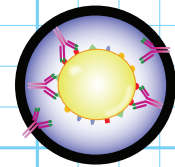


Lesson Content



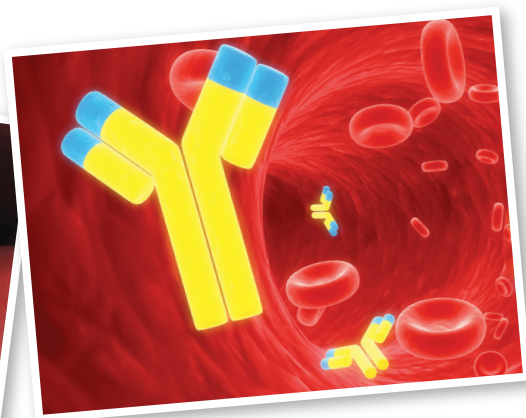
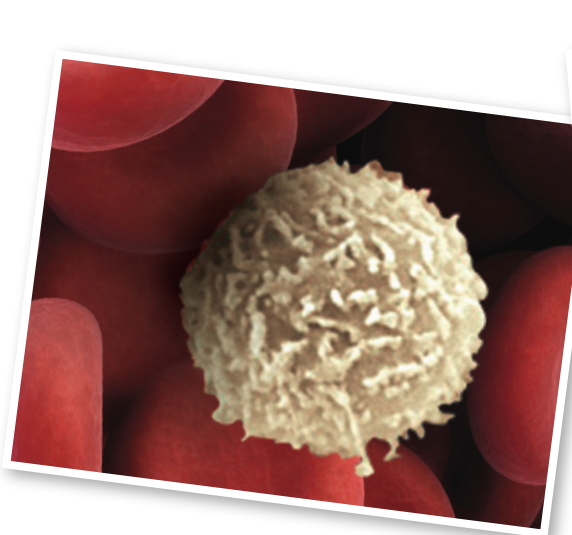
THE IMMUNE SYSTEM

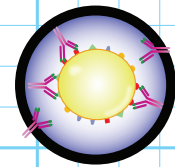
The skin is the largest organ in the body and is the body's first defence against infection. The skin acts as a barrier to bacteria and viruses. Bacteria and viruses can enter the body through the nose, mouth, eyes, ears or a cut in the skin. Platelets in the blood plug up a cut to try and stop these micro-organisms entering, however, once bacteria or viruses infect the body it must fight against them. This is the role of the white blood cells and they can do this in a number of ways. They can either attack the invader, dissolving it with chemicals, or they can produce an army of antibodies.



The Immune System Lesson

A system is a number of elements working together to perform a common goal. In this case the immune system is made up of such things as; the skin, small hairs in the nose and airways, bacteria in the intestines and stomach and white blood cells. White blood cells are made in the bone marrow – the soft centre of bones. When white blood cells detect invading bacteria or viruses they surround it and dissolve it with chemicals or they produce armies of Y-shaped proteins called **antibodies**.





THE IMMUNE SYSTEM

These antibodies can latch onto the surface of the invader and destroy it. Antibodies are specific. This means that the body has to manufacture a different antibody for every invader it encounters. This is why you generally only get chicken pox once. Once your body has made antibodies against this virus they remain in the body ready to stop any re-infection. However, the flu and cold virus change every year so your body has to make new antibodies to fight them each year. This is why the flu vaccination only lasts a year. The students can investigate the immune system in more depth on www.bdi.ie/mambo.

One of the first signs that the body has become infected with bacteria or viruses is an increase in temperature. The invaders that infect the body like to live at body temperature (37°C) so an increase in temperature is your body's initial defence.

Investigation

Investigation Question: What is normal body temperature? The children will use both strip and digital thermometers to investigate body temperature. The children can compare the accuracy of each method.

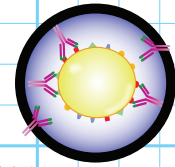
95	96	98	100	102	104	°F
35	36	37	38	39	40	°C



Investigation: Strip thermometers are simple, paper thermometers used on the forehead. A colour change indicates temperature. Digital thermometers are used in the ear and should be wiped after every use or the disposable plastic tip can be changed.

- Students work in pairs using both thermometers to calculate their body temperature.
- Students work in pairs using both thermometers (strip / digital thermometer) to calculate their partner's temperature.

Outcome: The students can investigate that 'normal' body temperature is around 37°C. They can also investigate the accuracy of each measurement. Digital thermometers are considered more accurate as the results are given correct to one decimal place.



THE IMMUNE SYSTEM

Physical Education Activity

⚠ Warning! This activity should be carried out in a suitable location, such as, the school exercise area. Children with certain health conditions should not undertake this activity.

Activity

The students can be given the opportunity to incorporate their knowledge of the human immune system during their PE lesson.

- Antibody Bulldog is based around the common children's game 'wild rover' or 'British bulldog'. A chain of students holding hands is formed at one end of a gym hall or school yard. An invader must then try to break through the antibody defensive wall.
- Alternatively, team games such as football, rounders, etc. can be split into two opposing teams – the antibodies and the invaders.

Outcome

The ideas discussed during this lesson are reinforced during these fun activities which mimic the body's basic response to infection.

Further Activities

- The children can undertake a study on the vaccines (eg. MMR) they received as babies. For further information on childhood vaccines visit www.citizensinformation.ie and www.healthhub.ie.
- For further investigative ideas and projects visit www.bdi.ie/mambo where you can find:
 - Word searches and pictures to colour.
 - Lego building projects – design your own antibody.
 - Information on how to build your own thermometer.
 - The story of the inspirational life of Louis Pasteur.
 - Information on practical investigations of pandemics and infection.