

## Science Mastery Secondary





#### **Welcome to Science Mastery Secondary.**

Having founded our first programme, Mathematics Mastery, a decade ago, I'm proud of the role Ark Curriculum Plus has played in the national shift towards a mastery approach to learning across more subjects. This methodology is designed to help *all* learners achieve, whatever their starting point. For science, beginning with a clear, well sequenced and ambitious curriculum is a crucial step but it's nothing without confident teachers, who have the subject knowledge and best practice pedagogies to deliver brilliant science lessons.

Our **subject excellence programme** provides the expert support and practical building blocks schools need to teach Key Stage 3 and 4 science using the mastery approach.

Currently, science education often presents as a fragmented collection of facts and theories of little relevance to students. The Science Mastery 5-year curriculum map is organised under the 'big ideas' of science. This allows students to make links between topics, building ideas into a coherent picture of how the world works.

Informed by extensive international research and practical insights into effective science teaching, we developed a programme that is carefully sequenced to support deep scientific understanding and skills development over time.

Science Mastery Secondary has been created and rigorously tested in Ark schools, so we know it works in real classrooms. It allows teachers to repurpose their time on the things that make great teaching and learning: co-planning and intellectual preparation, adapting delivery for each class and using formative assessment responsively.

#### How does it work?

Success starts with confident teachers delivering brilliant science lessons. That's why you'll have a dedicated subject expert guiding you through our 5-Step Improvement Process and your teachers will enjoy face-to-face induction training and flexible CPD. Plus, you'll have immediate access to the practical assessment, planning and teaching resources you need to embed Science Mastery in the classroom.

Putting it all together, we enable your school to achieve and sustain consistently excellent science teaching.

We partner with hundreds of schools, including some of the largest MATs in the country.

I feel privileged to be working with so many incredible school leaders and teachers, united in a shared mission to help all learners make progress in science, whatever their starting point. I hope you will join us!

**DR HELEN DRURY**EXECUTIVE DIRECTOR OF EDUCATION

# Put simply, what we do works!

Since developing Science Mastery Secondary we have received fantastic feedback on the programme. School leaders and teachers agree that our programme works.

Plus, schools from the more recent KS4 Pilot report that the new features, including exam skill practice, a short I-We-You modelling cycle, consistent worksheet structure, and drill questions, are having a positive impact on teaching and learning.

#### IN A RECENT SURVEY, OUR PARTNER SCHOOLS AGREED THAT THE PROGRAMME HAS IMPACT:



of Mastery Leads believe that students are **making greater progress** since using Science Mastery.



of all users of Science
Mastery agreed that there
is **greater consistency in teaching and learning**across the department.



of Mastery Leads said that there is **more time for planning and professional development** since using Science Mastery.

#### WHAT PEOPLE SAY

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I had some fantastic feedback today from SLT on how transformed the science department is, in just one year. I can truly say that the Mastery programme has been pivotal in that transformation."

JAYNE CHESLIN HEAD OF SCIENCE

WINCHCOMBE SCHOOL

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I would really recommend Science Mastery for any schools that are looking to see impact in their science curriculum and for their pupils' science knowledge to develop in a short space of time."

GEORGINA PICK HEAD OF SCIENCE

ARK PIONEER ACADEMY

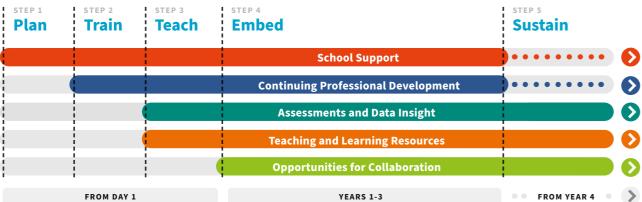


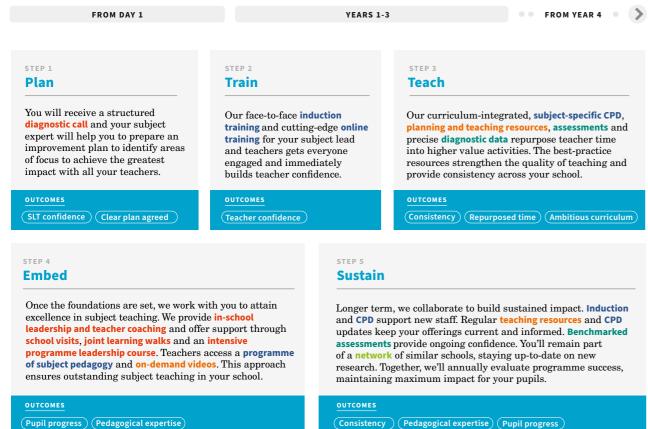
## Framework for success

The 2021 EEF School Planning Guide\*\* highlighted that 'the best available evidence indicates that **great teaching** is the **most important lever** schools have to **improve outcomes** for their pupils.'

To achieve powerful teaching that changes lives, teachers have told us they need to have strong subject knowledge, the best evidence-based pedagogies, rigorous assessment and effective planning, all working together.

Our Subject Excellence Programmes follow the AC+ 5-Step Improvement Process, which is based on over a decade's experience of transforming results in one of the most respected MATs and hundreds of schools nationwide. Improvement is a journey – that's why you will have a dedicated subject expert to guide you step by step, helping you achieve and sustain excellence.





#### \*\*Access the 2021 EEF School Planning Guide: https://educationendowmentfoundation.org.uk/news/introducing-eef-school-planning-guide-2020-21

#### A fully integrated programme

All the components of Science Mastery Secondary work together to ensure your school, staff and students get real impact from the evidence-led subject excellence programme.



#### **SCHOOL SUPPORT**

From day one, your dedicated subject expert collaborates with teachers to create a tailored improvement plan for your school. They'll then support you to success through the five steps over multiple years.



#### **CONTINUING PROFESSIONAL DEVELOPMENT**

Teachers and leaders get immediately actionable CPD at point of need. It supports subject knowledge, pedagogic delivery, curriculum design and more. Flexibility is key, with online or in-person sessions.



#### **ASSESSMENTS AND DATA INSIGHT**

Formative assessments for data-led instruction are available in each lesson, unit, term and year. Standardised assessments, directly linked to the curriculum, identify pupil learning gaps for targeted intervention.



#### **TEACHING AND LEARNING RESOURCES**

Curriculum-integrated planning tools and resources ensure successful programme delivery. From day one, you access carefully sequenced support for consistent, impactful, engaging lessons, built on best-practice pedagogies.



#### **OPPORTUNITIES FOR COLLABORATION**

You join a subject teaching network, fostering the exchange of best practices. Teachers and leaders connect at in-person CPD events, including induction, creating a community of practice.

## Dedicated school support

From day one, you'll have a dedicated Science Mastery Secondary subject expert from our team of educators. They each have a background in, or currently teach, secondary science. They'll collaborate with your leaders and teachers to create a tailored improvement plan for your school. Then they'll help to **introduce**, **embed** and **sustain** the programme over multiple years, ensuring a lasting positive impact on your students.

#### M360 diagnostic call

After a thorough review, a diagnostic call with your subject expert helps to identify key focus areas for maximum impact. You'll build an improvement plan to achieve these goals consistently with all teachers.

#### **School visits**

Your subject expert will regularly visit your school for joint learning walks with the Mastery Lead, to observe programme delivery. You can also involve them in co-planning or they can run customised CPD workshops.

#### **Online development sessions**

Our regular one-to-one sessions offer coaching and mentoring for your Mastery Lead. These are carefully designed to work for each stage of your implementation journey.

#### **Support for you**

Get in touch with your subject expert by phone or email, whenever you need advice or have questions. No query is too small and no problem too big. We are here to help!

**888** Meet some of our team on page 22



## Actionable CPD at point of need

#### CPD that is relevant and immediately actionable

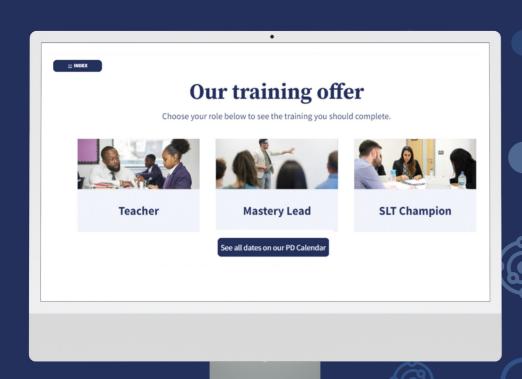
Science Mastery Secondary provides targeted continuing professional development that's **immediately** actionable, covering subject knowledge, pedagogy, curriculum design, assessment and more. It's **flexible** – accessible online just when you need it or through inspiring and practical in-person sessions that foster a community of practice.



The leading quality co-planning training session was excellent. It enabled me time to reflect on the importance of quality co-planning and included some useful ideas of activities to include to really drive coplanning forward to help the whole team to learn from each other and improve lessons for our students."

**HELEN CARRINGTON HEAD OF KS3 SCIENCE** 

ARK ALEXANDRA ACADEMY



#### **Induction training**

Everyone joining the programme takes part in induction training. New schools have four inperson places, and everyone can attend online. It's a wonderful way to get your team excited and prepared for their journey on the programme and to set them up for success. Plus, all modules are available on-demand (in our bespoke MyMastery platform) to revisit when required.

#### 'Teaching Mastery' badging

Teachers enjoy online CPD that builds subject and pedagogical expertise. For each completed module they gain a badge - a great way to evidence their professional development as steps towards further qualifications like NPQs.



#### **Termly 'Preparing to Teach' webinars**

Strengthening teachers' topic-specific subject **knowledge** for the upcoming term, our webinars support teachers in effective programme delivery. Breakouts focus on common challenges within similar year groups. It's a chance to share good practice and collaborate with other partner schools.

#### **Leadership certification**

Your Mastery Lead receives online CPD and ongoing mentoring from their subject expert. They will earn the *Ark Curriculum* Plus Certificate in Programme **Leadership**, providing recognition for both them and your school.



#### **In-school visits**

Your subject expert can deliver some of the above CPD sessions during one of their visits, providing more **bespoke training** to meet your school's needs.

Science Mastery training is in my opinion the best training I get from anywhere. I always come out of it bursting with ideas and often extremely excited to try new things."

LIYANA WARBURTON KS5 CHEMISTRY LEAD

KING SOLOMON ACADEMY

# Assessment to inform teaching

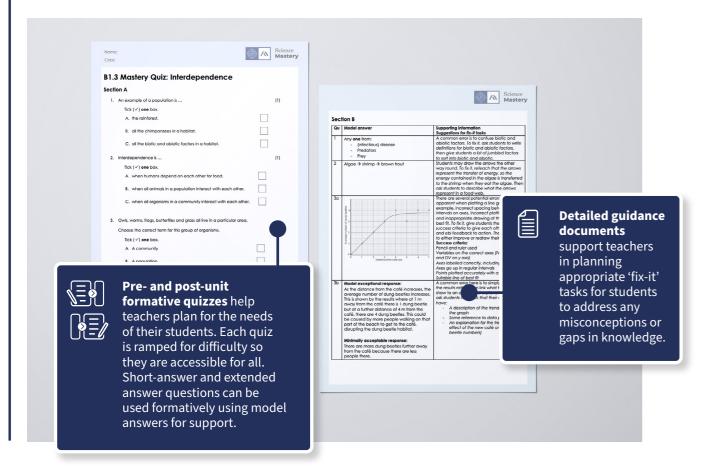
Science Mastery Secondary includes formative assessments within lessons, units and at the end of term, along with curriculum-linked standardised assessments. They help pinpoint student learning gaps and guide effective interventions.

#### **Formative assessments**

We provide a fully planned and integrated formative assessment model that complements and advances the skills students develop during their Science Mastery lessons.

#### THIS INCLUDES:

- **Pre-unit quizzes** to gauge student readiness for the upcoming unit
- Quick and easy Checks for understanding within the lesson
- A diagnostic **Mastery Quiz** at the end of each unit
- An **Exit Ticket** to check learning at the end of each lesson
- Exampro add-on subscription available including all our diagnostic questions, a KS3 test bank mapped to Science Mastery units and the option to create bespoke quizzes mapped to our content.



#### **Standardised assessments**



Science Mastery Secondary presents a picture of your school's progress compared to national data samples, providing reassurance and a clear view on how and what to improve. You can also analyse by student, class and cohort.

Summative assessments on Smartgrade (our partner platform, included when you join) are standardised yearly and provide a large, nationally representative data sample. Students can take termly diagnostic assessments on the platform for easy formative analysis.

#### **UNIQUELY, THE PROGRAMME PROVIDES:**

- Comparison to current attainment data rather than historic crucial for identifying pandemic-related gaps.
- School benchmarking to identify areas of strength and development.
- A large, nationally representative data sample from all our partner schools.
- Targeted reteach planning and support to guide improvement.



**Science Mastery Secondary** Ark Curriculum Plus 13

## Best-practice teaching and learning resources

#### We provide all the resources so you can focus on your students!

The best-practice planning tools and comprehensive lesson resources provide everything your school needs to deliver the programme successfully. From day one, your staff will have access and support to deliver consistent, impactful, engaging and pedagogically strong science lessons. The learning is sequenced to support students' development of: factual and conceptual understanding; mathematics, practical and enquiry skills; language and communication; and their application of knowledge and skills.

#### THE TEACHING AND LEARNING RESOURCES:

- Build on solid, evidence-led pedagogical principles – the 'four key elements of great science education' (see p19) – which give you confidence that they will have the greatest positive impact on your students.
- Promote oracy in a flexible and fun way that works for your students, making scientific success accessible to everyone.
- Provide structure and support so that you own the curriculum, with unit-level guidance documents.
- Are created with early career teachers (ECTs), non-specialists and specialists in mind, giving the relevant level of guidance for each.
- Include adaptation examples and guidance to suit your students' and schools' needs.

#### WHAT'S INCLUDED?



#### **Planning**

Curriculum overview Implementation guide Unit overviews Unit preparation booklets

#### **№** Teaching

Lesson slides

Practical guides

Student booklets

Student worksheets

Knowledge organisers

Student glossaries

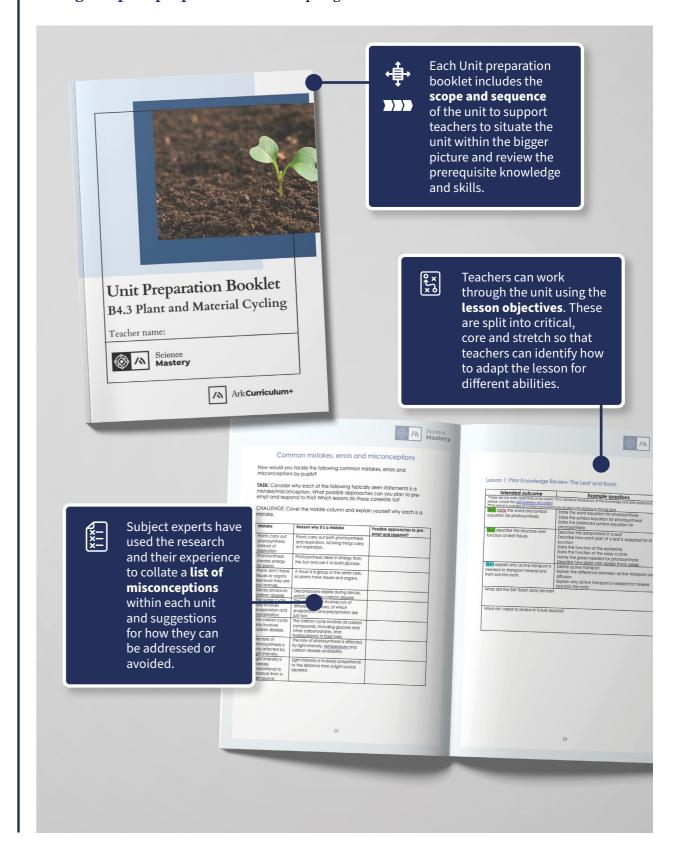
Exam guestion activities



Click here to access a free **Programme Preview** and see examples of these resources.

#### **Unit preparation booklet**

These are available for each unit and provide everything teachers need in order to think through lesson planning. The unit preparation booklet encourages science teachers to work collaboratively with a colleague or in a group so that planning time can be spent on high impact preparation and adapting for students' individual needs.

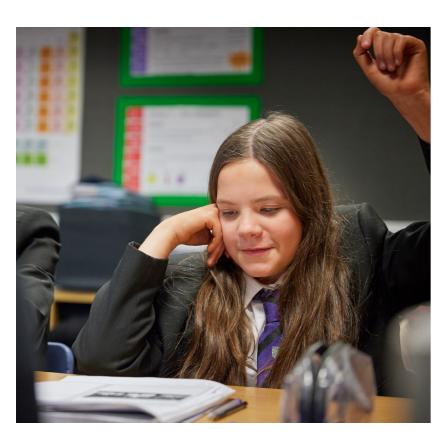


#### **Lesson resources**

The Science Mastery lesson structure is unique and allows teachers to take control of the learning, based on what is happening in the classroom that day. Assessment for learning opportunities are threaded throughout, constantly building upon what students are learning at every stage in the lesson.



Fully editable slide decks are provided for each lesson, including notes and guidance to support teaching and ownership. Our pedagogical principles, the four elements of science (see p19), are embedded in each lesson, building accessible best practice. Scientific literacy is elevated through explicit vocabulary instruction and a Talk Task in every lesson, helping students develop the skills to read scientific texts and to write and speak like scientists.





Fantastic resources to use so I can spend planning time thinking about expositions/adjusting resources to meet the needs of specific pupils, rather than creating whole resources myself."

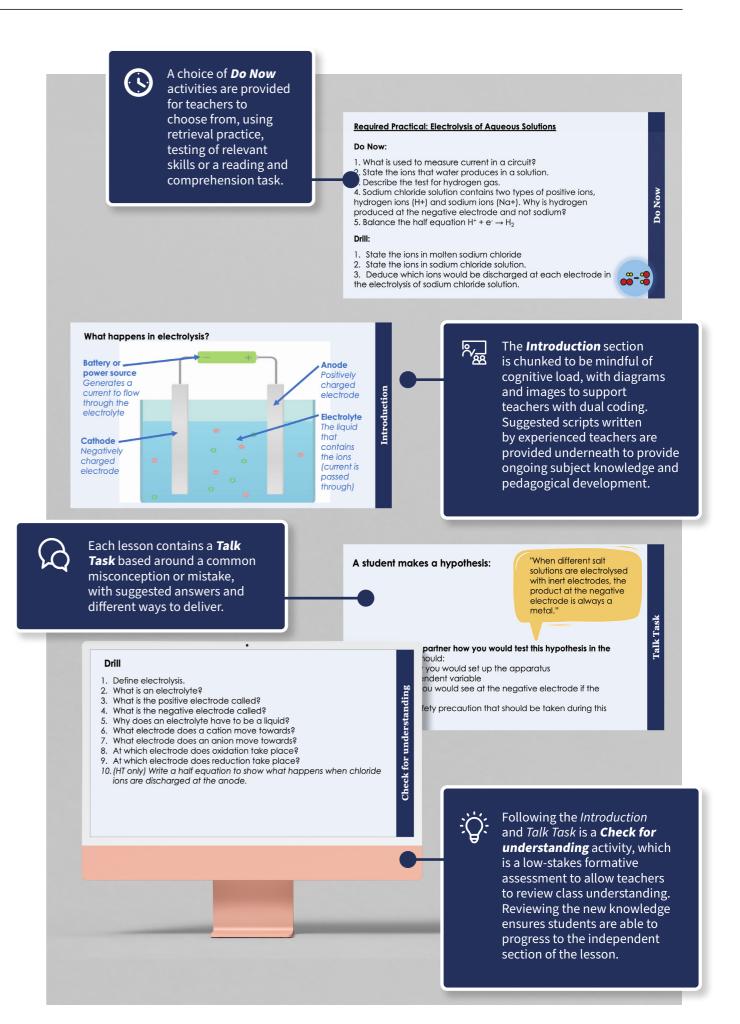
GEORGINA PICK HEAD OF SCIENCE

ARK PIONEER ACADEMY



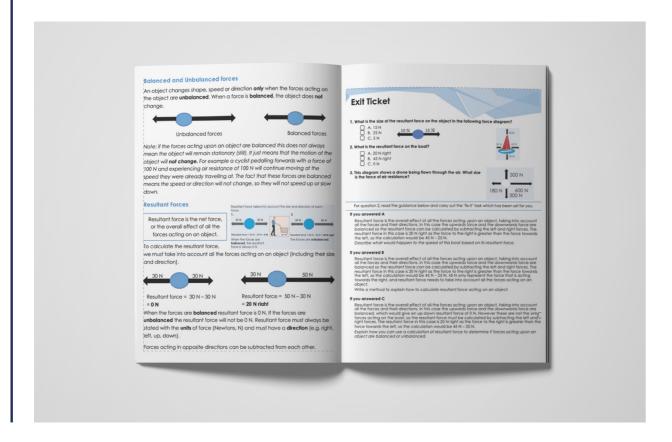
Using the Science Mastery resources has meant I've been able to use more of my time marking Exit Tickets and marking work and therefore thinking specifically about adapting the resources to my classes rather than teaching from scratch."

ASSISTANT PRINCIPAL KING SOLOMON ACADEMY



#### **Student booklets**

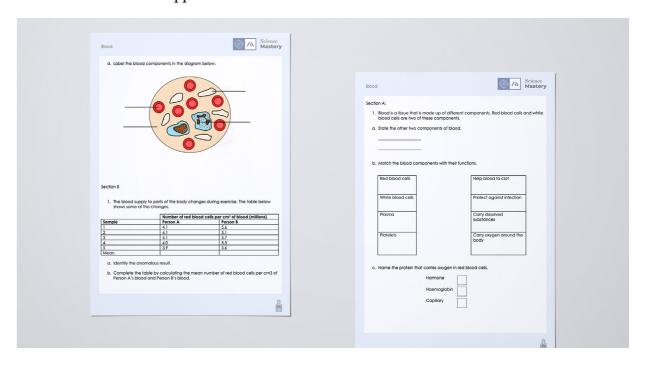
For each unit, an editable student booklet contains **student- friendly exposition** that explains the key ideas. A suite of **questions and follow-on 'fix-it' tasks** supports students in
identifying and addressing their misconceptions independently.





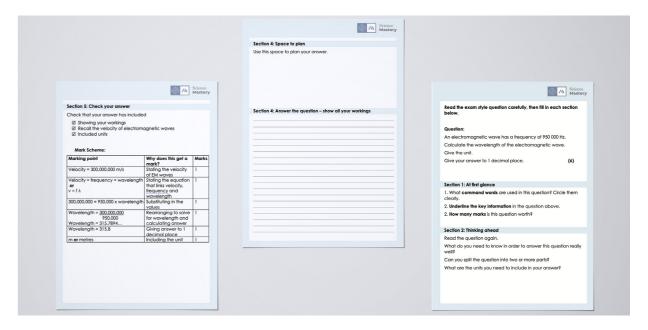
#### **Structured worksheets for Key Stage 4**

Every KS4 lesson contains a worksheet with a consistent structure of exam-style questions to **enable students to apply the new learning**. Worksheets are **scaffolded** with low demand questions building to more demanding and **commonly assessed application questions**. Teachers can select questions from the worksheet that are most appropriate for their students. The final part of each worksheet also includes an application to a different context and supports students to **make links between the sciences**.



#### **Exam question activities**

Each KS4 unit also has a range of exam question activities, where students are exposed to exam style mark schemes to help develop their exam technique. These address the most commonly assessed areas, with actual student responses included to compare with their own and familiarise them with the demands of mark schemes.



## Be inspired by like-minded schools

#### **Building a community of practice**

Partner schools join a subject teaching network, sharing best practice and learning from each other. Attend CPD events, including in-person induction training and our annual conference, to collaborate with and be inspired by your peers. Your subject expert may connect you with local or similar context schools, helping you gain insights on delivery or simply see Science Mastery Secondary in action in other settings.

#### **Annual conference**

We host an exclusive annual conference to facilitate sharing and learning between our partner schools and offer access to new research and thinking.

With exciting keynote speakers and practical workshops, you leave feeling reinvigorated, re-energised and ready to continue making a real **difference** to your pupils' achievement and progress.



It was nice to share good practice with other professionals from different subject specialisms about tricky practicals."

**TEACHER OF SCIENCE MASTERY** CONFERENCE ATTENDEE 2023

of those who completed our conference survey rated the opportunities to network with other schools as Good or **Excellent** 

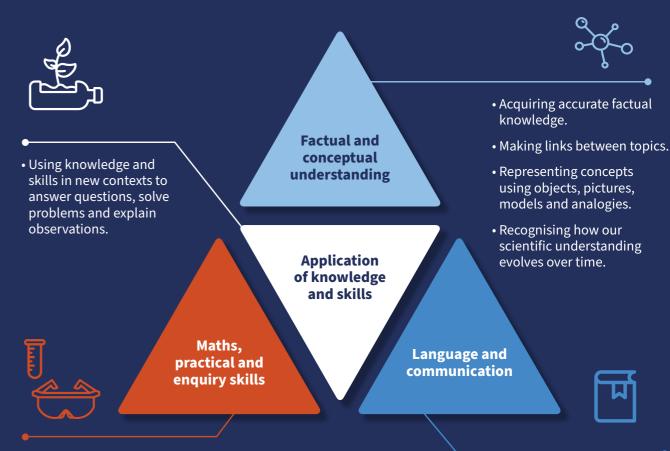


## Unique pedagogy



Together they enable all students to build a deep understanding of science. That's why these pedagogical principles are embedded throughout our subject excellence programme, in our school support, CPD, assessment, planning and teaching resources.

SCIENCE MASTERY TRANSFORMS SCIENCE TEACHING AND LEARNING BY FOCUSING ON THE FOUR KEY ELEMENTS OF GREAT SCIENCE EDUCATION:



- Investigating scientific questions using a range of practical skills.
- Developing procedural knowledge.
- Evaluating experimental design.
- Thinking numerically.

- Presenting scientific information accurately.
- Using scientific language.
- · Discussing scientific ideas.

# Standing out from the crowd

The impact of our programmes is clear, but in case you need even more reasons to choose AC+...



## Collaboratively designed and refined in classrooms

Grown in collaboration with Ark Schools, one of the highest achieving MATs in the UK, we continually learn and co-create together. Plus, we test what really works live in the classroom, making improvements that will have the biggest positive impact.

Our programmes support disadvantaged students – Ark Schools pupils make nearly half a grade more progress than their peers nationally. We're here to help give all students the opportunities that an excellent education provides.

### Recognised as an educational leader

We're proud to be recognised as a leader in subject improvement. We work with the Education Endowment Foundation, The Brilliant Club and the Fischer Family Foundation, whose research provides robust evidence of our impact. We collaborate with the subject associations, along with universities including Cambridge and UCL.

## Accountable to you and your pupils

We are a non-profit organisation. Our full attention is on supporting our partner schools and making our already impressive programmes the best they can be. We're particularly passionate about helping disadvantaged children and we aim to level the playing field, so that every young person can succeed.

The schools that we work with are charged a financial contribution which goes right back into delivering and developing the programmes. We're not accountable to shareholders, we're accountable to you!

## Aligned to Ofsted to support your quality of education

The Education Inspection
Framework looks for consistency
between the intent of schools'
curricula and the ways schools
empower their team to realise these
plans. We have supported many
schools to be expertly prepared for
an Ofsted visit by:

- Providing a powerfully sequenced, academically ambitious curriculum for all.
- Equipping subject leads with the confidence to articulate their curriculum intent, implementation and impact.
- Delivering immediately actionable teacher CPD at the point of need, supporting subject knowledge, pedagogic delivery, curriculum design and more.

## Our expert team

We are all teachers with experience leading Science departments and working in school leadership roles. We love working with Science Mastery Secondary schools because we truly believe in the power of evidence to inform practice and to narrow the attainment gap. We are members of the Chartered College for Teaching and the Association for Science Education – meaning we engage with the latest research and the subject community directly.



#### **Kathleen Webb**

Kathleen is the Head of Secondary STEM. She has worked on the design of the Science Mastery programme since 2019 and before that, she was the Science Curriculum Lead for Ark. Previously, Kathleen taught science in London schools and was Head of Biology at an Ark school. Kathleen has a BSc in Biochemistry, a PhD in Molecular Cell Biology and a PGCE in Chemistry. She is also a governor at a school in Kent.



#### Joanna Scouler

Jo is the Principal Design Lead for Science Mastery Secondary. She has been working on the design of the KS3 curriculum since April 2020. She has taught Science for a number of years between East London and Johannesburg and has a degree in Neuroscience from the University of St Andrews and a Master's in Leadership from University College London.



#### **Rosie Lloyd**

Rosie has worked with the Science Mastery team since November 2022 creating teaching resources and supporting schools using Science Mastery. She worked for many years in London as a Lead Practitioner in Science before moving to teach in the Peak District. Rosie is passionate about developing student engagement in science as well as improving the provision of science teaching within schools.



Co-planning has been much more successful and has led to better outcomes for students. The consistency and quality is far better than previously and the bigger picture is becoming more apparent."

**MELISSA THORP** ASSISTANT PRINCIPAL OF SCIENCE

**SKEGNESS ACADEMY** 



## It's easy to join us



Let us know you're interested by email, phone or by booking a meeting.



We'll have a virtual meeting or a call with you to learn more about your school.



Agree you're joining the Science Mastery **programme** with your senior leadership and sign a contract.



Get set up with Smartgrade and have a diagnostic call to agree the plan for your school's implementation.



Attend induction training and receive full support to introduce the programme in your school.

#### **GET IN TOUCH**

Speak to a member of our team about partnering with AC+ today.



partnerships@arkcurriculumplus.org.uk



020 3116 6363



Or book a call online at a time that suits you: calendly.com/ark-curriculum-plus

#### **OUR OTHER SUBJECT EXCELLENCE PROGRAMMES**

#### **PRIMARY**



Geography Mastery







Mathematics Mastery





#### **SECONDARY**



English Mastery



Geography Mastery



Mathematics Mastery











We work with schools like yours nationwide to deliver immediate impact and sustained subject excellence.

So if you're looking for stronger student outcomes, more confident teachers and consistently high-quality teaching and learning across your school... Relax. With Ark Curriculum Plus, you're in safe hands.

## Start your journey to subject excellence today!



Click here to request access to our **Programme Preview** and see more detail of what you get on the programme.

Ark Curriculum Plus

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