What is epilepsy?
Epilepsy is a neurological condition that affects the brain and nervous system. It is characterised by the tendency to have repeated seizures that start in the brain. Anyone can develop epilepsy: it happens in all ages, races and social classes.
Visit www.epilepsysociety.org.uk for more information.

What are seizures?
The brain is made up of millions of brain cells or ‘neurones’, which control the way we think, move and feel. The brain controls everything we do by sending electrical messages between the neurones that tell the body what to do and how to react. Seizures are temporary episodes that happen when the normal messages that are sent between neurones get interrupted or confused.

There are many different types of seizure that can happen for different reasons, for example, due to low blood sugar or a change in the way the heart works. So not all seizures are due to epilepsy. However, throughout this section when we refer to ‘seizures’ we specifically mean epileptic seizures.

Epileptic seizures are the symptoms of epilepsy. Although anyone can have a one-off epileptic seizure during their lifetime, a person with epilepsy is usually diagnosed after they have had more than one epileptic seizure.

What causes epilepsy?
Epilepsy is a sign of an underlying cause in the person’s brain that results in them having seizures. There are many different reasons why someone might develop epilepsy, and the cause is not always found. Broadly, the causes of epilepsy can be divided into three groups.

In symptomatic epilepsy there is a known cause for a person’s epilepsy, such as a head injury, infection, the brain not developing properly, a stroke, a scar or a tumour. A scan, such as Magnetic Resonance Imaging (MRI), may show the cause. Some symptomatic epilepsies may happen because of a genetic condition such as Tuberous Sclerosis, which causes structural abnormalities in the brain and other organs.

In idiopathic epilepsy the epilepsy is likely to be due to a genetic tendency, that could have been inherited from one or both parents, or it may be from a change that happens in the person’s genes before they are born.

In Cryptogenic epilepsy the cause for a person’s epilepsy has not yet been found, despite investigations.

Types of seizures
All epileptic seizures start in the brain, are sudden, short-lived and cause a change in the person’s awareness of where they are, what they are doing, their behaviour or their feelings. As the brain controls mood, memory, movement, consciousness and our senses, any of these things can be affected during a seizure. What happens to a person during a seizure depends on where in the brain the seizure happens and what that part of the brain normally does. Seizures can be divided into three groups.
In **focal seizures** (also known as ‘partial seizures’) the seizure happens in, and affects, just part of one side of the brain. This might be a small area in a simple focal seizure, or a slightly larger area in a complex focal seizure. In focal seizures the person will not lose consciousness, although they may be confused and not be aware of what is happening around them.

Examples of simple focal seizures include:
- a ‘rising’ feeling in the stomach or déjà vu (feeling like you’ve ‘been here before’);
- getting an unusual smell or taste;
- a sudden intense feeling of fear or joy;
- a strange feeling like a ‘wave’ going through the head;
- a feeling of numbness or tingling; and
- visual disturbances such as coloured or flashing lights.

Examples of complex focal seizures include:
- picking up objects for no reason or fiddling with clothing;
- mumbling or making chewing or lip-smacking movements;
- wandering around in a confused way; and
- making strange postures or movements such as cycling or kicking.

In **generalised seizures** the seizure happens in, and affects, both sides of the brain at the same time. This causes the person to lose consciousness and they will have no memory of the seizure afterwards.

Generalised seizures include the following.
- Seizures where the person becomes ‘blank’ and unresponsive for a few seconds, and although may look like they are conscious they are unaware of their surroundings (‘absences’).
- Seizures where the person’s muscles become either very stiff (‘tonic’ seizures) or lose tone (‘atonic’ seizures or ‘drop attacks’) and they fall down. Both types of seizure are brief but can cause injury.
- Seizures that cause muscle jerks (‘myoclonic’ seizures), often in clusters of repeated seizures.
- Convulsive seizures where the person has repeated rhythmic convulsions or jerking movements. These seizures may start with the person stiffening and falling (‘tonic clonic’ seizure) or may start with convulsions (‘clonic’ seizures).

In **secondarily generalised seizures** the seizure starts as a focal seizure but then the spreads and becomes generalised and the person will lose consciousness. This usually results in a convulsive seizure.

Some individuals have particular terms that they use to describe seizures in general, such as ‘fits’ or ‘attacks’, and some use these terms to describe particular types of seizures that they have.

Visit www.epilepsysociety/universitychallenge for more information on seizure classification.