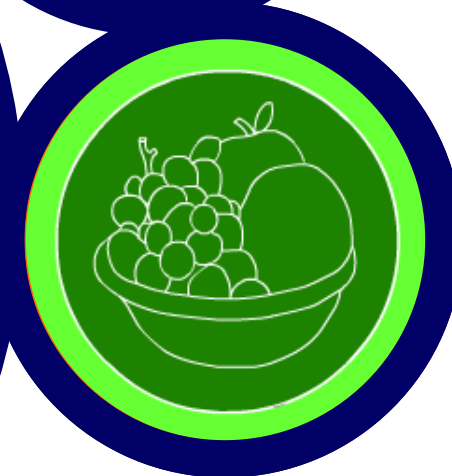


# KS3 Biology



## 9B Fit and Healthy





## 9B Fit and Healthy

- Being fit and healthy
- Smoking
- Diet, alcohol and drugs
- Maintaining fitness
- Summary activities





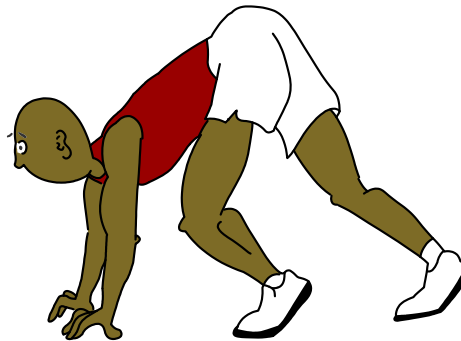
# Are you fit and healthy?

What does it mean if someone is fit and healthy?

Being fit and healthy can mean different things to different people.

It can be defined as the ability of a body to cope with all the demands of its lifestyle.

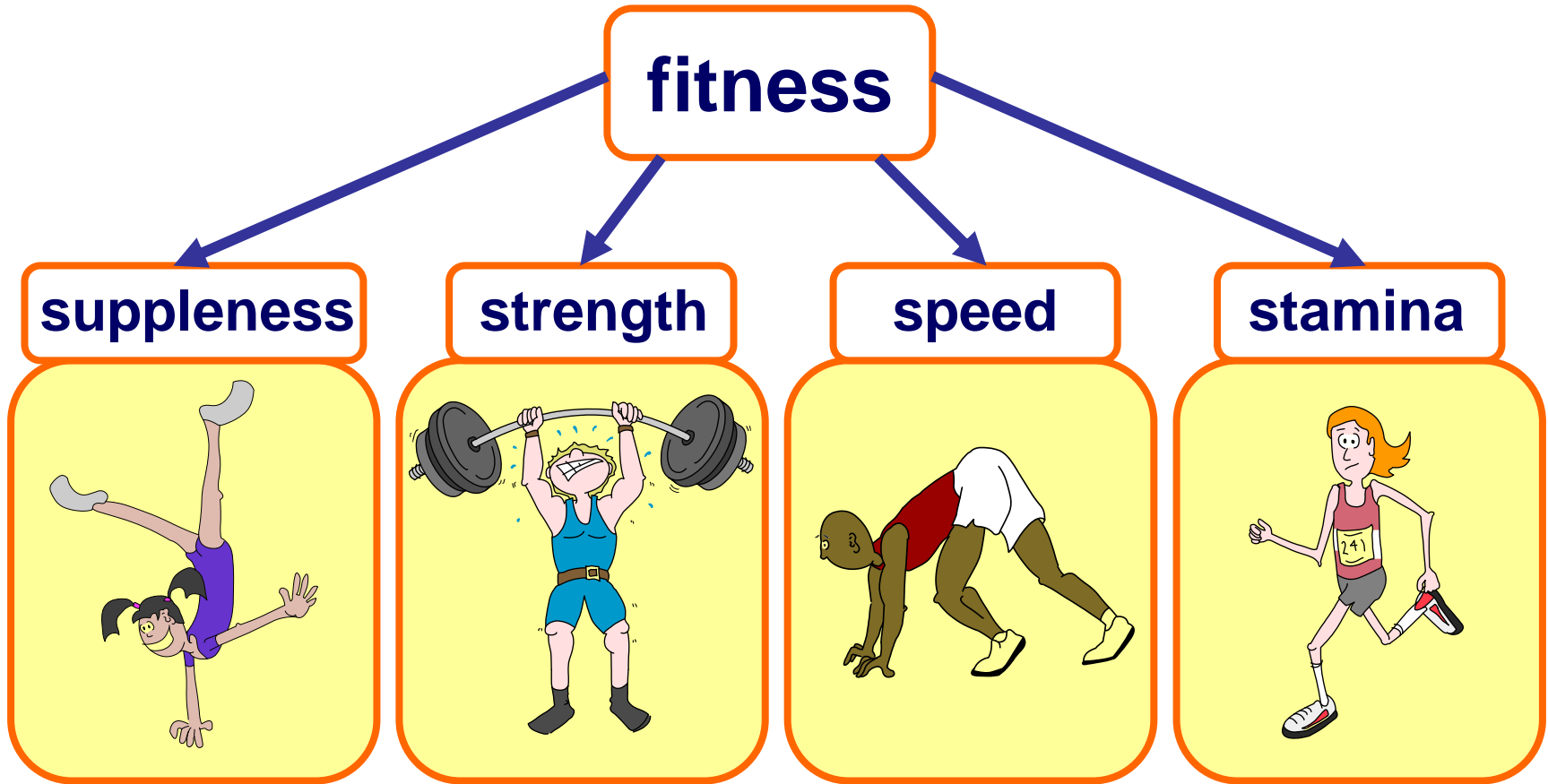
Fitness is made up of four factors. What are they?





# Are you fit and healthy?

Fitness is made up of four factors – “the four s’s”:



What parts of the body are involved in each fitness factor?



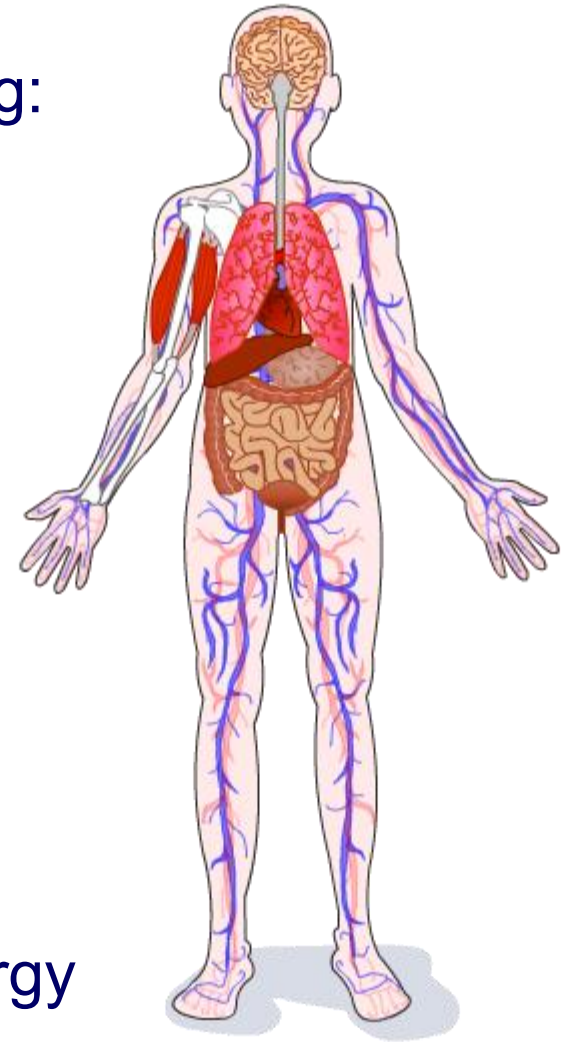


Fitness and health generally depend on how well the body's systems are working:

- respiratory system;
- digestive system;
- circulatory system and blood;
- skeletal system and joints.

Athletes follow strict fitness regimes to maintain these important systems and keep their bodies fit.

How do the body's systems get the energy they need to work properly?





# The utilization of energy and respiration

The body's cells carry out **respiration** to provide the body's systems with the energy needed to work properly.

Glucose and oxygen react in the body's cells to **release energy** by the following chemical reaction:



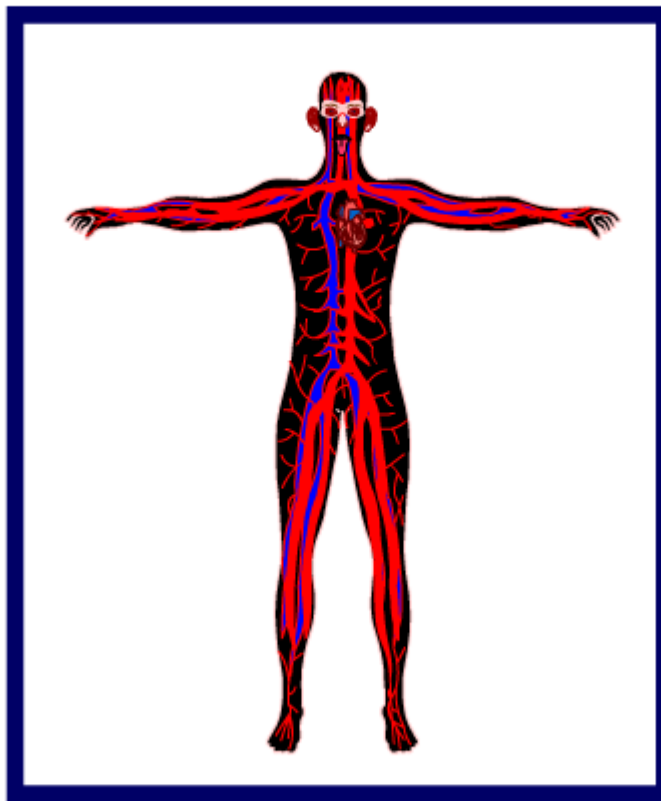
Which body systems are involved in providing the reactants involved in respiration?

Which body system is involved in transporting the reactants and products of respiration around the body?

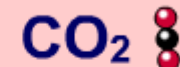
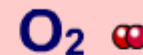


## Utilization of energy

## Circulatory system



diffusion of  
oxygen through  
a capillary wall  
to a cell in the  
capillary bed



cell wall

red blood cell

food

Digestive  
system

Respiratory  
system

Circulatory  
system

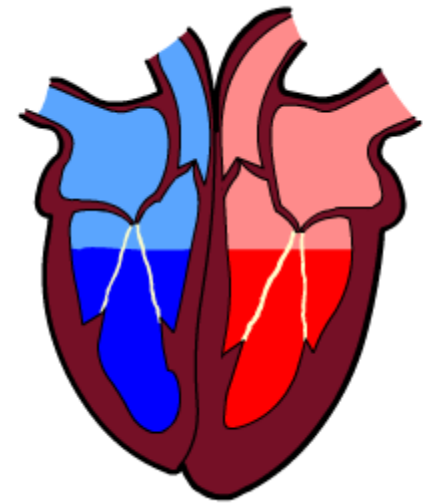






In a fit person, the normal heart rate and normal breathing rate are low.

To measure your heart rate you can place two fingers on your wrist and count the number of beats per minute. Ideally this should be between 60 and 90 beats per minute.



During exercise the heart rate increases. After exercise, the heart rate returns back to normal.

The time it takes for the heart rate to return to normal is called the **recovery time** and is a useful indicator of fitness.

The fitter a person is, the faster their recovery time. Why?







Fitness can be measured by calculating recovery times after a few simple exercise tests:

**Running on the spot.**

**Stepping on and off a step or chair.**

**Pressing a set of bathroom scales with arms raised.**



For each test:

- measure the heart rate of the person taking the exercise before and after the activity;
- measure the heart rate at regular intervals until it returns to normal;
- work out how long it took for the person's heart rate to return to normal after completing the exercise.





## 9B Fit and Healthy

- Being fit and healthy
- Smoking
- Diet, alcohol and drugs
- Maintaining fitness
- Summary activities



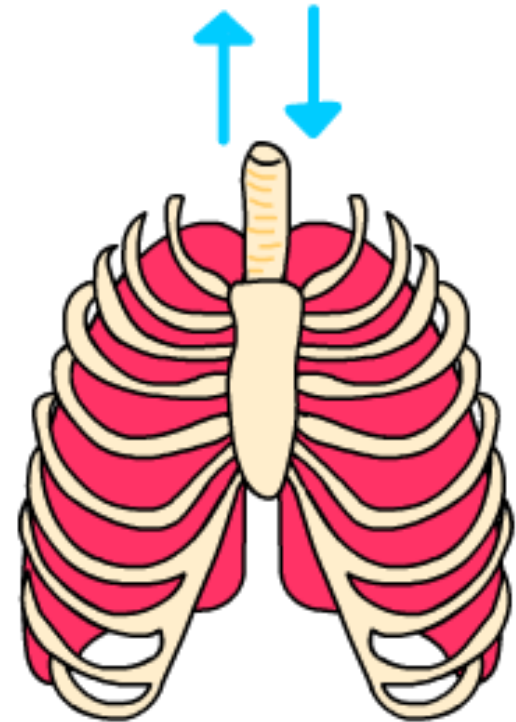


# The respiratory system and health

- Why is a respiratory system that works properly essential for good health?

The respiratory system provides the body with the oxygen it needs for respiration.

The lungs are delicate, spongy organs that deal with 12,000 litres of air each day.



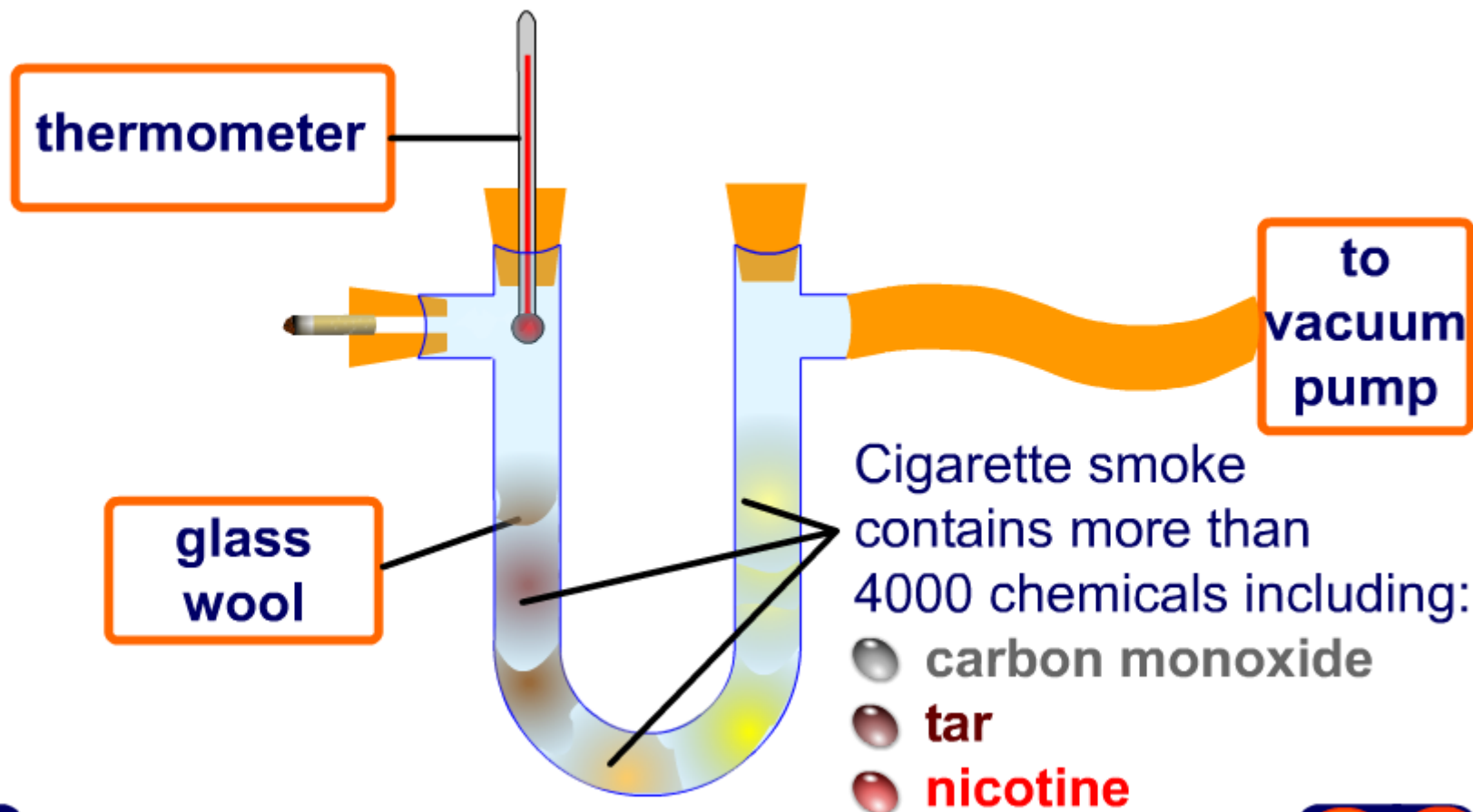
- Smoking is a very dangerous habit that has serious effects on the lungs and respiratory system.

How does smoking damage health and fitness?





What harmful chemicals are produced when a cigarette burns?



All these harmful chemicals are found in cigarettes.  
Click on each chemical to find out about its effects.



**used as rat  
poison**

**used as floor  
cleaner**

**used in gas  
lighters**

**reduces  
oxygen  
availability**

**used as a  
preserving  
fluid**

**addictive**

**coats lungs  
like it does  
roads**



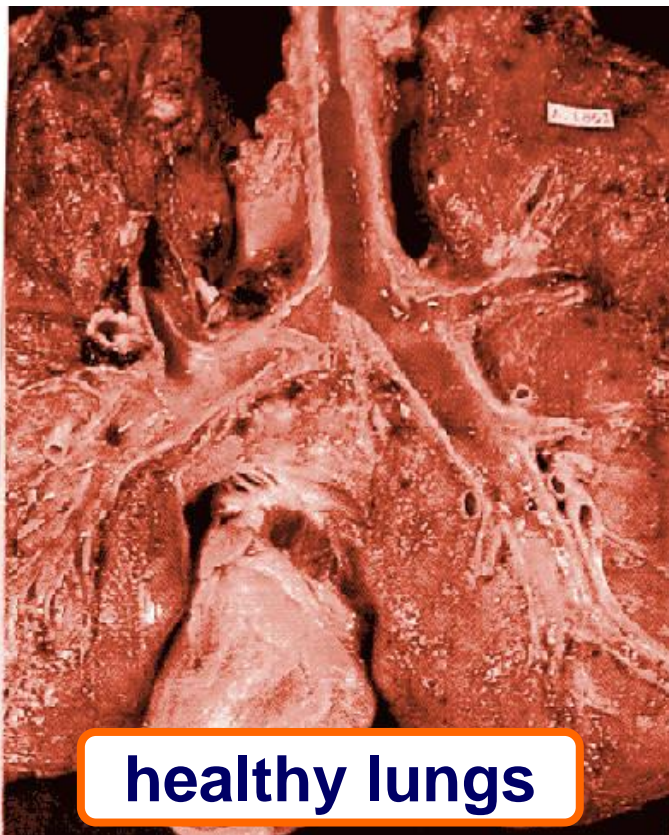




# How does smoking affect the lungs?



- Which picture shows the healthy lungs of a non-smoker and which show the unhealthy lungs of a smoker?



Not a difficult question to answer but some people still think that smoking is cool!



# How does smoking affect health?

- How will these chemicals be harmful to the body's systems?
  - **Carbon monoxide** – A poisonous gas that reduces the amount of oxygen that red blood cells carry around the body.
  - **Tar** – A brown, sticky substance that consists of tiny particles and is formed when tobacco smoke condenses. It is deposited in the lungs and coats the surface of the alveoli.
  - **Nicotine** – An addictive drug that affects the central nervous system. It increases the heart rate and narrows the blood vessels, causing high blood pressure.
- Smoking affects the respiratory and circulatory systems but has many other effects on the body. What other health problems and diseases are related to this habit?





# How does smoking affect health?



dental hygiene  
problems

asthma

lung cancer

heart disease

facial wrinkles

impaired  
immune system

cervical cancer

emphysema

mouth, lip and  
throat cancer

**Effects of smoking  
on health**

kidney cancer

leukaemia

pancreatic cancer

bronchitis

sperm abnormalities  
and impotence

testicular cancer

osteoporosis

stomach cancer

liver cancer

menstrual  
problems

bladder cancer





# Scary smoking statistics!

- Smoking doesn't just make you unfit and unhealthy, it kills.
  - In the UK, around **114,000 smokers** die every year as a result of their habit – that's the same as 13 people per hour!
  - Smoking kills around **five times** more people in the UK than road traffic accidents, other accidents, poisoning and overdose, alcoholic liver disease, murder and manslaughter, suicide and HIV infection **all put together!**
  - About half of all regular cigarette smokers will eventually be killed by their habit!

With such scary statistics about smoking, what can be done to help people give up this harmful habit?





- Passive smoking has health implications for people who do not smoke.

- People living with a smoker are 25% more likely to get lung cancer.
- Every year, 17,000 children are admitted to hospital due to inhaling smoke from those around them.



- Due to the serious effects of smoking on smokers and non-smokers, the government have proposed a ban in every cafe, restaurant and pub that sells food in England.

Will everyone have the same response to this proposal to protect public health?



# Smoking bans around the world

Smoking is banned in many public places around the world...

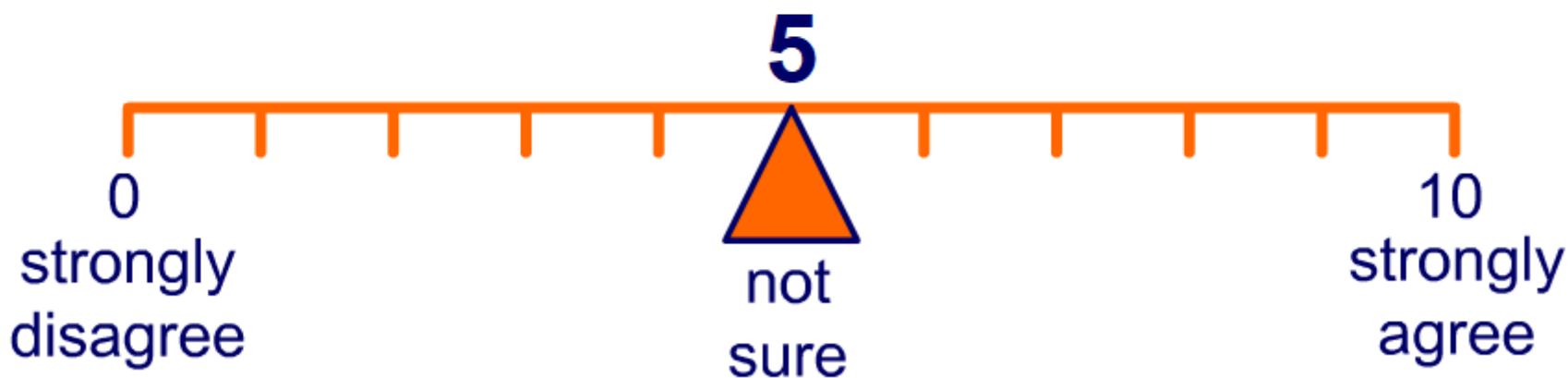




How much do you agree or disagree with the following statements about a smoking ban?

Move the slider to make your choice.

next





# Smoking – true or false?



**The facts are smoking is a dangerous,  
expensive and unattractive habit!**

**Which of the following statements  
about smoking are fact or fiction?**



**start**





## 9B Fit and Healthy

- **Being fit and healthy**
- **Smoking**
- **Diet, alcohol and drugs**
- **Maintaining fitness**
- **Summary activities**







- **Diet** is the usual food and drink that each person consumes and is a very important part of health.

A **balanced diet** means eating the right types of food in the right amounts so that the body gets the nutrients it needs.

What are the seven nutrients needed in a balanced diet?

- **carbohydrates**
- **proteins**
- **fats**
- **vitamins**
- **minerals**
- **water**
- **fibre**

Why are these nutrients needed and what foods contain them?





What is each type of nutrient needed for?

**fibre**

**for energy**

**fats**

**for growth and repair**

**proteins**

**for energy and to make cell membranes**

**carbohydrates**

**in small amounts for cells to work properly**

**vitamins**

**in small amounts to make body chemicals**

**minerals**

**for chemical reactions to occur and for transport**

**water**

**to keep the bowels working properly**







**solve**





## What foods make up a balanced diet?

Key

- a  Food for energy
- b  Fruit and vegetables
- c  Dairy foods
- d  Food for growth
- e  High energy foods





# Eating too little or too much

- How can eating too little or too much affect health?
- Eating too little means that the body doesn't get enough nutrients. Deficiency diseases, like anaemia or scurvy, can occur if specific nutrients are missing.
- Eating too much means that the body consumes more energy than it uses and so the excess starts to build up.

People who are very overweight for their height are said to be **obese**. Currently, **15%** of 15 year olds are obese.



Obesity is a serious health problem as it affects the heart, blood pressure and can lead to joint problems.





# What's the missing nutrient?



Match each deficiency disease to its missing nutrient.

kwashiorkor

deficient in protein

osteoporosis

deficient in vitamin D

anaemia

deficient in vitamin C

scurvy

deficient in calcium

rickets

deficient in iron

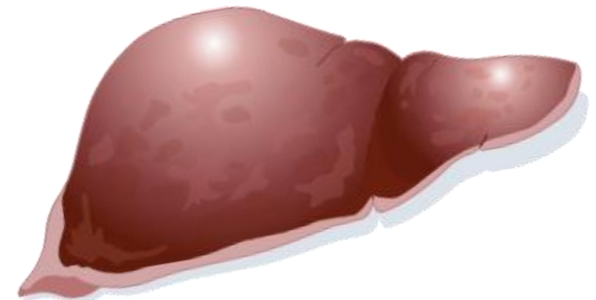


# How does alcohol affect health?

- Alcohol is a recreational drug that has short term and long term effects on the body.
- Alcohol is a **depressant** that works by slowing down the nervous system and relaxing the brain.

Alcohol can reach the brain in just one minute. Too much alcohol can damage the brain!

- The liver breaks down alcohol to remove this toxic drug from the body. Too much alcohol can damage the liver leading to cirrhosis or cancer!





- Alcohol is an addictive drug, which can have serious consequences. It kills nearly as many people as smoking.

It is recommended that men should drink no more than **21 units** a week (which is the same as **10 pints of lager**):



and women **14 units** (which is the same as **7 alcopops**):







# The effects of alcohol



short term

?

?

?

?

What are the effects of  
too much alcohol?



long term

?

?

?

?





# What is a drug?

- A drug is **any substance** that **changes** the way the body or mind works.

How many different types of drug can you name?



- Paracetamol, alcohol, nicotine, cannabis and ecstasy are all examples of substances that can be called **drugs**.

Some drugs are beneficial, like asthma drugs, but others like alcohol and nicotine in cigarettes can cause harm.

Drugs can be categorized into **over-the-counter** drugs, **prescription** drugs, **recreational** drugs and **illegal** drugs.





- **Class A**
- Ecstasy, LSD, heroin, cocaine, crack, magic mushrooms, amphetamines (if prepared for injection). Up to seven years in prison or an unlimited fine or both. Up to life in prison or an unlimited fine or both.
- **Class B** Amphetamines, Cannabis, Methylphenidate (Ritalin), Pholcodine. Up to five years in prison or an unlimited fine or both. Up to 14 years in prison or an unlimited fine or both.
- **Class C** Tranquilisers, some painkillers, Gamma hydroxybutyrate (GHB), Ketamine. Up to two years in prison or an unlimited fine or both. Up to 14 years in prison or an unlimited fine or both.





## Which type of drug?

over-the-counter/ prescription drugs	recreational drugs	illegal drugs
?	?	?
?	?	?

**amphetamines**

?

C

**solve**





## 9B Fit and Healthy

- **Being fit and healthy**
- **Smoking**
- **Diet, alcohol and drugs**
- **Maintaining fitness**
- **Summary activities**





- Fitness can be maintained by:
  1. eating a **balanced diet**;
  2. **avoiding** excessive alcohol;
  3. not smoking;
  4. getting regular exercise.



- Exercise can actually be hazardous if done inappropriately:
  - lifting weights which are far too heavy;
  - prolonged running on hard surfaces without appropriate shoes.

How can poor exercise cause injury to muscles and joints?





# Different types of joints



The place where bones meet is called a **joint**.  
Compare the **movement** at different joints.







## 9B Fit and Healthy

- **Being fit and healthy**
- **Smoking**
- **Diet, alcohol and drugs**
- **Maintaining fitness**
- **Summary activities**





- **alcohol** – An addictive drug that acts a depressant and affects the brain and the liver.
- **balanced diet** – Eating the right types of food in the right amounts so that the body gets the nutrients it needs.
- **carbon monoxide** – A poisonous gas in cigarette smoke that reduces the amount of oxygen in blood.
- **drug** – A substance that changes how the body works.
- **fitness** – Good health or physical condition, especially as the result of exercise and proper nutrition.
- **nicotine** – A poisonous, addictive drug in cigarettes that affects the central nervous system and heart rate .
- **tar** – A brown, sticky chemical produced by tobacco when it burns that coats the surface of the lungs.





How quickly can you unscramble  
anagrams of words about being

**f i t**

**a n d**

**h e a l t h y ?**

Click start for the first of seven anagrams.

**start**





# Multiple-choice quiz



board  
works

Are you fit to try  
this quiz on  
fitness and  
health?



start

