

Use with textbook pages 220–224.

pH scale and pH indicators

1. Define the following terms:

(a) pH indicator _____

(b) pH scale _____

Figure 1: pH values of common substances

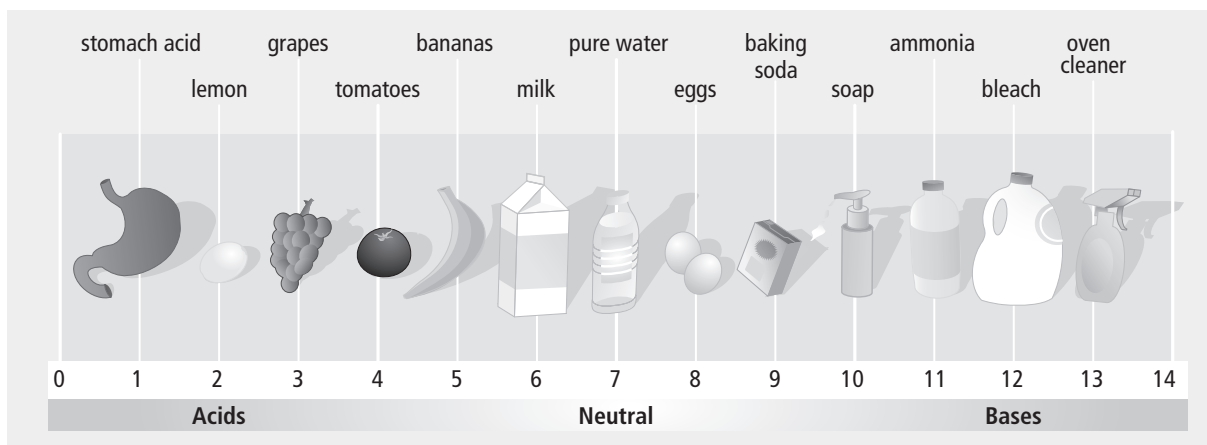
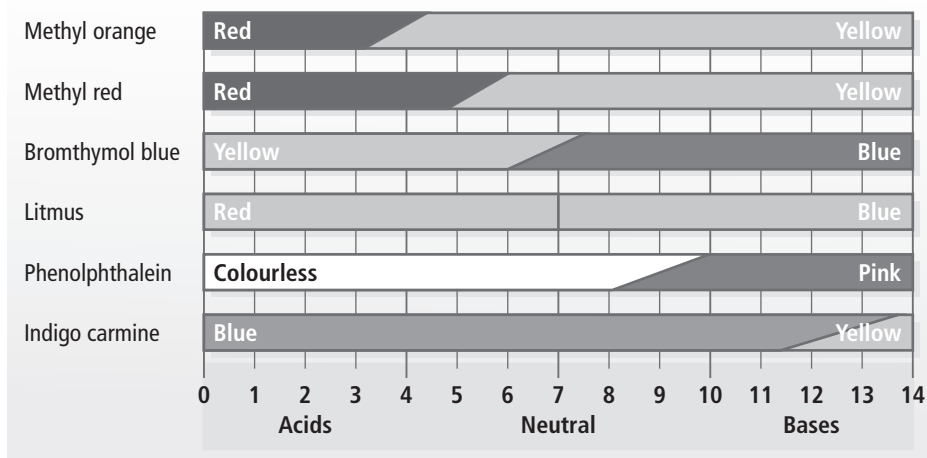


Figure 2: Common acid-base indicators and their pH colour change



2. Complete the following tables by using the two figures shown on the previous page. Identify whether the substance is an acid or a base and indicate what colour the pH indicator will turn.

(a)

Substance	pH Value	Acid or Base	Methyl Orange	Bromothymol Blue	Litmus
lemon					
ammonia					
milk					

(b)

Substance	pH Value	Acid or Base	Methyl Red	Phenolphthalein	Indigo Carmine
tomato					
oven cleaner					
egg					

3. Complete the following table. Identify whether the substance is an acid or a base and indicate what colour the pH indicator will turn.

Substance	pH Value	Acid or Base	pH Indicator	Colour of pH Indicator
black coffee	5		litmus	
milk of magnesia	10		phenolphthalein	
battery acid	0		bromothymol blue	
sea water	8		indigo carmine	
orange juice	3		methyl orange	
liquid drain cleaner	14		methyl red	

Use with textbook pages 220–229.

Acids versus bases

1. Compare and contrast acids and bases by completing the following table.

	Acids	Bases
definition		
pH		
what to look for in chemical formula		
production of ions		
electrical conductivity		
taste		
touch		
examples		

2. Classify each of the following as an acid or a base.

- (a) H_3PO_4 _____
- (b) NH_4OH _____
- (c) $\text{Mg}(\text{OH})_2$ _____
- (d) has a pH of 4 _____
- (e) has a pH of 9 _____
- (f) sulphurous acid _____
- (g) hydrogen bromide _____
- (h) potassium hydroxide _____
- (i) causes methyl orange to turn red _____
- (j) causes phenolphthalein to turn pink _____
- (k) causes indigo carmine to turn yellow _____
- (l) causes bromothymol blue to turn yellow _____