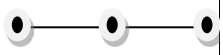
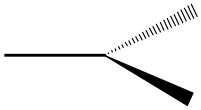
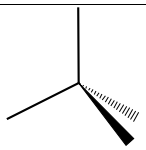
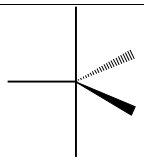
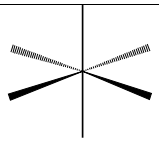
gridlocks – can you unlock the grid?

Shapes of molecules: the geometry of the central atom

Before you answer the puzzles below fill in the table of geometries using:

tetrahedral **120°** **109.5°** **octahedral**

number of electron pairs	geometry	undistorted bond angle	drawing	example
2	linear	180°		$BeCl_2$
3	trigonal planar			BF_3
4				CH_4
5	trigonal bipyramidal	120° & 90°		PCl_5
6		90°		SF_6

Gridlock 1

Each row, column and 2 x 2 box contains information about the first four geometries listed above. Use your problem solving skills and the answers in the table above to fill in the blank boxes.

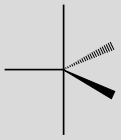
number of electron pairs		geometry	
3			linear
	109.5°		5

undistorted bond angle | number of electron pairs

gridlocks – can you unlock the grid?

Gridlock 2

This puzzle is based on geometries with 3, 4, 5 or 6 electron pairs.

number of electron pairs		geometry	
3			octahedral
			
109.5°			
undistorted bond angle		drawing	

Gridlock 3

In puzzle 3 you need to first work out which of the geometries are in the puzzle and then solve it.

number of electron pairs		geometry	
6			
		trigonal bipyramidal	
			
	CH_4		
example		drawing	

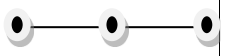
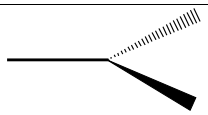
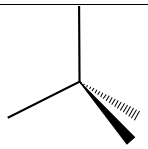
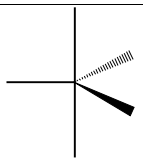
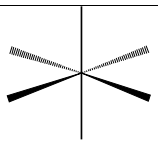
gridlocks – can you unlock the grid?

Shapes of molecules: the geometry of the central atom

Answers

Before you answer the puzzles below fill in the table of geometries using:

tetrahedral **120°** **109.5°** **octahedral**

number of electron pairs	geometry	undistorted bond angle	drawing	example
2	linear	180°		$BeCl_2$
3	trigonal planar	120°		BF_3
4	tetrahedral	109.5°		CH_4
5	trigonal bipyramidal	120° & 90°		PCl_5
6	octahedral	90°		SF_6

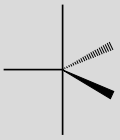
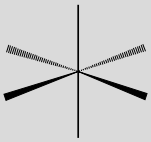
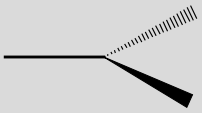
Puzzle 1 – answers

Each row, column and 2 x 2 box contains information about the first four geometries listed above. Use your problem solving skills and the answers in the table above to fill in the blank boxes.

number of electron pairs		geometry	
3	5	tetrahedral	linear
4	2	trigonal bipyramidal	trigonal planar
180°	109.5°	3	5
120° & 90°	120°	2	4
undistorted bond angle		number of electron pairs	

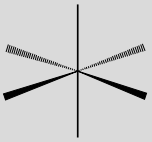
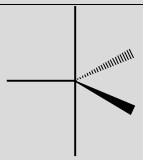
Puzzle 2 – answers

This puzzle is based on geometries with 3, 4, 5 or 6 electron pairs.

number of electron pairs		geometry	
3	4	trigonal bipyramidal	octahedral
5	6	trigonal planar	tetrahedral
90°	120°		
109.5°	120° & 90°		
undistorted bond angle		drawing	

Puzzle 3 – answers

In puzzle 3 you need to first work out which of the geometries are in the puzzle and then solve it.

number of electron pairs		geometry	
6	5	tetrahedral	linear
4	2	trigonal bipyramidal	octahedral
PCl_5	SF_6		
$BeCl_2$	CH_4		
example		drawing	