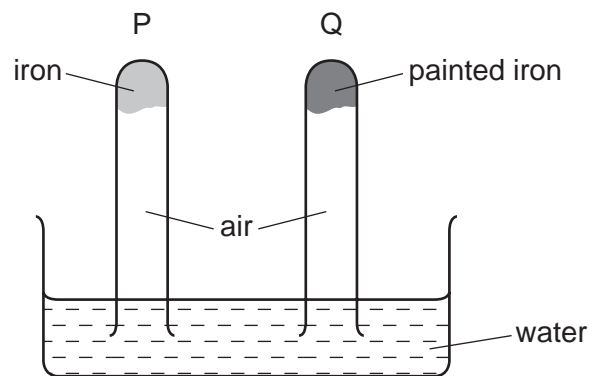


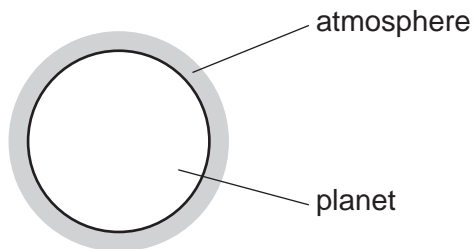
1 The diagram shows an experiment to investigate how paint affects the rusting of iron.



What happens to the water level in tubes P and Q?

	tube P	tube Q
<b>A</b>	falls	rises
<b>B</b>	no change	rises
<b>C</b>	rises	falls
<b>D</b>	rises	no change

2 A new planet has been discovered and its atmosphere has been analysed.



The table shows the composition of its atmosphere.

gas	percentage by volume
carbon dioxide	4
nitrogen	72
oxygen	24

Which gases are present in the atmosphere of the planet in a higher percentage than they are in the Earth's atmosphere?

- A carbon dioxide and oxygen
- B carbon dioxide only
- C nitrogen and oxygen
- D nitrogen only

3 Which pollutant found in air does **not** have an effect on respiration?

- A carbon monoxide
- B lead compounds
- C oxides of nitrogen
- D sulfur dioxide

- 4 Sulfur dioxide, carbon monoxide and oxides of nitrogen are common gaseous pollutants found in the air.

Which pollutants contribute to acid rain?

- A carbon monoxide and sulfur dioxide
- B oxides of nitrogen and sulfur dioxide
- C oxides of nitrogen only
- D sulfur dioxide only

- 5 The following substances can be formed when petrol is burnt in a car engine.

Which substance is the main cause of acid rain?

- A carbon
- B carbon monoxide
- C nitrogen dioxide
- D water

- 6 Which is a use of oxygen?

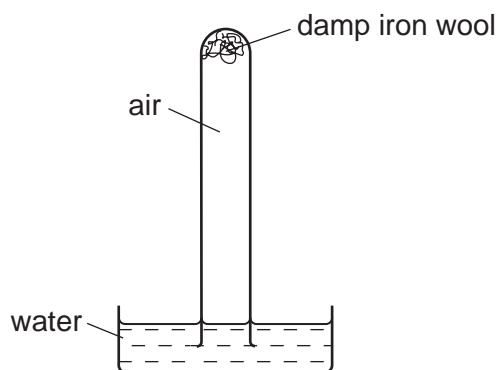
- A as the gas in a lamp
- B to react with ethene to form ethanol
- C to react with methane in a Bunsen burner
- D to react with hematite to form iron

- 7 Carbon monoxide is an air pollutant produced when petrol is burned in a car engine.

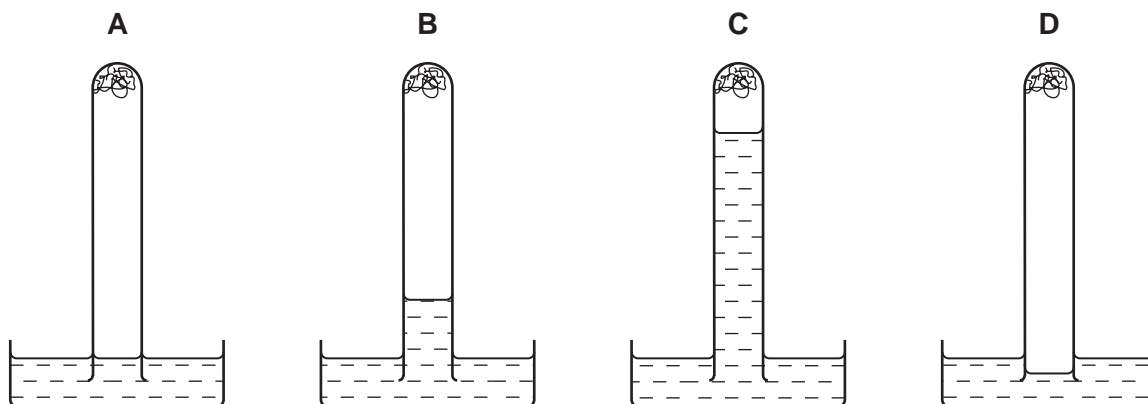
Why is carbon monoxide considered to be an air pollutant?

- A It causes climate change.
- B It causes the corrosion of buildings.
- C It is a significant greenhouse gas.
- D It is poisonous.

8 The apparatus shown is set up and left for a week.



Which diagram shows the level of the water at the end of the week?



9 Carbon monoxide is an air pollutant produced when petrol is burned in a car engine.

Why is carbon monoxide considered to be an air pollutant?

- A It causes climate change.
- B It causes the corrosion of buildings.
- C It is a significant greenhouse gas.
- D It is poisonous.

10 A farmer moves his cows into a concrete shelter for protection.

There is little access for fresh air once the door is closed.

Which gases would increase in amount in the shelter?

- A carbon dioxide and carbon monoxide
- B carbon dioxide and methane
- C carbon monoxide and oxygen
- D methane and oxygen

11 Which gas is **not** found in clean air?

- A carbon dioxide
- B carbon monoxide
- C nitrogen
- D oxygen

12 The pollutants released into the air from car exhausts and some power stations include oxides of the type XO and YO<sub>2</sub>.

What are X and Y?

	X	Y
A	carbon only	nitrogen only
B	carbon only	nitrogen and sulfur only
C	carbon and nitrogen	carbon and nitrogen only
D	carbon and nitrogen	carbon, nitrogen and sulfur

13 Which statement about rusting is **not** correct?

- A Only oxygen is needed for rusting.
- B Painting can stop iron gates rusting.
- C Rust is hydrated iron(III) oxide.
- D Water and oxygen are both needed for rusting.

14 Carbon monoxide is given out from the exhaust of vehicles that burn fossil fuels.

Which row shows why carbon monoxide is a pollutant?

	acidic	toxic
A	no	no
B	no	yes
C	yes	no
D	yes	yes

15 A steel bicycle which had been left outdoors for several months was starting to rust.

What would **not** reduce the rate of corrosion?

- A Remove the rust and paint the bicycle.
- B Remove the rust and store the bicycle in a dry shed.
- C Remove the rust and wipe the bicycle with a clean damp cloth.
- D Remove the rust and wipe the bicycle with an oily cloth.

16 Oxygen is a reactive element.

Which row shows which of oxygen's reactions are useful?

	fuel combustion	rusting	steel manufacture
A	no	no	yes
B	no	yes	no
C	yes	no	yes
D	yes	yes	no

- 17 Which method is **not** used for rust prevention?
- A** coating working parts of industrial machinery with oil
  - B** covering wire for gardening use with plastic
  - C** immersing gardening tools in water for storage
  - D** painting car bodies

- 18 Which of these gases is an atmospheric pollutant?

- 1 carbon monoxide
- 2 nitrogen dioxide
- 3 sulfur dioxide

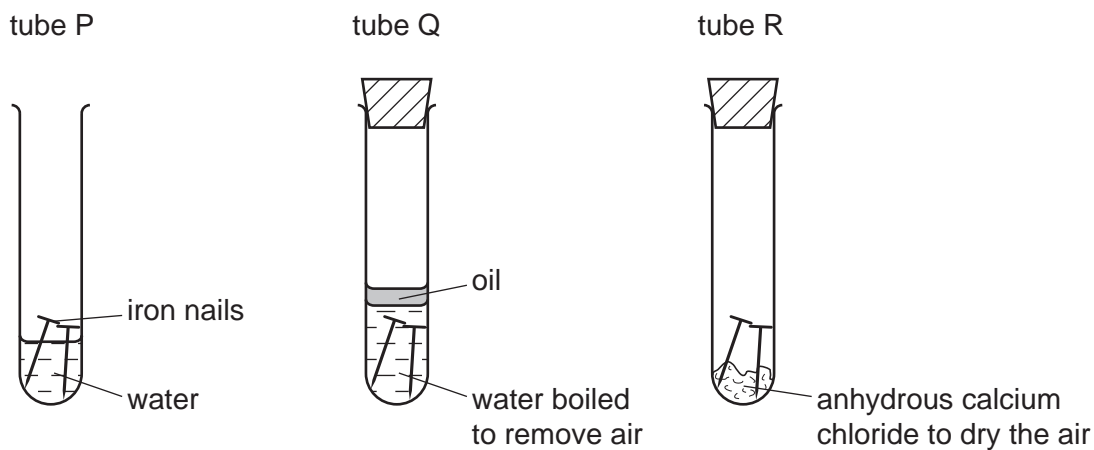
- A** 1 only      **B** 2 only      **C** 3 only      **D** 1, 2 and 3

- 19 A sample of air from a town centre was analysed and found to contain mainly nitrogen and oxygen, but also traces of the four gases below.

Which of these gases is a pollutant?

- A** argon
- B** carbon dioxide
- C** sulfur dioxide
- D** water vapour

20 The diagram shows experiments involving the rusting of iron.



The following results were suggested.

- 1 In tube P, the iron nails rust.
- 2 In tube Q, the iron nails do not rust.
- 3 In tube R, the iron nails do not rust.

Which results are correct?

- A** 1 and 2 only
- B** 1 and 3 only
- C** 2 and 3 only
- D** 1, 2

21 Which reaction involves oxidation?

- A** heating hydrated copper(II) sulfate in the air
- B** polymerisation of ethene
- C** rusting of iron
- D** thermal decomposition of calcium carbonate



22 Which is an air pollutant that affects a part of the body other than the lungs and blood system?

- A lead compounds
- B nitrogen
- C oxides of nitrogen
- D sulfur dioxide

23 A man blows up a balloon.

What is the approximate composition of his exhaled air in the balloon?

	% composition		
	carbon dioxide	oxygen	nitrogen
A	0.03	20	79
B	0.03	79	20
C	4	16	79
D	4	20	75

24 Four steel paper clips are treated as described before being placed in a beaker of water.

Which paper clip rusts most quickly?

- A coated with grease
- B dipped in paint and allowed to dry
- C electroplated with zinc
- D washed with soap and rinsed

25 A piece of uncoated iron and three pieces of iron with various coatings were left exposed to the air.

Which piece of iron would rust?

- A the painted piece
- B the tin-coated piece
- C the uncoated piece
- D the zinc-coated piece

26 Sulfur dioxide,  $\text{SO}_2$ , nitrogen dioxide,  $\text{NO}_2$ , and carbon monoxide,  $\text{CO}$ , are air pollutants.

Which row correctly shows their major source?

	motor car engines	power stations
A	CO	$\text{NO}_2$ , $\text{SO}_2$
B	$\text{NO}_2$ , CO	$\text{SO}_2$
C	$\text{SO}_2$ , $\text{NO}_2$	CO
D	$\text{SO}_2$	$\text{NO}_2$ , CO

27 Acid rain is formed when sulfur dioxide and oxides of nitrogen dissolve in rain water.

Which problem is **not** caused by acid rain?

- A breathing difficulties
- B dying trees
- C erosion of statues
- D lowered pH of lakes

28 The diagrams show four uses of iron.

In which of these uses is the iron most likely to rust?

**A**



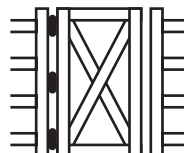
iron bucket  
electroplated  
with zinc

**B**



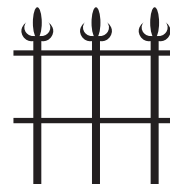
iron cored  
aluminium  
electricity cables

**C**



iron hinges  
on a gate

**D**



painted  
iron fence

29 Which air pollutant is **not** made when coal burns in a power station?

- A** carbon monoxide
- B** lead compounds
- C** nitrogen oxides
- D** sulfur dioxide

30 Iron rusts. This process involves the .....1..... of iron. Rusting can be prevented by covering the iron with grease or paint which stops .....2..... from reaching the surface of the iron.

Which words correctly complete gaps 1 and 2?

	1	2
<b>A</b>	oxidation	nitrogen
<b>B</b>	oxidation	oxygen
<b>C</b>	reduction	nitrogen
<b>D</b>	reduction	oxygen

31 Oxides of nitrogen are given out from car exhausts.

Which row best shows why oxides of nitrogen are unwanted?

	acidic	toxic
<b>A</b>	no	no
<b>B</b>	no	yes
<b>C</b>	yes	no
<b>D</b>	yes	yes

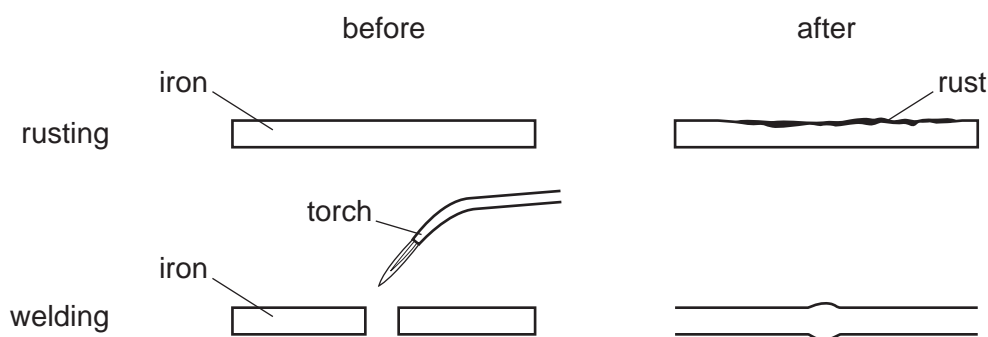
32 Iron rusts when it reacts with .....1.....

Rusting can be prevented by covering the iron with a more reactive metal, such as .....2.....

Which words correctly complete gaps 1 and 2?

	1	2
<b>A</b>	oxygen	copper
<b>B</b>	oxygen	magnesium
<b>C</b>	oxygen and water	copper
<b>D</b>	oxygen and water	magnesium

33 The diagrams show two processes.



For which processes is oxygen involved?

	rusting	welding
<b>A</b>	✓	✓
<b>B</b>	✓	x
<b>C</b>	x	✓
<b>D</b>	x	x

34 A factory burns coal with a high sulfur content.

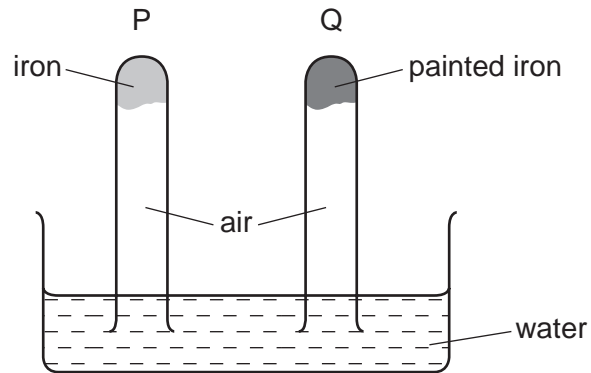
Which pollutant is **most** likely to lead to the death of trees?

- A** carbon dioxide
- B** carbon monoxide
- C** lead compounds
- D** sulfur dioxide

35 What is the correct order of abundance of the gases in the air?

- A** nitrogen → oxygen → argon → carbon dioxide
- B** nitrogen → oxygen → carbon dioxide → argon
- C** oxygen → nitrogen → argon → carbon dioxide
- D** oxygen → nitrogen → carbon dioxide → argon

36 The diagram shows an experiment to investigate how paint affects the rusting of iron.



What happens to the water level in tubes P and Q?

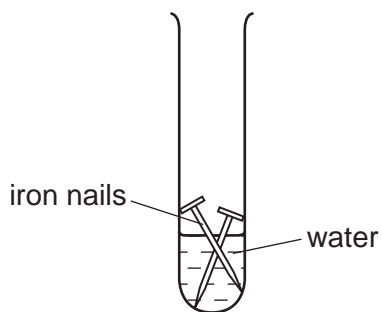
	tube P	tube Q
A	falls	rises
B	no change	rises
C	rises	falls
D	rises	no change

37 Argon is a noble gas used to fill light bulbs.

What is the approximate percentage of argon in air?

- A** 1%      **B** 20%      **C** 79%      **D** 99%

38 The experiment shown was set up to investigate the rusting of iron.



Rusting occurs in this experiment because of the presence of

- A hydrogen and oxygen.
- B nitrogen and oxygen.
- C nitrogen and water.
- D oxygen and water.

39 Coal is a fossil fuel.

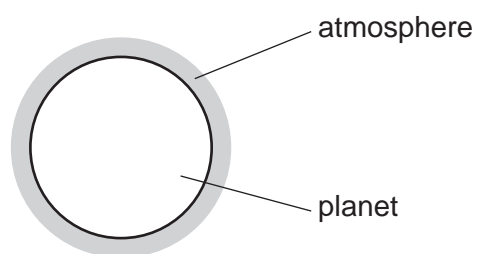
Which gas is **not** formed when coal burns?

- A carbon dioxide
- B carbon monoxide
- C methane
- D sulfur dioxide

40 Which is a use of oxygen?

- A filling balloons
- B filling light bulbs
- C food preservation
- D making steel

41 A new planet has been discovered and its atmosphere has been analysed.



The table shows the composition of the atmosphere.

gas	percentage by volume
carbon dioxide	4
nitrogen	72
oxygen	24

Which gases are present in the atmosphere of the planet in a higher percentage than they are in the Earth's atmosphere?

- A** carbon dioxide and oxygen
- B** carbon dioxide only
- C** nitrogen and oxygen
- D** nitrogen only

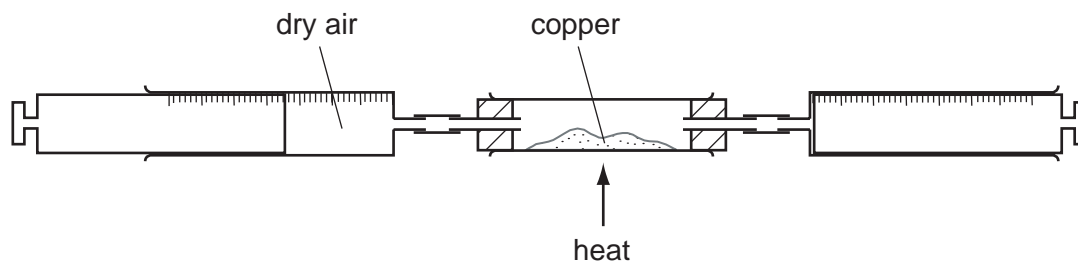
42 Carbon monoxide is an air pollutant produced when petrol is burned in a car engine.

Why is carbon monoxide considered to be an air pollutant?

- A** It causes global warming.
- B** It causes the corrosion of buildings.
- C** It is a greenhouse gas.
- D** It is poisonous.



43 Dry air is passed over hot copper until all the oxygen has reacted.



The volume of gas at the end of the reaction is  $120\text{ cm}^3$ .

What is the starting volume of dry air?

- A**  $132\text{ cm}^3$       **B**  $150\text{ cm}^3$       **C**  $180\text{ cm}^3$       **D**  $600\text{ cm}^3$

44 In which row is the air pollutant **not** correctly matched with its source?

	air pollutant	source
<b>A</b>	carbon monoxide	incomplete combustion of fuels
<b>B</b>	lead compounds	burning petrol in cars
<b>C</b>	nitrogen oxides	decomposing vegetation
<b>D</b>	sulfur dioxide	burning coal and other fossil fuels

45 Iron is a metal that rusts in the presence of oxygen and water.

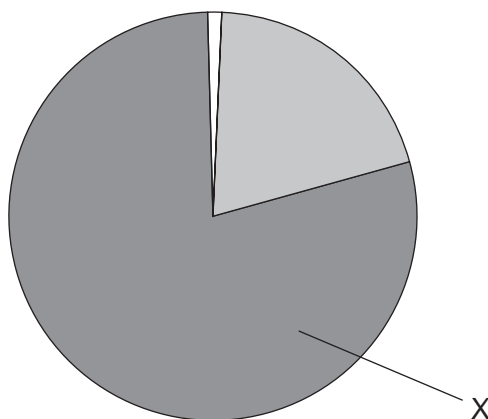
Mild steel is used for .....1..... and is prevented from rusting by .....2..... .

Stainless steel is prevented from rusting by .....3..... it with another metal.

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
<b>A</b>	car bodies	greasing	covering
<b>B</b>	car bodies	painting	mixing
<b>C</b>	cutlery	greasing	covering
<b>D</b>	cutlery	painting	mixing

46 The diagram shows the composition by volume of air.



What is X?

- A** argon
- B** carbon dioxide
- C** nitrogen
- D** oxygen

47 Statement 1: Alloying iron with other materials to form stainless steel prevents iron from rusting by excluding oxygen.

Statement 2: Painting, oiling and electroplating are all methods of preventing iron from rusting.

Which is correct?

- A** Both statements are correct and statement 2 explains statement 1.
- B** Both statements are correct but statement 2 does not explain statement 1.
- C** Statement 1 is correct but statement 2 is incorrect.
- D** Statement 2 is correct but statement 1 is incorrect.

48 The table gives the composition of the atmosphere of four newly discovered planets.

planet	composition of atmosphere
W	argon, carbon dioxide and oxygen
X	argon, nitrogen and oxygen
Y	argon, carbon dioxide and methane
Z	methane, nitrogen and oxygen

On which planets is the greenhouse effect likely to occur?

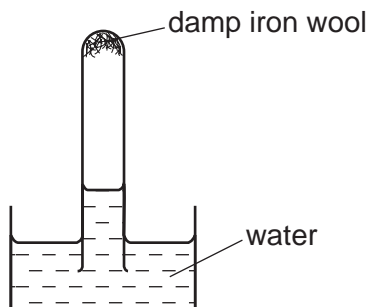
- A W only
- B W, X and Z
- C W and Y only
- D W, Y and Z

49 Which pollutant, found in car exhaust fumes, does **not** come from the fuel?

- A carbon monoxide
- B hydrocarbons
- C lead compounds
- D nitrogen oxides

50 A test-tube containing damp iron wool is inverted in water.

After three days, the water level inside the test-tube has risen.



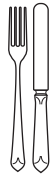
Which statement explains this rise?

- A** Iron oxide has been formed.
- B** Iron wool has been reduced.
- C** Oxygen has been formed.
- D** The temperature of the water has risen.

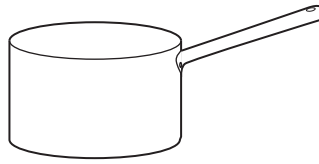
51 Which compound in polluted air can damage stonework and kill trees?

- A** carbon dioxide
- B** carbon monoxide
- C** lead compounds
- D** sulfur dioxide

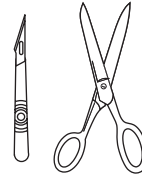
52 The diagram shows three types of item.



cutlery



cooking pan



instruments used  
in hospitals

Which method of rust prevention can be used for all three types of item?

- A** coating with plastic
- B** covering with grease
- C** galvanising
- D** using stainless steel

53 Which iron nail rusts?

**A**



zinc coated nail

**B**



painted nail

**C**



nail in  
damp cloth

**D**



nail covered  
in grease

54 Which statements are correct?

- 1 Carbon monoxide is responsible for the production of 'acid rain'.
- 2 Oxides of nitrogen are present in car exhausts.
- 3 Sulfur dioxide can be produced by the combustion of fossil fuels.

- A** 1 and 2 only  
**B** 1 and 3 only  
**C** 2 and 3 only  
**D** 1, 2

55 Substance K reacts with sodium carbonate to form a gas.

The gas turns limewater cloudy.

What is substance K and which process takes place in the reaction?

	K	process
<b>A</b>	ethanol	combustion
<b>B</b>	ethanol	neutralisation
<b>C</b>	hydrochloric acid	combustion
<b>D</b>	hydrochloric acid	neutralisation