Apply the VSEPR theory to these molecules and predict the VSEPR shape for each molecule. Look at the structure using the refcode provided to confirm that they are that shape. **NOTE: Some of the transition metal centres have the valence electron count to enable you to answer the question.** Use the tables below as a guide to setting out your answers:

TOP TIP!
When looking at some crystal structures on the database there will sometimes be two species on a refcode but you may only need to look at one of them. The two species are ions; one is a positive ion and the other is a negative ion. It is not possible to have 1 ion without the opposite 'counter **ion'.**

www.flickr.com/photos

Cadmium (Cd) has 6 electrons in its outer shell.

1. $Pb(CH_3)_4$

Refcode: *VADRAU*

Formula	
Central Atom	
Valence Electrons	
Surrounding Atoms	
Charge	
Total	
Electron Pairs	
No. e-pairs = Base Shape	

2. $CdI_2(NC_5H_5)_4$

Refcode: *COPGOD*

Formula	
Central Atom	
Valence Electrons	
Surrounding Atoms	
Charge	
Total	
Electron Pairs	
No. e-pairs = Base Shape	

3. $[NH_4]^+$

Refcode: *ACARBM01*

Formula	
Central Atom	
Valence Electrons	
Surrounding Atoms	
Charge	
Total	
Electron Pairs	
No. e-pairs = Base Shape	

4. $B(OH)_3$

Refcode: *JAGREP*

Formula	
Central Atom	
Valence Electrons	
Surrounding Atoms	
Charge	
Total	
Electron Pairs	
No. e-pairs = Base Shape	

Produced by Mumena Ali at Newcastle University as part of a Nuffield Bursary Project.
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I2- Using VSEPR to Predict Shapes of Molecules Worksheet

5. $[OsCl_3F_3]^{2-}$

Refcode: *YUHROI*

Osmium (Os) has 4 electrons in its outer shell.

Formula	
Central Atom	
Valence Electrons	
Surrounding Atoms	
Charge	
Total	
Electron Pairs	
No. e-pairs = Base Shape	

6. $HgCl_3^-$

Refcode: *KUSMAM*

Mercury (Hg) has 2 electrons in its outer shell.

Formula	
Central Atom	
Valence Electrons	
Surrounding Atoms	
Charge	
Total	
Electron Pairs	
No. e-pairs = Base Shape	

7. $[CBr_3]^+$

Refcode: *IYUVAZ*

Formula	
Central Atom	
Valence Electrons	
Surrounding Atoms	
Charge	
Total	
Electron Pairs	
No. e-pairs = Base Shape	

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