



Making a Food Web



Cut around the following name and pictures to build your own food web. Remember to layout a draft food web first before gluing them permanently onto page 14 of your workbook.



Pollution



Pollution is defined as **contaminants** that enter the environment and cause damage or negative changes. Pollution can include chemicals such as oil, CFC's, radioactive compounds or even energy like heat, light and sound. These contaminants are referred to as **pollutants**. There are many different kinds of pollution and three key ones are outlined below.

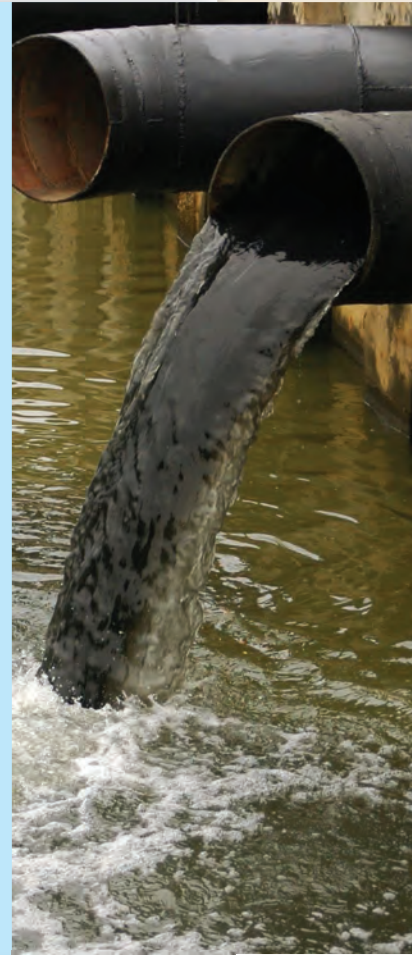
Air Pollution

This is when **particulates** or other harmful materials are released into the atmosphere. Our atmosphere is vital to the survival of all living things and is what makes our planet **habitable**. It has been estimated that seven million people die each year from air pollution related illness and disease. As well as death, air pollution also causes breathing difficulties, heart disease, asthma, stroke and lung cancer. Air pollution also affects plants and animal growth, and can destroy habitats through the production of acid rain. **Smog** is a combination of soot, smoke and sulfur dioxide mainly from vehicles, burning fossil fuels and factory fumes. Not only this but it can form ground level ozone which is quite toxic to all living organisms. This combination of **emissions** creates a thick smoky fog that covers cities and contributes to the major health problems stated above. Air pollution is a worldwide issue as it is common for the toxic particulates to be produced in one place but be shifted by the winds to another location and create smog or acid rain. Some countries have very strict rules and guidelines about air pollution but still suffer its effects because of what the neighbouring countries are doing. Air pollution leads to **global warming** and the **greenhouse effect** as well as the destruction of the **ozone layer**. Air pollution from vehicles and factories (that burn fossil fuels) comes in the form of sulfur dioxide and nitrogen oxides that mix with water in the atmosphere and produce acid rain. This in turn damages plants, animals and pollutes waterways. CFC's (which are prohibited) from air conditioners, aerosol cans and refrigeration systems, all cause damage to the ozone layer in the **stratosphere**. This area is responsible for reducing the amount of damaging **UV radiation** that makes it to the Earth's surface and would otherwise be harmful to all life on Earth.



Water Pollution

When waterways and water storage areas (like lakes, oceans and underground **reservoirs**) are contaminated with pollutants, it can pose many hazards to all living things. It affects not only the organisms living in the water but all **ecosystems**. It has been calculated that around 14000 people die daily from the effects of polluted water. Millions of people don't have access to clean drinking water in many countries across the world. The water becomes polluted from numerous sources such as **sewage** treatment plants, farm **runoff**, storm water from urban areas and roadways. Common contaminants include oil, faeces, detergents, fertilisers, **pesticides**, **herbicides**, litter and **decaying** organisms. It isn't only chemicals that pose a risk to humans but also **pathogens** like bacteria and single-celled organisms. An example of this is the parasite **Giardia** which causes severe diarrhoea. Even an excess of sediment is classed as pollution. These sediments are increased in areas where trees have been felled and land cleared for building. If rivers are full of sediments (dirt, silt, clay and sand) then the **turbidity** (cloudiness) of the water is increased and this prevents light from entering. When light can't get in, water plants and the animals that rely on those plants can't survive. Farms and other agricultural industries can create large amounts of pollution through runoff. When rain water runs off paddocks and orchards it takes fertilisers with it which enter waterways. This runoff can contain excessive amounts of **nitrogenous fertilisers**, herbicides, pesticides and phosphates which can kill aquatic life. The introduction of large amounts of nutrients (like nitrogen) can cause massive blooms of algae which again increases the turbidity. Rubbish has a major effect on waterways and the life in them. When people drop litter it washes into storm drains or rivers and passes into the oceans which poses a risk to wildlife. For example, fish and birds mistake plastic bags for jellyfish, eat them then feel full with having gained any nutrients. They don't break down, become lodged in the animals gut and they starve to death. The amount of litter in our oceans is ridiculous. Large garbage islands have been found with the largest in the Pacific Ocean estimated to be 700 000 km² in size. This island is composed of some large litter like drums or bottles but is mainly pieces of plastic that have been broken apart in the oceans and form a plastic **suspension** floating below the surface.



Land Pollution

When the soil is contaminated with chemicals from agriculture, improper waste disposal or factories, it has far reaching effects. Chemicals and sewage within the soil can **leach** into waterways and destroy habitats. Not only this but they can inhibit plant growth, kill necessary insects and cause disease in humans. Soil pollution affects all food chains, as it harms the producers responsible for creating the first step in the energy cycle. Rubbish dumps (landfills) are a major source of pollution. Not only do they look horrible but they also severely damage the soil and chemicals released from the trash leaches into waterways damaging them as well. Many electrical products like televisions and computers that are put into landfills, release **heavy metals** like lead and mercury which are very harmful to all living things. As rubbish **decomposes** in the landfills massive amounts of methane are released which contributes to global warming and the greenhouse effect.



While these three types of pollution are the main focus of the article, the table below outlines some other forms of pollution, their pollutants, sources and effects.

Pollution Type	Pollutants	Sources	Effects
light pollution	light energy	Cities, stadiums and motorways.	Light trespass and interference with astronomical sights.
noise pollution	sound energy	Motorways, airports and factories.	Damage hearing in all animals. Affect animal communication and ability to find prey or avoid predators.
visual pollution	Signs, power lines, rubbish and destroyed natural landscape.	Urban areas, mines, forestry and factories.	Destroys views and looks unappealing.
radioactive contamination	radioactive compounds	Bombs and power plants.	Land becomes unusable. Can cause mutations and death in living things.
thermal pollution	cooled or heated waste water	Power plants, paper mills, mining plants, oil refineries and urban areas.	Alters temperature of water, decreases amounts of dissolved oxygen and can cause increased algae growth.