

Engineering the Summer Olympics

Sports Engineering and Biomechanics look at how the human body moves when playing sports and then make and design sports equipment for athletes to use when competing.



Image: Marco Pomella on [Pixabay](#)

This is important in all sports:

- a better understanding of how the body moves can **help athletes** get better at their sport
- engineers help to **solve problems** like sports injuries
- **designing sports equipment** like making the lightest bike or the most aerodynamic javelin
- **making sports safer** for the players

Gymnastics

Artistic gymnastics has been an Olympic event ever since the first Olympic Games in 1896. It includes exercises on bars (below), rings (right), floor, vault and others.



Image: 12019 on [Pixabay](#)



Image: 10259 on [Pixabay](#)

As a gymnast spins around a bar (left image), they build up **potential energy**. This is released as **kinetic energy** when they flip and twist in the air.

By finding how much kinetic energy is released you can figure out how much impact their body will take when they land on the ground.

Gymnastic mats are designed to **absorb shock** making the gymnast safer when they land.

[This video](#) explains the physics of gymnastics.

Please note that the linked video is externally-produced material, for which no responsibility can be taken.



Racing wheelchairs

Wheelchair racing is a track and field event at the Paralympic games. When the first wheelchair racing event was held there were no sports wheelchairs, only slow, heavy ones.

Image: wal_172619 on Pixabay



Now, racing wheelchairs are designed to be **faster**, reach new **speed records** and be more **stable** than other wheelchairs. This includes:

Safety:

- Tilted wheels make it hard for the chair to tip over
- Oval wheels so they don't hit the Paralympians arms

Speed:

- A carbon fibre frame makes the wheelchair lighter, so it takes less energy to move

This [video](#) shows wheelchair engineering in action.

minecraft challenge

- 1. Build your choice of gymnastics equipment in Minecraft.** Think about how safe it would be for a gymnast to use, for example:
 - How easy is it to grip and hold on to the material
 - What is the ground made of to make it safe to land on
- 2. Build a racing wheelchair in Minecraft.** This would be used by a Paralympic athlete, so it must be comfortable, safe and fast. Some things to consider are:
 - The shape of the wheels for safety
 - The material you use so it is light and fast

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