



THE EDUCATION PEOPLE

Embedding Formative Assessment

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Outline

- Why formative assessment needs to be a priority
- What formative assessment is, and isn't
- Strategies and practical techniques

Four questions we should ask of research

1. Does it solve a problem we have?
2. How much extra achievement will it yield?
3. How much will it cost?
4. Can we implement it here?

Why formative assessment needs to be a priority



Why Formative Assessment?

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- A principle and an uncomfortable fact about the world
 - The principle:
 - "If I had to reduce all of educational psychology to just one principle, I would say this: The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him [or her] accordingly" (Ausubel, 1968 p. vi)
 - The uncomfortable fact:
 - Students do not learn what we teach.
 - What is learning?
 - Learning is a change in long-term memory (Kirschner et al., 2006)
 - The fact that someone can do something now does not mean they will be able to do it in six weeks, **but**
 - If they cannot do something now, it is highly unlikely they will be able to do it in six weeks

Building Plan “B” into Plan “A”

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Relevant studies

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- Fuchs & Fuchs (1986)
- Natriello (1987)
- Crooks (1988)
- Bangert-Drowns et al. (1991)
- Dempster (1991, 1992)
- Elshout-Mohr (1994)
- Kluger & DeNisi (1996)
- Black & Wiliam (1998)
- Nyquist (2003)
- Allal & Lopez (2005)
- Köller (2005)
- Brookhart (2007)
- Wiliam (2007)
- Hattie & Timperley (2007)
- Shute (2008)
- Kingston & Nash (2011, 2015)

Formative Assessment: A contested term

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	Long-cycle	Medium-cycle	Short-cycle
Span	Across terms, teaching units	Within and between teaching units	Within and between lessons
Length	Four weeks to one year	One to four weeks	Minute-by- minute and day-by-day
Impact	Monitoring, curriculum alignment	Student- involved assessment	Engagement, responsiveness



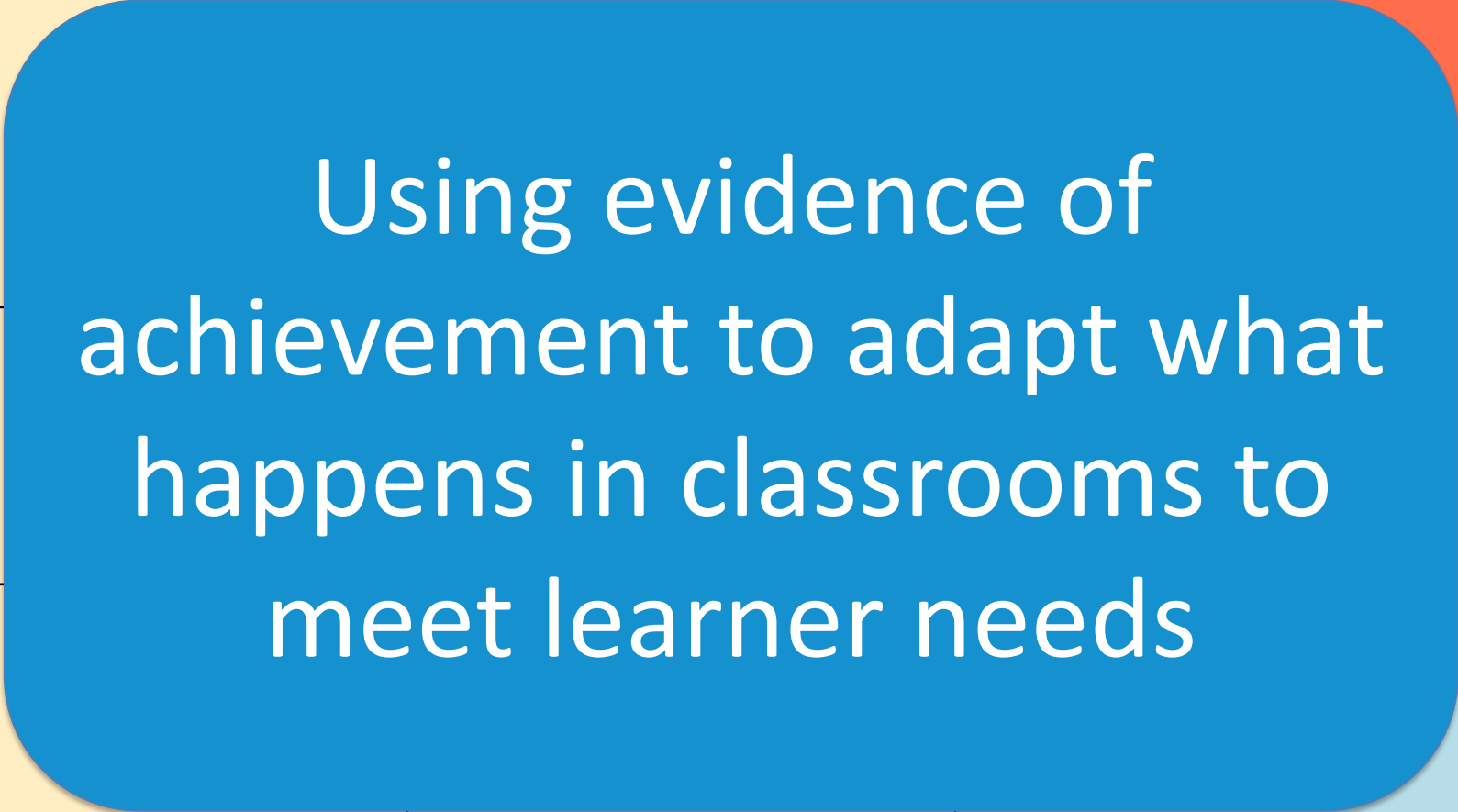
Unpacking Formative Assessment

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	Where the learner is going	Where the learner is now	How to get the learner there
Teacher	Clarifying, sharing, and understanding learning intentions	Eliciting evidence of learning	Providing feedback that moves learners forward
Peer		Activating students as learning resources for one another	
Student		Activating students as owners of their own learning	

Unpacking Formative Assessment

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	Where the learner is going	Where the learner is now	How to get the learner there
Teacher			
Peer			
Student			

Unpacking Formative Assessment

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	Where the learner is going	Where the learner is now	How to get the learner there
Teacher	Before you can begin	Responsive teaching	
Peer	The learner's role		
Student			

Education Endowment Foundation toolkit

Intervention	Cost	Quality of evidence	Extra months of learning
Feedback	££	□□□	+8
Metacognition and self-regulation	££	□□□□	+8
Peer tutoring	££	□□□□	+6
Early years intervention	£££££	□□□□	+6
One to one tuition	££££	□□□□	+5
Homework (secondary)	£	□□□	+5
Collaborative learning	£	□□□□	+5
Phonics	£	□□□□	+4
Small group tuition	£££	□□□□	+4
Behaviour interventions	£££	□□	+4
Digital technology	££££	□□□□	+4
Social and emotional learning	£	□□□□	+4

Education Endowment Foundation toolkit

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Intervention	Cost	Quality of evidence	Extra months of learning
Parental involvement	£££	□□□	+3
Reducing class size	£££££	□□□	+3
Summer schools	£££	□□	+3
Sports participation	£££	□□	+2
Arts participation	££	□□□	+2
Extended school time	£££	□□	+2
Individualized instruction	£	□□□	+2
After school programmes	££££	□□	+2
Learning styles	£	□□□	+2
Mentoring	£££	□□□	+1
Homework (primary)	£	□□□	+1

Education Endowment Foundation toolkit

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Intervention	Cost	Quality of evidence	Extra months of learning
Teaching assistants	££££	□□	0
Performance pay	££	□	0
Aspiration interventions	£££	□	0
Block scheduling	£	□□	0
School uniform	£	□	0
Physical environment	££	□	0
Ability grouping	£	□□□	-1

Unpacking Formative Assessment

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	Where the learner is going	Where the learner is now	How to get the learner there
Teacher	Clarifying, sharing, and understanding learning intentions	Eliciting evidence of learning	Providing feedback that moves learners forward
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Strategies and techniques for classroom formative assessment

Clarifying, sharing and understanding learning intentions

Teaching as an intentional activity

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- Learning intentions are descriptions of the *learning* that is intended as a result of completing tasks specified by the teacher.
- Success criteria are descriptions of the desired *performance* on those tasks (“I’ll be happy if...”)
- Success criteria
 - As limitations on what is expected
 - As practice in applying in different contexts
 - As explanations to students of what is meant
 - As scaffolding students’ responses

Share learning intentions

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- Explain learning intentions at start of lesson/unit:
 - Learning intentions
 - Success criteria
- Consider providing learning intentions and success criteria in students' language
- Use posters of key words to talk about learning:
 - E.g., describe, explain, evaluate
- Use planning and writing frames judiciously
- Use annotated examples of different standards to “flesh out” assessment rubrics (e.g., lab reports).
- Provide opportunities for students to design their own tests.

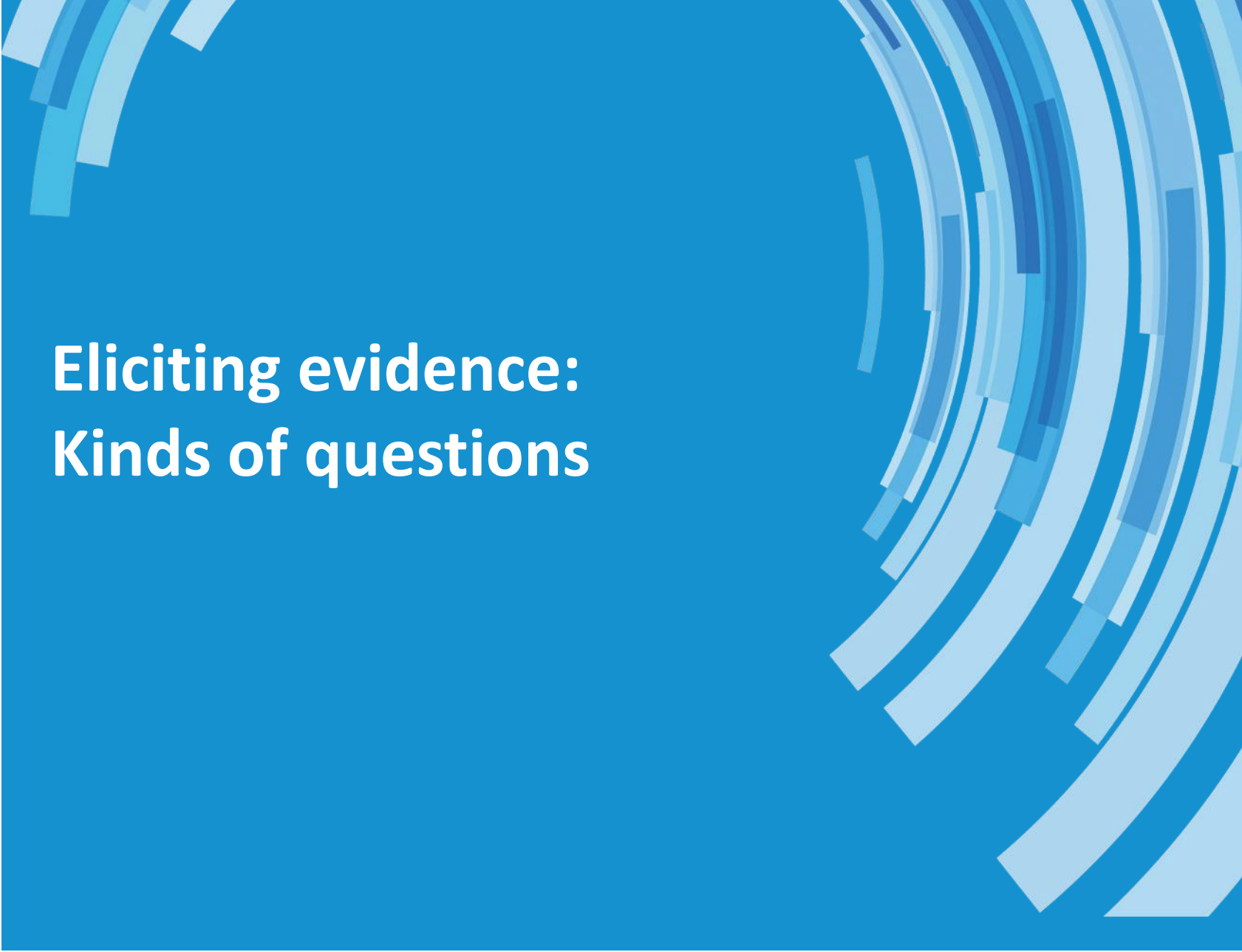
**Engineering effective
discussions, activities,
and classroom tasks
that elicit evidence of
learning**

Eliciting evidence

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- Key idea: questioning should
 - cause thinking
 - provide data that informs teaching
- Improving teacher questioning
 - generating questions with colleagues
 - low-order vs. high-order not closed vs. open
 - appropriate wait-time
- Getting away from I-R-E (initiation-response-evaluation)
 - basketball rather than serial table-tennis
 - ‘No hands up’ (except to ask a question)
 - ‘Hot Seat’ questioning
- All-student response systems
 - ABCD cards, “show-me” boards, exit passes

Eliciting evidence: Kinds of questions



Questioning in science: Discussion

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Ice-cubes are added to a glass of water. What happens to the level of the water as the ice-cubes melt?

- A. The level of the water drops
- B. The level of the water stays the same
- C. The level of the water increases
- D. You need more information to be sure

Diagnostic questions in science

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Janet was asked to do an experiment to find how long it takes for some sugar to dissolve in water. What advice would you give Janet to tell her how many repeated measurements to take?

- A. Two or three measurements are always enough
- B. She should take 5 measurements
- C. If she is accurate she only needs to measure once
- D. She should go on taking measurements until she knows how much they vary
- E. She should go on taking measurements until she gets two or more the same

Distractor driven *and* multiple-correct responses

Identify the adverbs in these sentences:

1. The boy ran across the street quickly.

(A) (B) (C) (D) (E)

2. Jayne usually crossed the street in a leisurely fashion.

(A) (B) (C) (D) (E)

3. Fred ran the race well but unsuccessfully.

(A) (B) (C) (D) (E)

Hinge questions

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- A hinge question is based on the important concept in a lesson that is critical for students to understand before you move on in the lesson.
- The question should fall about midway during the lesson.
- Every student must respond to the question within two minutes.
- You must be able to collect and interpret the responses from all students in 30 seconds

Providing feedback that moves learners forward

Kinds of feedback: Israel

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- 264 low and high ability grade 6 students in 12 classes in 4 schools; analysis of 132 students at top and bottom of each class
- Same teaching, same aims, same teachers, same classwork
- Three kinds of feedback: grades, comments, grades+comments

	Achievement	Attitude
Grades	no gain	High scorers: positive Low scorers: negative
Comments	30% gain	High scorers: positive Low scorers: positive

Butler (1988)

Responses

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	Achievement	Attitude
Grades	no gain	High scorers: positive Low scorers: negative
Comments	30% gain	High scorers: positive Low scorers: positive

What happened for students given both grades and comments?

- A. Gain: 30%; Attitude: all positive
- B. Gain: 30%; Attitude: high scorers positive, low scorers negative
- C. Gain: 0%; Attitude: all positive
- D. Gain: 0%; Attitude: high scorers positive, low scorers negative
- E. Something else

Effects of feedback

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- Kluger & DeNisi (1996) review of 3000 research reports
- Excluding those:
 - without adequate controls
 - with poor design
 - with fewer than 10 participants
 - where performance was not measured
 - without details of effect sizes
- left 131 reports, 607 effect sizes, involving 12652 individuals
- On average, feedback increases achievement
 - Effect sizes highly variable
 - 38% (231 of 607) of effect sizes were negative

Getting feedback right is hard


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Response type	Feedback indicates performance...	
	falls short of goal	exceeds goal
Change behavior	Increase effort	Exert less effort
Change goal	Reduce aspiration	Increase aspiration
Abandon goal	Decide goal is too hard	Decide goal is too easy
Reject feedback	Feedback is ignored	Feedback is ignored

Provide feedback that moves learning on

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- Key idea: feedback should:
 - Cause thinking
 - Provide guidance on how to improve
- Comment-only marking
- Focused marking
- Explicit reference to mark-schemes/rubrics
- Suggestions on how to improve:
 - Not giving complete solutions
- Re-timing assessment:
 - E.g., three-fourths-of-the-way-through-a-unit test




Activating students as learning resources for one another

Help students be learning resources

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- Students assessing their peers' work:
 - “Pre-flight checklist”
 - “Two stars and a wish”
 - Choose-swap-choose
 - Daily sign-in
- Training students to pose questions/identifying group weaknesses
- End-of-lesson students' review
- Best composite response

Activating students as owners of their own learning



Help students own their own learning

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- Students assessing their own work:
 - With rubrics
 - With exemplars
- Self-assessment of understanding:
 - Learning portfolio
 - Traffic lights
 - Red/green discs
 - Coloured cups
 - Plus/minus/interesting

- " + "
- I get that ballpark estimates are supposed to be simple. Meaghan
 - I know that you have to look at it and say ^{OK?} ^{Frankie}
 - I know when I am adding the number I end up with must be bigger than the one I started at. Jon
 - I get most of the problems. Julianna
 - It was ~~no~~ easy for me because on the first one it says 328 and I took the # 2 and I made it a 12. Kelly
 - I know that we would have to regroup. Alana
 - ~~it is~~ I know how to do Plus and minus ~~because~~ because we have been doing it ^{for a long time} for a long time.
 - I think because for ⁴ some years we've been I think I finally know that adding is combining the two numbers in the problem.
 - I think I am good at the partial sums method. ^{TRACOP}
 - I get it when you cross out a number and make it a new one. Emma
 - I know when you can't - from both columns you go to the third column and take that from it. Olivia

I know when my answer is right the ballpark estimate is close to the answer. Brenda

- I am still a tiny bit confused about subtraction regrouping. Meaghan
- I am a little bit confused about ball park estimate. Julianne
- I get confused because sometimes I don't get the problem. Frankie
- I am confused when you subtract really big numbers. Like 1,000 something. Jan
- I'm still a little bit confused about regrouping. Trevor
- I am confused about a little of the subtraction regrouping. Aidan
- I am a little confused about the regrouping still. Kelly
- Minus is confusing because when you have to regroup twice. Alana
- Minus is a little bit hard when you have to regroup. Darci
- I don't understand when you borrow which column to borrow from when both are 0. Olivia.

I am still confused about showing what I did to solve the problem. Brendan

- I am a little confused about when you need to subtract. Emma

interesting

Carrying the number over to the next number

Julianne

It's interesting how some people go to the nearest hundred, while others go to the nearest ten. Meaghan

It's interesting how some have to regroup twice. Alana

It is interesting sometimes how you have to regroup ~~the way~~ Darci

- It's pretty interesting about how you have to really work hard. Frankie
- ~~I am~~ I am interested in borrowing because I didn't just get it yet. I want to really get to know it. Jon
- I find it weird that you could just keep going from column to column when you need to borrow. Olivia
- On the ballpark estimate it is ~~pretty good~~ easy but some times confusing. Kelly
- I really think that regrouping is pretty amazing.
- It is cool how addition and subtraction regrouping is just moving numbers and you could get it right easily.

+/-/interesting: responses for “+”

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- I got that ball-park estimates are supposed to be simple
- I know that you have to look at it and say “OK”
- I know that when I am adding the number I end up with must be bigger than the one I started at
- I get most of the problems
- It was easy for me because on the first one it says 328 so I took the 2 and made it a 12
- I know that we would have to regroup
- I know how to do plus and minus because we have been doing it for a long time
- I get it when you cross out a number and make it a new one
- I know that when you can't – from both colomes you go to the third colome and take that from it
- I know that when my answer is right the ball park estimate is close to it

+/-/interesting: responses for “-”

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- I am still a tiny bit confused about subtraction regrouping
- I am a little bit confused about ball park estimates
- I get confused because sometimes I don't get the problem
- I am confused when you subtract really big numbers like 1,000 something
- I'm still a little bit confused about regrouping
- Minus is confusing when you have to regroup twice
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- I don't understand when you borrow which colome you borrow from when both are 0
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- I am still confused about showing what I did to solve the problem

+/-/interesting: responses for “interesting”

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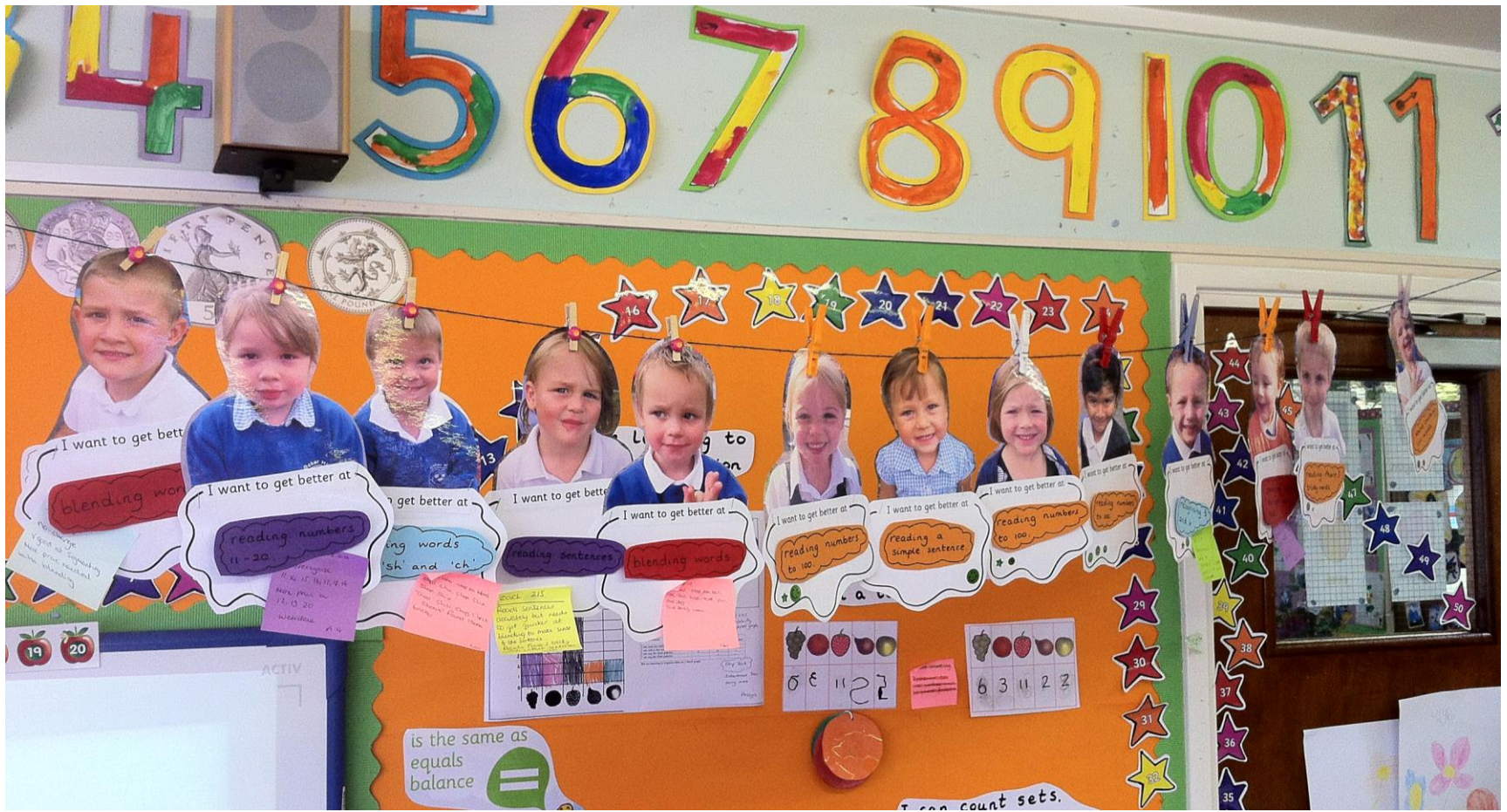
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- I find it weird that you could just keep going from colome to colome when you need to borrow
- On the ball park estimate it is easy but sometimes hard
- I really think that regrouping is pretty amazing
- It is cool how addition and subtraction regrouping is just moving numbers and you could get it right easily

Help students own their own learning

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- Students assessing their own work:
 - With rubrics
 - With exemplars
- Self-assessment of understanding:
 - Learning portfolio
 - Traffic lights
 - Red/green discs
 - Coloured cups
 - Plus/minus/interesting
 - Practice testing

Self-assessment in the early years



All ready for action in year 4...

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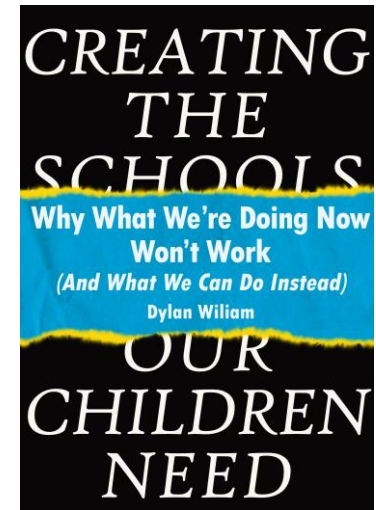
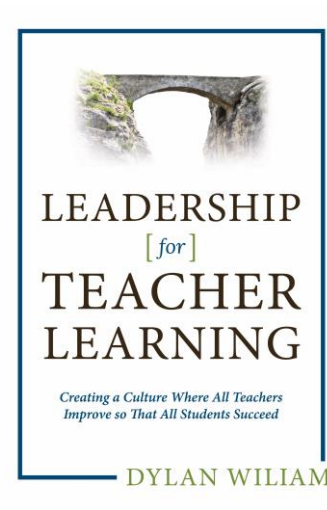
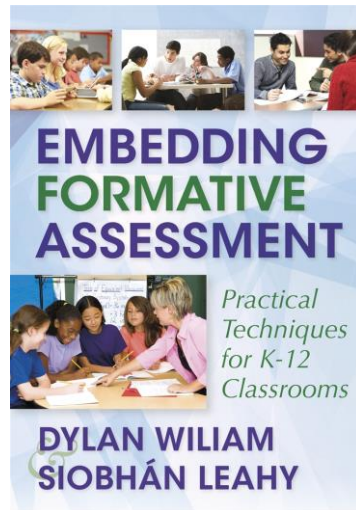
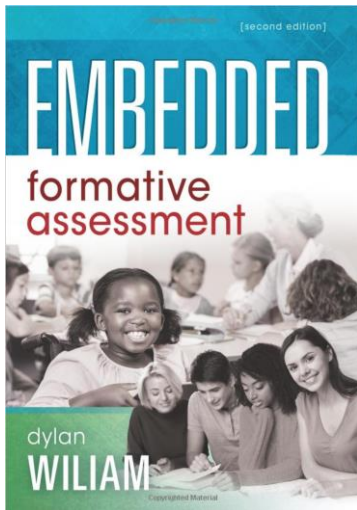


Tell me about you...

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Embedding formative assessment

A two-year professional development pack for schools and colleges:
teacher learning communities in action

Written by
Siobhan Leahy and Dylan William

