

WHAT IS IN DIRTY AIR?

It is difficult to measure how clean or dirty the air is. One reason is because there can be many different substances in the air. Air is a mixture of gases, including oxygen and carbon dioxide, and can also contain water vapour, tiny particles that are too small to see, and other chemicals in gas or vapour form. Some substances are good for us, like oxygen which we need to breathe to live. Others, on their own in small amounts are not a problem but when they build up in the air and/or mix with other substances, they can cause health problems. These are called air pollutants.

The table gives the description of substances and activities that might cause these substances. See how many activities you can spot in the picture on the next page. Pick a colour to use and colour the sources in.

Marker	Description	Sources
PM_{2.5}	This is extremely small particles that measure less than 2.5 micrometres (µm) across. To help you understand how small this is, a human hair is about 75 µm thick, which is 30 times bigger than PM _{2.5} .	Indoor sources include cooking, smoking and burning anything such as candles or incense . Particles can also settle on surfaces and be released back into the air during activities such as vacuuming . Outdoor sources include car exhausts.
Volatile Organic Compounds (VOCs)	A wide variety of chemicals that are emitted as gases (from solids or liquids) at ordinary room temperatures. VOCs are everywhere and are released from a wide range of products and materials used in our everyday lives. Concentrations of these chemicals can be much higher indoors compared to outdoors.	Common sources of VOCs include building materials, furniture (wood preservatives), household consumer products including cleaning products , cosmetics such as hairspray and nail varnish, air fresheners, fragranced products .
Formaldehyde	Formaldehyde is a colourless strong-smelling gas that is used in many household products and building materials. Formaldehyde can be released into the air as a gas at normal room temperatures. This process is called off-gassing.	Key sources are building materials, DIY paints, cleaning products, furniture , flooring and carpets.
Carbon dioxide (CO₂)	A gas found naturally in the earth's atmosphere and is part of the air we breathe. We also breathe out carbon dioxide from our lungs (as a waste product of our body's metabolism). CO ₂ has no taste, smell or colour and cannot be detected by humans, even at high concentrations.	Indoor sources include human activities and burning wood, coal or gas . Outdoor sources include burning fossil fuels and industrial processes such as cement production.
Carbon monoxide (CO)	A poisonous gas. It has no taste, smell or colour and cannot be detected by humans. Carbon monoxide alarms should be fitted to detect dangerously high levels.	Damaged or faulty gas appliances such as boilers or stoves .
Nitrogen dioxide (NO₂)	A toxic gas that is mainly formed by burning fossil fuels at high temperatures. It is reddish-brown in colour and is a key part of outdoor air pollution	Indoor sources of nitrogen dioxide include burning gas, oil, paraffin, wood or coal in stoves, ovens, heaters and fireplaces , especially if these are poorly maintained.
Pollen	Pollen is a powder containing the tiny grains or spores which are released from plants during their reproductive cycle. Pollen grains can vary in size depending on the plant species.	Outdoor or indoor plants .
Humidity	Humidity is the amount of water vapour in the air. On its own humidity is not a pollutant, but too much humidity can cause condensation when warm humid air comes into contact with a colder surface. This can lead to damp and mould.	Boiling water, cooking, showering
House dust mites	House dust mites are tiny bugs which live in humid and warm environments. They are generally only visible with a microscope but are one of the most common indoor allergens. House dust mites mostly eat dead skin cells shed by humans.	House dust mites are found in bedding , carpets, mattresses , clothing, and soft furnishings such as sofas and soft toys .
Moulds/fungi	Mould in the home is a common problem often caused by poor ventilation and high levels of moisture in the air, which causes condensation on cold surfaces including walls. Mould can also form within buildings as a result of water damage.	Mould is most commonly found in damp areas of the home such as bathrooms , but mould can grow anywhere in the home.
Pet hair and dander	Pet dander is the small particles of skin shed by animals, such as cats, dogs, rodents and birds. The particles from dead skin or fur and feathers can cause reactions in people who are allergic to them	Animals including pets and pests, and places the animals have been, such as on carpets, on furniture, in dust and in the air.
Radon	Radon is a radioactive gas found at varying levels across the UK. Radon can build up indoors if there is not enough ventilation.	Outdoors radon appears naturally in some areas of the UK in soil, rocks and water. It enters a building through the ground.

Pick a colour to use and colour the sources in.

