**Lancashire Secondary Consultant Team**

**Science Department Review**

**October 11th, 2021**

**Walton le Dale High School**

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**Carried out by *Andy Pearson – Secondary Science Consultant***

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| **Context of review** |
| The review has taken place in response to an invitation from the Headteacher and Subject Leader for Science to help establish a measure of the quality of education in Science  The review took place over the whole school day Monday 11th October 2021 and included the following activities:   * Discussion with Subject Leader for Science regarding the intent of science education at Walton le Dale. Discussion focuses on curriculum, progression within the curriculum and what students are expected to know and can do as a result of experiencing the science curriculum. * Discussion with Assistant Subject Leader regarding the use of assessment within science, focusing on assessment for learning, assessment of learning and assessment as learning. * A series of accompanied lesson visits, eleven in total, visiting a range of year groups, prior abilities and staff members in order to judge the implementation and impact of the science curriculum. Visits shared with subject leader, assistant subject leader and assistant headteacher (teaching and learning). Both Science and Psychology lessons were visited. * Student voice with five students from different year groups, teaching groups and of a variety of prior attainment. |

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| **Data review** |
| Outcomes for Summer 2019:  **Combined Science**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Number of candidates |  | % 7-7 & above | % 5-5 & above | % 4-4 & above | % 1-1 & above | | 8,235 | Lancashire | 8% | 39% | 61% | 98% |   **Biology**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Number of candidates |  | % 7-7 & above | % 5-5 & above | % 4-4 & above | % 1-1 & above | | 3,371 | Lancashire | 42% | 83% | 92% | 100% |   **Chemistry**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Number of candidates |  | % 7-7 & above | % 5-5 & above | % 4-4 & above | % 1-1 & above | | 3,334 | Lancashire | 43% | 79% | 91% | 100% |   **Physics**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Number of candidates |  | % 7-7 & above | % 5-5 & above | % 4-4 & above | % 1-1 & above | | 3,337 | Lancashire | 43% | 79% | 91% | 100% |   Findings   * Outcomes for combined science and separate science are shared to allow a county comparison only. * 2019 represents the last formal KS4 assessment data for most curriculum subjects |

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| **Curriculum design** |
| **Findings**   * The science curriculum is clearly sequenced. All students experience the science curriculum in the same sequence over the course of the five years at Walton le Dale. The subject leader has developed a thorough understanding of the science curriculum and has a clear rationale for its design. * Substantive and disciplinary knowledge are clearly sequenced throughout the curriculum and structures are in place to deliver disciplinary knowledge in the context of relevant substantive knowledge. * The curriculum design meets the needs of the national curriculum. * The subject leader and the science team have developed an understanding of the key threshold concepts in science that form the deep structure. The team have used these 'big ideas' to begin to develop core understanding that is essential to making progress through the curriculum. * The key stage three curriculum includes an introduction to Psychology as a transition opportunity for all students. A proportion of students select GCSE Psychology as an option at key stage four. * In science students follow a pathway through to Combined Science at GCSE or to Separate Sciences at GCSE. |
| **Suggested actions**   * Continue to develop the delivery and assessment of disciplinary knowledge in the context of substantive knowledge through explicit teaching. * Build in opportunities for curriculum review. Allow team members to periodically contribute to review conversations around best practice in relation to curriculum delivery, identifying misconceptions that occur during teaching. |

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| **Teaching and learning within the department** |
| **Findings – based on eleven visits to lessons with a focus on learning and teaching, each lasting no more than 15 minutes**   * Teaching and learning in science is of a good quality. * There is consistency of practice across the faculty in the use of super six starters, during which students are informally assessed on knowledge and skills from previous lessons over different intervals of time. At its best, this encourages retention and recall over a range of substantive content in the main. * There is consistency of practice in the use of exit three questioning that helps draw together the key learning and skills from the lesson. * Questioning is a strong feature of science lessons, with high levels of teacher engagement with students, using cold calling. * Staff 'touring' the classroom, prompting and probing, responding, and adapting is particularly effective. * Effective use of mini whiteboards in several lessons by a variety of staff was seen to promote effective whole class assessment. * Individual examples of best practice observed include:   + Question – response – follow up question – response – praise with specifics. An outstanding exchange between staff and students where the follow up, probing questioning particularly exposed the learning taking place and the subsequent praise being specific to the best features of the response.   + Whilst cold calling, prior lead-in time was given to allow students time to build their answers. This strategy is very effective as it allows the consistent use of cold calling in addition to adding a layer of calm preparation time.   + Particularly good use of classroom display in helping students answer part of the super six starter questions. Clear reminders of strategies that are helpful in understanding substantive knowledge.   + Explicit sharing of the organisational aspects of think-pair-share. Students roles in the activity clearly outlined. This ensured high levels of engagement with the proposed learning activity.   + Retention task covering a whole unit of work being used to reteach where necessary in preparation for an end of unit summative assessment. Skilful questioning and scaffolding enabling recall from students. |
| **Suggested actions**   * Continue to use and develop the super six starters and the exit three plenary tasks both formatively and diagnostically, encouraging staff to reteach and revisit where necessary. Begin to include disciplinary knowledge in the super six and exit three to help improve interweaving with substantive knowledge. * Share expertise and best practice at faculty meetings whenever possible. Possibly highlighting a different member of staff each meeting, with a chance to share a 'what went well' moment. |

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| **Student Voice** |
| * Conducted with five students from different year groups and different prior attainment backgrounds. One student from GCSE Psychology and four students studying science, year 7, year 9, year 9 and year 11 * Without exception, students are able to clearly articulate the learning from that day. Students had good understanding of the substantive and disciplinary knowledge being developed. * Students could link back to previous learning and had an awareness of the sequence of lessons to that point. Students were less confident talking about the upcoming lessons in a sequence and found it difficult to articulate the 'direction of travel' of the learning. * Homework was seen by students to be linked to both previous learning as consolidation and as a vehicle for introducing new content. * Students understand the purpose of the super six as an aide to retention and recall and valued this as part of the science and psychology lessons. |
| **Suggested actions**   * Use 'zoom in, zoom out' to help make the context of the learning explicit to students. Share the sequence of lessons that the students will be studying, linking backwards and forwards through the sequence. |

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| **Key findings and priority areas for development** |
| * This is currently a good science department. * Leadership of the department is clear and consistent. Roles are clear and the subject leader and assistant subject leader can articulate their intent for the science department with confidence. * The purpose and use of assessment is well understood, with mini whiteboards, cold calling and questioning particularly strong features in most science lessons. * The curriculum model for science is well designed and sequenced and being delivered consistently by all members of the science team. * Relationships between staff and students appear very positive and the behaviour for learning observed during the review was very positive, exhibiting high levels of engagement and participation with consistent application of rewards and sanctions being observed. * There is an opportunity to develop the explicit sharing of lesson sequences with students, not just linking backwards to previous knowledge but in anticipation of the knowledge yet to be developed. * There is also an opportunity to continue to develop the delivery and assessment of disciplinary knowledge in the context of substantive knowledge, an area already identified by the subject leader. |