

# Proton OLYMPICS

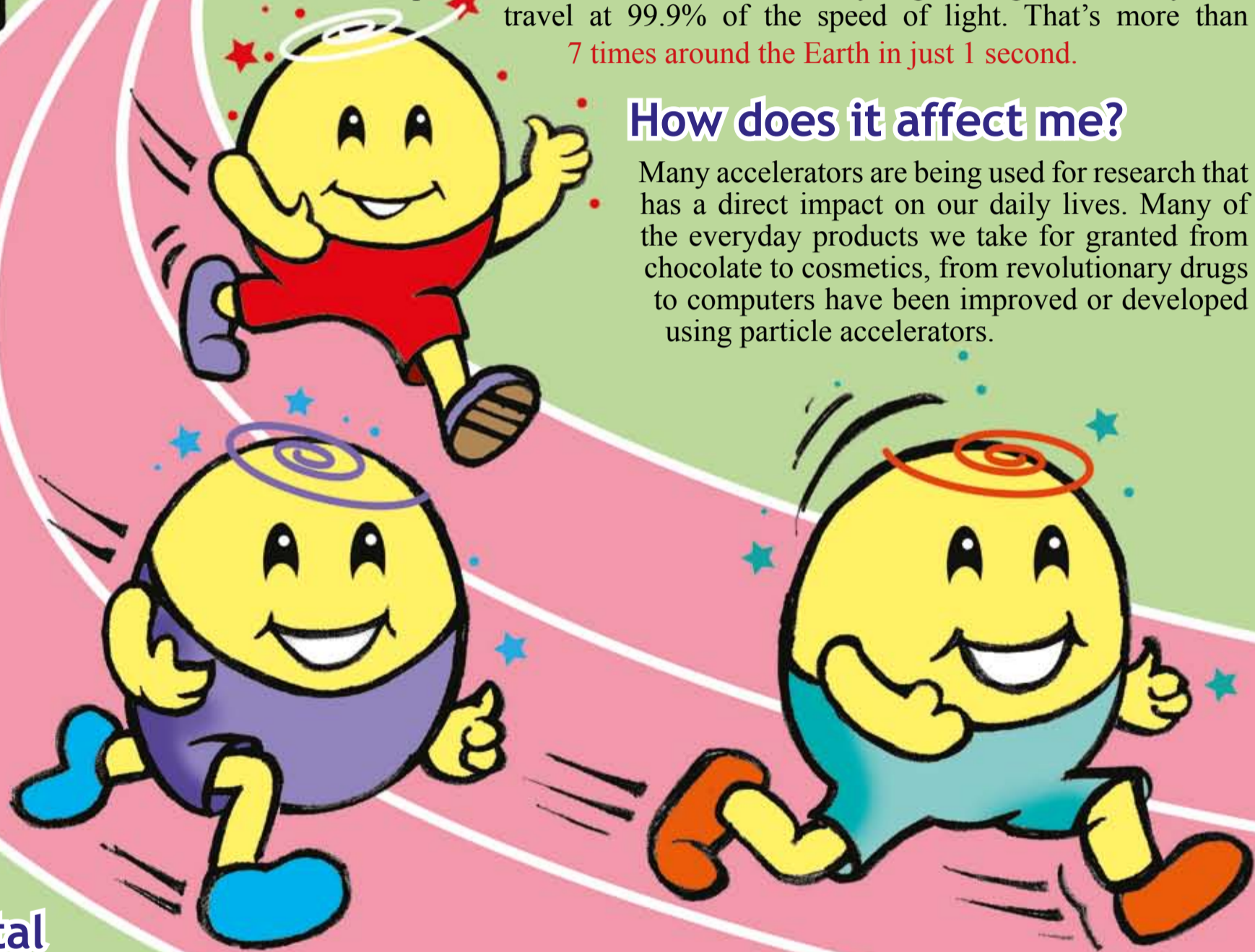
## The World of Particle Accelerators

Particle accelerators are some of the most amazing scientific tools known to man. These gigantic instruments speed up and increase the energy of a beam of particles using electric fields to accelerate them and magnetic fields to steer and focus them. At CERN near Geneva, in the new LHC accelerator, protons will be accelerated to very high energies and they will travel at 99.9% of the speed of light. That's more than **7 times around the Earth in just 1 second.**

## How does it affect me?

Many accelerators are being used for research that has a direct impact on our daily lives. Many of the everyday products we take for granted from chocolate to cosmetics, from revolutionary drugs to computers have been improved or developed using particle accelerators.

**30 million times faster than Usain Bolt!**



## Fundamental Research

In particle accelerators, particles of higher and higher energies are collided head-on or fired at fixed targets in order to answer the latest questions concerning the ultimate structure of matter. Each leap in energy gives a fascinating insight into the particle world, showing detail never seen before. The latest and largest accelerator ever built, the **LHC@CERN**, will answer some intriguing questions:

- **What is the origin of mass?**
- **What is 96% of the Universe made of?**
- **What happened to the antimatter?**
- **What are the secrets of the Big Bang?**
- **Are there other worlds hidden in extra dimensions of space?**

## Why Fundamental Science?

Some areas of fundamental research seem remote from everyday life and unlikely to bring immediate and practical applications.

### **Are they worth the effort in human and material resources?**

Fundamental science is where new ideas and methods begin that later become commonplace. The research may take us away from everyday life, but because it continually pushes the boundaries in thinking and technology, it is a springboard for many new developments.

**Science needs the space for curiosity and imagination!**