

# Assessment for Learning in science

Unit 3: Developing peer and self-assessment  
in science





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# How the science Assessment for Learning units fit together

Structuring learning to develop  
Quality First teaching



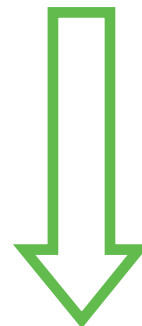
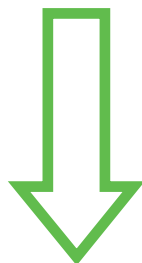
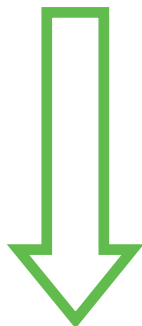
**CORE**

## Unit 1 Lesson scaffolding

Supporting structured learning through:

- learning objectives
- learning outcomes
- success criteria

## NEXT STEPS



### Unit 2a Oral feedback

Recognising learning  
Celebrating learning  
Highlighting  
next steps in learning  
Developing  
independent learners



### Unit 2b Written feedback

Recognising learning  
Celebrating learning  
Highlighting  
next steps in learning  
Developing  
independent learners



### Unit 3 Peer and self-assessment

Recognising learning  
Celebrating learning  
Highlighting  
next steps in learning  
Developing  
independent learners

# Unit 3: Developing peer and self-assessment in science

This is the fourth unit in a series of support materials to strengthen assessment for learning (AfL) in science. These materials link closely with the following quality standards developed for AfL.

## Assessment for Learning quality standards

- 2.1. All teachers have a secure and shared understanding of AfL and how it impacts on learning and standards.
- 2.5. In lessons, all pupils have a clear understanding of what they are trying to learn (learning objectives), how they can recognise achievement (learning outcomes), what 'good' looks like (success criteria) and why they are learning this (big picture).
- 2.6. All pupils have the confidence, dispositions and skills to evaluate the quality of their work and level of understanding, and work with their teachers and peers to take the next steps in their learning.

## Purpose of these materials

- To promote strategies to develop peer and self-assessment
- To highlight opportunities to introduce or extend these strategies when planning lessons
- To help teachers use pupil reflection as part of planning *How Science Works (HSW)* opportunities and their evidence gathering in the Assessing Pupils' Progress (APP) process

## Reference material

All materials referred to are listed at the end of this document and are available to download from [www.standards.dcsf.gov.uk/nationalstrategies](http://www.standards.dcsf.gov.uk/nationalstrategies).

## Key messages

To ensure pupils are confident in peer and self-assessment, teachers will need to:

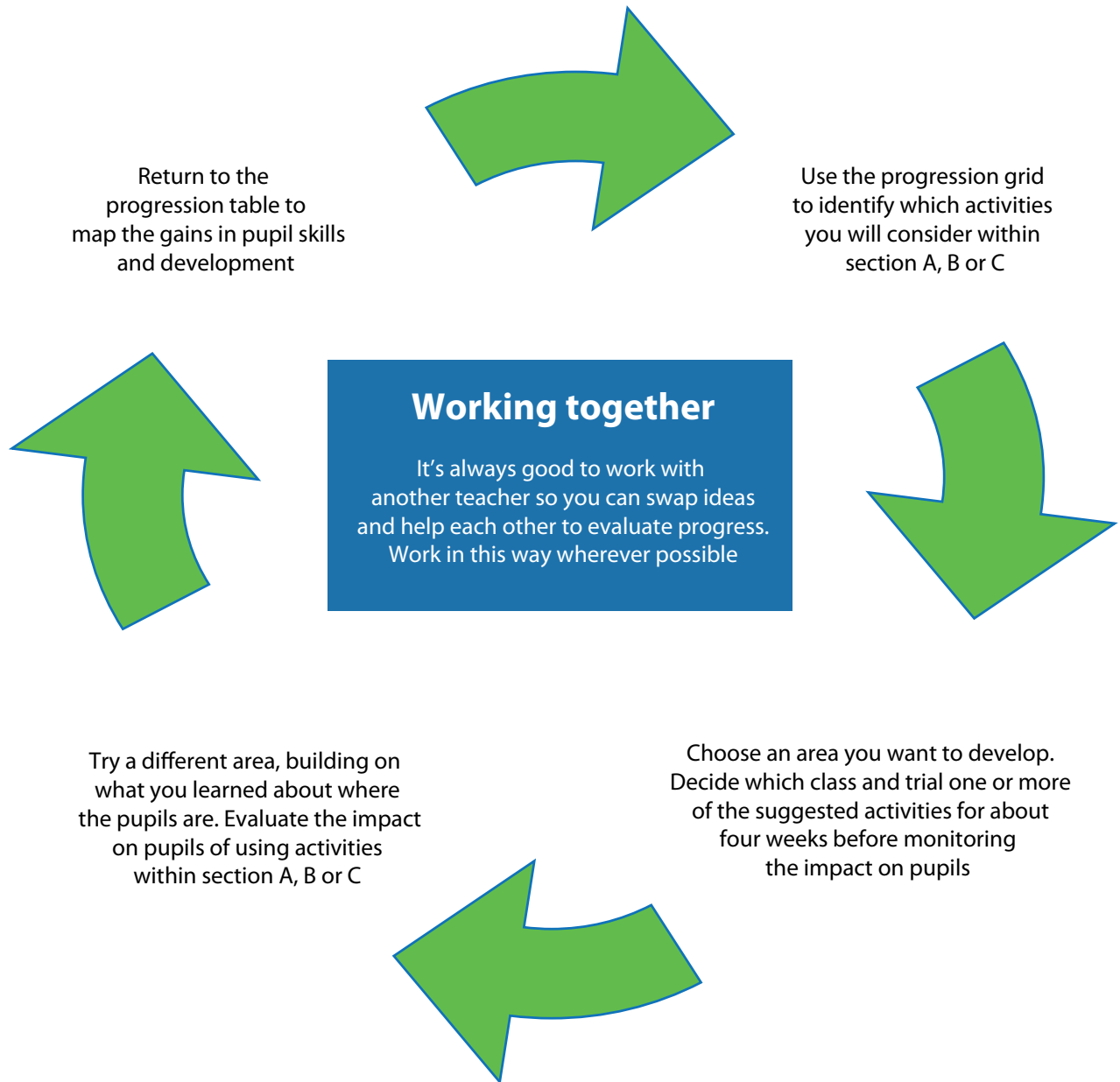
- ensure they explain and share the success criteria that relate to the learning objectives and intended learning outcomes from every lesson
- train pupils over time to assess their own work and the work of others
- use a consistent approach
- scaffold the language used in feedback
- plan peer and self-assessment opportunities in lessons
- frequently and consistently encourage pupils' self-reflection on their learning
- guide pupils to identify their next steps.

The following material builds on the tasks outlined in the 'Ready for more?' section of *Unit 5: Peer and self-assessment* from the AfL whole-school training materials.



## Cycle of professional development

The diagram explains how to use the progression table and take the next steps to develop your expertise in peer and self-assessment.



## Reviewing existing practice in peer and self-assessment

The progression table provides a tool for a department or individual teachers to review current practice and to identify an appropriate starting point for departmental development.

As a department, agree and highlight the statements that best reflect the practice of the whole department. At the bottom of each column is a reference to the tasks that will support your current practice and provide the appropriate material to develop from this point.

## Progression table: reviewing existing practice in peer and self-assessment

Highlight the table to show which column (Focusing, Developing, Establishing or Enhancing) best describes practice in your classroom or department. Look at the pupils then the teachers. This should be based on evidence from lesson observations or pupil and teacher voice.

Identify which row(s) are in need of most development.

Go to the activities that will best support your professional development needs (A, B or C) and try the activities in the most appropriate box.

	Focusing	Developing	Establishing	Enhancing
Pupils	<p>They have yet to understand the nature and benefit of peer and self-assessment. Their ability to determine what constitutes constructive feedback has yet to be developed</p> <p>F1</p>	<p>They are beginning to assess their own work and skill development, and that of their peers, against the learning objectives and learning outcomes</p> <p>D1</p>	<p>They can use success criteria to assess and improve their own and their peers' work and skills. They recognise the standards they are aiming for in science</p> <p>Es1</p>	<p>They can independently identify how to move their learning forward</p> <p>They readily relate success criteria to skills progression in science</p> <p>En1</p>
	<p>Peer-assessment discussions lack focus and pupils have yet to judge the strengths and weaknesses of their work</p> <p>F2</p>	<p>They are gaining confidence in paired and group discussion and are beginning to provide constructive feedback</p> <p>D2</p>	<p>They are increasingly confident in assessing their own work and skill development, and provide informative and constructive feedback to others</p> <p>Es2</p>	<p>They can engage in extended and focused dialogue about their learning and skill development.</p> <p>They apply an understanding of how they learn to make better progress in different contexts</p> <p>En2</p>

<p>Planned opportunities for peer and self-assessment are being developed F3</p>	<p>Learning objectives and outcomes are made explicit and transparent so that pupils can identify how well they have met the success criteria D3</p>	<p>Success criteria which describe progression in aspects of <i>HSW</i> are provided and pupils assess and improve their own work against these Es3</p>	<p>Collaboration is used to identify success criteria related to progress in the <i>HSW</i> skills for the lesson En3</p>
<p>Explicit <i>HSW</i> learning objectives and outcomes are being developed so that pupils can identify how well they have met the success criteria F4</p>	<p>Peer-assessment opportunities are provided and pupil reflection is used to address pupils' needs in future planning of <i>HSW</i> opportunities D4</p>	<p>Time is provided for pupils to reflect independently or collaboratively on the skills they have developed and how they have learned. Feedback is used to inform planning of future <i>HSW</i> opportunities Es4</p>	<p>Planning in <i>HSW</i> enables success criteria to be identified for peer and self-assessment and to inform the APP process En4</p>
<p>Pupils are being encouraged to discuss and reflect on their learning in a focused and constructive way F5</p>	<p>Pupils are provided with opportunities to give feedback to their peers (in relation to learning outcomes) D5</p>	<p>Pupils are trained to work effectively in group discussions, and constructive and informative feedback is modelled Es5</p>	<p>Pupil dialogue is orchestrated and maintained with timely intervention to accelerate understanding of the <i>HSW</i> skills and develop independent learning En5</p>
<p><b>A: Go to these activities to move from Focusing to Developing on page 9</b></p>	<p>Different types of feedback strategies start to emerge to probe progress against the learning objectives and outcomes, to help pupils improve their work D6</p>	<p>A range of peer and self-assessment strategies are used with confidence Es6</p>	<p>Strategies for effective learning are employed and pupils are encouraged to apply these En6</p>
<p><b>A: Go to these activities to move from Focusing to Developing on page 9</b></p>	<p><b>B: Go to these activities to move from Developing to Establishing on page 11</b></p>	<p><b>C: Go to these activities to move from Establishing to Enhancing on page 14</b></p>	

Teachers

## A: Activities to move from Focusing to Developing

Choose the box that you have identified from the review of the progression grid.

<b>Moving from F1 to D1</b>	They have yet to understand the nature and benefit of peer and self-assessment. Their ability to determine what constitutes constructive feedback has yet to be developed  F1	They are beginning to assess their own work and skill development, and that of their peers, against the learning objectives and learning outcomes  D1
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Share learning objectives and outcomes for each lesson with pupils, reviewing them at the end of the lesson (see <i>Unit 1: Lesson Scaffolding: Structuring learning to develop Quality First teaching in science</i>).</li> <li>● Think about how pairs or groups of pupils are organised for peer assessment and what you need to consider to promote the success of the activity.</li> <li>● Consider the type of plenary and how it might be used to assess the success of a peer-assessment activity in meeting the lesson objectives.</li> </ul>		
<b>Moving from F2 to D2</b>	Peer-assessment discussions lack focus and pupils have yet to judge the strengths and weaknesses of their work  F2	They are gaining confidence in paired and group discussion and are beginning to provide constructive feedback  D2
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● With a colleague, plan and observe one of each other's lessons which has an agreed focus on peer and self-assessment.</li> <li>● Note how learning objectives are shared and how learning is assessed at the end of the lesson. Is it clear to pupils how they will be able to demonstrate success with these?</li> <li>● Note the guidance pupils are given when talking to each other about their work. For example, are there clear success criteria for tasks? Is this written in language which is accessible to pupils and which they could use to scaffold their feedback to each other? Does it relate to the learning objectives?</li> <li>● In your feedback to each other focus on how to structure next steps for pupils in terms of constructive feedback.</li> </ul>		

<p><b>Moving from F3 to D3</b></p>	<p>Planned opportunities for peer and self-assessment are being developed</p> <p>F3</p>	<p>Learning objectives and outcomes are made explicit and transparent so that pupils can identify how well they have met the success criteria</p> <p>D3</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Select one teaching group and plan opportunities in the following four weeks to focus peer assessment on learning objectives.</li> <li>● For planned tasks, identify success criteria and write this in pupil-friendly language.</li> <li>● Structure the lessons to give sufficient time for pupils to give each other feedback on successes and areas for improvement in pairs relating to these tasks.</li> <li>● At the end of the four-week period, evaluate successes and issues arising in order to move this forward into regular lesson planning.</li> </ul>		
<p><b>Moving from F4 to D4</b></p>	<p>Explicit <i>HSW</i> learning objectives and outcomes are being developed so that pupils can identify how well they have met the success criteria</p> <p>F4</p>	<p>Peer-assessment opportunities are provided and pupil reflection is used to address pupil needs in future planning of <i>HSW</i> opportunities</p> <p>D4</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Check and plan where necessary to incorporate and sharpen the <i>HSW</i> learning objectives in your planning.</li> <li>● Share these <i>HSW</i> objectives with the pupils.</li> <li>● Inform the pupils that peer assessment will relate directly to the <i>HSW</i> learning objectives.</li> </ul>		
<p><b>Moving from F5 to D5</b></p>	<p>Pupils are being encouraged to discuss and reflect on their learning in a focused and constructive way</p> <p>F5</p>	<p>Pupils are provided with opportunities to give feedback to their peers (in relation to learning outcomes)</p> <p>D5</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Use examples of work from anonymous pupils and ask their peers to suggest possible ways of improving the work and how they would meet the learning outcomes.</li> <li>● Then ask pupils to look at each other's work and, using the expected outcome, to comment on strengths of each other's work and to identify areas for improvement.</li> </ul>		

## Evaluation of impact

Use these activities over a period of about four weeks. Monitor the impact by reflecting on learning gains, talking to pupils, teaching assistants and other teachers about the impact. Look at progress with periodic assessments, using APP.

Check the progression grid to see if you have moved forward in your practice.

You could also ask a colleague to watch a lesson with a focus on the area you are trying to improve, and ask them for feedback.

To continue your development, adjust what you do in the next four weeks by identifying your next steps from the progression grid and moving on to the activities in section B or C.

## B: Activities to move from Developing to Establishing

Choose the box that you have identified from the review of the progression grid.

<p><b>Moving from D1 to Es1</b></p>	<p>They are beginning to assess their own work and skill development, and that of their peers, against the learning objectives and learning outcomes</p> <p>D1</p>	<p>They can use success criteria to assess and improve their own and their peers' work and skills. They recognise the standards they are aiming for in science</p> <p>Es1</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Pair teachers up with another teacher to observe each other teaching lessons with a specific focus on quality of pupil feedback to each other.</li> <li>● Ask pupils to explain the basis on which they are giving feedback to each other.</li> <li>● Ask pupils to look at their own work and assess this against the success criteria.</li> <li>● Identify comments that prompt further thinking and clearly identify pupils' next steps.</li> <li>● Compare these next steps in relation to the science Framework to support progression in skills.</li> </ul>		
<p><b>Moving from D2 to Es2</b></p>	<p>They are gaining confidence in paired and group discussion and are beginning to provide constructive feedback</p> <p>D2</p>	<p>They are increasingly confident in assessing their own work and skill development and provide informative and constructive feedback to others</p> <p>Es2</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Plan lessons routinely to provide pupils with the opportunities to give each other guidance on how to improve their work.</li> <li>● As well as using pairs to share feedback, use larger groups to look at pieces of anonymous work and discuss areas of success and improvement against success criteria.</li> <li>● Identify <i>HSW</i> opportunities for the next term that could represent milestones in pupils' learning. Use the APP assessment criteria and <i>HSW</i> progression grid to support this.</li> </ul>		
<p><b>Moving from D3 to Es3</b></p>	<p>Learning objectives and outcomes are made explicit and transparent so that pupils can identify how well they have met the success criteria</p> <p>D3</p>	<p>Success criteria which describe progression in aspects of <i>HSW</i> are provided and pupils assess and improve their own work against these</p> <p>Es3</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Select a series of lessons that you will be teaching in the near future and ensure there is planned progression through this series of lessons.</li> <li>● Use peer and self-assessment arising from these pieces of work to routinely identify next steps and support progression.</li> </ul>		

<b>Moving from D4 to Es4</b>	Peer-assessment opportunities are provided and pupil reflection is used to address pupils' needs in future planning of <i>HSW</i> opportunities  D4	Time is provided for pupils to reflect independently or collaboratively on the skills they have developed and how they have learned. Feedback is used to inform planning of future <i>HSW</i> opportunities  Es4
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How do I get there?

- Plan into schemes of learning opportunities for pupils to reflect on their own work and to work with others to respond to feedback based on *HSW* learning objectives.
- Sample pupils' work to establish whether there is evidence that *HSW* objective-based comments are being acted upon. In pairs look at the pupils' work and evaluate the impact of focusing on *HSW* objectives.

<b>Moving from D5 to Es5</b>	Pupils are provided with opportunities to give feedback to their peers (in relation to learning outcomes)  D5	Pupils are trained to work effectively in group discussions, and constructive and informative feedback is modelled  Es5
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How do I get there?

- In lessons where there are planned opportunities for pupils to generate their own work, use clear, shared success criteria relating to *HSW*.
- Ask pupils to assess each other's learning against these criteria, first in pairs and then in fours.
- Show exemplar work to pupils in order to model next steps.
- Ask pupils to give each other feedback based on the success criteria and the information about 'what the next steps look like'.
- Ask them to try to give feedback to each other on how to improve their work, based on the success criteria.
- With practice, pupils will become confident in giving good-quality, focused oral feedback whenever they are given the opportunity.

<b>Moving D6 to Es6</b>	Different types of feedback strategies start to emerge to probe progress against the learning objectives and outcomes, to help pupils improve their work  D6	A range of peer and self-assessment strategies are used with confidence  Es6
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How do I get there?

- Plan into schemes of learning opportunities for a variety of types of peer and self-assessment on their own work with planned opportunities for them to respond.
- Use the idea of progression in *HSW* to identify probing or rich questions that help pupils to structure their feedback and to take the next steps in their development of *HSW* skills.
- Schemes of learning and pupils' work are reviewed in department time to evaluate the impact of these approaches on pupils' progress in science.



## Evaluation of impact

Use these activities over a period of about four weeks. Monitor the impact by reflecting on learning gains, talking to pupils, teaching assistants and other teachers about the impact. Look at progress with periodic assessments, using APP.

Check the progression grid to see if you have moved forward in your practice.

You could also ask a colleague to watch a lesson with a focus on the area you are trying to improve, and ask them for feedback.

To continue your development, adjust what you do in the next four weeks by identifying your next steps from the progression grid and moving on to the activities in section C.

## C: Activities to move from Establishing to Enhancing

Choose the box that you have identified from the review of the progression grid.

<p><b>Moving from Es1 to En1</b></p>	<p>They can use success criteria to assess and improve their own and their peers' work and skills. They recognise the standards they are aiming for in science</p> <p>Es1</p>	<p>They can independently identify how to move their learning forward</p> <p>They readily relate success criteria to skills progression in science</p> <p>En1</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Share success criteria specific to <i>HSW</i> objectives with pupils, illustrate them with examples of achievements against these objectives and also examples of improvements (from pupils' work).</li> <li>● Encourage pupils to develop their own success criteria for learning objectives or learning outcomes.</li> <li>● Ask pupils to evaluate their own progress at the end of the lesson or task and set targets for the next piece of work.</li> </ul>		
<p><b>Moving from Es2 to En2</b></p>	<p>They are increasingly confident in assessing their own work and skill development and provide informative and constructive feedback to others</p> <p>Es2</p>	<p>They can engage in extended and focused dialogue about their learning and skill development</p> <p>They apply an understanding of how they learn to make better progress in different contexts</p> <p>En2</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Model the process of giving feedback to enable pupils to construct a dialogue with their peers, based on clear, structured criteria with respect to <i>HSW</i> skills.</li> <li>● Ask pupils to decide whether they think an answer, explanation or analysis is reasonable, whether they can add to it, or whether they would have given a different answer, explanation or analysis.</li> </ul>		
<p><b>Moving from Es3 to En3</b></p>	<p>Success criteria which describe progression in aspects of <i>HSW</i> are provided and pupils assess and improve their own work against these</p> <p>Es3</p>	<p>Collaboration is used to identify success criteria related to progress in the <i>HSW</i> skills for the lesson</p> <p>En3</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Plan lessons routinely with outcomes relating to identified success criteria specific to <i>HSW</i> objectives.</li> <li>● Ask pupils to identify in their work, or that of their peers, examples of achievements against these objectives and also examples of improvements.</li> <li>● Most effective or successful examples can be modelled or celebrated against the APP criteria.</li> </ul>		

<p><b>Moving from Es4 to En4</b></p>	<p>Time is provided for pupils to reflect independently or collaboratively on the skills they have developed and how they have learned. Feedback is used to inform planning of future <i>HSW</i> opportunities</p> <p>Es4</p>	<p>Planning in <i>HSW</i> enables success criteria to be identified for peer and self-assessment and to inform the APP process</p> <p>En4</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Following informal assessment of <i>HSW</i> skills, plan feedback appropriate to the pupil(s) in order to facilitate next steps; these could represent milestones in pupils' learning.</li> <li>● Establish success criteria and share these with the pupils with explicit reference to expected standards to provide the basis for oral feedback.</li> <li>● Focus your feedback on your criteria and guide pupils on how they could improve.</li> </ul>		
<p><b>Moving from Es5 to En5</b></p>	<p>Pupils are trained to work effectively in group discussions, and constructive and informative feedback is modelled</p> <p>Es5</p>	<p>Pupil dialogue is orchestrated and maintained with timely intervention to accelerate understanding of the <i>HSW</i> skills and develop independent learning</p> <p>En5</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● For a task or lesson in a series, encourage pupils to develop appropriate success criteria.</li> <li>● Help pupils focus on what they need to produce or demonstrate to have their achievement recognised.</li> <li>● As an extension to a starting-point activity in a new topic, having found out what pupils already know, ask them to speculate about what they think they might need to learn about next.</li> </ul>		
<p><b>Moving from Es6 to En6</b></p>	<p>A range of peer and self-assessment strategies are used with confidence</p> <p>Es6</p>	<p>Strategies for effective learning are employed and pupils are encouraged to apply these</p> <p>En6</p>
<p>How do I get there?</p> <ul style="list-style-type: none"> <li>● Within a series of lessons, routinely build in reflection time and promote a climate for learning where discussion focused on learning can take place easily. Allow pupils to work in talk-pairs or groups for much of the time.</li> <li>● Plan opportunities for pupils to work independently or with each other to review and act upon feedback from their peers on their own work in relation to <i>HSW</i> skills.</li> <li>● Schemes of learning and pupils' work can be reviewed in department time to evaluate the impact of the approach on pupils' progress in science. This could be enhanced with reference to the <i>Assessment for Learning whole-school training materials – Unit 5: Peer and self-assessment</i>.</li> </ul>		

## Evaluation of impact

Use these activities over a period of about four weeks. Monitor the impact by reflecting on learning gains, talking to pupils, teaching assistants and other teachers about the impact. Look at progress with periodic assessments, using APP.

Check the progression grid to see if you have moved forward in your practice.

You could also ask a colleague to watch a lesson with a focus on the area you are trying to improve, and ask them for feedback.

## Further information

The Framework for secondary science can be accessed at:

[www.standards.dcsf.gov.uk/nationalstrategies](http://www.standards.dcsf.gov.uk/nationalstrategies). The following related documents can be found on the same website by searching using the document name or reference number.

1. *Science APP: AfL quality standards*
2. *Assessment for Learning whole-school and subject development materials – Unit 5: Peer and self-assessment* – Ref: 0737-2004
3. *Assessing Pupils' Progress in science* – Ref: 00036-2009
4. *Assessment for learning in science: supporting APP* – Ref: 00932-2009



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