1 A farmer's soil is very low in both nitrogen (N) and phosphorus (P).

Which fertiliser would improve the quality of this soil most effectively?

	percentage		
	nitrogen (N)	phosphorus (P)	potassium (K)
A	11	11	27
B	12	37	10
C	28	10	10
D	31	29	9

2 Which compound is **not** used as a fertiliser?

A ammonium phosphate

B ammonium sulfate

C calcium carbonate

D potassium nitrate

3 The formulae of four compounds, W, X Y and Z, are given.

compound	formula
W	$FeSO_4$
X	$(NH_4)_3PO_4$
Y	KNO_3
Z	$NaCl$

Which mixture of compounds makes a complete fertiliser?

A W and X **B** W and Z **C** X and Y **D** Y and Z

4 Fertilisers are mixtures of different compounds used to increase the growth of crops.

Which pair of substances contains the three essential elements for plant growth?

A ammonium nitrate and calcium phosphate

B ammonium nitrate and potassium chloride

C ammonium phosphate and potassium chloride

D potassium nitrate and calcium carbonate

5 Which elements are present in NPK fertilisers?

A nitrogen, phosphorus, potassium

B nitrogen, potassium, calcium

C sodium, phosphorus, potassium

D sodium, potassium, calcium

6 Which compound is **not** a fertiliser?

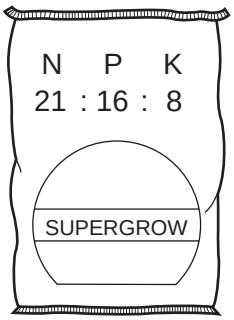
A ammonium sulfate, $(NH_4)_2SO_4$

B calcium hydroxide, $Ca(OH)_2$

C potassium chloride, KCl

D urea, $CO(NH_2)_2$

7 Which combination of chemical compounds could be used to produce the fertiliser shown?



A $(NH_4)_3PO_4$, KCl

B NH_4NO_3, $Ca_3(PO_4)_2$

C NH_4NO_3, $CO(NH_2)_2$

D NH_4NO_3, K_2SO_4, $(NH_4)_2SO_4$

8 Carbon dioxide and methane are 'greenhouse gases' which contribute to global warming.

Which process does **not** increase global warming?

A burning fossil fuels

B decay of organic waste

C farming cattle for beef

D growing crops such as sugar cane

9 A zinc compound forms carbon dioxide in two different reactions.

1 It is heated strongly.

2 It is added to hydrochloric acid.

Which type of reaction occurs in 1 and 2?

	1	2
A	combustion	neutralisation
B	combustion	oxidation
C	thermal decomposition	neutralisation
D	thermal decomposition	oxidation

10 Which elements does an NPK fertiliser contain?

A nickel, phosphorus, potassium

B nickel, potassium, calcium

C nitrogen, phosphorus, potassium

D nitrogen, potassium, calcium

11 Which method can be used to obtain ammonia from ammonium sulfate?

A Heat it with an acid.

B Heat it with an alkali.

C Heat it with an oxidising agent.

D Heat it with a reducing agent.

12 Which pair of compounds would make a N, P, K fertiliser?

A ammonium sulfate and potassium phosphate

B calcium hydroxide and ammonium nitrate

C calcium phosphate and potassium chloride

D potassium nitrate and ammonium sulfate.

13 Which compound contains two of the three essential elements needed for a complete fertiliser?

A ammonium chloride

B ammonium nitrate

C ammonium phosphate

D ammonium sulfate

14 Which compound would **not** be an effective fertiliser?

A ammonium nitrate, NH_4NO_3

B calcium oxide, CaO

C calcium phosphate, $Ca_3(PO_4)_2$

D potassium nitrate, KNO_3

15 Farmers add calcium oxide (lime) and ammonium salts to their fields.

The compounds are not added at the same time because they react with each other.

Which gas is produced in this reaction?

A ammonia

B carbon dioxide

C hydrogen

D nitrogen

16 A sample of fertiliser is tested by warming it with aqueous sodium hydroxide.

A colourless gas is produced which turns red litmus paper blue.

Which element, essential for plant growth, must be present?

A nitrogen

B phosphorus

C potassium

D sulfur

17 Nitrogen, phosphorus and potassium are essential elements for plant growth.

Which mixture provides all three essential elements?

	mixture	formula
A	ammonium phosphate + potassium chloride	$(NH_4)_3PO_4$ + KCl
B	ammonium phosphate + ammonium nitrate	$(NH_4)_3PO_4$ + NH_4NO_3
C	ammonium phosphate + ammonium chloride	$(NH_4)_3PO_4$ + NH_4Cl
D	ammonium nitrate + potassium chloride	NH_4NO_3 + KCl

18 Which substance would make the best general fertiliser?

	relative amount			solubility in water
	P	K	N	
A	5	0	5	soluble
B	5	5	20	insoluble
C	5	10	15	soluble
D	10	5	10	insoluble

19 What are X and Y in the reaction shown?

ammonium chloride + solution X $\rightarrow$ alkaline gas Y

	X	Y
A	hydrochloric acid	ammonia
B	hydrochloric acid	chlorine
C	sodium hydroxide	ammonia
D	sodium hydroxide	chlorine

20 Fertilisers need to supply crops with three main elements.

Which compound contains all three of these elements?

A H_3PO_4 **B** KNO_3 **C** $NH_4K_2PO_4$ **D** NH_4NO_3

21 Fertilisers are used to provide three elements needed to increase the yield of crops.

Which two compounds, when used together, would provide all three of these elements?

A ammonium nitrate and calcium phosphate

B ammonium nitrate and potassium sulfate

C potassium nitrate and calcium phosphate

D potassium nitrate and potassium sulfate

22 Which two substances, when reacted together, would form a salt that contains two of the essential elements provided by fertilisers?

A potassium hydroxide and nitric acid

B potassium hydroxide and sulfuric acid

C sodium hydroxide and nitric acid

D sodium hydroxide and sulfuric acid

23 A bag of fertiliser 'Watch it grow' contains ammonium sulfate and potassium sulfate.

Which of the three elements N, P and K does 'Watch it grow' contain?

	N	P	K
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

24 To grow roses, a fertiliser containing nitrogen, phosphorus and potassium is needed.

For the best flowers, the fertiliser should contain a high proportion of potassium.

Which fertiliser is best for roses?

fertiliser	proportion by mass		
	N	P	K
A	9	0	25
B	13	13	20
C	29	5	0
D	29	15	5

25 Fertilisers are used to provide three of the elements needed for plant growth.

Which two compounds would give a fertiliser containing all three of these elements?

A $Ca(NO_3)_2$ and $(NH_4)_2SO_4$

B $Ca(NO_3)_2$ and $(NH_4)_3PO_4$

C KNO_3 and $(NH_4)_2SO_4$

D KNO_3 and $(NH_4)_3PO_4$

26 Which element is **not** added to a fertiliser?

A aluminium

B nitrogen

C phosphorus

D potassium