

The Learning Cycle: #1 Aggregation of Marginal Gains

I've been trying to craft this post since watching Team GB Cycling over the during The London 2012 Olympics and, prior to that, the success of the Sky Pro Cycling Team in the Tour de France. Last night, a Twitter conversation with [@HuntingEnglish](#) and [@macn_1](#) spurred me into getting on with it, or at the very least, starting it. We had all watched the first two episodes of "[The Road to Glory](#)", a Sky documentary about the quest of the Sky Pro Cycling Team to be the first British cycling team to win the Tour de France. Led by Team GB Cycling Performance Director, Dave Brailsford, the documentary provides a fascinating insight into the meticulous approach that is needed to be successful at the highest level.

There's a useful article about the Aggregation of Marginal Gains from 2010 [here](#) but to summarise what the first two episodes of "Road to Glory" have covered so far, Brailsford's underpinning philosophy is that by identifying every component element of what it takes to win at the highest level and ensuring that *each* of these elements, however seemingly inconsequential, is deliberately attended to, you can put these tiny gains together as a whole so that the marginal gains result in one BIG gain. And that's the win.

For Team Sky when preparing for the Tour de France (and, for that matter, for Team GB Cycling when preparing for Beijing in 2008 and for London 2012), *every* part of the team's mechanical equipment, personal nutrition plans, hygiene and sleep regimes are discussed, analysed and attended to. In itself, this isn't dissimilar from other high performance teams and systems. But Dave Brailsford's approach illustrated in "The Road to Glory" explained *just how* precise this preparation is.

Team Sky have a customised bus with state of the art seating and lighting to ensure the ideal conditions for race preparation and recovery. A dedicated team driver who ensures that the team arrive at various venues when training and in races in good time; a team chef who co-opts *every* hotel kitchen they stay in to ensure there's no danger of food poisoning and that exact menus are followed, a massive team base in Belgium that houses every piece of mechanical equipment to construct every combination of bike parts to get the best out of each rider. There is also a team of trainers who get to the hotel ahead of the riders on a race day to

replace all the bed linen and mattresses with hypo-allergenic linen, individual pillows and an air conditioning unit that cleans and cools the air, all of which is designed to ensure a good nights' sleep, excellent recovery and reduce any risk of infection. There's also a dedicated psychologist who employs the latest neuroscience to provide riders with FMRI (Functional Magnetic Resonance Imaging) to identify psychological reactions to stress in each of the riders and provide the necessary cognitive tools to address these...and so the detailed list goes on.

What struck the three of us about this approach was the potential application of 'aggregation of marginal gains' for learning, from right across the whole school right into individual lessons and for individual learners. The conversation led us into what exactly it takes to be the *most effective learner* in *any* given subject or topic.

[@HuntingEnglish](#) and [@macn_1](#) started un-picking this at a 'marginal gains' level and we shared ideas about how this could be communicated to learners. We talked about creating an info graphic or leading discussions, students designing information charts, diagrams and analysing samples of work at this very micro-level and build this into personal learning plans for learners so that they were able to identify, at this meticulous level, in every subject, what they needed to:

(a) Know and understand

(b) Be able to do

(c) Be Like

The application of marginal gains is *already in evidence* in effective practice, not least with the amount of information we are able to draw on for individual learners so we can help shape their curriculum provision to meet their needs. But it is the *aggregation* of marginal gains approach that has prompted me to think a bit more about this. I wonder if there's an opportunity here to be really overt and specific in communicating to learners exactly *what* it is they need to do, *how* they need to do it and probably, as is always the case, *why* they need to do it at this micro-level. In addition, it may provide an opportunity to tie-in how other elements of

their experiences, which may well appear to be completely irrelevant, can be attended to and can contribute to learner effectiveness. If nothing else, it does seem to resonate with a highly aspirational approach that fosters a sense of agency for each and every learner.

Here's what [@HuntingEnglish](#) wrote when I was putting this together:

“What really resonates with me is your point about 'learner effectiveness'. I think the 'aggregation of marginal gains' concept could be a powerful way for students to reflect upon their progress. We often make visible the learning objective, such as honing a given skill, then refer back to it in subsequent lessons; however, too often this process is too teacher led.

The 'marginal gains' approach to self-assessment could be a powerful, and simple, way of students recording their learning in incremental steps. I am thinking of a wheel diagram again, with students reflecting (perhaps as a regular lesson plenary) upon what skill they have honed, or what new knowledge they have gained. I think such precise AFL could also be motivational in a whole host of ways; from making visible the power of home learning; to illuminating how many skills they are developing in any given PBL task; to adding a competitive element to self-reflection and metacognition - a rare thing indeed! This self-reflection, with such specific focus, really has the potential to have real impact.

That idea is really sparking some ideas, from co-creating a display with a cycling spin etc. I love it when something triggers a flow of ideas! I think I am going to trial the idea with my AS English Language group, as there are so many small knowledge and skill steps to master. I will definitely put a plan into action and share how it goes.”

And [@macn_1](#) responded as follows to the first draft of this extended learning conversation:

“I really like your emphasis on aggregation; as you mention, most of us already applying it in everyday practice, but not linking all those smaller gains together into a holistic picture of a pupils' progress. I think most schools now have some sort of 'progress review' for tutors/pupils, where we are looking across the range of subjects and pupils are setting cross-curricular targets, but lacking a sense of how these can be achieved and

the understanding of the wider impact a number of smaller adjustments could make to their overall learning and success.

As you noted, it's the really overt, specific nature of the concept that makes it work and could have a big impact for us – e.g. we have 'L2L' targets for students which they set at their review with their tutor, some are practical and some are cognitive. I'm not sure that we are entirely successful in helping students understand the potential impact of these targets, when taken together.... I'm not sure that I've actually ever linked them all together either ... not sure if I'm digressing here!

I can certainly see some sort 'record'/chart forming here, where students could note down a commitment, or 'pledge' (?) to make some small alterations to their learning, how they can achieve it, and the potential impact it could have?

So much potential with this concept! Definitely interested in exploring this further/collaboration - I have some colleagues in my dept who I know would also be keen to get involved! We've just finished a project with Exeter Uni around 'Grammar for Writing' (the name is misleading, it was really exciting!) and I sense this could be next! Action research??"

There's lots more to do on this and I sense it may be a case of a crowd-sourced approach via Twitter to pull all the ideas together.

I'm going to convert this post into a PDF and place it on the Learning Goggles Page with a view to it becoming a downloadable resource as it builds.

The Learning Cycle: #2 Compliance to your training plan

Reflecting on the second episode of "The Road to Glory", and inspired by a fantastic Twitter conversation with [@HuntingEnglish](#) and [@macn_1](#), this is the second of my Learning Cycle posts. My PLN buddies and I had all watched the first two episodes of "[The Road to Glory](#)", a Sky documentary about the quest of the Sky Pro Cycling Team to be the first British cycling team to win the Tour de France. Led by Team GB Cycling Performance Director, [Dave Brailsford](#), the documentary is providing a fascinating insight into the meticulous approach that is needed to be successful at the highest level.

In the second episode, we heard how [Bradley Wiggins](#), the team leader and 'arrow-head' of the Sky Pro Cycling Team, had been on a personal journey to get to the point where he was ready to be the team leader and achieve the successes that were to come his way this summer. Interviews with the team psychologist, throughout the documentary, made it clear that the role of [Dr Steve Peters](#) was integral to all the riders, but in particular, with Bradley Wiggins. Whilst Bradley's talent is unquestionable in terms of cycling ability, he has worked with Bradley on his levels of self-belief and, as Peters refers to them, his 'inner chimp' to really exploit the potential of his talent. There's a useful explanation of Peters role and his view of the 'inner chimp' on the [Sky Pro Cycling website](#) and he's written about it in his book, "[The Chimp Paradox](#)", which is now on my reading list...! Anyway, the term 'inner chimp' is used to describe the emotional part of the brain. I've always thought of it as the reptilian part, the amygdala, but I prefer the chimp analogy as it captures just how troublesome it can be when we are ruled by our un-thinking, reactionary emotions when faced with unfamiliar or challenging situations. Consider your first day of school (as a pupil or an NQT) and you'll soon start remembering not *what happened*, but how *it felt*. That's the chimp for you. It has no language, no ability to rationalise, it is our inner-most hub of feelings and reactions to the world around us. It is this that is often the determining factor in how *well*, and, at times, *if*, we learn.

As the trainers talked about Bradley's approach to becoming integrated into his new team and responding to his training plan, they used the word, "compliance". They said that once all riders, including Bradley, had 'complied' to their individual training programmes, then success would

inevitably follow. In the sequence that followed, this is exactly what started to happen. Even to the point of Bradley surprising everyone when he won his first 'bunch' sprint finish on one of the stages on the Tour of Romandie prior to the Tour de France.

But back to our learning agenda and that word, 'compliance'. It feels uncomfortable to talk of *any* form of compliance when we're discussing learning. For me, it conjures up the concept of 'yielding' or 'acquiescing' or even 'subjugation'. It suggests a pathway to passivity, as opposed to encouraging, if not demanding, *active engagement* in a process or with a system. So as I watched the programme, I struggled to find a way in which the concept of compliance might *ever* be applied to learning and what we ask our learners to do. To what, exactly, must they become compliant? But then, never one to walk away from a thinking struggle, I started to play around with the idea and see if there actually *was* a way to apply the philosophy of 'compliance' in learning. So here's what I've come up with...

Perhaps if learners are charged with the task of designing their *own* learning plans and are genuinely empowered to follow, amend and implement these, for themselves and if they comply to *this*, their *own* plan, perhaps that's a way to adapt the concept to learning? Stephen M.R. Covey talks about the need for us to make an explicit commitment to ourselves as the very first step in achieving trust, in his book, "[The Speed of Trust](#)". Before we can trust others, whether individuals or organisations, we must be able to trust ourselves. This means that when we say we are going to eat our five-a-day, we need to do it. Only by being committed to our own goals and making these a priority, he argues, will we be able to really know what it means to completely trust others to do the same. The "Road to Glory" documentary depicted compliance as a positive act, as a way of reducing *intra*-personal conflict (with oneself, and particularly, the inner chimp) and of giving in to the 'best' way. I had a conversation with [@lucysweetman](#) about this and she used a lovely phrase in reflecting back to me what I was saying. For the team of cyclists, their compliance was all about 'owning their ambition'. I love this phrase and it certainly resonates with the focus of so much of my work around motivation, confidence and self-directed learning. The practical application of this concept would need to be informed by a programme of Aggregation of Marginal Gains...

How manageable would it be to ask *every* learner to design their own personal learning plan informed by specific, individual goals that incorporate even the tiniest marginal gains? What would this look like? To be an effective learner in (x) subject would obviously have to include knowing the technical nuances of the subject, the skills related directly to this subject and being able to apply these in a variety of different topic areas. In addition, at a micro-level, it would also be explicit about the need to arrive to the lesson on time, with an open-mind and readiness to learn, demonstrated by bringing the correct equipment, knowing what was expected and listening to others' ideas, contributing to class discussions.

Do learners 'own their ambition'? Where is this already happening, and if so, how effective is it? Do we ask the learners how effective *their* learning regime is? What 'gains' do their existing plans already include and how could we include some micro-gains? If they are not complying with their learning plan, what can we do to help them engage with it? Who designed the plan and who takes responsibility for monitoring it?

All of this reminded me of the work on motivation by the fabulous Educational Psychologist, [Alan McLean](#). He highlights the 'Three A's' in his work on motivation in "The Motivated School". These are:

Affiliation - a sense of belonging and of feeling a part of a group and community, where all views and contributions are welcomed and valued.

Autonomy - ability and opportunity to make authentic choices and be self-directed in learning pathways.

Agency - self-belief and confidence that tasks can and will be achieved. Learning is both challenging and achievable.

For me, the *only* kind of learning plan learners can and should be expected to comply to is one that is overtly underpinned by the Three A's above. Only in that way, can they truly own their ambition.

Here's what [@HuntingEnglish](#) said:

"I also like the simplicity of the 'triple A' model for motivation. It gives a clarity to some of my instincts on the matter. I do think the Rosetta stone of learning is motivation - if it can be triggered and sustained then truly anything can happen.

With all my new teaching groups this week - effort and motivation have been integral to the tone I have sought to establish - which is where the 'bum warmer' marginal gain was referenced!"

Imagine the impact of every learner in a class, year group and school agreeing to 'comply' to their very own '3 A's' learning plan; accountable first and foremost to themselves and their self-selected personal goals. Imagine the quality learning conversations that would happen in the drafting and re-drafting of such plans. Think of the ways in which we could incorporate all of the marginal gains in what we know about learning dispositions, the skills required to be an effective learner as both subject-specific and generic experts and the understanding we have of [growth mindsets](#) if we worked alongside each learner to craft such learning plans. I'm not sure yet but this certainly feels that compliance to such a plan would be empowering, energising and motivating. It'll be interesting to hear what you all think.

Here's what [@macn_1](#) said in response to this...

"Your second post has really got me thinking about how we could apply this in school - I think there is a definite opportunity for some research here - in our school, I can really see your idea of linking marginal gains to learning plans and 'owning ambition' working - we already have scheduled review meetings and 20 mins of vertical tutoring time every day, so there is lots of potential for conversations to take place, frequently, ... lots to think about! It's early enough in the year to get a project going!

I'd be really keen to work with you further on this/contribute anything I can!"

Next: #3 The Peloton

The Learning Cycle: #3 The Peloton

It's amazing what one Twitter conversation can do. This is the third installment of The Learning Cycle inspired by (1) "The Road to Glory" documentary on Sky Atlantic HD that followed Performance Director of Team Sky Pro and Team GB Cycling as he lead the cyclists to the incredible success of this Summer in the Tour de France and London 2012 Olympics and (2) The conversation between [@HuntingEnglish](#) and [@Macn_1](#) that followed the programme.

After we'd discussed Brailsford's philosophy of 'Aggregation of Marginal Gains' (see #1 in this series for that!), we started discussing more generally the way in which the peloton works in cycling races. It's worth noting that pace-makers in athletics and most recently, in the midst of significant controversy, in the triathlon in London 2012, such an approach has been adopted to increase the chance of victory. The details of the roles in the peloton are new to me and [@HuntingEnglish](#) shared a far better understanding and knowledge of exactly how it works. Moreover, he came up with some brilliant ideas about how the model could be used to ensure quality collaborative learning opportunities, which I'm sure he'll be [blogging here](#) about very soon.

For me, the peloton model of cooperation sparked up an old favourite of mine...the difference between cooperation and collaboration. When learners are asked to work 'together' what do we expect from them? How can we ensure that there is genuine collaboration in a group, rather than simply cooperation? And does it really matter?

A few years ago, I was shown a film clip that has since done the rounds at leadership conferences and network meetings. The film follows a flock of geese who work together to travel vast distances as part of their seasonal migrational behaviour. I particularly like the 'honk' school of encouragement but I particularly dislike the irritating music, but you can't have everything.

[youtube=http://www.youtube.com/watch?v=x0LJB2_luu0]

"...I think the parallel with the geese 'V' is entirely appropriate. I think...it will spark more interest in the concept of the peloton - rather than filling in all the gaps - denying people the pleasure and purpose of learning it for themselves!" [@HuntingEnglish](#)

With cooperation, we may see group members consigning themselves to the path of least resistance. We may also observe some individuals remaining as individuals within the context of the group, and doing what needs to be done to get by. For our most able learners, this may be to adopt the time-honoured role of scribe. They do all the writing needed and, in doing so, move the 'group' through the task in the way that they decide is best and most effective. The remainder of the group co-operate with the scribe to enable this to happen.

If, on the other hand, we observe genuine collaboration, we will hear and see energetic discussion, an excited exchange of ideas and, hopefully, an equal distribution of workload throughout the task. The peloton and the geese demonstrate how this authentic collaboration can work to achieve safety, efficient energy output and attainment of a shared and mutually beneficial goal.

[This video](#) from The Business of Learning Conference (a truly collaborative project I worked on with [Jim 'The Lazy Teacher' Smith \(@thelazyteacher\)](#) and a team of amazing ASTs a few years ago) shows exactly what it means to collaborate. Please take a look. It's under 2 minutes long of pure genius and emotion about what learning is all about, from the learners' point of view. Best of all it was created by a group of 10 learners from 10 different schools who didn't even know each other less than 24hrs before. The post explains what the conference was all about.

So when it comes to assessing the quality of group work, we can, I think, learn a lot from the peloton model. Perhaps it will work well to share it with learners as a way to communicate our expectations of what 'quality collaboration' looks, sounds and feels like. In this way, they can check out for themselves whether they are truly collaborating or merely co-operating at any point during the learning process.

The characteristics of authentic collaboration could also be used to inform our overall programme of aggregation of marginal gains and explicitly shared with learners as they design their own to individual learning plans to which they agree to comply.

The Learning Cycle: #4 The Learning Quotient

This morning, [@HuntingEnglish](#) sent me a link via [@StuartMaginnis](#) to an interview with Team GB and Sky Pro Cycling Performance Director, [Dave Brailsford](#) in the magazine, '[Cycle Sport](#)'. I read this article a while back so this was a great opportunity to reflect on it once more with my 'Marginal Gains' Goggles on. In this article, Brailsford talks about the way in which he uses statistics to inform his thinking and planning. For the data rich environments of schools, this approach to performance analysis is very familiar. In fact, I found it surprising that it was highlighted as *such* a distinctive aspect of Brailsford's approach. After all, sport has led the way when it comes to gathering statistics and making informed training plans for athletes. From the time when the very first games, races and competitions were recorded, data has been collated, analysed and interrogated. But there is something distinctive about how Brailsford *uses* the data available to him. In acknowledging that the website he uses most frequently is not perfect, he makes the following observation,

"There are some flaws in it. For example, a rider will get the same amount of points for a sprint win as another rider will get for a summit finish but they are very different challenges. When you look at the rankings, Cav [Mark Cavendish] has 1,400 points and Hesjedal has 1,200 points but they've won them in completely different ways. As riders they don't overlap at all."

Cycle Sport Online May 20122 (<http://www.cyclesportmag.com/features/inside-the-mind-of-dave-brailsford/>)

Showing & Sharing What Progress Looks Like

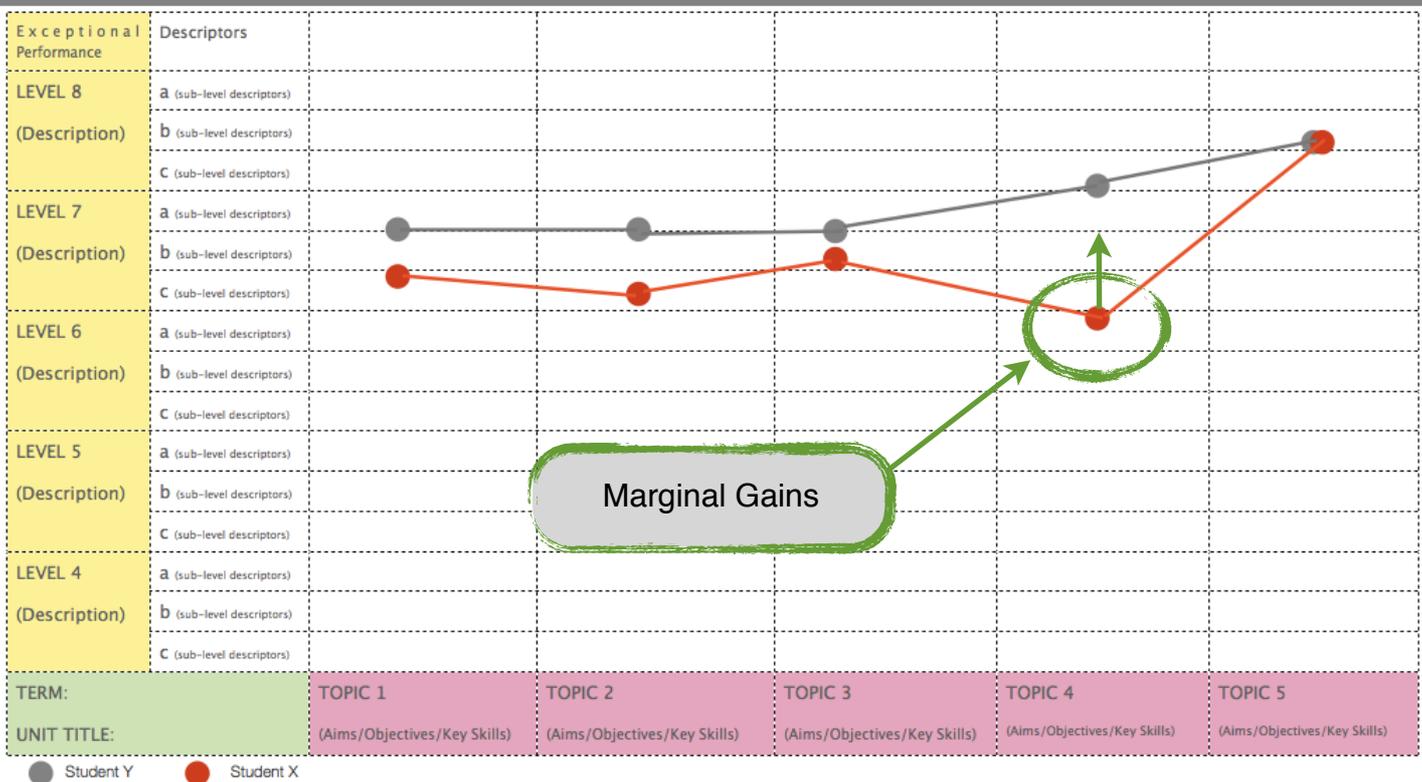
So here's where a learning programme built on the principles of Aggregation of Marginal Gains ([see #1](#)) began to resonate for me. By interrogating the data that is available to us and drilling right down into it, we all know that individual learning stories of learners become apparent. What the Marginal Gains approach to learning may give us, however, is an opportunity to very deliberately adapt our teaching to the specific learning needs of students. This will, in turn, enable us to use the data to inform the teaching of specific learning points and identify the specific skills, knowledge and understanding that will require development. More

importantly, if we can find a way to *show* this and, therefore, *share* this, with learners, then this will give a greater understanding of what progress over time looks like for *them*, in the context of a specific topic or subject area of expertise. With this, we can draw on the learning intelligence available to us and let it act not as a *driver*, but as a component *part*, of the conversations we have with learners.

The beauty of all of this is that we have an inordinate amount of innate ‘learning expertise’ that we can draw upon to identify what it is that students need to know and understand, be able to do and be like in order to be effective learners.

When mapped against the distinctive learning strengths and areas for development required by each learner, students can construct their own learning plan; one that with which they are eager to comply ([see #2](#)). In this way, they can really start to lead their own learning and ultimately ‘own their ambition’.

Two students with very different pathways to the same point over a period of time.
 What conversations would you have with these two learners about their progress?
 How would you use this to inform them of key areas they may need to revise, review and develop ahead of a summative assessment?



Reflecting on student progress in this very visual way to identify key learning moments on their respective journeys AND areas where the scheme of work might need tweaking. You could also use this to pair the students up so they can support each others' learning. This infographic can also become an informative script for a quality learning conversation between you, student and parent/ carer.

Such a meticulous approach may also result in teachers being able to distinguish between two learners who, in terms of their data, at any given point, may be working at the same level, but working in very different ways, underpinned by very different strengths. This echoes Brailsford's reservations in the quote above about the data source he relies on so heavily when assessing the ongoing performance of the riders in his team.

By using what we know makes an effective learner in subject or topic (x), we can, as learning experts in our own right, explicitly guide learners to deliberately design opportunities for them to practise the *specific* elements of their performance that will help them make the marginal gains they need.

In my earliest drafts of [Full On Learning](#) (about 3 years ago!) I had a go at designing a progress chart to illustrate this. The progress chart didn't make it into the final edit of the book, but Brailsford's comment on the flaws of the data that he uses in the quote above reminded me of it. In particular, his observation that data can inadvertently mask the *different* ways two people might achieve the same immediate end but hide a gap in the learning history that may be critical at a later date. So, I trawled my archived files and had a go at seeing if it works within the Marginal Gains concept. Here goes...

Seeing Progress Over Time & Not Missing Opportunities

The chart is designed to record in a visual way the *progress over time* of learners as they move through a scheme of learning. We know that [APP \(Assessing Pupil Progress see: Ofsted: "The Impact of Assessing Pupil Progress Initiative" 04 April 2011\)](#) can work really well to identify the specific elements of expertise that learners need to develop within a particular area over a period of time.

The chart provides a way to actually see and discuss the *specifics* of learning progression, or 'opportunities for improvement', as Marginal Gains would define them. The idea is that the chart *visualises* the learning pathway of every learner in a group. The immediacy of this visual approach to tracking progress over time makes it easy to *share* with learners exactly what progress *looks* like. It is designed to be used to highlight specific

success criteria and recognise just how this fits into the overall picture of “Being an effective learner in (x) subject)”. In this way, the ‘Why?’ of learning can also be shared it is clear how one single task fits into the on-going learning process.

Every learner can create their own chart to record their progress *over time*, using it as a reflexive tool. They can identify what *exactly* they have achieved, what, specifically, they need to do to improve and why they need to do it, rather than simply recording their attainment and moving, unthinkingly, on. Using the chart requires regular opportunities for reflection to be planned to encourage quality learning conversations underpinned by a far more concrete picture of learning.

The chart included in this post is a whole class version that teachers use to identify the specific areas for development that will need to be re-visited. In this example, it is clear that although, in the most *recent* piece of work, the two students have both attained a Level 8, one of them needs to revisit the preceding topic to practise the skills, check their understanding and correct any misconceptions. In other words, (if I’ve got it right!), it can be used to show exactly where the marginal gains for each student can be made. The individual charts can be used to see individual progress and can become personal and very specific ‘ambition templates’ for every learner.

Benefits of this visualisation:

- An opportunity to make progress over time in specific areas visible to learners and teachers
- A way to make abstract learning processes concrete and tangible
- To identify opportunities for marginal gains that may otherwise be masked by ‘most recent performance’
- To match teaching to individual learning needs and for learners to design their own Learning Plans to which they can comply (#2)
- To establish a shared start point and the basis for a script to stimulate and support quality learning conversations between teachers, tutors, learners, parents and carers
- To encourage learners to take ownership of their learning, goal setting and recognition of effort and achievement by designing and recording their own versions

- To track and compare learners who, in terms of performance data may be indistinguishable

With deliberately planned opportunities for reflection in lessons and conversations with tutors, students can use their charts to recognise their progress in specific areas and set their own goals by recording progress topic by topic and always within the context of a bigger curriculum area.

If you are following these posts, you'll know that these are 'think-pieces' designed to explore how the philosophy of Aggregation of Marginal Gains can be applied to learning. I welcome any thoughts you might have...