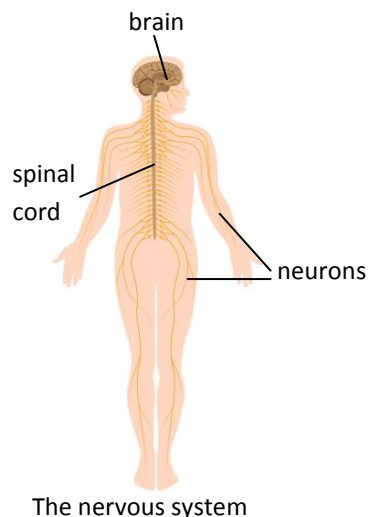


## Pupil worksheet

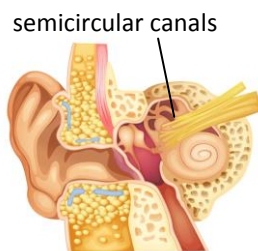
### You are a balancing expert!

Just standing still requires great balance. You won't realise this because you have had lots of practice at it, but when you were first learning to walk standing was difficult!

Sir Charles Sherrington, who was a professor at the University of Oxford in the early 20th century, explored how long specialised cells called neurons send information around the body. When you balance information from your eyes, skin and even your ears is being sent to your brain and spinal cord as electrical impulses along sensory neurons. Impulses are then sent back along motor neurons to your muscles which make tiny adjustments to stop you falling over.



### What have the ears got to do with balance?



Deep inside your ears you have three semi-circular canals which are full of fluid. When you move your head the fluid sloshes around inside the canals. Tiny hairs lining the canals sense when the fluid moves and send this information to your brain via a nerve (a bundle of neurons). The brain interprets the information as

movement. If you spin quickly you will feel dizzy for a bit afterwards. This is because the liquid is still moving around and signals are going to your brain telling you that you are still spinning, even though you aren't!

<http://www.oxfordsparks.net/video/youve-got-nerve>

### Your task

You are going to do an investigation into what affects how well you can balance. You need to gather data and analyse it to find the answer. You will then explain what you found out using what we know about how our nervous system helps us to balance.

### What to do

1. Work as a pair.
2. Time how long you can balance on one leg with your eyes open and your shoes on. Repeat, record your results and calculate a mean.
3. Repeat, but this time close your eyes. Make sure your partner is close by in case you wobble!
4. Repeat again but take your shoes and socks off so your bare foot is touching the floor (keep your eyes open this time).
5. Describe what your results show you about how these different variables affect balance.
6. Use the information on this sheet and the video to explain the science behind your results.

