Learning on Steroids:

Better Metaphors – Part Two

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Better Metaphors – Part Two

This is the second implementation guide on creating better metaphors. In the first part, we discussed the two criteria to a good analogy are understandability and substance. The first quality is fairly self-explanatory, but the second can often be missed, even though it is often more important.

Now the question is, how do you actually create better metaphors?

I'm going to go over three simple methods to use as a starting point for creating metaphors that mirror the substance of the idea you're trying to relate to. Once again, if you aren't already using the metaphor tactic, don't start here—go back and do a 30 Day Trial on the original implementation guide, which will make the process far easier.

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The three methods I'm going to discuss are:

1. Historical
2. Explanatory
3. Cases

Keep in mind that you don't *have* to use these three methods when creating metaphors, they're just a handy starting point. I don't usually deliberately say to myself, “okay, now I need to create a metaphor by using the historical method.” To do so would be too restrictive.

However, if you're *stuck* on an idea and can't seem to create a good metaphor that models the idea, these are three points you can use to start. You can also use these methods if you can only churn out weak metaphors that mirror the details, but not the

substance of a concept. (If this sounds confusing, I suggest re-reading Part One)

Method One: Getting the History Right

This method of creating analogies was something I learned from Kalid Azad. He runs a fantastic website called BetterExplained.com, and owners of the video course can find an interview between us in Learn More, Study Less.

The idea here is that difficult math concepts are often taught without their historical context. Although it may seem irrelevant as to who discovered an idea and when, it actually turns out that this can provide a key insight into understanding the underlying idea.

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This is because ideas are not discovered spontaneously. Any concept, whether it is math, physics, biology or business, was discovered within a particular context. And while the concept may be difficult, the context it was created in often provides the perfect metaphors for understanding it.

To borrow from Kalid's example, let's look at the natural logarithm, e.

Most students encounter this constant in a fairly sterilized way. You're given this number which is roughly 2.718, and then told about all these wonderful formulas that this magic number fits into. You're then expected to know these formulas and proofs, without any real understanding of what e actually is.

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However, a great way to form metaphors about this mathematical constant is to look at where it was first discovered. It turns out it wasn't discovered by mathematicians simply playing around with numbers, but by people trying to understand compound interest.

If you do a bit of research into the history, you can then get a bunch of useful metaphors for what e actually is.

You can imagine a bank account that has 100% interest. You could then imagine that this bank paid interest, not all in one lump sum, but every month. That way you earn, not only interest on the amount in the beginning, but interest on the interest earned in earlier months.

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Now you can imagine instead of doing this every month, the bank paid out interest every week. If we keep repeating this process we could ask ourselves how much the bank would pay if interest were paid continuously? This leads us to the value of e.

Another example not in mathematics would be understanding a business concept such as just-in-time inventory. Here, understanding the principles in isolation can become tedious, but if you place them in their historical framework (i.e. the efficiency of Japanese firms) then they start to make more sense.

The steps for using this approach to generate analogies is:

1. Do a bit of research into the historical context for the idea.
2. Ask yourself which problem was it created to solve or explain?

In many cases this should bring up good starting points to create substantive metaphors from.

Method Two: Explaining Things Properly

A second great method for creating analogies is to go deeper than the details you actually need to remember.

In most subjects, you're expected to understand them up to a particular depth. For example, if you're learning finance, you may need to know what the formula for an annuity is, however you may not be expected to derive and prove this formula. If you're taking an intro computer science class, you may be expected to understand recursion, but not the stack of function calls and how it is represented in memory.

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If you look at knowledge in this way, you can view it as a chain of whys that link up.

Recursion -> why? -- Stack of function calls -> why? -- assembly code -> why? ...

You can imagine these chains of whys as an annoying 3-year old who asks, “why?” to every response you can provide, until you've exhausted all explanation. We don't usually think about knowledge in this way, but it can be useful for forming good metaphors.

You can use this method to form better metaphors by drilling down one layer of “why's” and focusing on finding analogies there, instead of just at the surface layer.

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To use the example from Part One about the planets in the solar system, comparing the gas giants to carbonated beverages that like to be cold, is at the very surface layer. If you drilled one layer deeper in both of these analogies (but why are gas giants cold/further away? why are colas better cold?) and you get completely different answers, therefore the metaphors is weak.

However, if you drill down one layer and focus on creating metaphors for *that*, you can then end up with stronger metaphors.

My replacement metaphor of a field of dandelions and a rotating fan was stronger, because the "why" for gas giants being further and the "why" for outer dandelions being intact were similar. In both cases the central object is creating a force that strips the atmosphere/seeds from the nearby objects.

So how can you use this to create better metaphors?

1. Write down a fact or principle you're trying to remember with metaphors
2. Below that write, “why is this so?”
3. Below that, write an explanation you can find for why that is the case
4. Use that explanation to create a metaphor.

Method Three: Testing Multiple Cases

This third method is less of a tool in generating metaphors as it is a way of taking metaphors you've already constructed, seeing how strong they are and then fixing them where they break down.

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The idea here is that you start with a metaphor for a particular concept. Then you search for examples where it is no longer a good metaphor. Once you find those weak points, you can either redesign the metaphor to accommodate them, or change the situation slightly so the metaphor is still useful.

Let's say you're trying to understand gas laws, and you use the example of children who are running around, bumping into each other in a room to create pressure. The more energy the children have, one could imagine the more pressure on the environment.

As a starting point for a metaphor, this isn't too bad. It's understandable, and it relates the property of gases that more energy = more pressure.

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However, this metaphor is weaker on other areas, since it can't explain other properties of gases such as that one mole will occupy the same volume at the same pressure, regardless of mass. It also doesn't explain why if the pressure is increased, temperature increases.

The metaphor can be strengthened in these two cases by modifying the analogy slightly. We could start by saying that the kids are often fighting with each other, and if they are pushed into a smaller area (higher pressure), they will fight more frequently and create a heated situation.

We could extend the analogy by arguing that these bickering kids need the same amount of personal space, regardless of how heavy they are, which explains why the same amount of kids will occupy the same volume, regardless of weight.

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This third method for creating metaphors, by extending the analogy to cover missing areas, won't always create perfect metaphors. In my above analogy, there are many areas where it would take a real creative stretch to keep the analogy between kids and atoms in a gaseous state. However, if you're already creating metaphors, you can use this method to make them stronger.

Good luck with these tactics, and I'll see you on the other side!