many other factors, including athletes being able to devote more time to their sports.

Advances in the technology of sporting equipment have also been important.

In swimming the development of body-length swim suits, to reduce drag in the water, improved times so much and led to so many worlds records in 2008-2009, that swimming's ruling body decided to ban them.

These suits were made of high-technology fabric, were tight-fitting and trapped air to create buoyancy, and were designed with the help of NASA.

But Ariarne did not need one of these suits to become the second fastest swimmer of all time in the women's 400m freestyle, and has her sights set on Olympic gold.

The Tokyo Olympics were due to begin next month, but have been postponed due to COVID-19.

Follow your passion in life

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"I was never the most talented swimmer when I was younger, but I started having more success because I trained harder and was more focused than others," she says.

And Ariarne said you don't have to be a world class athlete to benefit from the fun and good health of sport and exercise.

"I think sport and exercise is a great way to help set you up for life."

SPOT THE DIFFERENCE

There are seven differences between the first walrus and the second one. See if you can spot them, then check the solution below.

DID YOU KNOW?

Walruses have very thick skin and a layer of fatty blubber to keep them warm in the icy Arctic seas.



SOLUTION: 1. Tail changed, 2. Eye opened, 3. Left flipper longer, 4. Nostrils moved, 5. Tusk longer, 6. Right leg changed, 7. Shape of back changed.