A Guide to Science at Carlinghow Academy

This document outlines the expectations of how we teach Science at Carlinghow Academy. It includes the key strategies we use and what Science looks like in the school.

This guide includes information about the following:

- Intent, Implementation and Impact
- Developing Experts / Using Developing Experts at Home
- Knowledge Organisers
- Displays/Working Walls and Rocket Words
- Assessment
- Retrieval quizzes / Flashbacks
- Arbor and Interventions
- Objectives
- Presentation
- Photographs in practical activities
- Topics in books
- Cross curricular work
- Marking
- Resources
- Home learning and Homework
- CPD

Intent

Carlinghow Academy's curriculum is driven by the academy's vision that all children 'can and will succeed'.
We provide an ambitious knowledge engaged curriculum that offers exciting and meaningful learning opportunities that motivate and inspire.
The curriculum is underpinned by the National Curriculum and ensures that, at each stage of their learning journey, each child acquires a rich bank of knowledge and skills. This knowledge and these skills in all curriculum subjects are learned, practised, retrieved and remembered at every stage of their journey through school.
Our curriculum is not narrowed, we have designed an ambitious curriculum based on the knowledge of our learners that includes a high proportion of disadvantaged and SEND pupils to ensure that they are equipped with the knowledge and cultural capital they need to succeed in life. Where appropriate a bespoke and highly personalised curriculum offer is made to individual pupils. Hooks, enrichment activities and extra-curricular opportunities supplement 'big question' each topic to enable our children to make connections in their learning and acquire a deep understanding. We ensure that the links we make are real, not contrived and choose areas where genuine connections between subjects occur naturally. Ensuring that the connections make sense to the children.
We are determined that every child, will have a lifelong love of science, and will be able to question and investigate a hypothesis. Our curriculum is led by the high quality and diverse texts that we choose to support learning.
We have created an environment where children are motivated to learn together in a respectful, safe and trusted learning environment where individual success are celebrated.
It is our intent that when our pupils leave school, they will articulate tier 3 vocabulary of the Science curriculum. They will know and remember key learning of Science from their primary years.

Implementation

The curriculum is a knowledge engaged curriculum based on good quality resources.
This Science guide explains how the Science curriculum is implemented at Carlinghow Academy.

The school has adapted the curriculum to help reflect and represent the diversity of our pupils. Creativity and teacher expertise, underpinned by high quality research informed CPD, is woven into the curriculum with specialist teachers and outside agencies working with pupils and teachers, sharing good practice and ensuring that learners learn from the best.

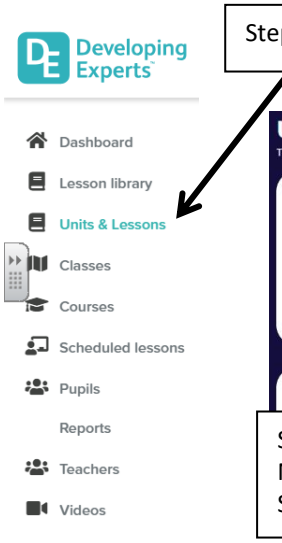
Impact

The impact of providing such an ambitious curriculum driven by the academy's vision and values and taught by skilled teachers ensures that the children of Carlinghow Academy leave prepared for the next stage of their education and able to succeed in life. Knowledge, understanding and skills are secured and embedded so that children attain highly. They take pride in all that they do, always striving to do their best. They demonstrate emotional resilience and the ability to persevere when they encounter challenge. They develop a sense of self-awareness and become confident in their own abilities. They are kind, respectful and honest, demonstrate inclusive attitudes and have a sense of their role in our wider society. They have strong communication skills, both written and verbal, and listen respectfully and with tolerance to the views of others. They

take risks and are emotionally resilient recognising that we make mistakes and learn from them. They dream big and have high aspirations fostered by the belief that with determination and hard work anything is possible.

Developing Experts

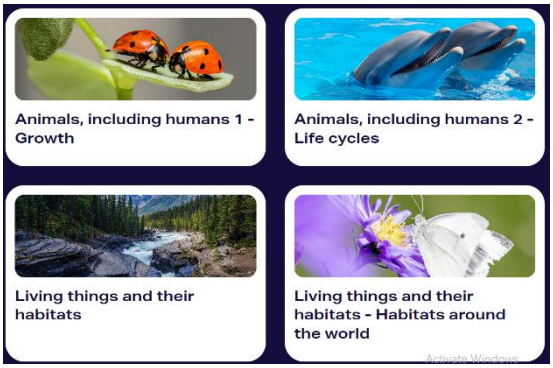
Available https://developingexperts.com/ you will have an individual login for this. There is also a supply login using the supply@carlinghowacademy.org.uk email. Please contact the science co-ordinator for password details. Teachers should use Developing Experts to plan and teach Science in school. Adapting lessons and outcomes where necessary. For example if your topic is space you may wish to link the solar system in with your science lessons. Lessons should also be adapted and differentiated for SEND children and suitable learning challenges should be set that respond to a pupils' diverse learning needs. You may choose objectives for pupils with SEN and/or disabilities that are different from those of the rest of the group, or " modify the curriculum to remove barriers so all pupils can meet their given objectives.



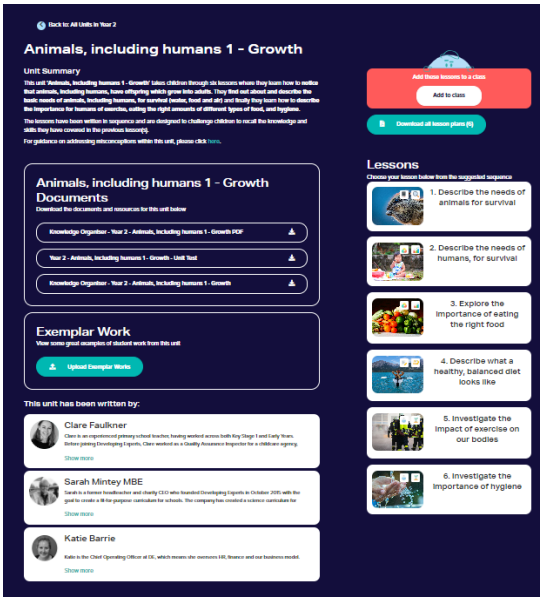
Step 1 – Select Units and courses

Step 2 – Select English National Curriculum Science

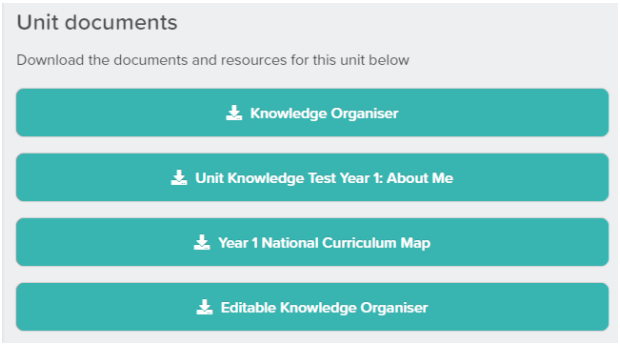
Step 3 – Select your year group



Step 4 – Select your topic



Step 5 – This will give you an overview of the topic and the lessons in it. Please be sure to look at the Curriculum overview for your year group as some start from the top and others from the bottom



In the unit overview you will find a Test about the topic and a word mat which is called the knowledge organiser. This includes the vocabulary that will be used in that unit of work. There may be some additional vocabulary on the year group's overviews, however you can use the edit the mat if you wish. These can also be found on the server: Curriculum Folders 2020-2021 – Science – Developing Experts Curriculum Maps. Here you can then just pick the year group and topic you require.

Children using Developing Experts at Home

All pupils from Reception to year 6 have a unique login to Developing Experts which can be used in school and at home. This allows children to see the lessons and have access to the quizzes by using their own dashboard. This maybe be helpful to reinforce the lesson you have done at school and allow the children time to do the quizzes that they may not have time to do in school. Please encourage pupils to access Developing Experts at home as part of their weekly science homework, differentiating where necessary.

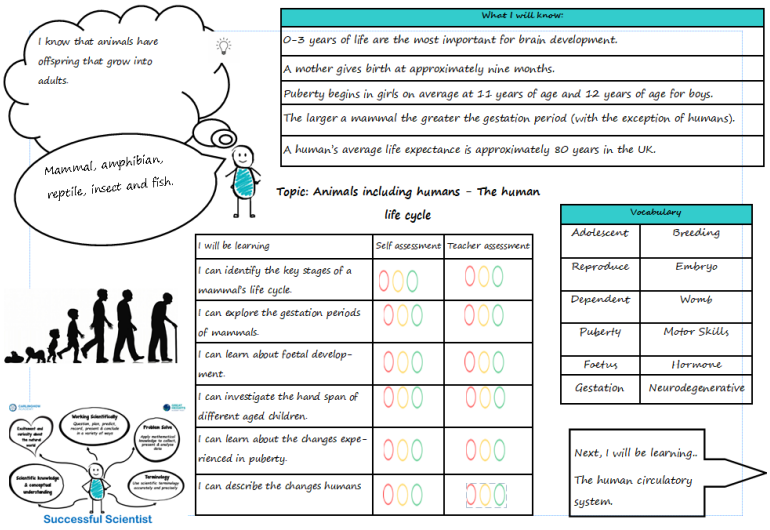
To provide the children with their login codes, please click on **Classes,** then select the class. Choose the **Pupils** tab and from there, you can **Print class letters,** which have instructions for pupils of how to log in.

To add lessons to their dashboard, visit the **Courses** tab. Click **Build a course** and then filter the lessons by Year group to show lessons for that age group. You can select entire units by clicking on the unit banner or select individual lessons by clicking on the lesson tile. Once you have selected your chosen lessons, click **Organise units.** From here, you can drag and drop the units into whichever order you choose and click **Organise lessons** to do the same with the lessons. Click **Finalise course.**

Give your course a name. Start date: If you would like the lessons to be released one per week into the pupil dashboard, give you course today's start date and one new lesson per week, in the order that you set, will appear. If you wish for all the lessons to be accessed at once, choose a date a long time in the past and all the lessons you have selected will then appear.

Classes - you must assign the course to your class otherwise the lessons will not appear in the class or pupil dashboard. Select the day you teach science and click **Create course.** You are still able to edit your course once it has been created by clicking on the **Courses** tab again.

Knowledge Organisers



Knowledge Organisers should be in books at the start of each new unit. These are found on the server > Curriculum 2023-24 > Science Knowledge Organisers. Please make sure you print out the correct unit knowledge organiser and stick it in the children's books before they start the next unit of work.
These should be reviewed with pupils at the start and end of each lesson. The knowledge organisers contain sticky knowledge that children will need to learn over the course of the unit.

Displays/Working Walls and Rocket Words

Each class should have a science working wall displayed which should be updated with the unit of work that is being taught with the relevant unit title and images/scientific vocabulary and ideas that you are working on. There are many scientific words that children may come across in a unit, however to allow the children to learn key words for each lesson there are 5-6 rocket/key words for each lesson that is being taught. The rocket words and explanations are found at the beginning of each Developing Experts lesson. These words should be used to assess children's learning and understanding throughout the lesson to encourage children to use them in their explanations and work. They should then be displayed on the science Working Walls at the start of each lesson so that the children can refer to them throughout the lesson. These will need be updated weekly and match the science lesson that is being taught. Rocket words from previous lessons should be stored in a folder near the science working wall so that they are still accessible by pupils.

Children's work should also be displayed and in line with other subjects. It would also be good to have table top resources for the children to be able to explore and use that relate to the topic including some information books.

Assessment

Formative and summative assessments are recorded on Arbor.
Formative assessments are completed using learning objectives and knowledge organisers in books.
Summative assessments are completed termly and is a best-fit snapshot of a child's development and progress in science within that term.

See assessment timetable below:

Subject Assessments	KS1	LKS2	UKS2
Aut 1	Unit test, found on Developing Experts to be completed at the end of the unit. Formative assessment data on Arbor.	Unit test, found on Developing Experts to be completed at the end of the unit. Formative assessment data on Arbor.	Unit test, found on Developing Experts to be completed at the end of the unit. Formative assessment data on Arbor.
Aut 2	Unit test, found on Developing Experts to be completed at the end of the unit. Formative assessment data on Arbor. Summative assessment data on Arbor.	Unit test, found on Developing Experts to be completed at the end of the unit. Formative assessment data on Arbor. Summative assessment data on Arbor.	Unit test, found on Developing Experts to be completed at the end of the unit. Formative assessment data on Arbor. Summative assessment data on Arbor.
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Sum 1	Unit test, found on Developing Experts to be completed at the end of the unit. Formative assessment data on Arbor	Unit test, found on Developing Experts to be completed at the end of the unit. Formative assessment data on Arbor	Unit test, found on Developing Experts to be completed at the end of the unit. Formative assessment data on Arbor
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Retrieval Quizzes / Flashbacks

Retrieval quizzes (or flashbacks) should be used at the start of each lesson to assess children's prior knowledge against the previous learning, including previous years. The retrieval grid should be used as an assessment tool at the end of the unit to assess against the sticky knowledge taught in the unit that half-term.

Using Arbor

When assessing children on Arbor, assess the unit you have taught within that half term against the sticky knowledge you have taught. Please ensure you look through children's books and Seesaw to find the evidence of children achieving each objective so that assessments are accurate, alongside using the Knowledge Organisers. If you use the Developing Experts tests as a pre and/ or post assessments this could also be used to inform your judgement.

Objectives

Please ensure that all lessons have an objective at the top of the children's work which corresponds with the Medium-Term Plan and the children have an opportunity to be able to self-assess this. If the children write the objective, then they still need to use green, yellow or red to mark on how they assessed their understanding.

Presentation

Children should be taught to work their highest standard of presentation in their books as with all other subjects.

Topics

There should be a clear sequence of work being followed so there shouldn't be any other work in between. Please aim to keep all topic work together and not separate it with random pieces of other work that you may be catching up on. This could be added to your previous unit or done at the back of the book with a small note added to the topic that it is for.

Cross-Curricular Work

There are many links that science can have with different subjects, these links should be recognised and pointed out to the children. These should also be mapped out on MTPs prior to the teaching of the topic.

If you are doing science work in other subjects that relates to your science topic, please do the work in your science book and make a note in the other subjects' book – See science book (date). There should be at least one piece of cross-curricular science/writing each half term and at least one piece of cross-curricular science/maths each half term. These links should be previously planned and should be marked on MTP's, with the work produced being evidenced in science books.
English – Writing reports, letters etc, instructions, science reading comprehensions
Maths – Data handling, Measuring
Computing – processing and analysing data, use of special equipment like data loggers etc.
Art, Design Technology, Music, PE, History, Geography.

There must be clear English and Maths links noted on MTPs and evidenced on either Seesaw or in books each half term.

Photographs

Opportunities for outdoor learning should be provided. When lesson activities are practical please add photographs to the children's books to evidence the journey and outcome of that lesson. When photographs are used, children should write their own comment giving context to what

Marking

This should be done as per the school marking policy. Please remember when providing written feedback the next steps should relate to the achievement of the objective, and where appropriate move the learning forward with the use of 'Think Pink' tasks.

The knowledge organisers should be self-assessed by the pupils and teacher at the end of each lesson.

When writing green comments please be specific about what element of the pupils' work is good.

Think Pinks/ Next Steps

Should be

- Be related to the work that they have been doing.
- Move children on to their next step of learning.

- Challenge the children further and allow opportunities for chn to extend their understanding and apply the new knowledge to different scientific areas/concepts
- Use the knowledge they have acquired in the lesson to make further predictions.
- Develop their understanding of the meaning of science vocabulary.
- Address misconceptions.
- Ask them to improve a diagram or the presentation of data. E.g. add labels, add captions, ask them how the data could be seen in a clearer way.
- Allow them to think about other variables that they could change in an experiment and the impact of this.
- Challenge them to think of another situation they could apply that knowledge to.

Should Not

- Be more of the same.
- Move them on too quickly or slowly.
- Give them the answer.
- Be too basic.
- Tell children to do corrections.
- Just be about handwriting and sentence structure (unless you are asking them to check the spelling of a scientific word using dictionary or working walls.)
- Tell children to complete think pinks.
- Have spelling mistakes.

Science Resources

Science resources are stored in the mezzanine at the back of the sports hall. There are labelled resources in boxes on the shelves.
Please ensure resources are returned after each use/lesson.
Please check Developing Experts prior the half term to see if there are any further resources that you may need and let the **science co-ordinator know so that they can be purchased.**
If you feel that you know of a better experiment/ activity that you can do that is not on Developing Experts as long as it is related to the lesson that you are teaching from Developing Experts then it is fine to do change activities. However, if you still need resources then please let the Science subject leader know.

Home Learning

Science work should be provided via Seesaw that follows the same unit of learning as would have been taught in school. Links to Developing Experts should be used and work should be set that both challenges and progresses the children's learning. These lessons can be adapted where necessary as children may not have the correct resources at home, however the LO should still be reached. Paper copies should be given out if a child does not have access to Seesaw.

Homework

Weekly science homework should be purposeful with view to extending the learning of that week's objective. Examples include: application of the concept to a real-life situation, prepare students for an upcoming lesson, or to move children's learning forward. Seesaw should be used to set homework on a Friday or a paper copy given out if a child does not have access to Seesaw.

CPD

Staff are advised to ensure that they have a good understanding of the science topic that they are teaching.

Developing Experts

Developing Experts has CPD on their lesson plans and website.

Out Reach CPD

This is an excellent free online resource and takes you through topics in different key stages.

- https://www.reachoutcpd.com/
- Takes you through each unit has 4 sections per unit including science needed and suggests misconceptions that the children may have.
- Gives you a certificate at the end
- Provides links and resources that can be used in lessons

Stem Learning

This is a free resource that offers CPD, lesson resources and ideas for all STEM subjects. It will also keep you up to date with the latest technologies and news.

https://www.stem.org.uk
https://www.futurelearn.com/courses/planning-forlearning