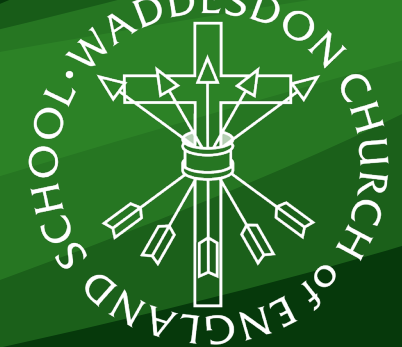
WADDESDON TEACHING AND LEARNING

Familiar Fundamentals



Waddesdon Teaching & Learning
Familiar Fundamentals

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Introduction

What makes great teaching?

'The fundamental goal of everyone that works in education is to improve students' lives. While many personal, family, and cultural factors contribute to students' outcomes, a large body of research indicates that what teachers do, know and believe matters more to the achievement of students than anything else we can influence. The quality of teaching is hugely important to the outcomes of young people, and great teaching can be learnt. Raising the quality of teaching within existing schools is probably the single most effective thing we could do to promote both overall attainment and equity.' (Wiliam, 2018)

Robert Coe's 2014 work on 'What makes great teaching'[1] examines 3 key questions:

- What makes 'great teaching'?
- What kinds of frameworks or tools could help us to capture it?
- How could this promote better learning?

The report recommends reviewing teaching 'effectiveness' by using evidence from cognitive psychology and effective strategies for learning such as those proposed in Rosenshine's Principles of Instruction[2].
Evidence Based Education's Great Teaching Toolkit[3] provides further research. It gives a credible summary of the elements of great teaching practice, the kind that impact most on learning. The conclusions summarise that great teachers:

- understand the content they are teaching and how it is learnt;
- create a supportive environment for learning;
- manage the classroom to maximise opportunity to learn;
- activate and support hard thinking.

This booklet supports the above by outlining and explaining how evidence-informed **Familiar Fundamentals**, supported by effective professional development, lead to the great teaching that occurs across the Waddesdon curriculum.

What do we mean by Familiar Fundamentals?

Familiar Fundamentals are the bread-and-butter of highly skilled, highly attuned and highly effective Teaching and Learning. These are accrued over years of reflective practice and through the sensible and open-minded application of research. This booklet enables teachers to use research-informed pedagogies as part of their everyday practices. These Familiar Fundamentals can be applied in the classroom, through independent work and alongside purposeful and meaningful EdTech use. Awareness, practice and refinement of these Familiar Fundamentals support Quality First Teaching at Waddesdon.

1 Coe R et al, 'What makes great teaching?, CEM/Sutton Trust/ Durham University 2014
2 Rosenshine B, 'Principles of Instruction', American Educator, 2012
3 Coe R/Kime S, Great Teaching Tookit-Evidence Review, Evidence Based Education, Cambridge Assessment International Education 2020

The **Familiar Fundamentals** at Waddesdon are:

Theories (the Why)	1 Cognitive Load Theory 2 Rosenshine's Principles of Instruction
Instruction and Application	3 Retrieval Practice 4 Direct Instruction 5 Deliberate Practice 6 Modelling and Scaffolding 7 Dual Coding
Checking Application	8 Feedback 9 Formative Assessment
Successful Learners	10 Self-regulated Learners 11 Collaborative Learners

How do Familiar Fundamentals link to classroom practice?

Learning intentions are clear, focussed and appropriate	Cognitive Load Theory, Direct Instruction
Activities promote challenge, application (practice), engagement and depth of thought	Retrieval Practice, Deliberate Practice, Self-regulated Learners
All groups of students are provided with appropriate levels of support and challenge so that they can succeed	Rosenshine's Principles, Modelling, Dual Coding, Formative Assessment
Students understand how to produce high quality work	Rosenshine's Principles, Feedback, Formative Assessment, Modelling, Direct Instruction
Knowledge and understanding are effectively checked	Rosenshine's Principles, Retrieval Practice, Formative Assessment
High quality feedback promotes learning	Feedback, Direct Instruction

How do the Familiar Fundamentals link to EdTech?

Research by the Education Endowment Fund[4] into the use of technology in learning concludes that 'teaching quality is more important than how lessons are delivered'. The report's recommendations for using digital technology to improve learning include:

- considering how technology will improve teaching and learning before introducing it;
- using technology to improve the quality of explanations and modelling;
- using technology to provide ways to improve the impact of pupil practice;
- using technology to play a role in improving assessment and feedback.

At Waddesdon we believe that EdTech can support and enhance the learning and progress of all students, and works within the Familiar Fundamentals guidance. In all cases quality teaching comes before the use of technology.[5]

How can I use this booklet?

This booklet can be used to support teacher practice via ongoing CPD discussions around teaching and learning. Teachers may choose to identify a specific Familiar Fundamental as a 'Personal Pedagogy' (see final section of document) that would improve the outcomes for the students they teach, or work with others looking at effective practice within/across subject teams.

4 Rapid Evidence Assessment on Remote Learning, Education Endowment Foundation April 2020
5 Using Digital Technology to improve learning, Education Endowment Foundation, March 2019

1: Cognitive Load Theory

What is Cognitive Load Theory?

Our working memory can only hold a limited amount of information for a limited time. By committing information to the long-term memory, our ability to learn is transformed as this overcomes the limits of our working memory and attention. We can avoid overloading working memory and improve learning through careful attention to instructional design.

What does the research say about Cognitive Load Theory?

Sweller's theory[6] identifies three different forms of cognitive load:
- Intrinsic cognitive load: the inherent difficulty of the material itself, which can be influenced by prior knowledge of the topic;
- Extraneous cognitive load: the load generated by the way the material is presented and which does not aid learning;
- Germane cognitive load: the elements that aid information processing and contribute to the development of 'schemas'. CLT suggests that if the cognitive load exceeds our processing capacity, we will struggle to complete the activity successfully.

The domains of attention, working memory and long-term memory must therefore be a consideration when teaching students effectively.

What does effective consideration of Cognitive Load Theory look like in the classroom?

- Ensuring learning intentions are clear and focused on learning, not task-centred;
- Students read information before/after teacher explanation (not during);
- Teachers take small steps in the delivery of new knowledge and skills;
- Chunking of information throughout the lesson in logical steps;
- Consideration of dual coding strategies;
- Use of modelled and worked examples.

How can EdTech support Cognitive Load?

Tech can support cognitive load in a variety of ways for example:
- producing videos and presentations with voice recording and visuals that are directly related to the learning topic;
- use of Snip Tool to select key information from texts/content/images and remove extraneous information;
- using scheduled assignments to deliver information in steps and allow extra consolidation time;
- scripted pre-recorded instruction to review and re-use.

Further reading links:

D Shilbli & R West, Cognitive Load Theory and its Application in the Classroom, Impact Magazine, 2018

Blakey J, Cognitive Load Theory, What Does the Research Say, Evidence Based Education, 2019

Cognitive Load Theory Updated: 20 Years On - Implications for Teachers and Teaching, @Leadinglearning, 2019

6 Chandler, Paul and Sweller, John: Cognitive Load Theory and the Format of Instruction, Cognition and Instruction, 1991

2: Rosenshine's Principles of Instruction

What are Rosenshine's Principles of Instruction?

In a series of studies Barack Rosenshine[7] set out the hallmarks of effective teaching, discovered in his work over the past four decades. In his research (2012), a wide range of teachers were observed to identify the differences between the most effective and least effective teachers. Rosenshine's ten 'research-based principles of instruction' come from three sources, summarised in the report as follows:

- Research in cognitive science;
- Research on the classroom practices of master teachers;
- Research on cognitive support to help students learn complex tasks.

The 10 principles are as follows:

1. Daily review
2. Presenting new material using small steps
3. Asking questions
4. Providing models
5. Guiding student practice
6. Checking for student understanding
7. Obtaining a high success rate
8. Providing scaffolds for difficult tasks
9. Independent practice
10. Weekly/monthly review

What do Rosenshine's Principles look like in the classroom?

The Principles of Instruction are not a lesson check list, but should be evident over extended phases of learning. The recent work of Tom Sherrington[8] divides Rosenshine's Principles into the following four strands:

STRAND 1: Sequencing, concepts and modelling (2,4,8)

- Presenting material using small steps, followed by practice
- Limiting the amount of material students receive at any one time
- Giving clear detailed instructions and explanations
- Think aloud and model steps
- Use more time to provide explanations
- Provide many examples
- Re-teach where necessary

STRAND 2: Questioning (3,6)

- Ask a large number of questions and check for understanding
- Ask students to explain what thay have learned
- Check the response of all students
- Provide systemic feedback and corrections

7 Rosenshine B, 'Principles of Instruction', American Educator, 2012
8 Sherrington T, Principles of Instruction in Action infographic, 2019

STRAND 3: Reviewing material (1,10)	STRAND 4: Stages of practice (5,7,9)
• Beginning a lesson with a short review of previous learning • Re-teaching material when necessary	• Provide a high level of practice for all students • Guide students as they begin to practice • Prepare students for independent practice • Monitor students when they begin independent practice

How can EdTech support Rosenshine's Principles of Instruction?

- Retrieval software/resources
- Digital sharing of resources linked to the principles e.g retrieval quiz banks, model answers, scaffolding resources
- Live modelling via a visualiser
- Use of assessment tools to support stages of practice

Further reading/CPD links:

Teacherhead Kitchen Pedagogy
Teacherhead Rosenshine Masterclass Video Clips
Teacherhead Rosenshine's Principles, 10 Further Questions
17 Teaching Principles of Instruction, Teacher Toolkit
Rosenshine's Principles in Action, T Sherrington, John Catt 2019

3: Retrieval Practice

What is Retrieval Practice?

Retrieval practice is the process of bringing to mind information from memory. This often takes the form of regular low-stakes testing or quizzing, but also takes other forms such as producing mind-maps from memory, writing everything you know about a topic, self-testing with flash cards or explaining a complex concept.

What does the research say about Retrieval Practice?

Research shows that the more we practise remembering information, the more likely it is we can transfer information to our long-term memory. Retrieval practice[9], sometimes known as 'The Testing Effect', is a highly effective study strategy, more so than simply reading notes for example[10]. When quizzing, it is important to change the wording of questions so that students don't just learn how to answer a particular question[11]. There is also strong evidence that spacing retrieval[12] is effective and the interleaving of topics within subjects can be useful when introduced carefully.

What does Retrieval Practice look like in the classroom?

- Regular low-stakes quizzing which links to current and prior learning (daily, weekly, monthly)
- Asking more questions, to more students, more of the time
- Use of knowledge organisers to aid retrieval
- Rehearsal and performance
- Interleaved lessons planned into the curriculum delivery to revisit subject material from previous term/year
- Inclusion of current and prior learning when setting assessments
- Retrieval strategies e.g. brain dump, 'give me 3'

How can EdTech support Retrieval Practice?

- Running regular multiple choice 'auto-marking' quizzes using tools such as Socrative, Kahoot or Quizzizz, then reviewing the answers as a class.
- Use of retrieval question banks e.g Carousel, Excel question banks
- Use of software programmes with inbuilt retrieval activities e.g Hegarty Maths, Seneca
- Setting self-study quizzing using tools like Quizlet (with adaptive testing)
- Using shared board tools like Padlet or a shared live document to ask students to recall information on a topic and then arrange and connect that information
- Using formats to capture student understanding https://www.mentimeter.com/
- Language learning apps

Further reading/application links:

Optimising Learning via Retrieval Practice, The Learning Scientists
Karpicke J, Retrieval-based Learning: The Need for Guided Retrieval in Elementary School Children, Journal of Applied Research in Memory and Cognition, 2014
Carousel Learning Retrieval Platform
Retrieval Practice; Research and Resources for Every Classroom, Kate Jones, 2019

Online courses:

Seneca Learning Retrieval Practice

9 Roediger III, H.L.,& Karpicke, J.D. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. Psychological Science, 17(3), 249-255
10 Dunlosky, J. (2013). Strengthening the student toolbox: study strategies to boost learning. American Educator, 37(3), 12–21
11 Trumbo, M. C., Leiting, K. A., McDaniel, M. A., & Hodge, G. K. (2016). Effects of reinforcement on test-enhanced learning in a large, diverse introductory college psychology course. Journal of Experimental Psychology: Applied.
12 Kapler I, Weston T and Wiseheart M (2015) Spacing in a simulated undergraduate classroom: Long-term benefits for factual and higher-level learning. Learning and Instruction

4: Direct Instruction

What is Direct Instruction?

Direct instruction means that the teacher stands in front of a class and presents the information. The teachers give explicit, guided instructions to the students. Using direct instruction is effective when it suits the skill students have to learn.

Direct instruction does not mean that learning is passive, or that teaching is reduced to drill and practice. Direct instruction is a systematic approach to teaching in which the teacher is very explicit about what students are to learn, the language of instruction clear, and allows teachers the opportunity to monitor their students while teaching, and to provide constructive feedback.

Direct instruction should not be confused with rote instruction, which is an approach that requires students to memorise answers and repeat them in rote-like fashion.

What does the research say about Direct Instruction?

Engelmann's principles of direct instruction[13] are underpinned by cognitive and behavioural sciences. More recent research[14] proposed that direct instruction is one of the most effective teaching strategies and is one of the most widely used methods of teaching. Direct instruction begins with the "clear and systematic presentation of knowledge"[15], with the goal of helping students to develop background knowledge so that they may apply and link it to new knowledge. Generally, direct instruction is highly effective for teaching multi-step procedures that students would otherwise have difficulty discovering on their own, such as geometry, algebra, and computer programming.

What does Direct Instruction look like in the classroom?

- Beginning a lesson by introducing the main idea to the class and then to check to see if students are ready to practise the skills and concepts that you presented
- Organising content around big ideas/bigger picture
- Allowing students to practise and apply skills through independent and small group work after the teacher-led lesson format
- Scaffolding instruction. For example, when teaching students writing, provide support for editing. Depending on the students' writing level, some of these editing suggestions could come as a checklist
- Reviewing material and instructions. Reviewing or modelling instructions can help students know what they are expected to do
- Supporting vocabulary development via explicit teaching of key terms/language
- Abstract models with concrete examples
- Clearly addressing misconceptions head-on.

How can EdTech support Direct Instruction?

- By using visualizer to provide easily accessible visual support of the skill which students need to learn
- By pre-recording clear instructions that can be re-watched and reviewed by students

Further reading links:

5 Meanings of Direct Instruction, Rosenshine B, 2008
A Brief Introduction to Direct Instruction, The Education Hub
Direct Instruction Infographics
https://www.bookwidgets.com/blog/2019/03/direct-instruction-a-practical-guide-to-effective-teaching

13 Englemann S & Carnine D, Theory of Instruction, Principles and Applications, NIFIDE Press, 1991
14 Stockard J, A brief summary of research on Direct Instruction, National Institute for Direct Instruction, 2015
15 Kim T, Axelrod S, Direct Instruction: An Educators' Guide and a Plea for Action, Temple University 2005

5: Deliberate Practice

What is Deliberate Practice?

Deliberate practice is when teachers provide regular and purposeful opportunities for students to put into practice the skills they have been taught and content they have learnt. Teacher Education Fellows at the Ambition Institute[16], suggest 3 phases in introducing effective deliberate practice:

1. Ensuring practice happens by prioritising it
2. Making practice shine by refining practice activities
3. Ensuring practice matters by designing practice and support so that it affects students' actions.

What does the research say about Deliberate Practice?

Anders Ericsson[17] defines deliberate practice as, "purposeful practice that knows where it is going and how to get there". He argues that we gain expertise through the improvement of our mental processes, and it's possible to develop mental models of what 'good' looks like in any domain through regular deliberate practice. In 2017, John Hattie released his updated list of 250+ factors that influence student achievement. It included deliberate practice as a factor, with a high effect size d = 0.79. Whilst there is some debate over the impact and role of deliberate practice , it does not mean that the idea is not without merit, especially when is it effectively focusing on improvement, rather than just repetition.

What does Deliberate Practice look like in the classroom?

For deliberate practice to be purposeful, teachers need to provide students with a clear model of what expert performance looks like and the actions needed to be taken to achieve that level of performance. This in turn requires guidance and feedback from the teacher to support students through the deliberate practice[18]. Deliberate practice helps learners by offering practice which:

- is challenging – outside learners' current capacity
- is focused – requiring learners' full concentration
- is bitesize – one skill at a time, well-defined, specific goals
- offers feedback – providing guidance on how to improve
- Wis sequenced – skills build up in a careful, considered order
- produces and depends on effective mental representations[19]

How can EdTech support Deliberate Practice?

- By using software to provide purposeful, formative assessment and feedback
- By sharing of resources/mental models for effective deliberate practice
- By supporting the deliberate practice by sharing of best practice in a digital format e.g use voice-text software to share exemplar work with others
- By using software that allows students to edit and improve on their practice.

Further reading links:

Macnamara et al, Deliberate Practice and Performance in Music, Games, Sports, Education, and Professions: A Meta-analysis, Association for Pychological Science, 2014
Fletcher-Wood H, Deliberate Practice Teachers Education Handbook, Ambition Institute, 2019

16 Fletcher-wood H, Deliberate Practice teachers education handbook, Ambition Institute, 2019
17 Ericsson, A., Pool, R. (2016). Peak: Secrets from the new science of expertise. London: Bodley Head.
18 Hambrick et al, Deliberate practice: Is that all it takes to become an expert?, Elsevier 2014
19 Ericsson, A, Pool, R

6: Modelling & Scaffolding

What is Modelling and Scaffolding?

Modelling is the process of providing the novice learner with exemplar practice to support their own deliberate practice. All too often, students go from being told things in the abstract, to being asked to do things without anyone modelling the process explicitly. Without models, student thinking and work can be patchy and filled with misconceptions/avoidable errors. By providing models to students, greater clarity is provided. 'Scaffolding' is a metaphor for temporary support that is removed when it is no longer required. Initially, a teacher would provide enough support so that students can successfully complete tasks that they could not do independently.
"The power of teacher modelling lies in finding a good balance with student practice. Model, practise, review; model, practise, review…that's the cycle that's needed." Tom Sherrington, Teacherhead

What does the research say about Modelling and Scaffolding?

Rosenshine's Principles of Instruction[20] and Sweller's Cognitive Load Theory[21] both support the value of modelling and the use of scaffolding with students. Rosenshine suggests that more effective teachers recognise the need to deal with the limitations of working memory and success in breaking down concepts and procedures into small steps, therefore forming secure schemas in student learning. Rosenshine suggests effective teachers engage in a 'cognitive apprenticeship', supporting students to reach ambitious goals, using scaffolding processes that guide them on the way. The teacher will gradually remove the support (the scaffold) as the student becomes able to complete the task independently.

What do Modelling and Scaffolding look like in the classroom?

After teachers have ensured students have the pre-requisite knowledge/skills and misconceptions have been addressed, modelling is the next step in securing effective understanding and a well-structured schema. The teacher modelling and thinking aloud while demonstrating how to solve a problem are examples of how to provide further cognitive support. In the classroom this can be done via:

- narrating the thought process
- setting the standards of 'what excellence looks like/does not look like'
- live modelling, worked examples and backward fading: I do, we do, you do
- silent modelling to support student focus
- checking for understanding whilst providing models (cold calling, say it again say it better, process questions, Think, pair, share)
- Provision of visual, written or verbal scaffolding support.

Further support can be provided via scaffolding, such as writing frames, key word banks, sentence starters, exemplars. These should be temporary as they support the cognitive process but are withdrawn so students do not become reliant on them.

How can EdTech support Modelling and Scaffolding?

- Use of visualizer to support live modelling
- Sharing of exemplars via SharePoint
- Using student practice (WABOLL/WAGOLL) from digitally submitted work (student submission of work via Microsoft Teams Assignments makes this more efficient) to inform next steps.

Further reading links:

Tharby A, I, We,You - A Simple Approach to Modelling, Classteaching, 2018
B Rosenshine, Principles of Instruction, 2012

20 Rosenshine B, 2012
21 Chandler, Paul and Sweller, John: Cognitive Load Theory and the Format of Instruction, Cognition and Instruction: 8(4) 1991, 293-

7: Dual Coding

What is Dual Coding?

Dual coding is an aspect of cognitive science which suggests that using diagrams alongside text can help learners build schemas and connections to link knowledge and ideas. Images, if chosen correctly, can help learners to rapidly understand meaning and then enable them to think more critically about a concept.

What does the research say about Dual Coding?

First identified by Allan Pavio (1971), the concept proposes that diagrams can help in the understanding of meaning by illustrating and visually structuring knowledge. Providing information in both visual and verbal form can clarify ideas and best use of our working memory. This can reduce the cognitive load required to help knowledge to stick and can then help learners progress into higher order thinking at a quicker pace. The visual images used must be meaningful and thought through carefully to avoid complication and overload.

What does consideration of Dual Coding look like in the classroom?

- Consideration of dual coding strategies e.g. support with visual images such as diagrams to support development of understanding
- Cutting the amount of content included on a slide or resource; chunking the information into headings that stand out; lining up information neatly to give the reader confidence in its order; using fonts and colour with restraint
- Removal of extraneous images/animations
- When creating diagrams, ensuring that the text is included on the diagram rather than having a separate key
- Via method of presentation of material e.g sketch notes, infographics, graphic organisers, icons.

How can EdTech support Dual Coding?

To avoid cognitive overload, teachers should ensure that presentations are clear of extraneous detail, animations or visual images; the use of dual coding supports this. Tech can support dual coding in a variety of ways, for example:

- Recording a screencast of a presentation, using tools like Loom or iPad screen recording
- Drawing whilst explaining, using a visualizer
- Use of icons to support visual understanding
- Use of Snip tool or select key information from texts/content and remove extraneous information.

Further reading links:

Caviglioni O, Dual Coding with Teachers, John Catt 2019
The Learning Scientists, Dual Coding and Learning Styles
Boxer A, Dual Coding for Teachers Who Can't Draw', ResearchEd Home 2020
Future Learn, An Introduction to Dual Coding

Online courses/resources

Seneca Learning, Dual Coding for Teachers
thenounproject.com
olicav.com

8: Feedback

What is Feedback?

Feedback is information given to a student about their performance, which aims to bring about improvements in their learning. There are four types of feedback: [22]

1. Feedback about a specific task
2. Feedback on the process of the activity
3. Feedback to manage a student's learning (metacognition)
4. Feedback about them as individuals (least effective).

The **Assessment and Feedback Policy** at Waddesdon says that feedback should be MEANINGFUL, MANAGEABLE and MOTIVATIONAL, with a clear purpose. The nature and occurrence of feedback is outlined in the Whole-School and Subject-Specific Entitlement.

What does the research say about Feedback?

The evidence suggests that, done well, feedback can have a very high impact on learning.[23] To be effective, feedback needs to give a clear indication of what the student needs to do next, and focus on clear strategies for improvement. Targets need to be clear and actionable. Feedback should cause thinking[24] and time should be given to enable students to consider and respond to it appropriately.[25] Awarding grades can reduce the impact of feedback[26] and lengthy feedback can dilute the message and lead to students being overwhelmed. Feedback provided by peers, when focused on improvement rather than evaluation, can be a very powerful tool.[27]

What does Feedback look like in the classroom?

- Whole class feedback – visual, verbal and written formats
- Verbal 1:1 support
- Written feedback on work
- Re-teaching and adapted delivery to address identified misconceptions
- Peer feedback
- Feedback that moves forward/ requires actions

How can EdTech support Feedback?

- Work submitted via Teams Assignments uses a rubric to provide feedback
- Attaching written comments / adding annotation on digital documents e.g. using the comment feature on Word
- Adding recorded voice notes to handed in work, using the voice recording features in apps
- Recording a screencast whilst annotating feedback, using screen recording apps like Loom
- Using student Teams Channels/Class Notebook to provide personalised digital feedback e.g. via Chat function
- Sharing student work to support peer review and feedback
- Give immediate feedback to students via self-marking quizzes e.g. Microsoft Forms, retrieval software

Further reading links:

Wiliam, D. (2011), Embedded Assessment, Bloomington: Solution Tree Press
Chiles m, The Feedback Pendulum, John Catt 2021
Hattie.J. & Timperley, H (2007). The Power of Feedback, Review of Educational Research, 77(I), 81-112
Waddesdon Assessment and Feedback Policy
Evidence Based Education, A short guidance to delivering effective and meaningful feedback to students

22 Hattie and Timperley (2007)
23 Education Endowment Fund, Feedback report, 2018
24 Wiliam (2011)
25 Elliot et al, 'A Marked Improvement- a review of the evidence of written marking, Education Endowment fund, 2016
26 Butler R, 'Enhancing and undermining intrinsic motivation: the effects of task-involving and ego-involving evaluation of interest and performance, British Journal of educational psychology, 1988
27 Wiliam (2011)

9: Formative Assessment

What is Formative Assessment?

Formative assessment is the process whereby a teacher uses information about students' understanding to make adjustments to their teaching as they go. This process should therefore improve the effectiveness of teaching and learning. Teachers will commonly use discussions, questions and activities to elicit students' understanding. Teachers then use this information to adjust their teaching in order to help students move forward in their learning.

What does the research say about Formative Assessment?

Designing well-chosen questions and tasks will identify where students have successfully understood new information or where they are developing misconceptions. Assessing all students' understanding through a time-efficient hinge question[28] for example, rather than just asking few students builds a more valid picture of understanding. Feedback to students should ideally be task- and not ego-based.[29] Enabling students to act on teacher feedback[30] and engage in self- or peer assessment can be highly beneficial.

What does Formative Assessment look like in the classroom?

Effective formative assessment tools are those that enable a teacher to gauge understanding of their whole class, more of the time. Examples of formative assessment strategies used in the classroom include:

- Asking more questions, to more students, more of the time
- Cold calling (no opt-out culture)
- Think, pair, share used to support and avoid 'gotcha moments', say it again, say it better
- Whiteboards to share responses collectively
- Hinge point questions
- Retrieval strategies
- Diagnostic questioning
- Probing and process questions
- SIR marking

How can EdTech support Formative Assessment?

- Use of comments on digital work for students to use when making updates/improvements
- Use of quizzing tools to assess understanding or pose hinge questions through multiple choice questioning (eg. Kahoot, Quizziz, Nearpod, Microsoft Forms Quizzes, ALEKS)
- When teaching via Teams, teachers can use 'chat bombing' i.e. asking students to type an answer into the chat window and asking all students to send at the same time (to avoid copying)
- Comparative Judgement software to support assessment judgements https://www.nomoremarking.com/

Further reading links:

Wiliam, D. (2011) Embedded Formative Assessment. Bloomington: Solution Tree Press.
Fletcher Wood, H. (2018) Responsive Teaching. London: David Fulton.
Wylie C & Wiliam D, 'Diagnostic Questions, Is There Value in Just One?', ETS 2006
What Makes Great Assessment?, Evidence-Based Education

Online courses

Seneca Learning , The CRAFT of Assessment
Seneca Learning, Assessment for teachers
Evidence-Based Education - Assessment Essentials

28 Wiliam 2011
29 Kluger and DeNisi, The Effects of Feedback Interventions on Performance: A Historical Review, a Meta-Analysis, and a Preliminary Feedback Intervention Theory, Psychological Bulletin March 1996
30 Education Endowment Fund, Feedback report, 2018

10: Self-Regulated Learners

What is Self-Regulated Learning?

Approaches which incorporate metacognition and self-regulation help students to think about their own learning more explicitly, often by teaching them specific strategies for planning, monitoring and evaluating their learning. Self- regulated learning can be broken into three essential components:[31]

- Cognition - the mental process involved in knowing, understanding, and learning
- Metacognition - often defined as 'learning to learn'
- Motivation - willingness to engage our metacognitive and cognitive skills.

What does the research say about Self-Regulated Learning?

Metacognition and self-regulation approaches have consistently high levels of impact. However, teaching these skills is challenging. Prompting students to reflect on their work or to consider the strategies they will use if they get stuck have been highlighted as valuable.

Wider evidence related to metacognition and self-regulation suggests that disadvantaged students are likely to particularly benefit from explicit support to help them work independently, for example, by providing checklists or daily plans.[32] Keeping motivation high for students to learn remotely includes sustaining a sense of a learning community (e.g. some lessons or collaborative tasks) and establishing expectations and social norms around learning.

What does Self-Regulated Learning look like in the classroom?

- Students use successful learning study techniques to aid revision (understand, condense, recall, practise, repeat/ re-visit)
- Time to support self-regulated activities and note-taking, spaced practice
- Explicit teaching of learning/revision strategies e.g. via Successful Learning sessions
- Metacognitive talk - narrating the thinking when solving problems.

How can EdTech support Self-Regulated Learning?

- Provide clear communication and support for parents (school website, LMS such as Google Classroom, homework diary such as Show My Homework)
- Signpost students to platforms where they can be supported through learning episodes e.g. BBC Bitesize Daily, Oak National Academy, Khan Academy, Future Learn
- Encourage students to test themselves through scaffolded retrieval practice with tools such as Quizlet, and Seneca Learning
- Use of language apps to support acquisition of new vocabulary e.g. Duolingo.

Further reading links

Metacognition and Self-regulation Guidance, Reports and Recommendations, Education Endowment Fund
Motivating Students to Learn Remotely, The Education Hub

Online courses

Seneca Learning, Metacognition for Teachers

31 EEF Guidance report: Metacognition and self-regulation
32 EEF Rapid Evidence Assessment on Remote Learning, April 2020

11: Collaberative Learners

What is Collaborative Learning?

Collaborative or cooperative learning, simply put, is students working together in groups. This is a long-standing and effective principle of learning. These groups are constructed to be small enough for everyone to be accountable and able to participate fully with the task. Students within the groups may be assigned separate roles or tasks to work on which contribute to a common outcome or they may work together on a shared task. Key principles to keep in mind are 'positive independence' - in order for learning to be successful, the task requires every student to complete their task and work towards a common goal, and 'group accountability' – the outcome of the task is as good as the weakest member.

Collaborative learning can take place in mixed ability teams or differentiated groups, with high prior attainers being given more challenging tasks to complete and lower ability groups being given more support and structure to a task. It works best when learners have the opportunity to explore and discuss problems with their peers and are given the opportunity to reflect on their learning.

Remote teaching and the use of computers and digital technologies are more productive when they support collaboration by learners. Teachers can use it to support discussions, interactions, and feedback.

What does the research say about Collaborative Learning?

The impact of collaborative learning approaches in teaching is consistently positive. However, how positive it is can vary on how the tasks are constructed. It is important to move beyond just instructing students to "work in groups", and instead design structured tasks that depend on accountability and promote independence for everyone in the group. Collaborative learning can work well for all ages across the curriculum if the activities are suitably designed and structured to meet the students' capabilities. Evidence also suggests that promoting competition between groups can support the collaborative approach and also have positive benefits on team building, developing social and communication skills, as well as thinking skills.

What does Collaborative Learning look like in the classroom?

Collaborative or cooperative learning can take many forms in the classroom including, but not exclusively:

- Think, pair, share, Quizzing, Trade – a useful method to allow students to revise over key content, vocab or exam questions
- Talking chips / chips in – designed to support class discussions and debates to ensure all students get involved
- Sage-N-Scribe – this allows guided practice before individual practice in order to build confidence in students.

How can EdTech support Collaborative Learning?

- Working in groups on shared documents via Microsoft 365 or collaborative Apple documents
- Breakout rooms in live lessons
- Students working together or supporting each other on shared walls, using apps such as Padlet, Whiteboard on Teams, etc.
- Immersive learning tools such as NearPod
- Collaborative workspaces e.g. shared folders or discussion threads on a channel on Teams
- Creative tasks e.g., BookCreator and StoryboardThat

Further reading links:

Collaborative Learning Toolkit, Education Endowment Fund
Groupwork in the Classroom - Small Group Tasks, University of Waterloo CA

Professional Development:
Providing Support for Understanding and Applying the Familiar Fundamentals

Waddesdon CPDL Programmes

Available for all teachers:

- Whole-school CPDL programme and exploration of subject-specific CPDL theme (annually)
- Engaging in the research that informs the Waddesdon Familiar Fundamentals via Personal Pedagogies
- 'Designing Great Assessment' in-house programme
- Instructional Coaching at Waddesdon
- Professional Development programme
- Pop-up CPDL sessions
- Self-driven CPDL
- Sharing best practice via whole-school TeachMeets, subject meetings

Career stage specific:

- ECT (was NQT) 2-year mentoring and support programme
- Growing Great Teachers programme (teachers in first 2-5 years of teaching career)
- Middle and senior leadership support programme (in-house and external programmes offered)
- New staff induction programme

See Waddesdon CPDL Provision document for further details

EDTech Professional Development programmes

- Google Teacher Certification programme
- Microsoft Education programme
- Future Learn programme- Using technology in evidence-based teaching and learning

Further Reading:

- Seven Research-Informed Pedagogies for Remote Learning, Sandringham EdTech Demonstrator School
- Christodoulou D, Teachers vs Tech. The Case for an Ed Tech Revolution, Oxford Press 2020
- Lemov D, Teaching in the Online Classroom. Surviving and Thriving in the New Normal, Jossey-Bass, 2020

Personal Pedagogies:
Taking Ownership of your Own Professional Development and Learning

"Our strategy should therefore be to make the best choices we can from the best evidence available, to try it out, with an open mind, and see if it works. If it does, we can keep doing it; if not, we will learn from that experience and try something else."
Professor Rob Coe, Director of Research and Development at Evidence Based Education; Senior Associate Education Endowment Foundation; previously Professor of Education at Durham

"Teaching, like any complex cognitive skill, must be practised to be improved."
Daniel T. Willingham: Why don't students like school?

"...teachers benefit enormously when they have the opportunity to learn from the enlightening world of educational research combined with the scope to weave those ideas into their understanding of what makes impact in specific contexts—in their subject, with their learners, in their school or college."
Tom Sherrington—Rosenshine's Principles in Action

Why a personal pedagogy?

All staff, regardless of their years of experience, can always look to develop, enhance and even change their practice based on the latest evidence of best practice. The Waddesdon Familiar Fundamentals are the basis for this and can be used by staff to further explore the world of research.

Staff may choose to log their research and the impact of adaptations to their practice and use this to form a professional discussion in both their mid-year and end-of-year appraisal meetings. Opportunities to showcase their research approach and findings will be provided in CPDL teach-meets during the year.

Example personal pedagogy questions:

- How can I significantly improve my use of modelling and scaffolding?
- How can I effectively deliver manageable, meaningful and motivational feedback?
- In what ways can I fine-tune my use of direct instruction to ensure clarity in the information students are being given?
- What resources can I access to increase regular structured retrieval opportunities in my lessons?

Thinking scaffold

1. What is my 'Personal Pedagogy' question?
2. Which familiar fundamental/s link to this question?
3. Why have I chosen this aspect, what is my justification that there is a need for this?
4. What commitments to actions will I take? How will I explore this question?
5. What additional support will I access? e.g. reading, online courses, in-house CPD sessions, instructional coaching support
6. Evaluation from my personal CPD time. How has my practice evolved through research?