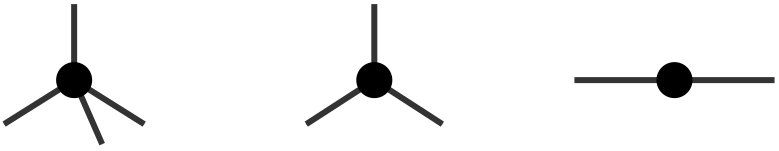
▶ Video explanation (YouTube Short) · Instagram

Shapes of Carbon Compounds: sp³, sp², sp

1. Three kinds of carbon

Groups around C	Hybridisation	Shape	Angle	Example
4	sp³	Tetrahedral	about 109.5°	Methane, CH_4
3	sp²	Trigonal planar	120°	Ethene, C_2H_4
2	sp	Linear	180°	Ethyne, C_2H_2



sp³ **sp²** **sp**

2. The shortcut

Count the **groups** around carbon. A double or triple bond counts as **one** group. 4 groups: sp³. 3 groups: sp². 2 groups: sp.

3. s character

sp 50%, sp² 33%, sp³ 25%. More s character means shorter, stronger bonds.

Solved example

Q. Find the hybridisation of each carbon in $CH_3–CH=CH_2$.
A. CH_3 carbon: 4 groups, sp³. CH= carbon: 3 groups, sp². $=CH_2$ carbon: 3 groups, sp².

Practice questions

1. (MCQ) The carbon in ethyne is (a) sp³ (b) sp² (c) sp (d) sp³d
2. (Very short) What is the bond angle in methane?
3. (Very short) What is the shape around sp² carbon?
4. (Short) What is the s character of sp² hybrid orbitals?
5. (Short) Find the hybridisation of carbon in CO_2.
6. (Short) Why is a C≡C bond shorter than a C–C bond?

Answer key

1. (c).
2. About 109.5°.
3. Trigonal planar.

4. 33%.
5. sp: two groups around carbon.
6. Greater s character and more bonding between the atoms.

▶ Watch the video explanation · Instagram