



SCIENCE MARK

SCHOOL
HANDBOOK

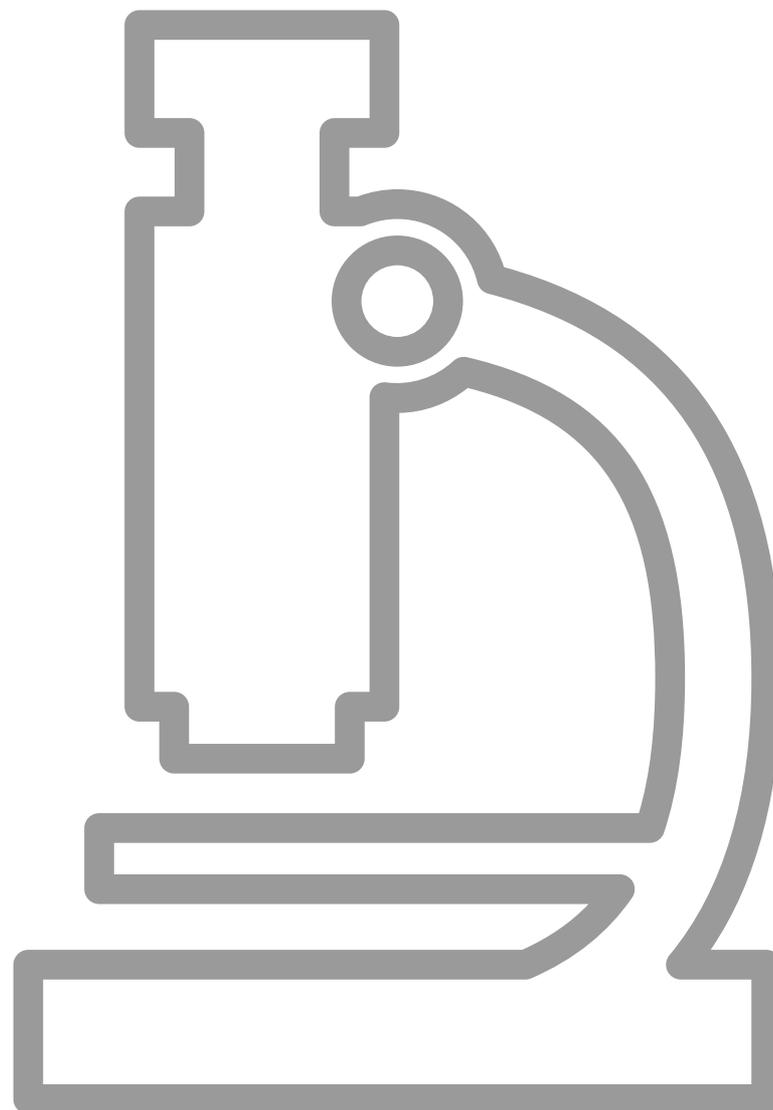


Science
LEARNING NETWORK



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WELCOME TO SCIENCE MARK

Science Mark has a set of ambitious aims. It sets out to:

- › celebrate excellence in secondary science
- › provide schools with a framework for improving science education
- › develop networks of excellence in secondary school science across the UK and beyond
- › assemble and make accessible a rich data base of current best practice in secondary science

If you are successful in gaining this award, it will show that you and your team:

- › are reflective, evaluative and focused on improving outcomes for young people in science
- › are focused on the sustained growth and development in science
- › have embedded the essential elements of an excellent science department
- › have a broad focus and can respond strategically to changes

The process of gaining the award will have various benefits. It will:

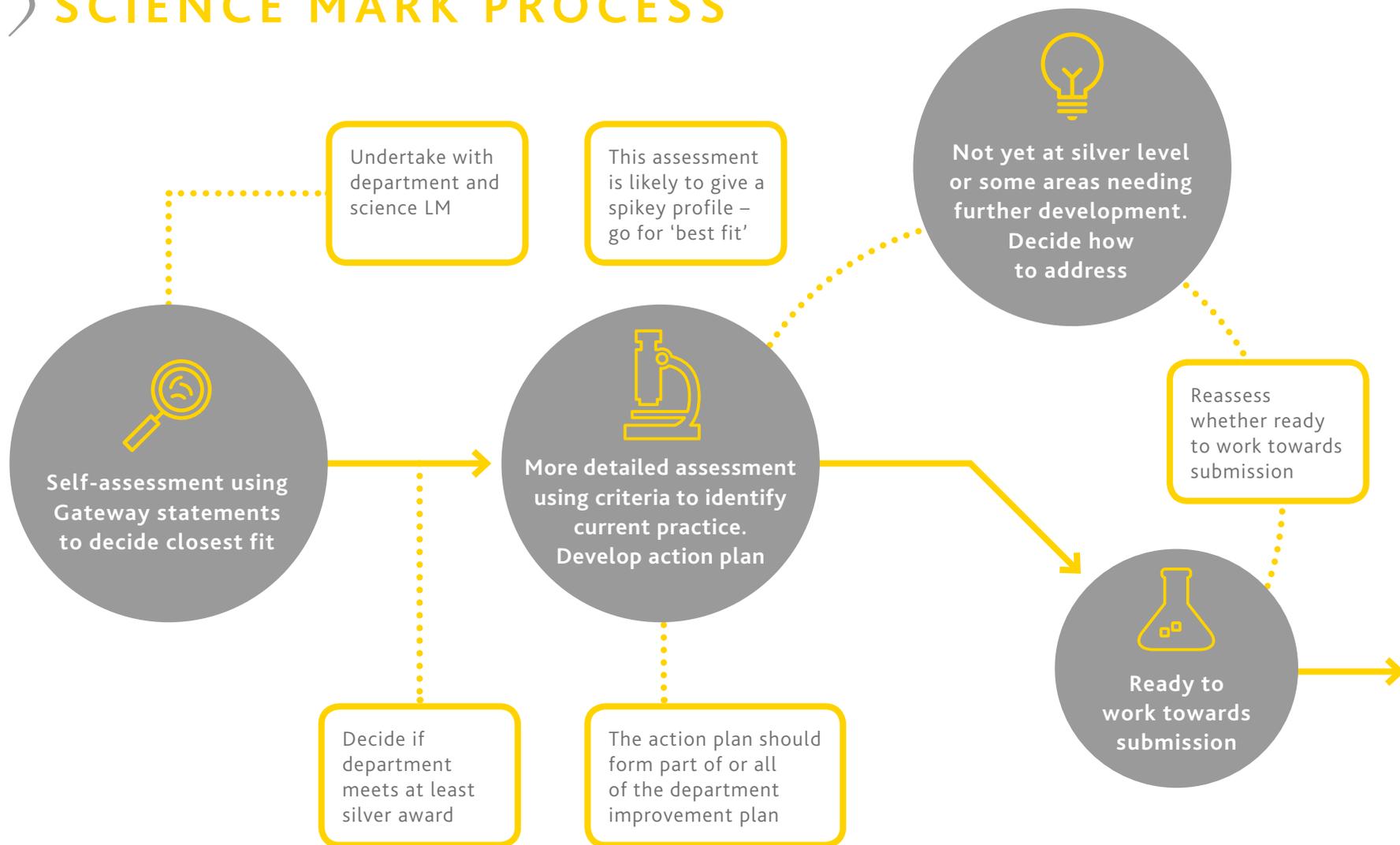
- › strengthen the reputation of your school
- › help you to attract, develop and retain the best staff
- › promote, acknowledge and reward the work of your science department
- › attract students keen to learn about science
- › drive improvement within your school, as other departments learn from the science department's experiences of the scheme



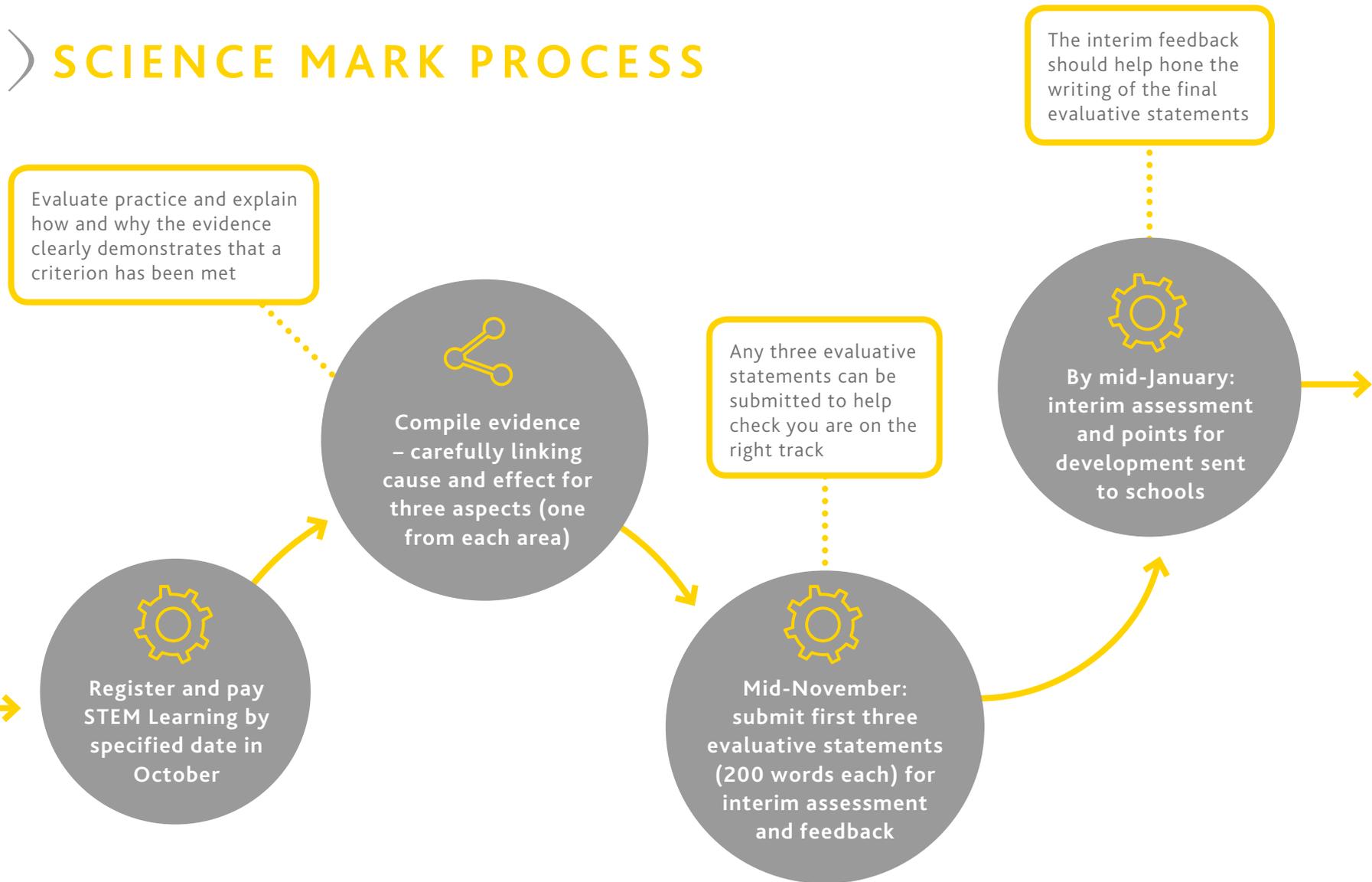
Science Mark is an award scheme to enable secondary schools across the UK to evaluate, strengthen and celebrate their science provision. Schools can achieve silver, gold or platinum awards. At its heart is a set of criteria which examines three areas of your department's work: curriculum; leadership and management; and learning and teaching.

It is worthwhile bearing in mind that the award is not intended to be something that all or even most schools would be capable of achieving in the short term. It is designed to be aspirational; it is a mark of excellence, sets a high standard and should be approached accordingly.

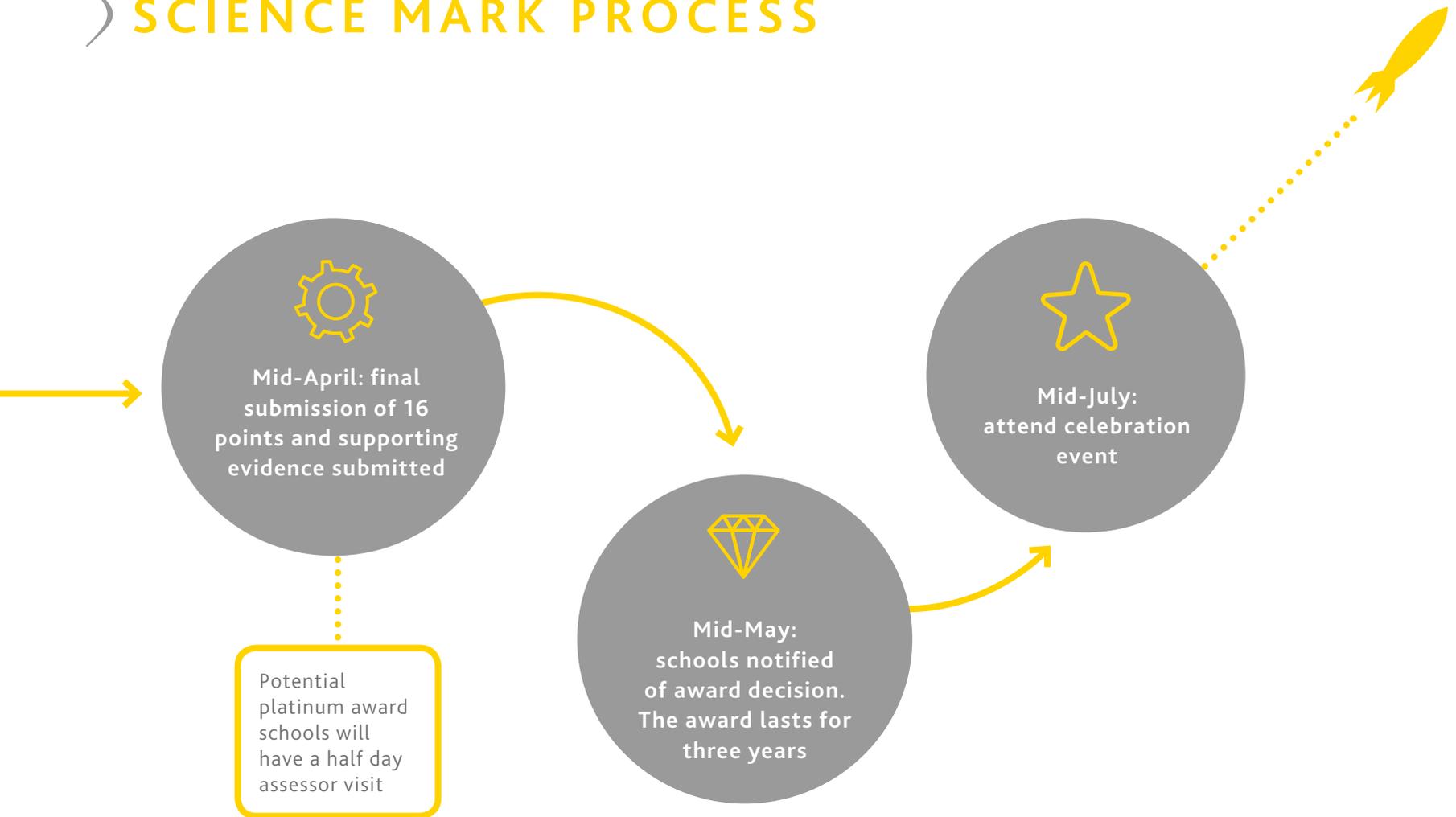
SCIENCE MARK PROCESS



SCIENCE MARK PROCESS



SCIENCE MARK PROCESS



PART 1: PRIORITISING, PLANNING AND FOCUSING



SELF-ASSESSMENT



Science Mark is for schools that have already reached a high standard of effectiveness and this will help you judge whether this applies to yours. Before you commence, it is worthwhile making sure you have used the STEM Learning Self-Evaluation Tool and considered the advice (set.nationalstemcentre.org.uk).

USING THE SPREADSHEET

One of the first documents you will need to use is the spreadsheet with the Gateway statements. This should assist with enabling you to decide which level to apply for.

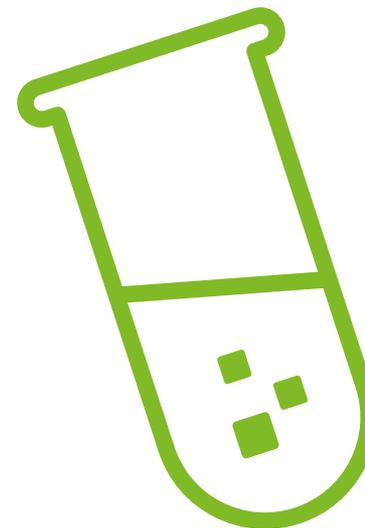
Use the Science Mark Gateway statements to calibrate the school

against the three levels: silver, gold or platinum. There are three main focus areas: curriculum; leadership and management; and learning and teaching. Use a 'best fit' approach to decide which level best matches your department and use this to consider which level to apply for. The same level has to apply in all three areas, even if performance may be stronger in some areas than others.

Next use the Science Mark assessment criteria and outcomes (these are also on the spreadsheet). The higher the award, the more challenging the outcomes. For each criterion, agree which outcome best fits your department's current levels of performance. There is also a

comments box on the spreadsheet to enable the recording of any ideas at the time, such as marginal decisions, ideas about how to address or other indicators that may assist in the development of the action plan.

Your responses will help confirm which level to apply for. Where your department has a 'spikey profile', use this to identify what needs to be addressed to raise effectiveness to a consistently high standard. An unrealistically aspirational plan is unlikely to be achieved in a year; however it is quite reasonable for a school to expect to address areas of under performance and raise its overall profile during the year.



› ACTION PLANNING

The next steps are to:

- › decide and agree on the level to aim for
- › to use insights gained to set up an action plan. This is available in three versions, one for each level of the award, and including the relevant criteria for that level.

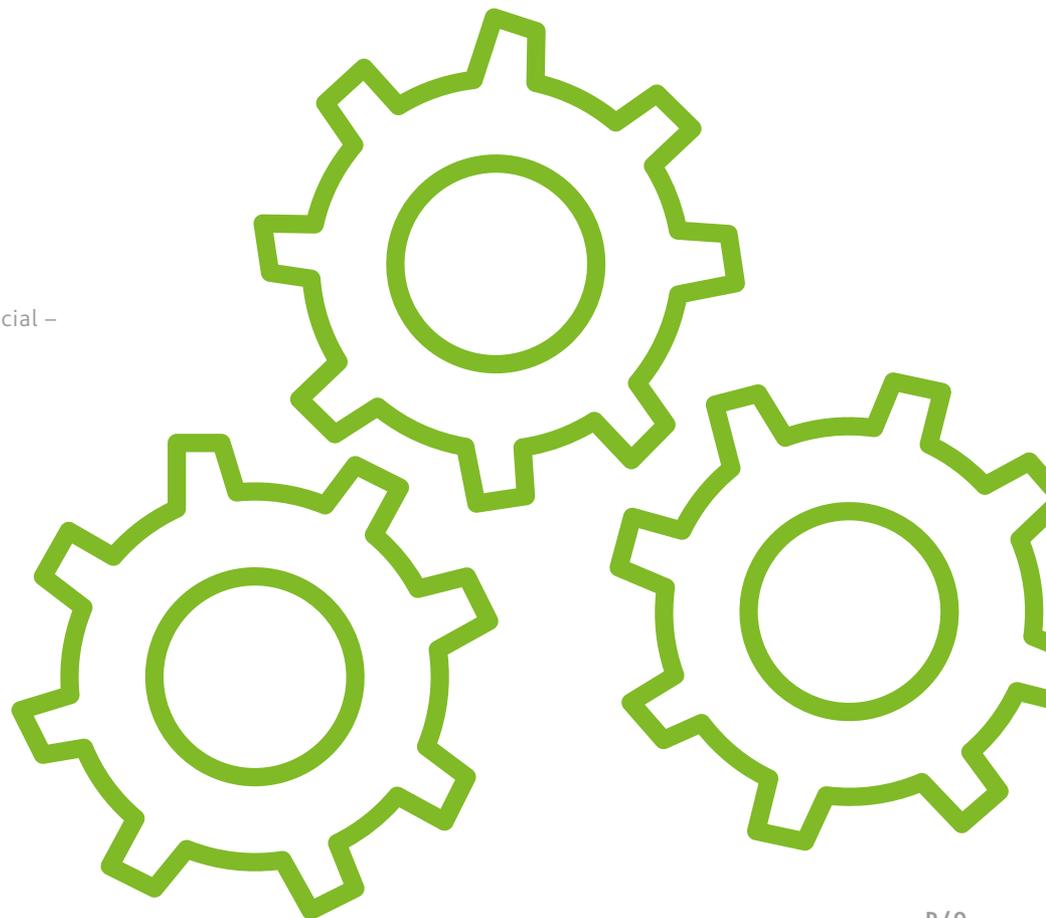
The spreadsheet is for internal use only and doesn't form part of the assessed submission. Its use is optional, but strongly recommended. The action plan arising from it does form part of the submission; it does not influence the awarding of a particular level but may be used in providing feedback from the assessor.

Planning things out before you start is really important. The Science Mark

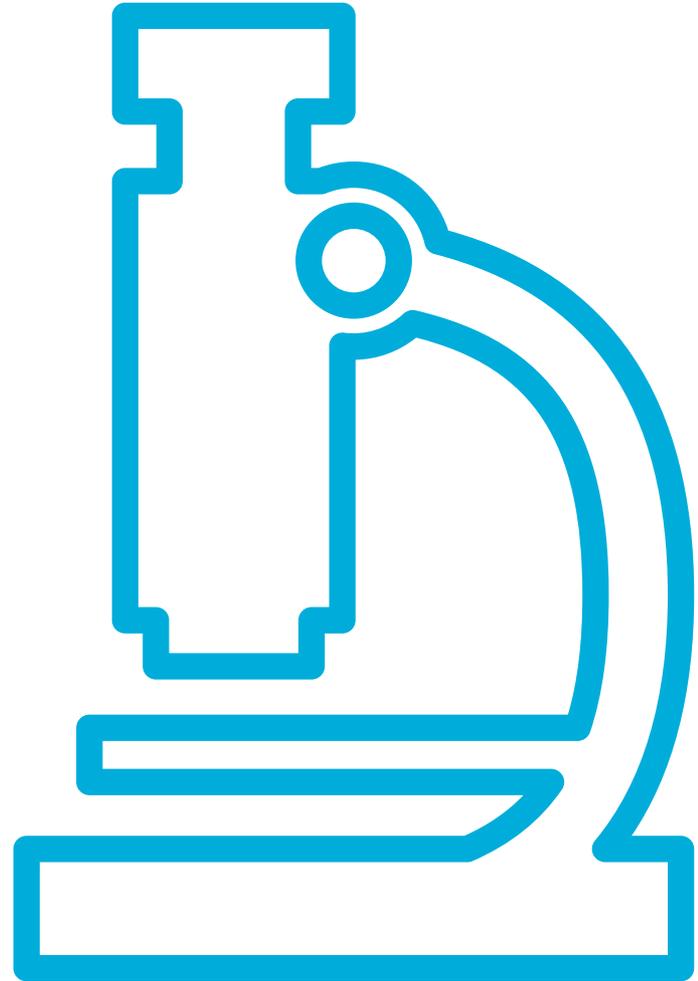
action plan template is used to help you plan out:

- › activities to be undertaken
- › what the outcome will be
- › who is involved
- › when it will be completed
- › what the impact will be
- › what evidence will demonstrate this

The last two are particularly crucial – they drive the whole process.



PART 2: GATHERING EVIDENCE AND EVALUATING IT



A KEY RELATIONSHIP: CRITERIA, EVALUATIVE STATEMENTS AND EVIDENCE

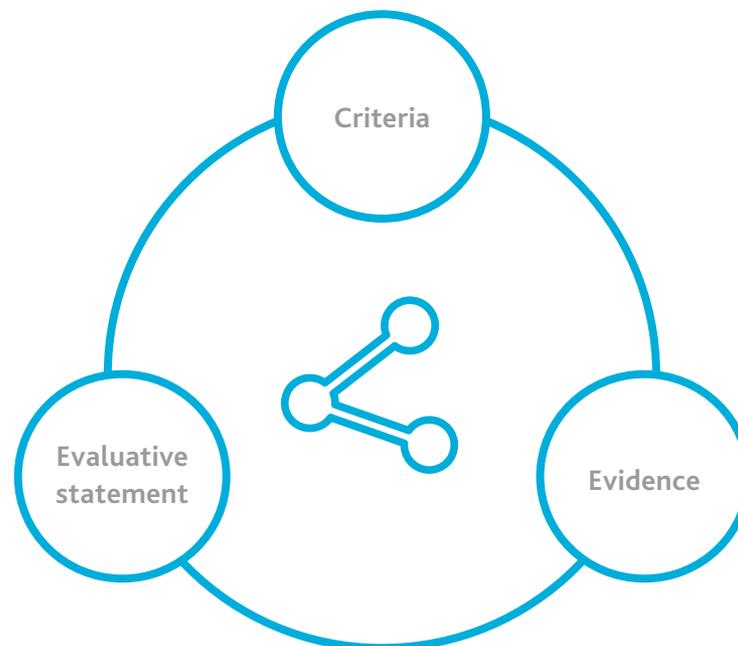


This relationship sits at the centre of the Science Mark process; understanding and mastering it is central to the process of making a high quality submission (and is also provides a valuable process of self-evaluation).

Each of the Science Mark criteria need to be responded to by an

evaluative statement, supported by evidence. The stronger the relationship, the more convincing the submission will be.

You need to show that you have matched each criteria by producing succinct evidence of what you do and an evaluative statement that shows how your work matches the criteria.



› MARSHALLING EVIDENCE

The key to an effective submission is getting the right evidence. A really good source of evidence will help you to address a number of the criteria. Submitting large volumes of evidence is neither desirable nor required. Clear, concise communication is part of the skill set of a good leader and an effective Science Mark submission.

The following are core documents that you can use as evidence to demonstrate where the criteria have been met. The first part shows documents that must be included and the second suggests others that you may find useful.

ESSENTIAL DOCUMENTS:

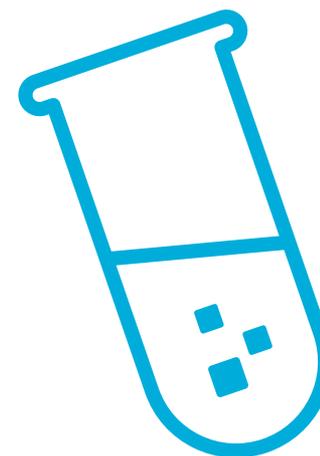
- › science development/improvement plan
- › extracts from schemes of learning (one sample per key stage with two lesson plans)
- › a record of how science staff have used CPD (including networking, teach meets, links with professional bodies, etc) to make an impact on improving their practice and outcomes for young people
- › specific data analysis relating to Science (eg from RAISE online: internal data)

OPTIONAL ADDITIONAL DOCUMENTS:

- › extracts from science self-evaluation reports, including the STEM Learning Self-Evaluation Tool
- › extracts from reports showing monitoring and evaluation of intervention or other initiative
- › extracts from most recent faculty review (internal or external)
- › student or staff voice summaries, such as follow up and impact
- › selection of key points from meetings with other stakeholders
- › extracts from department meeting minutes
- › a small sample of pupils' work
- › portfolio of annotated photos, newspaper articles, blogs, etc, with clear annotation as to why these have been included

Try to find rich sources of evidence that bring together several aspects of your work, supports and is supported by other evidence and can be used for several criteria.

Excessive documentation is not helpful: indeed it could suggest that a school is not able to make specific links between cause and effect. Nor is it the assessor's job to make the links between the documents submitted and the criteria. You need to clearly identify in each section which the relevant evidence is.



› EVALUATIVE STATEMENTS

The evaluative statements are the most important element of an effective submission. They weave the evidence together with a broader picture of the approach the department takes, to show how the criteria are met.

For example, the outcome for gold award, strand 2.5 partnership working states 'There is a strong track record of innovation in the department and of participation in debate and developments with colleagues within and beyond the school'.

Evidence you might provide for this statement could include:

- › a record of the partnerships the department has been involved in
- › evidence of how these partnerships have improved teaching

This could include:

- › a scheme of work extract showing strategies or resources developed in partnership
- › an example of lesson planning showing a partnership approach
- › an example of students' work to show how an innovative teaching strategy has had a positive impact on learning
- › a log of partnership events in which students have been involved, indicating how this has improved outcomes for young people

You then need to draft an evaluative statement indicating the impact that the work of the team is having in this area and the evidence that supports your assertions. The quality of your evaluative statements is much more important than having large volumes of examples. A good statement is likely to be around 200 words in length.

This example is taken from one of the successful schools in the pilot programme:

EVIDENCE:

The department has worked this year to create a shared vision (see PowerPoint and handbook) in line with the whole school priorities. These were for students to:

- › enjoy the science curriculum and be engaged in their learning
- › have a high level of scientific literacy and practical skills
- › narrow the gap for SEND and PP students

The department regularly reviews this vision by using pupil surveys and work scrutinises to evaluate the students' experience of science. The technicians have produced a range of engaging and exciting practicals, now used to engage and enthuse pupils and to develop their practical skills.

SEND and PP pupil data is regularly scrutinised by all classroom teachers to analyse and evaluate pupil achievement

and plan intervention. New research in marking and feedback has been used to develop how feedback is given to pupils to narrow the gap.

Two team leaders are on the Teaching Leaders Fellows programme to develop outstanding leaders in challenging contexts. This programme has ensured the leadership team has a firm pedagogical and leadership understanding of the need for a shared vision in the department.

IMPACT:

Pupil voice surveys show that pupils enjoy the curriculum, stating the opportunity for practical and the quality of teacher feedback as the main areas that they have positive experiences in.

KS3 PP students were able to achieve very highly in 2014, out-performing non-PP students in progress. This was the result of a clear vision and intervention programme for these pupils.

› EVALUATIVE STATEMENTS

One of the most common shortcomings of evaluative statements is that they are only descriptive: they list what has been done. Some description is important as a context has to be provided but the reader should fairly rapidly be presented with an evidenced view as to whether what was done had a positive impact.

This chart offers a way of critiquing a draft evaluative statement; the aim is to move towards the evaluative end.

DESCRIPTION		EVALUATION	
Statement describes what was implemented, and is supported by evidence. There is no reference to intended outcomes or analysis of impact.	Statement describes what happened and suggests why. It is supported by (referenced) relevant evidence. There is some analysis of impact and reference to what was intended.	Statement analyses impact of actions with reference to intended impact, supported by evidence. Wider reflection and indications of further actions are included.	Statement uses evidence to support an insightful analysis of impact against intended outcomes. There is a clear recognition of wider outcomes. The evaluation is wide ranging, challenging assumptions and clearly outlining further actions.

Effective evaluative statements explain why the school is effective rather than state that it is effective. They convince the reader that what has been done is more effective than alternative strategies and indicate how impact upon student progress was a key driver.

You may find these ideas useful; they were drawn up considering the submissions made by the pilot schools:

- › don't confuse being busy with being effective
- › this isn't a prospectus – explain how you got to be good rather than asserting that you are good. Avoid bland generalisations – back up claims with evidence
- › don't submit loads of evidence and see if the assessor thinks that you are good – tell the assessor that you are good – and provide evidence of the outcomes for young people and staff that have been achieved
- › doing anything costs money (often, most significantly, the time of paid staff). Ask if a particular activity represents good value for money and has provided positive impact on young people and staff
- › although you should certainly draw upon judgments from external agencies, make it clear that the school itself is capable of recognising effective practice
- › some focus areas will be 'work in progress' – not everything has to be presented as being completely resolved. Show what has been identified as the next step: it's a good way of representing a process that is being followed. However, next steps are like conclusions – they should be justified. Assessors won't expect all issues to be resolved they may raise concerns if nothing has been resolved

An effective Science Mark submission is clear and easy to follow. Clear referencing is very important, assessors need to be able to look at your evaluative statement for a specific area and easily see how it links to the evidence you are using to back it up.

It is a good idea to make use of a 'critical colleague' in reviewing the evaluative statements and the supporting evidence. This is likely to be someone external to the department who hasn't had a central role in preparing the submission. They should be prepared to give you clear guidance on how effective the submission is.

Make sure you have covered each part of the criteria. These notes provide some guidance on each criterion in turn:

1. CURRICULUM:

- › developing an understanding of the big ideas of science is an invitation to show how the curriculum supports students' independent application of science concepts
- › personalised provision is about the finessing of curriculum delivery to meet different needs of pupils
- › enhancement and enrichment is about making further provision to address the needs of students with a range of attitudes towards the subject
- › skills development is an opportunity to make clear how the curriculum is planned so that students develop a full range of enquiry skills as they follow courses

2. LEADERSHIP AND MANAGEMENT:

- › the key point is how the vision permeates the way the department functions. You need to show how the vision is developed, shared and revised regularly in the department as well as there being one
- › it should be indicated how the department supports teachers to develop and extend both their command of their subject and pedagogical knowledge
- › it should be shown how departmental systems and processes are clear, efficient and effective and how they are responsive to changes and critically evaluated
- › it should be indicated how staff development is used and how it impacts student outcomes, helping teachers progress in their career trajectories as well as meeting school priorities
- › partnerships referred to should be varied and effective; they should be evaluated in terms of their impact on school effectiveness
- › leadership of the curriculum needs to demonstrate focus on how well it manages change using effective processes

3. LEARNING AND TEACHING:

Departments need to show

- › progress in overall terms (ie over a key stage), within a lesson or over a sequence of lessons can be demonstrated
- › how students are developing the capacity to refine theories and models for themselves; and how they develop independence as learners in general and as scientists in particular
- › how pupils' investigative and enquiry skills are developed in most lessons
- › how students are supported to develop ideas and communicate them effectively
- › how teachers' subject and pedagogical knowledge impacts on pupils' learning
- › how the assessment and tracking system is known to be effective and is used to improve teaching

INTERIM SUBMISSIONS

You will need to make an interim submission, consisting of one evaluative statement from each of the three sections along with supporting evidence by the notified date. You also need to submit the action plan and a signed statement verifying the authenticity of the submission. Make sure it is clear which level of award you are submitting for and provide contact details (phone or email) for someone the assessor can ask for any clarification and provide feedback to.

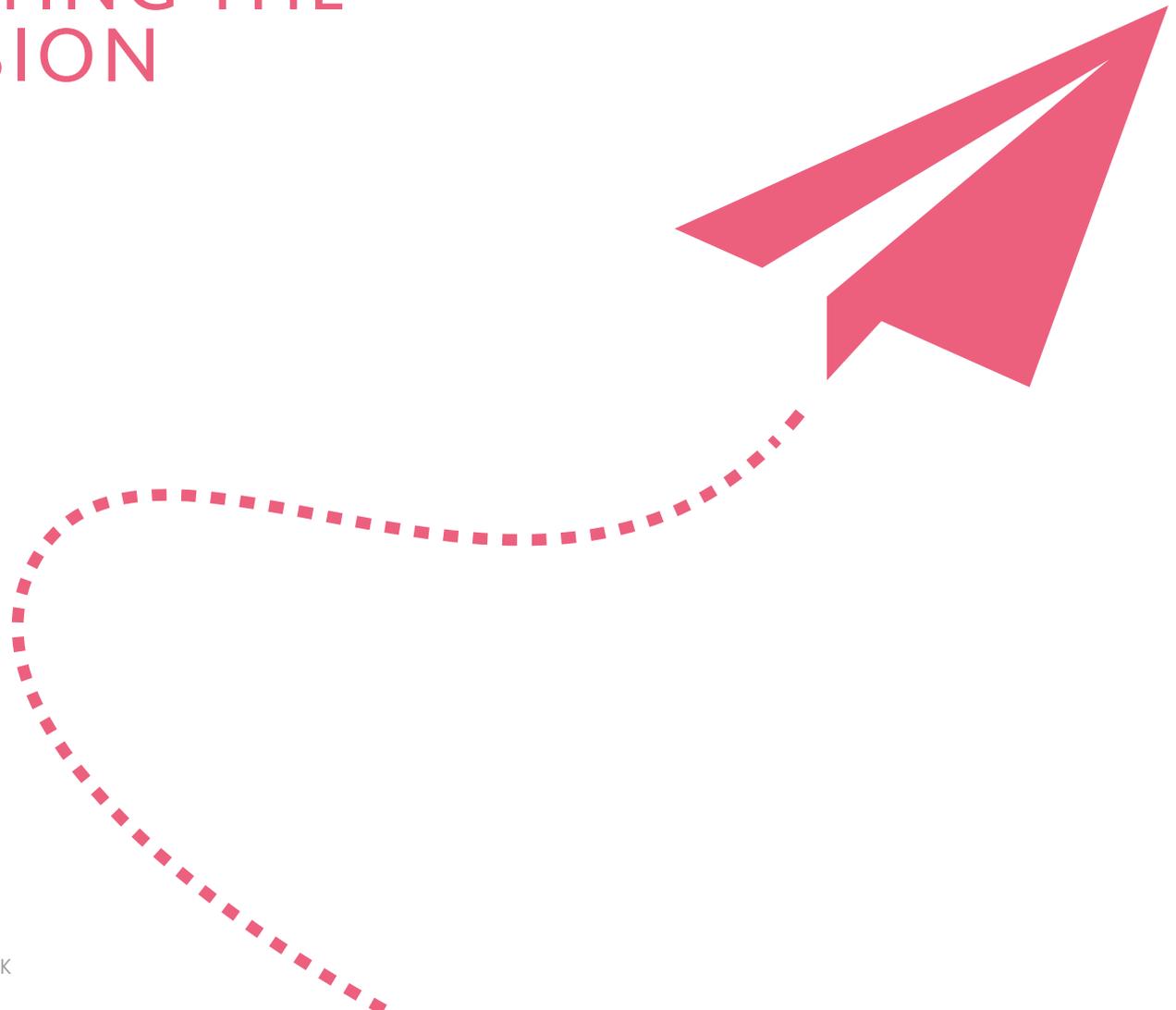
Choose carefully which sections to submit. The assessor will provide evidence which is designed to be formative; if you submit three statements which weren't particularly challenging to produce, the feedback may be less useful than if at least one of them was in an area that was less straightforward.

Feedback has to be provided to you by a specified date. Assessors' work is quality assured by the National Science Learning Centre to ensure it is both reliable and valid.

When you receive the feedback, use this and your action plan to prepare the rest of the submission. It would be unwise to leave all of this until the interim feedback is received, but you should be prepared to modify the rest of your submission in the light of insights gained.

- › For an example of a perspective on big ideas in science education, see '*Principles and big ideas of science education*' edited by Wynne Harlen: www.interacademies.net/File.aspx?id=25103
- › For an example of the thinking behind curriculum pathways in science, see: http://dera.ioe.ac.uk/739/7/sci_pathways_0110109_Redacted.pdf. Note that this was developed in relation to CPD activities, some of which are no longer current but displays an approach that can be used.
- › For some ideas about developing the role of student voice go to: www.wholechildeducation.org/blog/three-strategies-for-encouraging-and-developing-student-voice
- › Managing STEM enhancement and enrichment www.nationalstemcentre.org.uk/elibrary/resource/5719/managing-stem-enhancement-and-enrichment
- › '*Developing Scientific enquiry*' was produced to support an earlier iteration of the KS3 programme of study but the approaches are still relevant: www.nationalstemcentre.org.uk/elibrary/resource/5327/scientific-enquiry-training-materials
- › National College for Teaching and Leadership '*Developing the Vision*': <http://apps.nationalcollege.org.uk/resources/modules/academies/academies-online-resource/ac-s3/ac-s3-t6.html>
- › A range of background reading on PCK is available, including a diagram and bibliography at: www.csun.edu/science/ref/pedagogy/pck/
- › National College for Teaching and Leadership '*The importance of staff development*': www.nationalcollege.org.uk/transfer/open/csbm-managing-hr-in-schools/csbm-6hr-s3/csbm-6hr-s3-t3.html
- › Partnerships can take a wide range of different forms. There are some useful ideas about different examples at: www.educationscotland.gov.uk/learningandteaching/partnerships/
- › One of the self-study guides in '*Strengthening teaching and learning in science through using different pedagogies*' at: www.nationalstemcentre.org.uk/elibrary/resource/5305/strengthening-teaching-and-learning-in-science-through-using-different-pedagogies is on using models and modelling.

PART 3: COMPLETING THE SUBMISSION



COMPLETING THE SUBMISSION

Collect together all your evaluative statements and evidence

Have a 'critical friend' check through them

Send the completed submission to the Science Mark office by the notified deadline

Respond to any questions from the assessor promptly

You will then receive a decision on your submission and feedback

Following the interim feedback, work at completing the submission. It will usually be the same assessor that assesses the complete submission. You may need to modify the initial submission and you should certainly reflect any generic comments in the final submission.

Remember that an effective Science Mark submission is one where you have evaluated your own department's performance and made judgments about its impact on students. Stakeholders' views, data, external reviews and inspection reports might help fill out the picture but you need to indicate that you can recognise what is effective practice. Show how the aspects of your

submission link to outcomes and progress wherever possible. Exam results and data are important in this but don't exclude more qualitative aspects.

Again, make good use of your 'critical friend'; ensure they have seen the feedback and can judge how effectively you have responded.

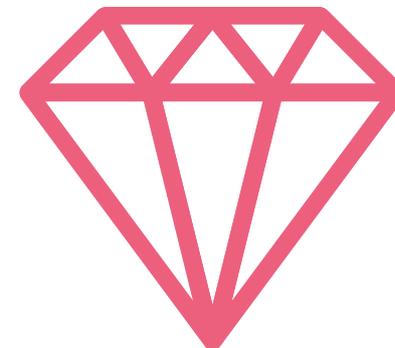
Be mindful of the submission deadline. Assessors will be working to a tight timescale and won't normally be able to accept late submissions. The final submission is subject not only to assessment and feedback, but also quality assurance procedures. The assessor may need to get in touch to clarify certain points or request additional information.

If you are applying for Science Mark at platinum level the assessor will need to visit the school, meet various people and spend some time in the department. The length of the visit will be not more than half a day. The assessor will make contact to arrange both a convenient date and also to suggest who and what they would like to see. The visit does not have a standard format but is led by features of the submission.

You will be notified of the decision and provided with feedback. The date of the Awards Ceremony will have been notified already and you will be invited to attend.

The Science Mark is a prestigious award; you should make sure that

you make good use of the kudos and benefits it brings. Being successful will indicate that your department is highly effective and also that you have evaluated it well. Be proud of this success.



› GATEWAY STATEMENTS

Area	SILVER	GOLD	PLATINUM
Progress indicators:	Students are making and exceeding progress at least in line with national expectations, as outlined in the RAISEonline transition matrices.	Most students are making and exceeding progress above national expectations, as outlined in the RAISEonline transition matrices.	All groups of students are making and exceeding progress that is well above national expectations, as outlined in the RAISEonline transition matrices.
Curriculum:	Students begin to see the interconnectedness of scientific concepts.	Students benefit from a curriculum that is imaginative and skilfully planned to meet all their needs and to capture their interest.	Students have a curriculum that gives an excellent balance of all aspects of science in imaginative and relevant contexts and which also challenges them to understand more about science.
	All students' needs are met by the good delivery of appropriate courses and differentiated provision.	They are fully involved in a wide range of practical work. It creates a range of opportunities for strong spiritual, moral, social and cultural development.	All students' needs are met by innovative planning, delivery and continued evaluation of this curriculum, and which actively enthuses and prepares them for making the transition to further study and training.
	They benefit from an enriched and enhanced curriculum, and opportunities to work with other departments or partners. Students have an awareness of local scientific issues and are curious about the science they see around them.	Students are regularly offered opportunities to work with other departments or partners within and beyond normal curriculum time, and experience how scientific concepts and processes are currently being used by scientists to make discoveries and inventions.	They can proactively and independently use concepts and processes to understand phenomena and features of their locality as well as critically evaluating projects that science can help to address and opportunities that science can help realise.

Area	SILVER	GOLD	PLATINUM
Leadership and management:	The department is underpinned by a vision that has been developed collaboratively, giving team members a common purpose.	The department has worked on a collaboratively developed vision which reflects the whole school's values. Their vision represents shared aspirations for the collective outcomes of science education in the school.	The departmental vision has been developed collaboratively with stakeholders both within and beyond the science team, and it is regularly developed and redefined, based on cutting edge developments in science and science education.
	The staff are supported to make use of relevant and contemporary developments in science to enhance teaching and learning, and are encouraged to take advantage of a range of relevant CPD opportunities to meet standards and develop their professional practice.	Team members systematically make use of relevant and contemporary developments in science to maximise students' experiences of science. They generally exceed the Professional Standards in their work and take an active role in identifying how to develop their practice and performance. There is a wide range of CPD opportunities designed to improve subject and pedagogical knowledge.	Staff actively engage in action research relating to pedagogy, and team members support themselves and each other to exceed Professional Standards. There are a range of well-targeted approaches to CPD, including coaching and mentoring which are regularly evaluated for impact on outcomes and practice. Team members can progress their careers in a variety of ways and do so successfully.
Learning and teaching:	Students confidently and competently carry out a range of practical investigations, needing little support from their teachers. They can communicate their ideas in science in different ways and for different audiences.	Students use ideas and evidence well to construct and evaluate scientific explanations, and plan and execute a range of investigations independently demonstrating high levels of initiative and questioning skills. Students are confident about explaining and linking the 'big ideas' in science, and can articulate their relevance to everyday life.	Students are able to manipulate ideas, evidence and models to explain a wide variety of phenomena and to critically evaluate theories and assess the appropriateness of scientific writing for different audiences and purposes. Students show high levels of engagement with the 'big ideas' of science, and constantly question scientific concepts whilst also being able to offer clear explanations to a wide range of natural phenomena.
	Teachers have good subject expertise and know how to develop students' understanding of the 'big ideas' in science.	Teachers make effective and creative use of their subject and pedagogical knowledge and can help students to anticipate and overcome misconceptions in their learning.	Teachers continually challenge and exploit their own, and their students', subject knowledge and have a very clear understanding of how science is learnt best.
	Teaching and planning are informed by a range of evidence from on-going assessment and observation, and students know how they need to improve based on teacher, self and peer assessment.	Teachers and students have a shared and evidenced view about how to make progress. Students are able to independently evaluate and improve their work in response to teacher or peer feedback.	Students have a clear and robust view of what they have learned and how they learn well, and provide feedback to teachers on how to support their learning more effectively.

APPENDIX 2 SCIENCE MARK ASSESSMENT CRITERIA



SECTION 1: CURRICULUM

	OUTCOMES		
Criteria	SILVER	GOLD	PLATINUM
<p>1.1 Developing an understanding of the 'big ideas' of science</p> <p>The curriculum is designed to support students in developing a progressive understanding of the big ideas of science and their applications and interrelationships.</p>	<p>Students develop an increasing understanding of the big ideas of science. They are beginning to see the interconnectedness of scientific concepts.</p>	<p>Students can confidently explain what the big ideas of science are. They can also articulate their relevance to everyday life with ease.</p>	<p>Students show high levels of engagement with the big ideas of science. They constantly demonstrate curiosity by the way they question scientific concepts, and can offer clear explanations to a wide range of natural phenomena.</p>
<p>1.2 Provision personalised to meet the ongoing needs of students</p> <p>The curriculum is planned to meet the needs of all students by the astute selection of courses, planning of lessons, teaching and deployment of resources and strategies for curriculum enhancement and enrichment. It builds progressively upon provision from earlier stages and enables students to benefit from appropriate and relevant further study or employment opportunities.</p> <p>It is related to a range of areas of training and employment and students understand about opportunities they can access.</p>	<p>All students' needs are met by the good delivery of appropriate courses and differentiated provision. Transition and transfer between years and schools supports continuity and progression, so that students are ready for a range of training and further education opportunities. Students' progress to post-16 STEM courses in line with national expectations.</p>	<p>The selection and design of curriculum pathways meet all students' needs and all students are working at or above the appropriate level for their age and ability. Provision builds on prior learning and not only prepares but engages students in further opportunities, making transition and transfer between years smooth. Higher than national numbers of students progress to post-16 STEM-related study or employment.</p>	<p>All students' needs are met by the planning, delivery and continued evaluation of the curriculum and all students are working at or above the appropriate level for their age and ability. The curriculum challenges and engages all students to understand more and it actively prepares and enthuses them for making the transition to further study and training. High numbers of students progress to post-16 STEM-related study or employment.</p>

<p>1.3 Provision enriched and enhanced to provide rich and valuable experiences</p> <p>The curriculum draws upon cutting edge science to develop the way that concepts are presented and made relevant, and the processes that are taught.</p> <p>Effective use is made of local and regional contexts, partnerships and opportunities to enhance the curriculum.</p>	<p>Students benefit from an enriched and enhanced curriculum by having opportunities to work with other departments or partners. Students recognise a range of opportunities and careers that exist where science skills are valued and important. Students are aware of local scientific issues, and are naturally curious about the science they see around them.</p>	<p>Students benefit from an enriched and enhanced curriculum by regularly having opportunities to work with other departments or partners both within and beyond normal curriculum time. Students experience how scientific concepts and processes are being used currently by scientists to make discoveries and inventions. They understand local scientific issues and ask questions about how these issues are relevant to their daily lives.</p>	<p>All students without exception benefit from an enriched and enhanced curriculum by having opportunities to work with other departments or partners both within and beyond normal curriculum time. Students understand, at a level appropriate to their age and ability, how the concepts and processes they are mastering are being used by a range of STEM professionals in making discoveries and inventions. They can proactively and independently use concepts and processes to understand features of their locality and region, identifying things that science can help to address and opportunities that science can help realise.</p>
<p>1.4 Strategies used to develop skills development</p> <p>As a result of collaboration between team members and with other professionals in and outside the school the curriculum develops a deeper understanding of various concepts, application of skills and good engagement with science.</p>	<p>Students' learning is enhanced because of good links with:</p> <ul style="list-style-type: none"> a) the mathematics, English and ICT departments b) the local and wider community <p>Students have a good use of scientific vocabulary, are confident in their use of mathematical skills in science and make appropriate use of ICT to enhance their learning in science.</p>	<p>Students regularly experience rich learning opportunities because of strong links with:</p> <ul style="list-style-type: none"> a) a range of subject departments b) the science community <p>Students demonstrate high standards of literacy, numeracy and ICT skills, and also develop higher order employment skills.</p>	<p>Students learn how different disciplines can be drawn upon to answer questions, develop explanations and improve the quality of life because of the department's excellent and active links with:</p> <ul style="list-style-type: none"> a) a wide range of subject departments b) the wider STEM community c) regular visits by science professionals <p>Students are offered opportunities to write for lay and science audiences outside of school and to routinely present their science work to parents and partners, thereby developing exceptional presentation and communication skills.</p>

SECTION 2: LEADERSHIP AND MANAGEMENT

	SILVER	GOLD	PLATINUM
<p>2.1 Vision</p> <p>There is a shared strategic vision which is dynamic and underpins the ethos of the department.</p> <p>The whole science team identifies with it and works towards its realisation.</p>	<p>A vision has been developed collaboratively and informs the department's behaviour, goals and strategies.</p> <p>Team members have a common purpose.</p>	<p>The department has collaborated to develop their vision, which reflects the whole school's priorities.</p> <p>The vision represents shared aspirations for the collective outcomes of science education in the school and their ideas as to how they should be achieved and is influenced by developments in the wider science world.</p>	<p>The vision has been developed collaboratively with stakeholders both within and beyond the science team and reflects a broad perspective.</p> <p>There is ongoing development and redefining of the vision, based on the latest cutting edge developments in science and science education.</p>
<p>2.2 Knowledge and understanding of science and science education</p> <p>Cutting edge developments in science inform the development of the curriculum.</p> <p>Developments in pedagogy are shared and evaluated to support the development of the practice of the team.</p>	<p>Team members are supported to make use of relevant and contemporary developments in science to enhance teaching and learning.</p> <p>The team regularly shares good practice and trial new and relevant strategies in class.</p>	<p>Team members systematically make use of relevant, contemporary developments in science to capture students' interest and to maximise students' experience of science.</p> <p>They develop pedagogy through a robust plan-do-review cycle.</p>	<p>Various stakeholders play roles in the use of contemporary and cutting edge developments in science to enhance teaching and learning.</p> <p>Action research in pedagogy is an expectation for all staff and evaluated for impact on maintaining curiosity.</p>
<p>2.3 Systems and processes that underpin the department</p> <p>The Science Improvement Plan, self-evaluation process and monitoring/evaluation programme make effective use of resources and clarify how the team is to progress and achieve its aims.</p> <p>Progress towards aims is efficiently monitored and evaluated.</p>	<p>The Science Improvement Plan is based on robust self-evaluation: it clearly indicates the main priorities for the department, how these will be met and the expected impact it will have.</p> <p>Monitoring is systematic and provides accurate evidence of progress being made against the department's priorities.</p>	<p>The Science Improvement Plan is a 'living' document that underpins the development of the practice of the department with clearly identified roles for all staff and well-articulated processes for self-evaluation and planning.</p> <p>Monitoring is planned and systematic, and outcomes, together with next steps, are shared with all staff to drive high levels of improvement.</p>	<p>The Science Improvement Plan has been developed collectively, and self-evaluation, planning and monitoring are collaborative processes involving a range of stakeholders.</p> <p>Monitoring is a rigorous, transparent process that is well planned across the year with a clear focus at all times. Monitoring and self-evaluation are designed to relentlessly drive high levels of improvement.</p>

<p>2.4 CPD and staff development</p> <p>Capacity within the team is built and talent nurtured and staff feel valued.</p> <p>Teachers meet professional standards well; performance management is robust and follows the whole school policy.</p> <p>Career progression is provided for resulting in good recruitment and retention of staff.</p>	<p>Team members are challenged and supported to meet standards and develop their professional practice, and are offered a range of CPD opportunities to achieve this.</p> <p>School performance management policies are used effectively and strengthened by the involvement of SLT.</p> <p>Team members feel valued and able to develop both within the school and beyond.</p>	<p>Team members meet and sometimes exceed Professional Standards.</p> <p>They take an active role in identifying how to develop their practice and performance, and are able to access a range of CPD opportunities focussed on improving subject and pedagogical knowledge.</p> <p>Performance management is well used to challenge improvement in teachers.</p> <p>Team members feel valued and can identify opportunities both within and beyond the school.</p>	<p>Team members support themselves and each other in meeting and exceeding Professional Standards.</p> <p>They are developed through a range of well-targeted approaches to CPD, including coaching, mentoring and action research.</p> <p>Performance management is a searching process that challenges and supports teachers' improvement.</p> <p>Team members are able to progress their careers in a variety of ways and do so successfully.</p>
<p>2.5 Partnership working</p> <p>The department works in partnership with a range of stakeholders.</p> <p>Team members understand the benefits of collaborating with each other, with other teams in the school and the science community beyond.</p>	<p>The department is well informed about current developments in science and science education through good partnership working.</p>	<p>There is a strong track record of innovation in the department and of participation in debate and developments with colleagues within and beyond the school.</p>	<p>The department has strong links with a wide range of stakeholders that improve, challenge and enhance the educational experience for all students.</p>
<p>2.6 Curriculum</p> <p>The curriculum is effectively planned and taught, resources are deployed efficiently with good H&S practice and good promotion of SMSC.</p>	<p>The curriculum is effectively managed so that it meets the needs of all groups of students, secures good outcomes, enables students to work safely and systematically develops some aspects of SMSC.</p>	<p>The curriculum is skilfully designed to meet the full range of student' needs, develop their ability to manage risk, achieve exceptionally well and systematically develops all aspects of SMSC.</p>	<p>The curriculum is actively developed by a range of stakeholders to be imaginative and stimulating, enabling highly effective continuity and progression whilst also meeting the full range of students' needs.</p> <p>It enables students to undertake risk assessment, develop a thirst for knowledge and rigorously develops all aspects of SMSC so that students are able to become scientifically literate.</p>

SECTION 3: LEARNING AND TEACHING

	SILVER	GOLD	PLATINUM
<p>3.1 Making progress</p> <p>Teachers clearly understand how science is learnt best so the strategies and resources are well focused on the needs of the students to enable them to make good progress.</p>	<p>Evidence shows students are making and exceeding progress at least in line with national expectations.</p>	<p>Evidence shows that most students are making and exceeding progress above national expectations.</p>	<p>Evidence shows that all groups of students are making and exceeding progress that is well above national expectations.</p>
<p>3.2 Linking evidence and ideas to develop theories and models</p> <p>Teaching is planned to enable students to use evidence and concepts to develop and evaluate ideas and models.</p>	<p>Students use ideas, evidence and models to construct explanations.</p>	<p>Students use ideas and evidence well to construct and evaluate their explanations, solve problems and develop models in a range of contexts.</p>	<p>Students are able to manipulate ideas, evidence and models to explain a wide variety of phenomena and to critically evaluate theories</p>
<p>3.3 Investigative and enquiry skills</p> <p>Teaching enables students to confidently operate as scientists and fully engage in a range of practical work.</p>	<p>Students confidently and competently apply a range of skills to the planning and carrying out of investigations, requiring little support from their teachers.</p> <p>Students are taught to recognise safe and unsafe situations in the laboratory.</p>	<p>Students independently plan and execute investigations with confidence, competence and high levels of initiative.</p> <p>Students can identify how to operate safely in a laboratory.</p>	<p>Students think for themselves, raise and investigate their own questions, use scientific knowledge and understanding, and apply a full range of skills in a wide range of practical work.</p> <p>Students consistently identify how to operate safely in a laboratory.</p>

<p>3.4 Communication and teamwork</p> <p>Teaching is designed to support students to develop skills of communication in various forms and for a variety of audiences.</p> <p>Teaching strategies challenge students to develop and evaluate teamwork skills which they can use to be more successful.</p>	<p>Students can communicate ideas in different ways and for different audiences.</p> <p>They collaborate to carry out tasks and to share and develop ideas, working more effectively as a result.</p> <p>Social interactions and groups are effectively managed to enable good learning.</p>	<p>Students adapt stylistic conventions for a range of audiences and purposes.</p> <p>They have developed proficiency in taking on different roles in teams and use this to enhance their learning.</p>	<p>Students can critically evaluate the appropriateness of scientific writing for different audiences and purposes.</p> <p>They identify the best way to work constructively and successfully with other pupils according to the nature of the task, are keen to evaluate their effectiveness, and can adjust their role in a dynamic way during teamwork to ensure the group works effectively at all times.</p>
<p>3.5 Subject and pedagogical content knowledge</p> <p>Teaching is based on excellent subject knowledge and deploys a range of strategies to develop students' understanding and effectively challenge misunderstanding.</p>	<p>Teachers have good subject expertise and understand how to develop an understanding of the 'big ideas' in science.</p> <p>They are well-equipped to challenge common misconceptions and to ensure students learn well.</p>	<p>Teachers make effective and creative use of their subject and pedagogical knowledge and have a clear understanding of how science is learnt best.</p> <p>They are able to recognise why misconceptions may arise and can help students to overcome them.</p> <p>They are well-equipped to respond to the specific needs and learning styles of all students.</p> <p>Students can evaluate the ethical, social and political implications of scientific or technological advances.</p>	<p>Teachers continually challenge and exploit their own and their pupils' subject knowledge and have a very clear understanding of how science is learnt best.</p> <p>Teachers are able to help students to recognise why misconceptions arise and can enable them to act as mentors to help their peers to correct any misunderstandings.</p>
<p>3.6 Assessment, tracking and intervention</p> <p>Teachers and students draw upon a range of evidence to form robust judgements about progress made in learning.</p> <p>This is used to adapt teaching during lessons and to inform next steps in teaching and learning, and to deepen students' scientific understanding.</p>	<p>Teaching is informed by a range of evidence from the assessment of progress and observations during lessons.</p> <p>Students can articulate how to improve based on teacher, self and peer assessment.</p>	<p>Teachers and students have a shared and evidenced view about progress and next steps.</p> <p>They systematically check their understanding throughout lessons.</p> <p>Students are given opportunities to independently evaluate their work in response to teacher feedback, and can develop strategies to improve their own work.</p>	<p>Students have a clear and robust view of what they have learned and how they learn well.</p> <p>They provide feedback to teachers on how to support their learning more effectively.</p> <p>Students are able to critique their own and their peers' work.</p>

APPENDIX 3 LEVELS OF FEES



LEVELS OF FEES

Science Mark has a self-funding structure, to ensure freedom from limitations of numbers or dependency upon fixed term sponsorship. The fees levied cover the costs of developing the materials, assessing submissions, administering the programme and the presentation of awards.

For the year 2015-16 the fees are:

- › for 11-16 schools and colleges, £750
- › for 11-18, 13-18 or 14-18 schools and colleges, £950

It is understood that schools may be in other circumstances, such as special schools, middle deemed secondary, junior high schools, etc. In this case a request should be made to the Science Mark office indicating the size, age range, status and any special circumstances relating to the school and a quote will be made for the fees.

DURATION OF AWARD

A Science Mark award lasts for three years from the date of the awards ceremony. During that period of time a school in receipt of the award can use it in any publicity or promotional materials or activities.

RESUBMITTING FOR A HIGHER LEVEL OF AWARD

If a school prepares a submission for a higher level of award before the previous award has expired (ie would receive the new award less than three years after receiving the previous award) and the submission is led by the same member of staff, the fee will be subject to a 50% discount. If the submission is for a higher level of award and is made before the previous award has expired but is led by a different member of staff, the fee will be subject to a 25% discount.

RENEWAL OF AWARD

If a school prepares a submission that will renew the existing level at the end of the three years (ie avoids the award lapsing) the fee will be subject to a 25% discount.

CONFERRING OF AN AWARD OTHER THAN THE LEVEL APPLIED FOR

An important aspect of Science Mark is that, at a relatively early stage, a school decides which level its overall submission is to be aimed at. It is quite understood that many schools have an uneven profile of impact but the idea is to encourage a focus upon the features of activity that need more attention.

However it may be that a submission doesn't match the outcomes stipulated for a particular level. If the assessor judges this to be the case at the interim stage it will be second marked and the school notified. If this happens at the final stage it will be second marked.

If the submission is deemed to fit the outcomes for a higher level then this will be awarded. If it fits most of the criteria for a higher level the school may be contacted to see if the submission can be strengthened in the remaining areas.

If the submission fails to meet the outcomes for the level submitted it may be assessed against the outcomes for a lower level. However it will need to meet all of those for an award to be made. If a submission fits most of the criteria for a particular level the school may be contacted to see if the submission can be strengthened in the remaining areas.



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The National Science Learning Network is a joint initiative by the Department for Education and the Wellcome Trust.