Improving pupil outcomes in science while reducing teacher workload

Process evaluation report

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Executive summary

Learning by Questions (LbQ) is a web-based classroom application that uses scaffolded questions and immediate feedback to develop pupil mastery of curriculum content. Real-time assessment data from LbQ allows teachers to offer immediate intervention to individuals or groups of pupils, without the need to mark pupil work.

Our evaluation sought to identify whether the use of LbQ in end of topic summary lessons had an impact on Progress Test in Science scores for Year 7 pupils. It also sought to find out if its use resulted in reduced teacher workload.

We were unable to ascertain the impact of LbQ on pupil progress due to the COVID-19 lockdown. However, we were able to draw some insights into the implementation and short-term use of LbQ over half a school year. Our reflections were as follows:

- The real-time class feedback function is one of LbQ's biggest strengths. It allows for close class monitoring and teachers felt this led to big gains in pupil understanding by highlighting areas of misunderstanding and ranking them by how many pupils have the misunderstanding. All teachers reported that they were able to provide more feedback when using LbQ than their usual teaching methods.
- Pupils with higher and middle Cognitive Abilities Test (CAT) scores favoured LbQ more than pupils with lower CAT scores.
- Combining questions with simple diagrams is an excellent way of encouraging dual coding and appeared to allow pupils to use LbQ more autonomously.
- All teachers reported a reduction in planning and marking time when using LbQ.
- All teachers would recommend LbQ to other teachers.

Our recommendations to improve LbQ are as follows:

- Fully functional technology is essential for the effective running of LbQ. If using hardware or software is deemed to be more work than the standard method of teaching, the software will not be fully embraced.
- A "How-to Guide" for using LbQ with lower CAT score groupings would be useful to help teachers get the most out of LbQ.
- Many teachers may overlook the key word list when setting up question sets on LbQ. Perhaps an option for pupils to pull up key words when using the website would be useful.
- Allow more than three question sets to run to allow high-flying pupils to be stretched.
- Allow the option to toggle on/off strictness of spellings.

Introduction

A description of the issue that we wanted to address

Workload is an issue that affects all teachers. Most teachers believe the effective use of information and communications technology (ICT) in the classroom can reduce workload and benefit the progress of pupils. However, evidence is lacking into specific approaches that demonstrate this. Learning by Questions (LbQ) is a classroom application that uses scaffolded questions and immediate feedback to develop pupil mastery of curriculum content. Real-time assessment data from LbQ allows teachers to offer immediate intervention to individuals or groups of pupils, without the need to mark pupil work

What existing research evidence exists?

The Department for Education (2014) Workload Challenge found that the three biggest areas that lead to unnecessary workloads are: marking, planning and data management. Hattie et al. (2008) identified feedback as an important strategy that enables pupils to make progress. If marking is the main way of providing feedback for pupils, these two findings illustrate a degree of dissonance between reducing teacher workload and enabling pupil progress.

An article by Selwood and Pilkington (2005) concluded that teachers believed the introduction of ICT has helped to reduce teacher workload. They reported that teachers expected that ICT could effectively be used to engage disaffected pupils, whilst allowing the monitoring of progress and performance.

The Institute for Effective Education (2018) reported that the use of LbQ by both primary and secondary school teachers resulted in a reduction in teacher workload of one to two hours per week and an improvement in pupil motivation and achievement.

The use of LbQ as a teaching and learning strategy is supported by McDaniel et al. (2007) who concluded that in the classroom testing can be used to promote learning, not just evaluate it. By providing teachers with real-time assessment data on pupils, teachers can intervene immediately to address pupil misunderstandings. This should accelerate pupil acquisition of knowledge as Kulik and Kulik (1988) found that immediate feedback is more effective in promoting acquisition of test content than delayed feedback.

It was hoped that the use of LbQ would be the ICT solution that not only remedies the conflict between teacher workload and providing pupil feedback but also results in better outcomes for pupils.

What did we do?

Identification of our sample group

Sacred Heart Catholic High School is a non-selective secondary school, for girls aged 11–18, located in Newcastle upon Tyne. With an enrolment of around 1,400 pupils, it is much larger than other schools of its type. The proportion of girls who are supported through the pupil premium is 34% and 20% are in receipt of free school meals. Sixty percent of the girls are Catholic. An above average proportion of pupils are from minority ethnic groups and a well above average speak English as an additional language. The proportion of disabled pupils and those who have special educational needs supported at school is below average.

There were eight sets in Year 7 in 2019/20. These sets were allocated based on end of Year 6 Cognitive Abilities Test (CAT) scores. Four of these sets were mixed higher CAT score classes (ie, those with the highest CAT scores were allocated evenly within these classes), two were mixed middle CAT score classes and two were lower CAT score classes. As we wished to investigate the impact of LbQ on different groupings, pairs of classes with similar CAT scores

were created; two of the four high CAT score classes were selected (by coin toss) to participate, while all middle and lower CAT score sets participated. The participating classes contained a total of 165 pupils, 40 of whom received free school meals. A coin toss was used to randomly allocate one class from each pair to the intervention group and one to the control group.

A summary of allocations is given below. The number in brackets is the number of pupils in that class.

Year 7		
Control	Intervention	Subgroup
7S (31) KMI/KBT	7A (31) DVY	High CAT scores
7D (27) ARN	7E (29) MEY	Medium CAT scores
7T (18) AWN	7H (29) KMI	Low CAT scores

Note: The teachers were allocated to each class by the head of science. This is not something that could be reasonably controlled due to the complex nature of timetabling in school.

Parents were informed of the evaluation, by letter, to reassure them that no pupils were being unfairly disadvantaged. An opt-out was offered to parents if they did not wish for their child's data to be collected and shared with third parties. No parents objected.

Method

Stage 1. Introduction to study, tablet setup and staff training

On 17 June 2019, science teachers were introduced to Learning by Questions (LbQ) and given training in its use. This allowed them to become familiar with the software and the tablets that would be running LbQ.

Tablets were received on 15 July and set up prior to the start of the project in September.

Staff were briefed again on the project and the use of LbQ in a science department meeting on 11 September 2019. Control and intervention group class teachers were informed of their roles and intervention group teachers were provided with the LbQ topic checklist that outlined the LbQ question sets that needed to be completed and by when.

Stage 2. Pre-testing of control and intervention groups

The GL Assessment Progress Test in Science was used to gauge a benchmark score for all pupils in the study. Pupils sat the "11T" paper test (suitable for 11–12 year olds) in their classrooms during the week of 16–20 September. All 165 pupils completed the test.

Test were marked by GL Assessment and scores were available for analysis on 17 October 2019.

Stage 3. Running the trial

Intervention group teachers (of 7A, 7E and 7H) began teaching subject content after the pre-testing was complete. They did not complete the question sets as a starter activity as suggested to them in the table below due to time constraints when handing out and collecting in tablets.

Question set	Term to complete by	Done?
Complex units	SPRING	
Converting units with prefixes - deci, centi, milli	SPRING	
Converting units with prefixes - mega- kilo -	SPRING	
Basic laboratory apparatus	INTRO IN SEPT	
Apparatus for heating	AUTUMN	
Drawing laboratory apparatus	AUTUMN	
Combustion: using a Bunsen burner	INTRO IN SEPT	
Combustion: the products	AUTUMN	
Combustion: complete and incomplete	AUTUMN	
Combustion: the fire triangle and fire extinguishers	INTRO IN SEPT	
Simple units	SPRING	
Using equation triangles to rearrange equations	SPRING	
Symbols and names for units with prefixes	SUMMER	
Symbols and names of quantities in physics	SUMMER	
Units in physics mixed questions Set 1	SUMMER	
Units in physics mixed questions Set 2	SUMMER	
Units in physics mixed questions Set 3	SUMMER	

Instead, they went straight onto the question sets in the table below in summary lessons at the end of each topic. A topic lasted on average four to five weeks. Summary lessons were one hour long and involved pupils completing up to three LbQ question sets with teachers monitoring and providing feedback as appropriate. This was done on a whole class level based on what the LbQ real time feedback showed, however teachers would also circulate the room and assist pupils on an individual level. Not all classes followed the same order of topics so different topic question sets were completed by different classes.

Question set	Year	Topic	Done?
Cell structures: comparing plant and animal cells	7	B1	
Specialised cells: an overview	7	B1	
Specialised animal cells	7	B1	
Specialised plant cell	7	B1	
Using a microscope	7	B1	
Making and observing microscope slides	7	B1	
Cells vocabulary	7	B1	
The structure and function of the respiratory system	7	B2	
Levels of organization	7	B2	
Structure and function of human skeleton	7	B2	
Structure and function of female reproductive system	7	B3	
Structure and function of male reproductive system	7	B3	
Human life cycle and puberty	7	B3	
Menstrual cycle	7	B3	
Fertilisation and implantation	7	B3	
Foetal development and birth	7	B3	
Human reproduction vocabulary	7	B3	
Sexual reproduction in plants	7	B3	
Properties and Arrangement of Particles in a Solid, Liquid and Gas	7	C1	
Changing state	7	C1	
Diffusion	7	C1	
Heating and cooling curves	7	C1	
Particle model vocabulary	7	C1	
Atoms and elements	7	C2	
Compounds and mixtures	7	C2	
Naming simple compounds	7	C2	
Periodic table: basics	7	C2	
Element names with symbols	7	C2	
Properties of acids and alkalis	7	C4	

Neutralisation	7	C4	
Understanding forces 1: balanced forces	7	P1	
Understanding forces 2: unbalanced forces	7	P1	
Forces vocabulary	7	P1	
Weight = Mass × Gravitational Field Strength Equation and Calculation (With Equation Triangles)	7	P1	
Weight = Mass × Gravitational Field Strength Equation and Calculation	7	P1	
Waves basics - light and sound	7	P2	
Amplitude and frequency of sound waves	7	P2	
Dispersion of light	7	P3	
Reflection and refraction of light	7	P3	
Reflection of coloured light	7	P3	
The solar system (note under physics on LbQ)	7	P4	
Day and night, years and seasons	7	P4	

Appendix 2 shows the question sets that were completed by each intervention group teacher.

Lesson observations
I arranged to observe and assist in the setting up of LbQ and the tablets at the beginning. The purpose of these observations were to ensure that intervention teachers were comfortable in the use of the tablets, setting up a session on LbQ, reading the real time feedback and then responding to it. I did not observe 7E but had a meeting with their teacher who did not require assistance in running LbQ as he is our school IT facilitator as well as a teacher.

Reviews with intervention group teachers
Reviews were scheduled to take place at the end of each term. Only the end of autumn term review was carried out due to COVID-19. During the review, I met with the intervention teachers to confirm the following verbally:

1. Had they completed the topics that they should have?
2. Had they completed the correct number of LbQ summary lessons for the topics?
3. Had they used the correct number of LbQ activities as starter activities?
4. Were there any issues when using LbQ that needed to be addressed?

The project plan was adapted where possible in response to this feedback. Additional written feedback was gathered on paper by myself and the following questions were asked:

1. How difficult was it to use LbQ with your class over the past term? Please provide additional information to support.
2. How much time providing feedback does using LbQ require of you in comparison to how you would normally give feedback? Please provide extra information to support.
3. How likely are you to use LbQ in the future?
4. Would you recommend LbQ to a teacher who wants to reduce their planning workload? Please provide extra information to support.
5. Tell us something about the time you have saved by running a question set (eg, planning, marking assessments)?

Stage 4. Post-testing and results analysis

The project was cut short as of 20 March 2020 due to school closure as a result of COVID-19.

The remaining actions that were not completed were as follows:

1. April 2020: Second review with intervention group teachers – feedback and reporting issues.
2. June 2020: Control and intervention groups to complete an end-of-year 'in-house' assessment. This was to be a paper assessment produced by a teacher not linked to the project.
3. June 2020: Intervention teachers to complete an end-of-year questionnaire to provide information on how they felt LbQ had affected their workload.
4. June 2020: Intervention pupils to complete an end-of-year questionnaire to provide their views on the efficacy of LbQ.
5. July 2020: Project coordinator to collate data and write final report.

Process evaluation data and feedback

Feedback from December review with intervention group teachers

A questionnaire was completed by each intervention group teacher along with a conversation about initial thoughts on Learning by Questions (LbQ).

7A DVY questionnaire responses

1. How difficult was it to use LbQ with your class over the past term? Please provide additional information to support.

   Very easy to use the software but there were some issues with tablets not connecting to the internet. The question sets are good and apply to what we have covered.

2. How much time providing feedback does using LbQ require of you in comparison to how you would normally give feedback? Please provide extra information to support.

   About the same – spend a lot of time circulating the class giving 1:1 feedback.

3. How likely are you to use LbQ in the future?

   Very likely (I use it with other groups who are not in this study).

4. Would you recommend LbQ to a teacher who wants to reduce their planning workload? Please provide extra information to support.

   Yes – useful for plenaries and another revision tool for those bored of Seneca etc.

5. Tell us something about the time you have saved by running a question set (eg, planning, marking assessments)?

   Clearly saved time as no marking – bonus.

DVY conversation feedback:

Teacher clearly likes using LbQ and has been using it a lot with other classes and year groups. She was frustrated by intermittent tablet functionality but sees the value in using LbQ in terms of assessing pupil understanding and then addressing misconceptions.

I observed the class in one of their first LbQ lessons and pupils were very quick at picking up how to use it. Some pupils were frustrated with tablet issues, others pointed out that it was quite strict with regards to spelling of correct answers and they sometimes missed when more than one answer needed to be selected. Discussion with this class teacher led to the idea of issuing spelling homework based on incorrect LbQ answers that were down to spelling.

7E MEY questionnaire responses

1. How difficult was it to use LbQ with your class over the past term? Please provide additional information to support.

   The use of the platform itself is very easy, starting questions is easy and getting the pupils signed in is also easy. Tablets can be temperamental, so I usually switch to using laptops.

2. How much time providing feedback does using LbQ require of you in comparison to how you would normally give feedback? Please provide extra information to support.

   Feedback is much easier as LbQ identifies specific areas to focus on, making the whole process more responsive to pupil needs and more efficient.

3. How likely are you to use LbQ in the future?

100%.

4. Would you recommend LbQ to a teacher who wants to reduce their planning workload? Please provide extra information to support.
   Yes, revision and intervention can be completed with minimal planning but high impact.

5. Tell us something about the time you have saved by running a question set (e.g. planning, marking assessments)?
   Planning time saved, all you really have to do is check question sets and occasionally modify. Immediate verbal feedback–not written, saves time.

MEY Conversation Feedback:
MEY is very positive about using LbQ when using laptops. He has not had any issues using the software and finds pupils are using it well. He has been allowing pupils to speak to each other when using LbQ but has given some consideration to whether it might be more effective to make them work through their question sets in silence.

7H KMI questionnaire responses
1. How difficult was it to use LbQ with your class over the past term? Please provide additional information to support.
   Difficult, my class are a nurture group who need consistency to remain on task. A few tablets would periodically not switch on whilst others have struggled to understand some of the question sets. Perhaps differentiated question sets could be written. The strictness of spellings creates a barrier for pupils who knew answers but were getting questions incorrect due to spelling.

2. How much time providing feedback does using LbQ require of you in comparison to how you would normally give feedback? Please provide extra information to support.
   I find myself giving more feedback to pupils because LbQ is good at highlighting a lack of pupil understanding. However, because LbQ highlights a large amount of misunderstanding in a lower ability class, I have to pick and choose which bits to review with pupils so as not to demotivate them.

3. How likely are you to use LbQ in the future?
   More likely to use with laptops or an ICT suite.

4. Would you recommend LbQ to a teacher who wants to reduce their planning workload? Please provide extra information to support.
   Yes, for more able classes. Using with low ability classes can be stressful.

5. Tell us something about the time you have saved by running a question set (eg, planning, marking assessments)
   I have saved time in terms of planning lessons and marking books, however, I am not sure how productive lessons are.

KMI conversation feedback:
KMI has found the running of LbQ with a lower prior attainment group to be quite challenging. We discussed providing a key word list at the start of LbQ lessons to help pupils with spelling of answers. I observed this class during one of their first LbQ sessions and it was a challenging

lesson to teach. There were some issues with tablets, which demotivated some of the pupils from the offset. Pupils also struggled with different questions at a rate that made it difficult to help all pupils. I suggested that KMI edit some of the question sets in future to make them more accessible to pupils. KMI also had a trainee teacher with her in this lesson. He was also helping pupils during the lesson but also found that pupils struggled to access the questions.

Feedback

I have not been able to collect any other feedback from teachers in the trial due to COVID-19. Pupil questionnaires were not due to be completed until 22 June 22 2020 so it was also not possible to collect feedback from pupils.

I did receive positive feedback from other teachers in the science department who were using LbQ with their classes outside of the trial. They found the question sets very well written and were using some of the Key Stage 3 question sets with lower prior-attaining GCSE pupils. Lower prior-attaining GCSE pupils took to using the software very well and were very positive towards it.

Liz Pugh, science advisor from LbQ, observed 7A and 7E using LbQ and interviewed pupils from those classes in January 2020. She was able to provide feedback, which can be seen in Appendix 1.

Conclusion

Our evaluation sought to identify whether the use of Learning by Questions (LbQ) in end of topic summary lessons had an impact on Progress Test in Science scores for Year 7 pupils. It also sought to find out if its use resulted in reduced teacher workload.

We were unable to ascertain the impact of LbQ on pupil progress due to the COVID-19 lockdown. However, we were able to draw some insights into the implementation and short-term use of LbQ over half a school year. Our reflections were as follows:

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- Combining questions with simple diagrams is an excellent way of encouraging dual coding and appeared to allow pupils to use LbQ more autonomously.
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- Many teachers may overlook the key word list when setting up question sets on LbQ. Perhaps an option for pupils to pull up key words when using the website would be useful.
- Allow more than three question sets to run to allow high flying pupils to be stretched.
- Allow the option to toggle on/off strictness of spellings.

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Appendix 1

Observation feedback from Liz Pugh at LbQ

Liz Pugh, science advisor from Learning by Questions (LbQ), observed 7A and 7E using LbQ and interviewed pupils from those classes in January 2020. She was able to provide the following feedback:

Pupils were very self-reflective with regards to their learning. They were able to articulate to me which sorts of questions allowed them to develop their learning and which sort of questions caused them frustration and presented a potential barrier to their learning.

Unsurprisingly, the pupils spoken to liked the multiple choice questions, although they did say that these weren't as easy as they seemed and that they did make them think.

Pupils didn't like the longer response open text style of questions as much. During discussion, pupils indicated that they felt that the longer response questions held them up, which implies that the pupils saw a competition element in LbQ. This is something that could be addressed in the classroom by sharing and discussing the longer answer responses, using them as an opportunity for literacy development and impressing their importance.

Pupils enjoyed using LbQ and found the feedback to be helpful in supporting them to progress at their own pace without teacher support. This indicated to me that they were developing resilience and confidence to correct their work. Pupils also described how they 'didn't feel upset' when they got an answer incorrect and liked that they could try the question again until they got the answer correct, which appeared to have a further positive impact on their confidence.

Some pupils described frustration when they got an answer incorrect due to a spelling mistake, although they recognised that spelling of key scientific terminology is important. At LbQ, we have made some changes to the way that we structure vocabulary question sets so that key terminology is available in the image, although we maintain that spelling of subject-specific terminology is an important part of pupil literacy.

The pupils that I spoke to were in the sets with middle and high Cognitive Abilities Test (CAT) scores and I was pleased to see the positive impact that using LbQ had on their attitude to learning, resilience and confidence.

Appendix 2

Completed staff checklist of LbQ question sets

7E – MEY

Question set	Term to complete by	Done?
Complex units	SPRING	
Converting units with prefixes - deci, centi, milli	SPRING	
Converting units with prefixes - mega- kilo -	SPRING	
Basic laboratory apparatus	INTRO IN SEPT	Y
Apparatus for heating	AUTUMN	
Drawing laboratory apparatus	AUTUMN	
Combustion: using a Bunsen burner	INTRO IN SEPT	Y
Combustion: the products	AUTUMN	
Combustion: Complete and Incomplete	AUTUMN	
Combustion: The fire triangle and fire extinguishers	INTRO IN SEPT	Y
Simple units	SPRING	
Using equation triangles to rearrange equations	SPRING	
Symbols and names for units with prefixes	SUMMER	
Symbols and names of quantities in physics	SUMMER	
Units in physics mixed questions Set 1	SUMMER	
Units in physics mixed questions Set 2	SUMMER	
Units in physics mixed questions Set 3	SUMMER	

Question set	Year	Topic	Done?
Cell structures: comparing plant and animal cells	7	B1	Y
Specialised cells: an overview	7	B1	Y
Specialised animal cells	7	B1	Y
Specialised plant cells	7	B1	Y
Using a microscope	7	B1	Y
Making and observing microscope slides	7	B1	Y
Cells vocabulary	7	B1	Y
The structure and function of the respiratory system	7	B2	Y
Levels of organization	7	B2	Y
Structure and function of human skeleton	7	B2	Y
Structure and function of female reproductive system	7	B3	
Structure and function of male reproductive system	7	B3	
Human life cycle and puberty	7	B3	
Menstrual cycle	7	B3	
Fertilisation and implantation	7	B3	
Foetal development and birth	7	B3	
Human reproduction vocabulary	7	B3	
Sexual reproduction in plants	7	B3	
Properties and arrangement of particles in a solid, liquid and gas	7	C1	Y
Changing state	7	C1	Y
Diffusion	7	C1	Y

Heating and cooling curves	7	C1	Y
Particle model vocabulary	7	C1	Y
Atoms and elements	7	C2	Y
Compounds and mixtures	7	C2	Y
Naming simple compounds	7	C2	Y
Periodic table: basics	7	C2	Y
Element names with symbols	7	C2	Y
Properties of acids and alkalis	7	C4	
Neutralisation	7	C4	
Understanding forces 1: balanced forces	7	P1	Y
Understanding forces 2: unbalanced forces	7	P1	Y
Forces vocabulary	7	P1	Y
Weight = Mass × Gravitational Field Strength Equation and Calculation (With Equation Triangles)	7	P1	Y
Weight = Mass × Gravitational Field Strength Equation and Calculation	7	P1	Y
Waves basics – light and sound	7	P2	Y
Amplitude and frequency of sound waves	7	P2	Y
Dispersion of light	7	P3	
Reflection and refraction of light	7	P3	
Reflection of coloured light	7	P3	
The solar system (note under physics on LbQ)	7	P4	
Day and night, years and seasons	7	P4	

7A – DVY

Question set	Term to complete by	Done?
Complex units	SPRING	
Converting units with prefixes - deci, centi, milli	SPRING	
Converting units with prefixes - mega- kilo -	SPRING	
Basic laboratory apparatus	INTRO IN SEPT	
Apparatus for heating	AUTUMN	
Drawing laboratory apparatus	AUTUMN	
Combustion: using a Bunsen burner	INTRO IN SEPT	
Combustion: the products	AUTUMN	
Combustion: complete and incomplete	AUTUMN	
Combustion: The fire triangle and fire extinguishers	INTRO IN SEPT	
Simple units	SPRING	
Using equation triangles to rearrange equations	SPRING	
Symbols and names for units with prefixes	SUMMER	
Symbols and names of quantities in physics	SUMMER	
Units in physics mixed questions Set 1	SUMMER	
Units in physics mixed questions Set 2	SUMMER	
Units in physics mixed questions Set 3	SUMMER	

Question set	Year	Topic	Done?
Cell structures: comparing plant and animal cells	7	B1	Y
Specialised cells: an overview	7	B1	Y
Specialised animal cells	7	B1	Y
Specialised plant cells	7	B1	Y
Using a microscope	7	B1	Y
Making and observing microscope slides	7	B1	Y
Cells vocabulary	7	B1	Y
The structure and function of the respiratory system	7	B2	Y
Levels of organisation	7	B2	Y
Structure and function of human skeleton	7	B2	Y
Structure and function of female reproductive system	7	B3	Y
Structure and function of male reproductive system	7	B3	Y
Human life cycle and puberty	7	B3	Y
Menstrual cycle	7	B3	Y
Fertilisation and implantation	7	B3	Y
Foetal development and birth	7	B3	Y
Human reproduction vocabulary	7	B3	Y
Sexual reproduction in plants	7	B3	Y
Properties and arrangement of particles in a solid, liquid and gas	7	C1	Y
Changing state	7	C1	Y
Diffusion	7	C1	Y
Heating and cooling curves	7	C1	Y
Particle model vocabulary	7	C1	Y
Atoms and elements	7	C2	Y
Compounds and mixtures	7	C2	Y
Naming simple compounds	7	C2	Y
Periodic table: basics	7	C2	Y
Element names with symbols	7	C2	Y
Properties of acids and alkalis	7	C4	
Neutralisation	7	C4	
Understanding forces 1: balanced forces	7	P1	Y
Understanding forces 2: unbalanced forces	7	P1	Y
Forces vocabulary	7	P1	Y
Weight = Mass × Gravitational Field Strength Equation and Calculation (With Equation Triangles)	7	P1	Y
Weight = Mass × Gravitational Field Strength Equation and Calculation	7	P1	Y
Waves basics – light and sound	7	P2	Y
Amplitude and frequency of sound waves	7	P2	Y
Dispersion of light	7	P3	
Reflection and refraction of light	7	P3	
Reflection of coloured light	7	P3	
The solar system (note under physics on LbQ)	7	P4	
Day and night, years and seasons	7	P4	

7H – KMI

Question set	Term to complete by	Done?
Complex units	SPRING	
Converting units with prefixes - deci, centi, milli	SPRING	
Converting units with prefixes - mega- kilo -	SPRING	
Basic laboratory apparatus	INTRO IN SEPT	
Apparatus for heating	AUTUMN	
Drawing laboratory apparatus	AUTUMN	
Combustion: using a Bunsen burner	INTRO IN SEPT	
Combustion: the products	AUTUMN	
Combustion: complete and incomplete	AUTUMN	
Combustion: the fire triangle and fire extinguishers	INTRO IN SEPT	
Simple units	SPRING	
Using equation triangles to rearrange equations	SPRING	
Symbols and names for units with prefixes	SUMMER	
Symbols and names of quantities in physics	SUMMER	
Units in physics mixed questions set 1	SUMMER	
Units in physics mixed questions set 2	SUMMER	
Units in physics mixed questions set 3	SUMMER	

Question set	Year	Topic	Done?
Cell structures: comparing plant and animal cells	7	B1	Y
Specialised cells: an overview	7	B1	Y
Specialised animal cells	7	B1	Y
Specialised plant cells	7	B1	Y
Using a microscope	7	B1	Y
Making and observing microscope slides	7	B1	Y
Cells vocabulary	7	B1	Y
The structure and function of the respiratory system	7	B2	Y
Levels of organisation	7	B2	Y
Structure and function of human skeleton	7	B2	Y
Structure and function of female reproductive system	7	B3	
Structure and function of male reproductive system	7	B3	
Human life cycle and puberty	7	B3	
Menstrual cycle	7	B3	
Fertilisation and implantation	7	B3	
Foetal development and birth	7	B3	
Human reproduction vocabulary	7	B3	
Sexual reproduction in plants	7	B3	
Properties and arrangement of particles in a solid, liquid and gas	7	C1	Y
Changing state	7	C1	Y
Diffusion	7	C1	Y
Heating and cooling curves	7	C1	
Particle model vocabulary	7	C1	Y

Atoms and elements	7	C2	Y
Compounds and mixtures	7	C2	Y
Naming simple compounds	7	C2	Y
Periodic table: basics	7	C2	Y
Element names with symbols	7	C2	
Properties of acids and alkalis	7	C4	
Neutralisation	7	C4	
Understanding forces 1: balanced forces	7	P1	
Understanding forces 2: unbalanced forces	7	P1	
Forces vocabulary	7	P1	
Weight = Mass × Gravitational Field Strength Equation and Calculation (With Equation Triangles)	7	P1	
Weight = Mass × Gravitational Field Strength Equation and Calculation	7	P1	
Waves basics – light and sound	7	P2	
Amplitude and frequency of sound waves	7	P2	
Dispersion of light	7	P3	
Reflection and refraction of light	7	P3	
Reflection of coloured light	7	P3	
The solar system (note under physics on LbQ)	7	P4	

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