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

Why formative assessment needs to be a priority

Why formative assessment?

- 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”

Relevant studies

- 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

	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	

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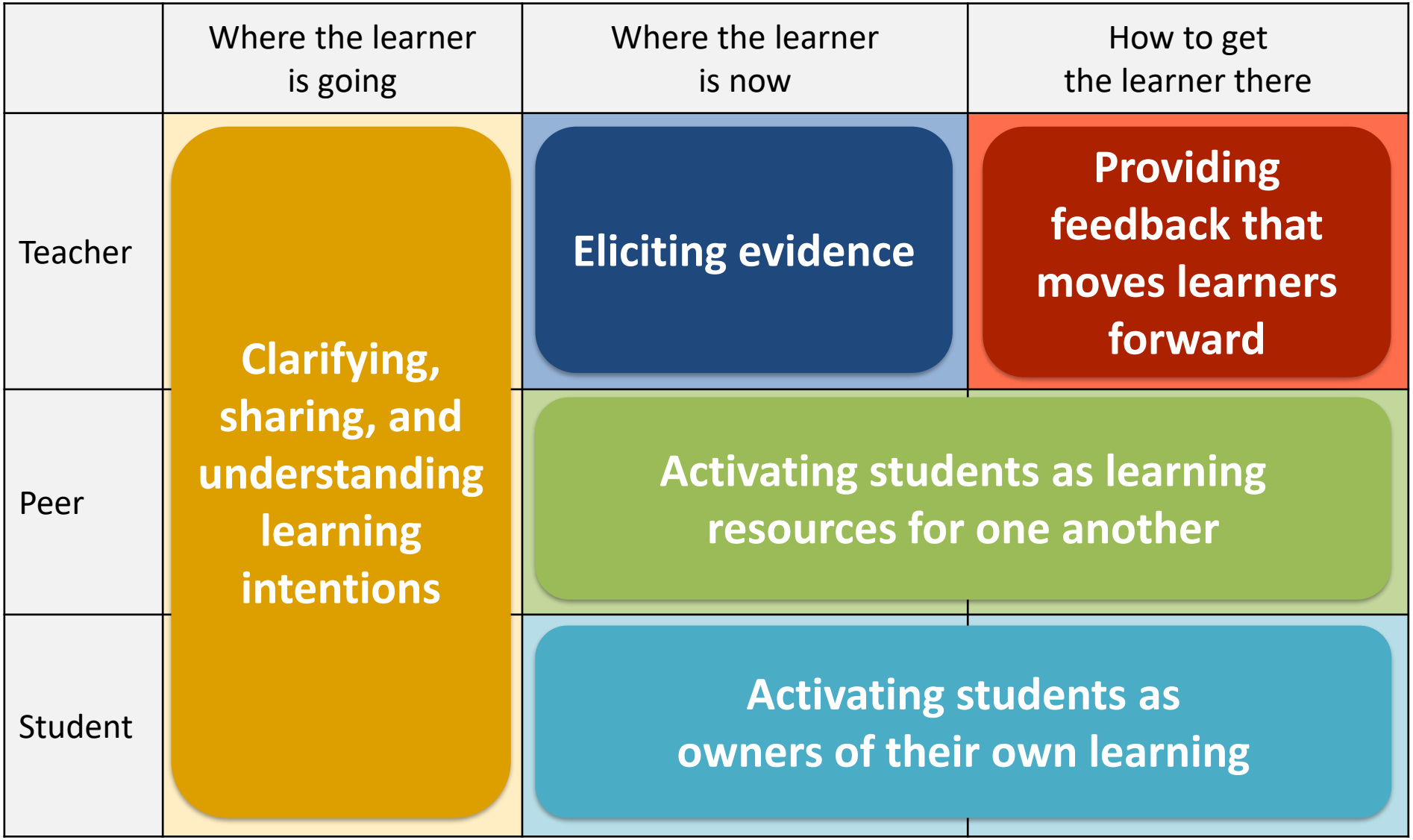
Balancing chemical equations

$$\square\ Hg(OH)_2 + \square\ H_3PO_4 \rightarrow \square\ Hg_3(PO_4)_2 + \square\ H_2O$$

Unpacking Formative Assessment



Unpacking Formative Assessment

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

Using evidence to adapt what happens in class-rooms to meet learner needs

Unpacking Formative Assessment

<table>
<tr><th></th><th>Where the learner
is going</th><th>Where the learner
is now</th><th>How to get
the learner there</th></tr>
<tr><td>Teacher</td><td>Before you
can begin</td><td colspan="2">Responsive teaching</td></tr>
<tr><td>Peer</td><td colspan="3" rowspan="2">The learner’s role</td></tr>
<tr><td>Student</td></tr>
</table>

Strategies and techniques for classroom formative assessment

Clarifying learning intentions and sharing success criteria

Teaching as an intentional activity

- 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…")

	Purpose	Mostly useful to
Learning intentions	Planning teaching	Teachers
Success criteria	Evaluating teaching	Teachers and pupils

Teaching as an intentional activity

- 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

- Share learning intentions and success criteria when appropriate (not necessarily at the beginning)
- Use planning and writing frames *judiciously*
- Start with examples rather than rubrics
  - Give at least two examples of the best work
  - Don’t conflate intended and unintended features
- Ask students to assess work of anonymous others
- Over time, reduce use of student-friendly language
- Ask students to design their own test questions.

Success criteria and self-monitoring

Learning intentions	Success criteria
To be able to describe and explain the adaptations of animals to cold climates	• *To be able to state three adaptations that polar bears have to help them to survive in cold climates.* • *To be able to explain how each adaptation helps polar bears survive in cold climates.*
To be able to describe what happens during photosynthesis	• *To be able to state the two reactants and two products of photosynthesis.* • *To be able to describe at least one thing that happens to each of the products of photosynthesis*

Spenceley (2022)

Eliciting evidence

Eliciting evidence

- Key idea: questioning should
  - cause thinking
  - provide data that informs teaching
- Improving teacher questions
  - generating questions with colleagues
  - low-order vs. high-order not closed vs. open
- Improving teacher questioning
  - appropriate wait-time
  - ‘No hands up’ (except to ask a question)
  - All-student response systems


14
14
14
14
14
Explore

Providing feedback that moves learners forward

Effects of feedback

- 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

Why getting feedback right is hard

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

Kluger and DeNisi (1996); Wiliam (2011)

Practical techniques for feedback

- Key idea: feedback should:
  - Cause thinking
  - Provide guidance on how to improve
- Four-quarters feedback
  - Individual feedback
  - Whole-class feedback
  - Peer assessment
  - Self assessment
- Comment-only marking
- Focused marking
- Explicit reference to mark-schemes/rubrics
- Not giving complete solutions

Making feedback into detective work (1)

Feedback as information	Feedback as detective work
You've done a really great job of ordering the first 3 objects in order of smallest to largest. The final two are the wrong way around. Shall we try again with these different objects?'	"You're nearly there, but two of these are the wrong way round. Can you see which ones they are?"
Great use of capital letters. Make sure you are forming your letters correctly and using full stops in all your work	Great use of capital letters. Look back at your work and draw a line under five words that you think could be written better.
When reading maps, remember the order of North, East, South, West. This will be really useful across all of our map work.	Can you think of a way that would help you remember the order for North, East, South West?
You've named lots of carnivores, but not many herbivores. Check back over your work to see if you have included all of the herbivores we've learned about.	You've named lots of carnivores. Check back over your work to see if you have included all the other kinds of animals we've learned about.

Making feedback into detective work (2)

Feedback as information	Feedback as detective work
You need to add more factual details to support your argument in your 3rd paragraph	One of these paragraphs could do with adding more factual details to support your argument. Can you figure out which one, and supply the missing details?
Ensure that you use BIDMAS throughout your calculations.	In three of these calculations, you haven't used BIDMAS correctly. See if you can find them and fix them
When writing in German, remember to use the correct grammatical gender: 'der', 'die' or 'das'.	In the second paragraph, you have used the incorrect grammatical gender for "the" (der/die/das) in three places. Please find them and fix them.
Throughout your answers you need to use specialist terminology, and use it appropriately; ensure that you are monitoring this as you write, and revisit responses where you require more.	There are at least five places in these answers where it would be much better to use specialist terminology. I've highlighted two of them. Please redraft using the appropriate language in the other three.

Some more feedback techniques

- Minimal interventions
- Classifying errors
- Self-generated feedback
- —/=/+ (not as good as/about the same/better)
- Recording oral feedback

Activating students as learning resources for one another

Cooperative learning: a research success story

- Two essential components
  - Group goals:
    - so students are working as a group, not just in a group
  - Individual accountability:
    - the best learning efforts of every member of the group must be necessary for the group to succeed, and
    - the performance of each group member must be clearly visible and quantifiable to the other group members

Slavin, Hurley and Chamberlain (2003)

Help children be learning resources

- Students assessing peers' work:
  - "Pre-flight checklist"
  - "Two stars and a wish"
  - Choose-swap-choose

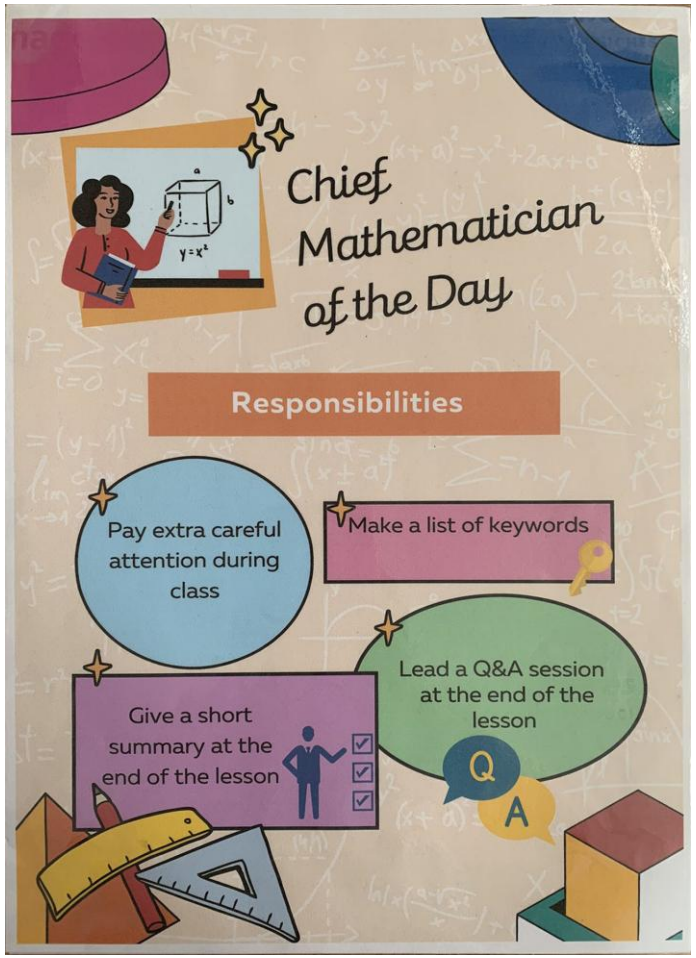
Choose-swap-choose

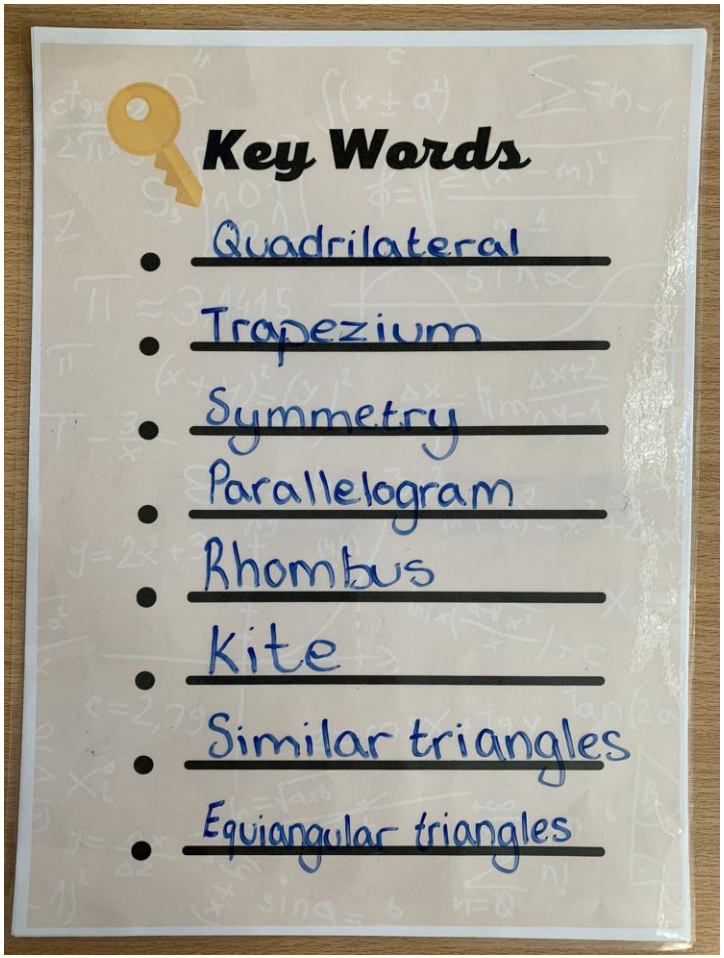
- Conditions
  - Students make multiple attempts at the same task
  - There is a relatively permanent record of the attempt
  - There is a degree of subjectivity in the assessment
- Primary
  - Writing letters of the alphabet
  - Forward roll
  - Playing a musical phrase
  - Dance move
- Secondary
  - Calligraphy
  - Welding
  - Mitre-joints in a picture frame
  - Ruler and compass constructions

Help students be learning resources

- Students assessing peers' work:
  - "Pre-flight checklist"
  - "Two stars and a wish"
  - Choose-swap-choose
- Ladder of feedback (Perkins, 2003)
  - Clarify->Value->Concerns->Suggest
- Peer assessment as stepping-stone to self-assessment
  - Anonymous peers->actual peers->self-assessment
- Group questions
- Students' end-of-lesson review

End-of-lesson student review





Ryan-Nesbitt (2022)

Help students be learning resources

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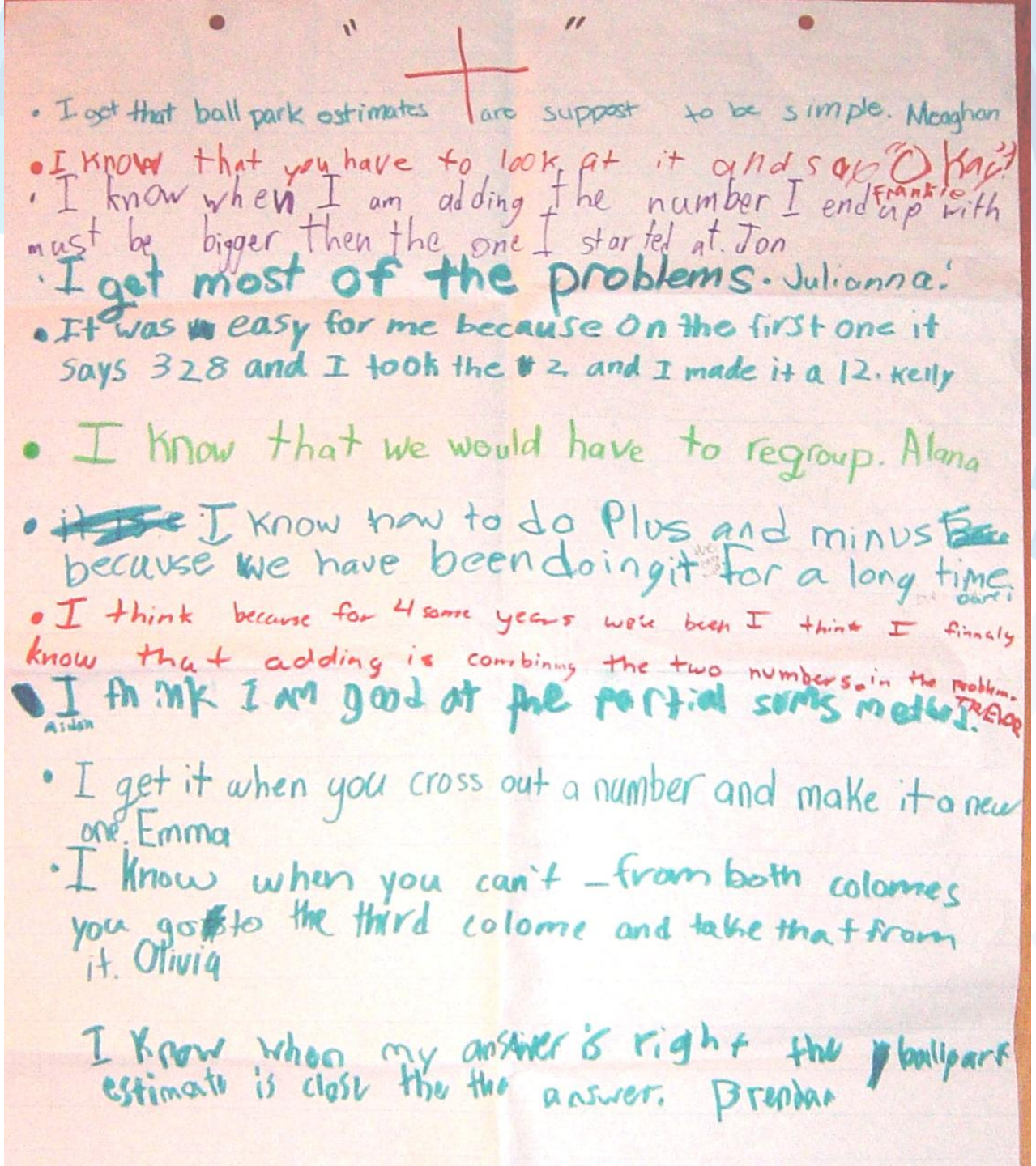
- Group questions
- Students' end-of-lesson review
- Best composite response

Activating students as owners of their own learning

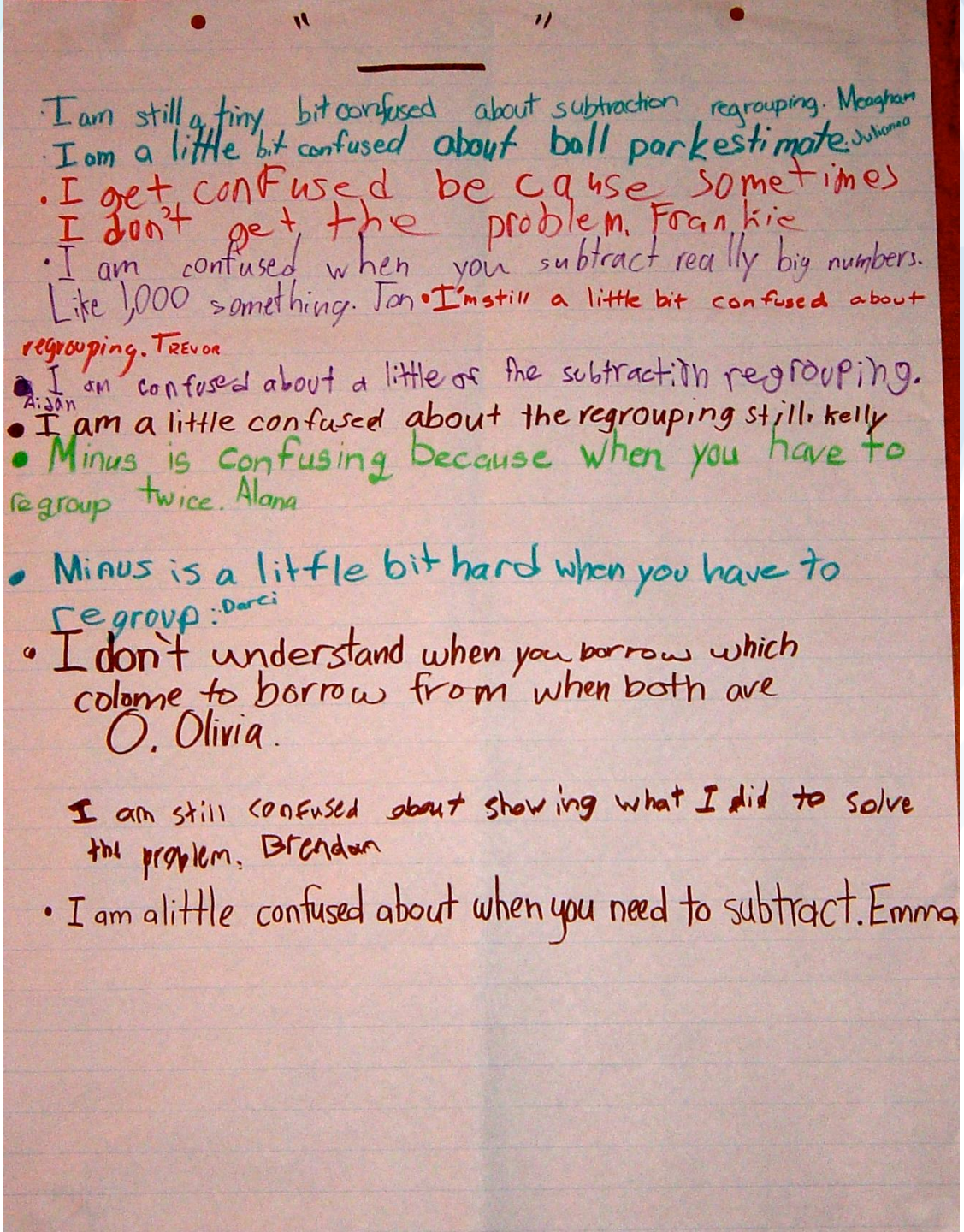
Help students own their own learning

- 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 ball park estimates are suppost to be simple. Meaghan
- I know that you have to look at it and say "Okay" I know when I am adding the number I end up with must be bigger then the one I started at. Jon Frankie
- I get most of the problems. Julianna.
- It was 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. Dani
- I think because for 4 some years we've been I think I finnaly know that adding is combining the two numbers in the problem. TREVOR
- I think I am good at the partial sums method. Aiden
- I get it when you cross out a number and make it a new one. Emma
- I know when you can't - from both colomes you go to the third colome and take that from it. Olivia

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



I am still a tiny bit confused about subtraction regrouping. Meaghan
I am a little bit confused about ball park estimate. Julianna
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. Jon
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 litfle bit hard when you have to regroup: Darci
I don't understand when you borrow which colome to borrow from when both ave O. Olivia.
I am still confused about showing what I did to solve the problem. Brendan
I am alittle confused about when you need to subtract. Emma

interesting

Carrying the number over to the next number Julianna

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

It's intereting how some have to re group twice. Alana

It is interesting sometimes how you have to regroup ~~[illegible]~~ 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 colome to colome when you need to borrow. Olivia
- On the ball park 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 nombers and you could get it right easily.

+/–/interesting: responses for “+”

- 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
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- I know that when you can’t – from both colomes you go to the third colome and take that from it
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+/–/interesting: responses for "–"

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- I am a little confused about when you need to subtract
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+/–/interesting: responses for “interesting”

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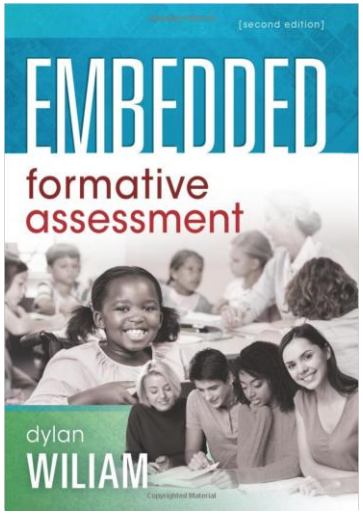
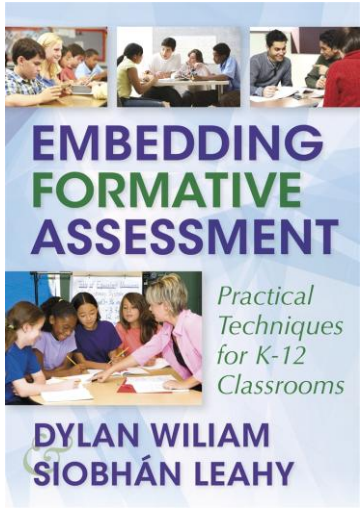
  - Practice testing

Technique review

To find out more…





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