Summary of Music Theory

Tone (physical definition): A sound produced by vibrating a medium at a particular frequency (or "pitch").
Note: A name given to a tone.
Octave: A range of tones from a tone of a single frequency to a tone of double that frequency.
Scale: A selection of tones over an octave, including the octave end tones.
Evenly tempered scale: A scale in which the ratios of the frequencies of successive scale tones are constant (or, the frequencies of the scale tones are equally spaced on a logarithmic scale).
(Western) chromatic scale: A tempered scale of 13 tones (notes) (12, if only one of the octave end-tones is counted. If the first note of the scale is of frequency 440 cycles per second (Hertz, or hz), then the scale notes are denoted as A A# B C C# D D# E F F# G G# A, or as A Bb B C Db D Eb E F Gb G Ab A. This scale is usually referred to as a 12-tone scale (i.e., one of the octave endpoints is not counted, since it has the same note name). The notes are numbered 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. In music terminology, a physical tone is called a "note." Confusingly, the interval (distance) between two adjacent notes is called (in music terminology) a "semitone," and the interval between two next-adjacent notes is called a "tone."
Major (diatonic) scale, or key: An 8-tone subscale of the 13-tone chromatic scale (or 7 tones of 12), consisting of notes 0, 2, 4, 5, 7, 9, 11, and 12. (These notes correspond to the white keys on a piano.) The distances between the notes of the scale are 2, 2, 1, 2, 2, 2, 1; this sequence (2212221) is called the scale step pattern. The scale is named after the starting note. Examples: Scale (key) of C (or C major): C D E F G A B C; scale (key) of A (or A major): A B C# D E F# G#. (The ratio of the frequency of the i-th note of the Western chromatic scale to the frequency of the first note of the scale is given by the formula (2 raised to the power i/12), or exp[(i/12) ln(2)]. For the major diatonic scale, these ratios are approximately equal to the following fractions, called "diatonic ratios": 1, 9/8, 5/4, 4/3, 3/2, 5/3, 15/8, 2.)
Minor (diatonic) scale, or key: An 8-tone subscale of the 13-tone chromatic scale, consisting of step pattern 2122xxx, where xxx is 221 (ascending melodic minor scale) or 122 (descending melodic minor scale) or 131 (harmonic minor scale).
Chord: Any two or more notes (of a diatonic scale) sounded together.
Triad: A chord consisting of three alternate notes of a scale. Example: chord CED of the scale of C.
Major chord: A triad based on a major scale pattern (i.e., scale step pattern 2212221, chord step pattern 047, or notes 1, 5, and 8 of the chromatic scale). The chord is given the name of the starting note, e.g., Cmaj, or simply C: CEG. The notes of the chord are called the first (or root), third, and fifth. The first and fifth notes have a strong harmonic relationship (the second harmonic of the fifth is the third harmonic of the first), and sound very well together.
Minor chord: A triad based on a harmonic minor scale pattern (i.e., step pattern 2122131, chord step pattern 037, or notes 1, 4 and 8 of the chromatic scale). The chord is given the name of the starting note, plus an "m", e.g. Am: ACE. The notes of the chord are called the first, minor third, and fifth.
Diminished chord: A triad with step pattern 036, or notes 1, 4 and 7 of the chromatic scale. Notation: Starting note plus "dim" or "o". Example: Bdim or Bo: BDF. The notes of the chord are called the first, minor third, and diminished fifth.
Seventh chord: A four-note chord, in which the tenth note of the chromatic scale is added to the other three (e.g., first, fifth and eighth, for a major chord). Example: C7 = CEGA.

Basic chords of a key ("diatonic" chords): all seven triads of a scale, denoted by Roman numerals (I, II, III, IV, V, VI, VII) and having names tonic, supertonic, mediant, subdominant, dominant, submediant, leading note. E.g., the key of C has diatonic chords C (CEG), Dm (DFA), Em (EGB), F (FAC), G (GBD), Am (ACE), Bdim (BDF). The leading chord (a diminished chord) is rarely used (it does not sound particularly pleasant). Most musical pieces use only a few chords of the key. For a piece in a major key, the usual chords used are just the three major diatonic chords of the key, viz., I, IV, and V (i.e., the tonic, subdominant, and dominant). If only two chords are used, they are usually I and V. If four major chords are used, they often I, IV, V and II (a fifth above V). If a minor chord is included, it is often VI. There are many other chords (e.g., ninth, suspended, augmented) in addition to the diatonic chords, obtained by adding other notes, or by sharping and flatting certain notes. Example: The main chords in the key of C are C, F, and G (i.e., I, IV and V).

Chord substitutions. Since chord I shares two notes with chords VI or III, the latter may occasionally be substituted, for variety. Similarly, IV shares two notes with II or VI, and V shares two notes with III or VII. E.g., Am may sometimes be substituted for C, or Dm for F.

The circle of fifths (cycle of fifths). A note (on a major diatonic scale) that is four notes above another is said to be a "fifth" above (although it is actually just four notes above). For example, G is said to be a fifth above C. As noted above, notes that are a "fifth" apart are closely harmonically related, and sound particularly good when played together. Similarly, chords whose root notes are a fifth apart sound good together. As noted, many songs are based on chords I, IV, and V. Note that chord I is a fifth above chord IV. The following is a listing of successive "fifths," arrayed in a circle, called the "circle of fifths." If memorized, it can be used to quickly determine which chords typically go together in a song, e.g., DAE, or DAEB. It can also be used to help remember the number of sharps or flats in a particular key.

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          C
     F         G
  Bb             D
 Eb                A
  Ab             E
     Db        B
       Gb = F#
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Key	Sharps or Flats
Gb	Bb Eb Ab Db Gb Cb
Db	Bb Eb Ab Db Gb
Ab	Bb Eb Ab Db
Eb	Bb Eb Ab
Bb	Bb Eb
F	Bb
C	No sharps or flats
G	F#
D	F# C#
A	F# C# G#
E	F# C# G# D#
B	F# C# G# D# A#
F#	F# C# G# D# A# E#

Memory aids for the circle of fifths: Fat Cats Go Down Alleys Eating Bread; BEAD-G.