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Write the molecular formula for this compound.

- $C_8H_9NO$
- $C_{15}H_{25}N$
- $C_5H_9FO$
- $C_{15}H_{27}NO$

How many total lone pairs would be on atoms in this compound?

- 3
- 1
- 5
- 3

What is the electronic geometry around the atom indicated by the arrow?

- Trigonal Planar
- Tetrahedral
- Tetrahedral
- Trigonal Planar

What is the molecular geometry around the atom indicated by the arrow?

- Trigonal Planar
- Trigonal Pyramidal
- Tetrahedral
- Trigonal Planar

Indicate the following bond angles, where the central atom listed is the atom indicated by the arrow.

- C-C-C 120°
- C-C-H 120°
- C-N-H 107°
- H-N-H 107° (Close to 109.5°. A little less due to the lone pair.)
- C-C-C 109.5°
- C-C-H 109.5°
- C-C-C 120°
- C-C-H 120°

What is the hybridization of the atom indicated by the arrow?

- $sp^2$
- $sp^3$
- $sp^3$
- $sp^2$
For the atom indicated by the arrow, show the **atomic orbital diagram** for the valence electrons in the isolated atom (i.e. before it is bonded). The first one has been done for you.

### Done for N:

Now, for the same atom, show the **orbital diagram** for the atom now that it is bonded. The first one has been done for you.

### Describe the bonding** for the bond between the atoms designated as 1 and 2. Include which orbitals are overlapping to form what types of bonds.

<table>
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<tr>
<th>Bonding Description</th>
<th>Diagram 1</th>
<th>Diagram 2</th>
<th>Diagram 3</th>
<th>Diagram 4</th>
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