







**Table 5: Supplementary Material**

**Student verbal utterances mapped against accompanying gestures. Case 2 example illustrates cooperative use of speech with gestures. With gestures translating all spatial information.**

Case 2			
Verbal Utterances	Gesture Description	Gesture Type	Gesture
1. "Think SF <sub>6</sub> is octahedral."	Student uses left hand to outstretch the index finger	Iconic	
2. "... so they would keep as far apart as possible... there would be.."			
3. "a fluoride here..."	Student uses right hand to point to the tip of the outstretched left hand index finger....	Deictic-Iconic	
4. "...and here..."	...then points to the base knuckle of the same finger.	Deictic-Iconic	
5. "...and sulfur here.)	Student uses right hand to point to the middle knuckle of the outstretched left index finger.	Deictic-Iconic	
6. "...and then there would be..."	Student pivots the outstretched left index finger upwards by approximately 45 degrees.	Iconic (2 <sup>nd</sup> )	
7. "... another one..."			
8. "pushed here...so there would be.."	Student uses right hand to point to the tip of the approx. 45 degrees outstretched left index finger.	Deictic-Iconic	
9. "a fluorine here..."			

## Table 5: Supplementary Material

Student verbal utterances mapped against accompanying gestures. Case 2 example illustrates cooperative use of speech with gestures. With gestures translating all spatial information.

10. "...and here."

Student uses right hand to point to the base knuckle of the approx. 45 degrees outstretched left hand index finger.

Deictic-Iconic



11. "...sulfur here..."

Student uses right hand to point to the middle knuckle of the approx. 45 degrees outstretched left index finger.

Deictic-Iconic

Student 3 shakes their head.



12. "I'm trying to think where it should be..."

Student uses left hand to outstretch index finger directly upwards at approximately 90 degrees to the 1<sup>st</sup> iconic left handed gesture and in the same plane.

Iconic (3<sup>rd</sup>)

13. "No... and then there would be another one..."



14. "... a fluorine pushed here..."

Student uses right hand to point to the base knuckle of the outstretched left hand index finger.

Deictic-Iconic



15. "...here..."

...then points to the tip of the same finger.

Deictic-Iconic



## Table 5: Supplementary Material

Student verbal utterances mapped against accompanying gestures. Case 2 example illustrates cooperative use of speech with gestures. With gestures translating all spatial information.

16. "...and sulfur here..."

Student uses right hand to point to the middle knuckle of the outstretched left index finger.

Deictic-Iconic

