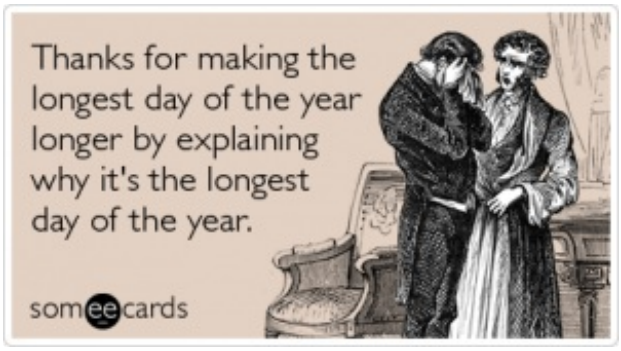
Teaching sequence for developing independence Stage 1: Explain : June 26, 2013

> *"Explaining a joke is like dissecting a frog. You understand it better but the frog dies in the process."*
>
> *EB White*

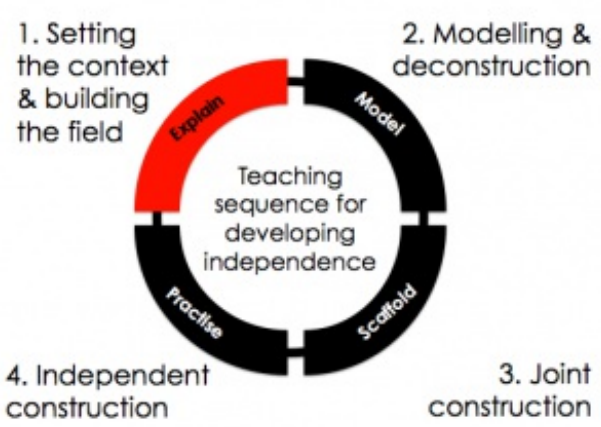


There are some definite pit falls to avoid in explaining things to kids. The biggest criticism of teachers talking is that it's boring. And, generally speaking, boring kids is not a good way to get them to learn stuff.

But to suggest that teachers should therefore avoid explaining their subjects to students is a bizarre leap. Surely it would be vastly more sensible to expend our efforts in improving teachers' ability to explain?

This then is the aim of this post: How can we make our explanations better?

The starting point in teaching any new concept or idea is lay the groundwork of propositional knowledge required. This type of transmission lesson is deeply unfashionable and is something that many teachers are at pains to conceal. We all know that sometimes the most effective way to teach children is to talk to them, although we must always be wary that if they're not learning, we are just talking.



To determine whether learning has taken place we can either check whether the can remember what we've taught or whether they understand it. And obviously we'd prefer that they understood, right? Well maybe remembering and understanding are not as far apart as we might think. Maths teacher Kris Boulton recently wrote a fascinating post asking why it is that students often seem to understand a thing and then forget it. In it he suggests that "if we put *all* our thought and effort into building understanding, we do so at the expense of memory, and will nurture students who understood everything, once, rather than understand it, still." And it's the 'still' that makes the difference.

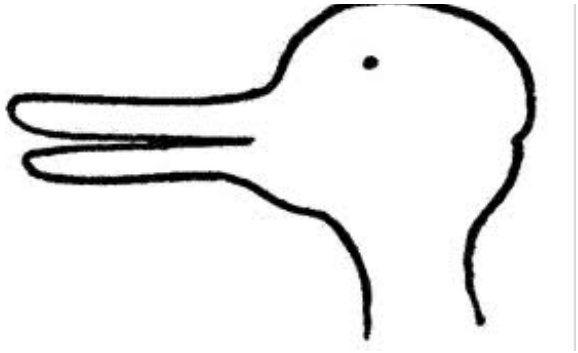
So then, what makes a great explanation? I'm going to argue for for an explanation to work it has to be clear, memorable and relevant. And, ideally, it should also try to avoid killing the frog.

Clarity

If an explanation is precise enough it is a lever capable of moving the world. But to be able to clearly explain a complex concept takes thought and planning. It's useful to remember that what's clear to me may not be so obvious to another. Wittgenstein's duck/rabbit puzzle is a useful way to visualise this:

There have been plenty of occasions when I've tried to

show my students a duck, for them only to be able to see a rabbit. Often the cause is that my own understanding is a little shaky. If I, as the teacher, am unclear, it's unlikely my students will follow my explanation. This is a clear illustration of the need for excellent subject knowledge. I have definitely struggled at times this year to teach A level English Language; it's full of new concepts and terminology and I've had to learn a lot of it on the fly. This has resulted in some rather poor explanations. As Einstein may or may not have said, "If you can't explain it simply, you don't understand it well enough."



One way I rely on to ensure my explanations are clearer is to break down the components of what I want to teach and give students the language they need to explain it. It might seem easier to describe the circulatory system as 'very fine tubes' but it's far more useful to call them capillaries. My best advice here is to make sure you use the specialist academic language used by experts as often and as clearly as you can. And insist that students use it too. What we practise we get good at so if we allow them to practise using sloppy, imprecise language, that's what they'll get good at.

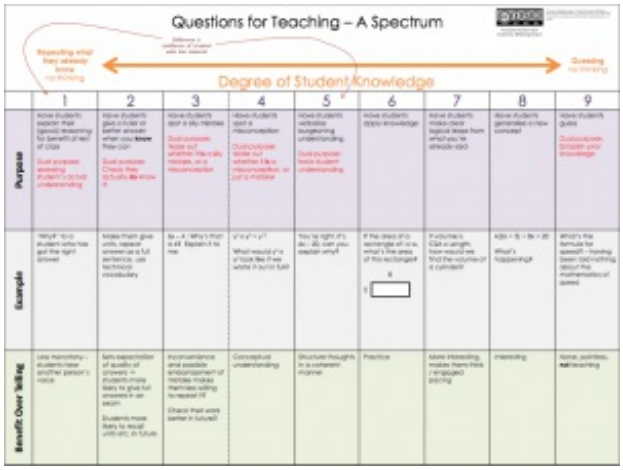
Of course, there's a fine line between talking over students' heads and baffling them with irrelevant jargon and talking down to them. Of the two I'd rather err on the side of too complex rather than too simple; I'd rather they were forced to changed their thinking by incorporating new terms into the schema they are developing then leave them with something so slimmed down it's almost stripped of meaning.

So, you've tried to be as clear as possible, but has it been clear enough? An essential component of being clear is checking that students have followed your explanation. This simplest way to do this is by asking questions. Personally, I'm too lazy and too easily confused to use something as complicated as Bloom's Taxonomy to think about the questions I want to ask (that and I think it's a bit rubbish.) Instead I rely on asking questions that clarify, probe or recommend:

Be mindful though about why you're asking questions. If they don't make your explanation clearer, maybe this is not the right time. Obviously if I'm asking questions to clarify then it ought to follow that this should result in students being able to articulate their understanding.

This fantastically useful question spectrum designed by @redorgreenpen will help interrogate the purpose behind your questioning:

Memorability

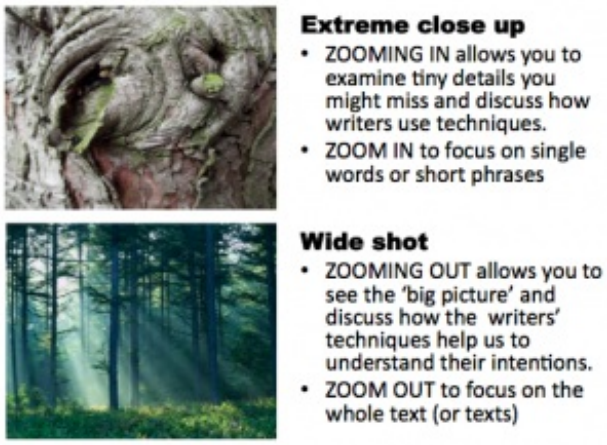


Whether you want to explain the effects of varied paragraphing, Pythagoras's theorem, osmosis or the Treaty of Versailles, it's vital to compare the new concept you're teaching to familiar ones that students will already be familiar with. This means we should avoid using The Simpsons to teach Macbeth, or the Mr Men to teach the rise of the Nazi party. This isn't just about dumbing down (although you may have a view on that) it's more that if Willingham is right that "memory is the residue of thought" we must ensure our comparisons make students think about the ideas we're trying to teach. If they don't think about it, they won't remember it. So, if I want students to understand the plot of Macbeth, it won't help them to be thinking about Marge and Homer instead. If I want students to understand how the leaders of the Nazi party came to power, making them think about Mr Silly and Mr Grumpy will only be a distraction. These activities may or may not be 'fun' or 'active', but they're not

a useful way to explain what you actually want students to know because they won't remember what you want them to remember. In one of my most memorable biology lessons, my teacher knocked over the model skeleton (it's the law that there must be at least one lab per school to contain a full size model skeleton) and told us that we'd remember the lesson for the rest of our lives. I have. But I cannot for the life of me recall what the lesson was about.

Our analogies should help students construct a schema into which they can fit new ideas. So, if I was an IT teacher trying to explain the concept of a firewall I might use the analogy of a bank clerk. In this analogy a website is a bank; if I want to get my money out of the bank they're not usually keen me me to rummage around in the vaults and help myself. Instead I have to ask the clerk. The firewall does a similar job; if I want to access a secure site on internet, I have to go through the firewall first. This analogy is helpful because it relates a new concept to an existing one without me wasting a lot of time think about banks and money; it helps me think about websites and firewalls better. In a wonderful blog post on Lightbulb moments, another maths teacher, David Thomas, bridges the gap between direct instruction and discovery learning to show how he teaches sequencing and scatter graphs.

One of the most useful and memorable analogies I've used is to explain the skills of analysing and evaluation using camera shots. I called the technique "Zooming in and out", and it made something that many students previously found incomprehensible into something that they 'got'. In brief, the skill of analysing is compared to a close up shot where you are able to see details which you might otherwise miss and evaluating is compared to a wide angle shot where you can see how the details fit into the big picture.



Relevance

This isn't an argument for being down with the kids. What I mean by relevance is that what we explain to students should be necessary for them to know; it should lead logically from what they have already understood.

Even if an explanation is clear and memorable sometimes it won't take root simply because it's not relevant. This is all about sequencing ideas and building up a knowledge base (or schema) one step at a time. There's little chance that even the best explanation of sentence structure is going to make sense if students aren't clear on what a verb is, and it's unlikely that they'll understand why Brutus decides to kill Caesar if they have no idea about the formation of the Roman Republic.

So our explanations need to be carefully sequenced. Generally, spending time time on explaining the context of an idea is time well spent. I guess it's possible to fall down a rabbit hole here and going to far back, and possibly it might seem depressingly utilitarian to limit our explanation to what we think students 'need to know'. But at some point this is precisely what we must do. It seems self-evident to suggest that explanations should 'start at the beginning', but often this isn't possible. As experts, we are required to determine where our explanation should begin and the vital steps from there on.

The Kevin Bacon game, or 6 degrees of separation is useful way to get students to reflect on the explanations we've offered. The ideas is that they need to logically sequence their understanding from one concept to another. So we might ask them to suggest the 6 degrees of separation between the assassination of Archduke Ferdinand and the outbreak of the Great War, or between Pip's first meeting with Magwitch and his discovery that he has 'great expectations'. To keep them on track we might specify that step 4 must be the introduction of Mr Jaggers, or the Ottoman-German Alliance or whatever. And if 6 degrees is too few or too many then feel free to extend the chain as far as you think it should stretch.

One further point: sometimes the best way to explain may not involve talking. Laura McInerney has this wonderful example of students 'discovering' the truth of a concept through experience:

> *On my fourth day with a brand new Year 13 BTEC Health & Social Care group, we had a conversation that went like this:*
>
> ***Me:** "Who are the people most likely to suffer obesity in England today?"*
>
> ***Student**: "Rich people"*
>
> ***Me:** "Why rich people?"*
>
> ***Student**: "Because they can afford the most food, so they eat the most, so they get fat. Poor people can't afford food, so they starve, so they are thin."*
>
> *No matter how I tried to question, reason, explain that people with lower incomes are the group with the highest risk of obesity, the students simply would not have it. In their heads, the more money you had, the more food you had, the fatter you would get.*
>
> *Unsure what to do next I made an unusual move:*
>
> ***Me:** "Right, get your coats….."*
>
> *Ten minutes later (with appropriate permissions having been sought from school & supermarket) we were stood at the tills in our local Tesco. Each student had a basket.*
>
> *Me: "Okay, let's imagine you've just got home from work and you're a single parent, you've got two children, they're hungry because they haven't eaten since midday and you're tired. You can spend £5 on tonight's dinner but you need enough food for all three of you and you have to be able to make all of the meal in fifteen minutes or less. Off you go…."*
>
> *Twenty minutes later when the students stood in front of me with a sorry mess of frozen pizzas, angel delight, and tesco value meals the problem began to dawn. We then went and stood in the freezer section comparing the nutritional values of cheaper and more expensive goods. Slowly, clicked some more. Finally we thought about who has the time to buy and cook fresh food, or who has the money/education/space to buy or grow (and store) fresh herbs. After trogging back to our classroom we then got back to looking at the data and writing out analyses (and yes, it's not quite as straight forward as poor = fat, or cheap=frozen food, but we could only get to that once they understood the risks).*

I hope some of that has been useful. Or, more to the point, I hope it's clear, memorable and relevant. If it's not, do please point out where I might improve my thinking.

Coming next: **modelling**

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