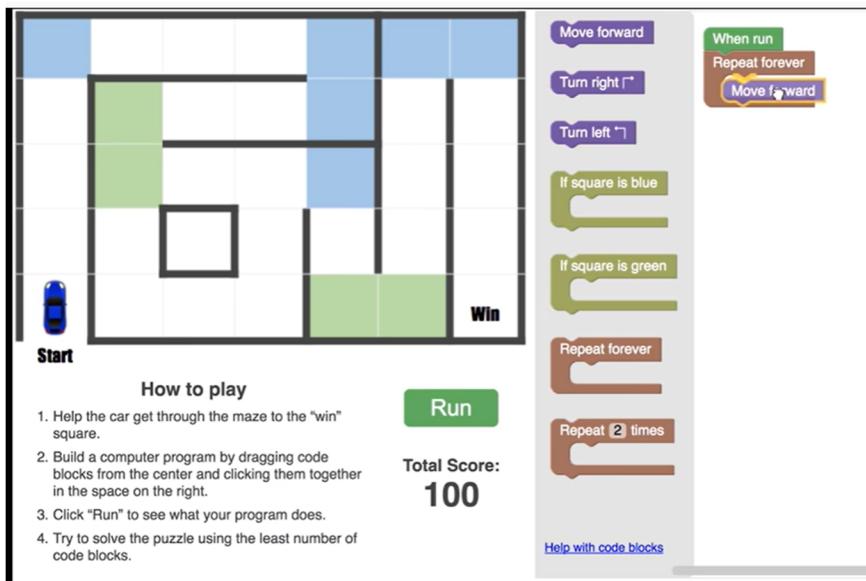


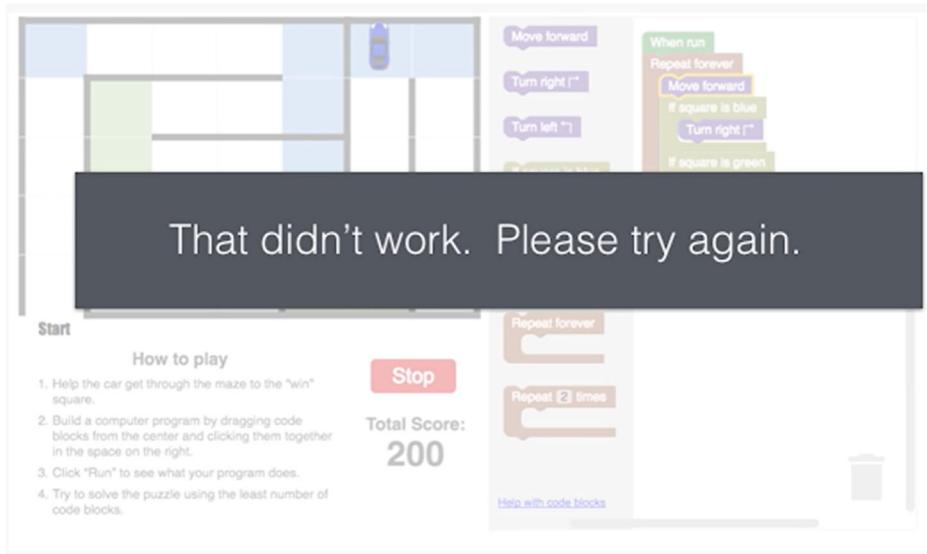
The Super Mario Effect – Tricking Your Brain into Learning More – Mark Rober

Transcript

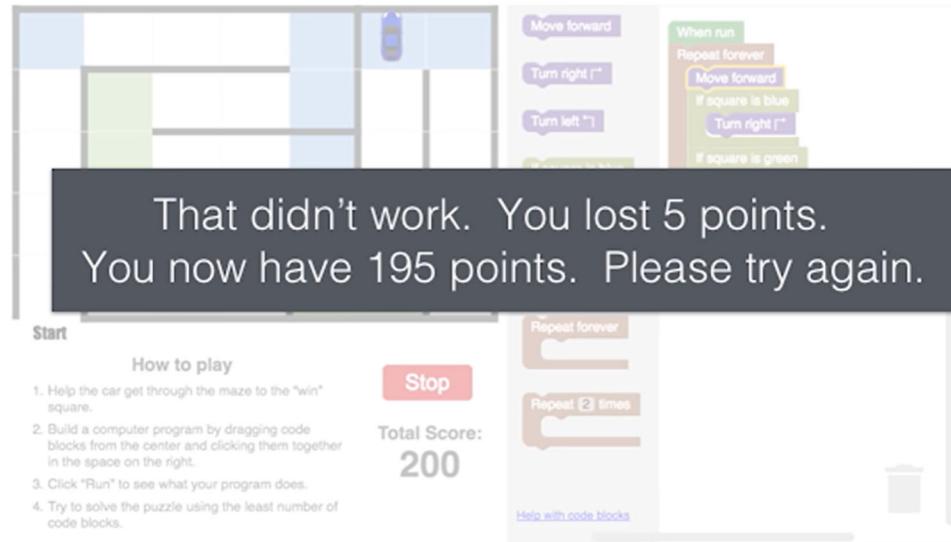
About a year ago, I asked my YouTube followers to play a simple computer programming puzzle that I made with a buddy. The object of the puzzle was to get your car across the maze by arranging these code blocks that represent typical computer programming operations, such as if-else statements and while loops. Once you thought you had a good code, you would hit Run, and your car would move based on the commands you had in the program. I asked my YouTube followers to play it because I said I wanted to prove that anyone from any background could learn to code. Fifty thousand of them took the challenge and attempted the puzzle.



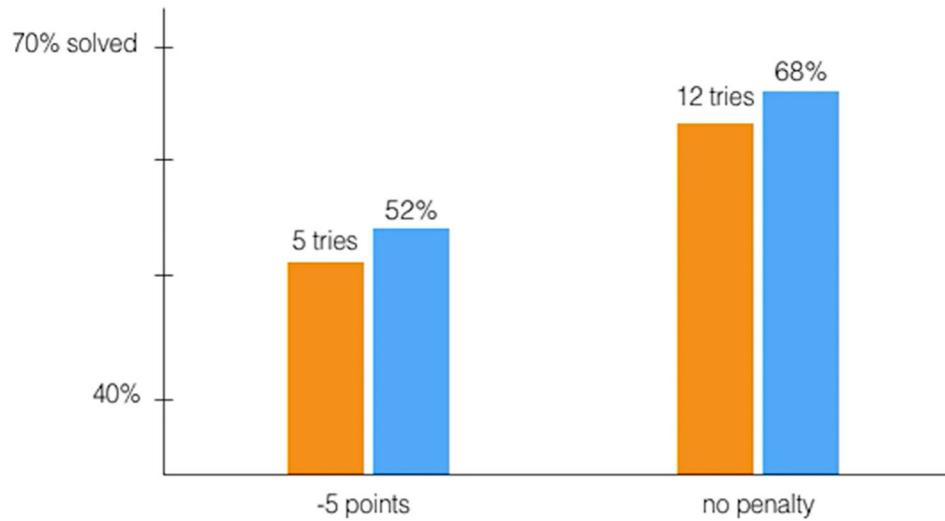
But the truth was that I didn't actually care about proving that anyone could learn to code. What they didn't know is that we actually randomly served up two slightly different versions of the puzzle. In one version, if you hit Run and you weren't successful, you didn't lose any of your starting 200 points. We showed you this message.



However, in the other version, if you hit Run and again you weren't successful, we showed this slightly different message, stating that you lost five points from your starting 200 points. That was the only difference. In one version, if you failed, we simply took away five no-value-in-the-real-world, no-one-will-ever-see-these, completely meaningless, fake internet points. That minor difference is crucial to keep in mind for the results I'm about to show you from the 50,000 data points we collected.



For those who were penalized for failed attempts, their success rate was around 52%. For those who were not penalized, their success rate was 68%. That statistically significant delta of 16% was really surprising and almost seemed too hard to believe until we looked at another piece of data that we collected, which was attempts to solve before finding success. It's shown in orange right here.



So, those who didn't see failing in a negative light nearly had two and a half times more attempts to solve the puzzle. As a result, naturally, they saw more success and therefore learned more. So if you think about that and sort of unpack these results, the trick to learning more and having more success is finding the right way to frame the learning process. And this observation seemed really profound to me. It made me wonder, What if you just frame the learning process in such a way that you did not concern yourself with failure, how much more successful could you be, how much more could you learn? The next thought was that if this is a real effect, clearly there must be some evidence for this in real life. It made me think of toddlers. They are constantly trying new things, and they certainly aren't concerned with failure. When my son learned to walk, he didn't think about how dumb he might look if he fell down, and as his parents, we didn't punish him if he wasn't successful either. The focus was always on the end goal, and we celebrated the successes with him. As a result of constantly failing and trying and discovering new things during that phase of our life, we discover so many more new capabilities within ourselves, and it's not even close to any other time in our life. But maybe using a toddler is sort of cheating because their brains are different than ours.

To make the case that perhaps they aren't that different than us, I'd like to tell you about a plumber I first met when I was eight years old. He was Italian.



When Super Mario Bros. came out, my friends and I became obsessed - like, we wanted to get to the castle and rescue the beautiful Princess Peach from the evil Bowser. We'd get to school and ask each other, "Dude, what level did you make it to? Did you pass the game?" We never asked each other about details on all the different ways we might have died. When it comes to games like this, no one ever picks up the controller for the first time and then after jumping into a pit thinks, "I am so ashamed; that was such a failure," and they never want to try again, right?



What really happens is they think, "I've got to remember there's a pit there; next time, I'm going to come out with a little more speed and jump a bit later." The focus and the obsession is about beating the game, not how dumb you might look if you get hit by a sliding green shell. And as a direct result of that attitude of learning from but not being focused on the failures, we got really good, and we learned

a ton in a very short amount of time. We were the right side of this graph. This is what I call the Super Mario Effect: focusing on the princess and not the pits to stick with a task and to learn more.



The Super Mario Effect

Focusing on the Princess and not the pits, to stick with a task and learn more

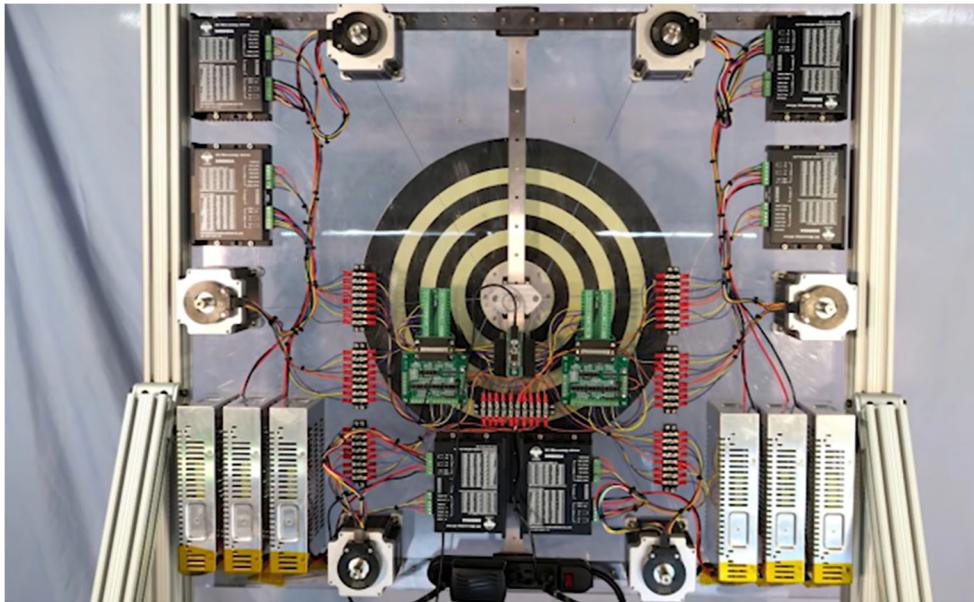
This caused me to reflect and realize that there were lots of other examples from my own personal experience where this attitude of life gamification, this Super Mario Effect led to more success and therefore more learning. I have a science YouTube channel where I will sometimes use my engineering skills to build things such as the world's largest Super Soaker or the Guinness World Record world's largest Nerf gun.



So, these builds usually take me about two to three months, but there was one that took me three years. Basically, I wanted to make a dartboard where you could get a bullseye every time. The idea was that if you throw a dart, we could track it through the air, and then we'd move the board to sort of catch a bullseye.

And so, once we did the math, we realized that if we wanted to track the dart for a typical, like, game of darts, typical velocity, we would basically have to both track the dart and move the board in the same amount of time it takes for a human to blink once. No big deal, right? I'm not going to bore you with all

the details and the failures and the setbacks from a lot of metaphorical sliding green shells and those pesky Hammerhead Bros, but eventually we figured out it would take something that looks like this, which is six stepper motors and motion controllers, a Vicon motion capture system with six cameras, and just a ton of tweaking and rewriting the code.



But finally, eventually, we arrived here.



What's interesting is when I look back on that process, like, I can honestly say my attitude towards that was the same attitude I had toward, like, rescuing the princess from Bowser. Like, of course, each failure and setback sucked; it stung. But it was no different than falling in that pit on Level 8-1, and you're like, "Argh," and you got to go back and try again. It was always like, "OK, that sucked, but what did we learn from that? What can we do next for it? Let's hit it again." And this concept of life gamification is more than just, like, "Have a positive attitude" or "Never give up" because those sort of imply you're having to endure against your true desire to quit. I feel like when you frame a challenge or a learning process in

the way I'm describing, you actually want to do it. It feels natural to ignore the failures and try again, in the same way a toddler will want to get up and try and walk again or in the same way you want to keep playing Super Mario Bros. or in the same way the group on the right had a desire to stick with that puzzle two and a half times longer. They weren't getting paid to do that. Nobody was forcing them or watching them. It was just them on their computer, alone in their house. Their outlook made it so they wanted to keep trying and learning.

The icing on the cake for the dartboard was I took it on Jimmy Kimmel and challenged him to a game of darts. I'll just set this clip up by saying two things. The first is we also had a mode on the board where if your buddy had it and threw a dart, the board would move the other way. And the second is that we couldn't get this thing working during rehearsal, and it was just barely kind of creeping along. I get up to stand in the elevator, which is the door that moves up before you go down out on stage. I look to the right, all six cameras had failed. So my buddy John is feverishly, like, restarting all the cameras as I'm going out onto stage knowing this, and there's, like, four things and bits, and I work up to the dartboard as the sort of grand finale. So just keep that in mind as this clip starts. Like, that's where my headspace is. Three freaking years, and it comes down to this moment.

(Video)

Mark Rober (MR): What you're going to do is give this dart to your buddy, and you're going to challenge him just to, like, hit the board.

Jimmy Kimmel (JK): Just try to hit the board. OK. Alright.

MR: Alright, hot shot. Double or nothing?

JK: Alright, yeah, yeah, alright. Ready?

MR: Alright. And so, then I step up here.

JK: This does this automatically?

MR: That's right.

JK: And you built this?

MR: That's right. I step up.

Here we go.



(End Video)

Fake it till you make it. I will say, in all of our testing, literally, we never had a dead-center bullseye as much as that one right there. So, like, after that, I haven't even touched the board since. I'm like, "I'm so done with it."

And I really believe that if you reframe, like, the challenges, it can make all the difference. I have a simple thought experiment to sort of showcase this. Let's say I gave you a test and it had instructions on it that you would carry out, and to do that, it had sort of buttons like this. And the instructions would say something like, "Push button 3 for 5 seconds" and then, "Push button 6 for 1 second," then, "Push buttons 3 and 5 for 6 seconds," and so on. And unless you carried out the instructions on page one exactly, you couldn't see the other 32 pages of the test. How much would I have to pay you to take that test for an hour?

TEST



- 1) Push button 3 for 5 seconds.
- 2) Push button 6 for 1 second.
- 3) Push buttons 3 and 5 for 6 seconds.
- 4) Push button 1 for 2 seconds.
- 5) Push button 4 for 3 second.
- 6) Push buttons 6 and 1 for 6 seconds.
- 7) Push buttons 2 and 4 for 2 seconds.

Now suppose I change the word "test" here to "game," and I rotated this, and for the input device, I shrunk the buttons and moved them here, and I gave it a cool paint job and maybe different button styles. And then instead of using words, I represented the tasks you needed to accomplish visually like

this. Note the output is the exact same: you have to push these buttons in a very specific manner to move on to the next page or level, as it were.

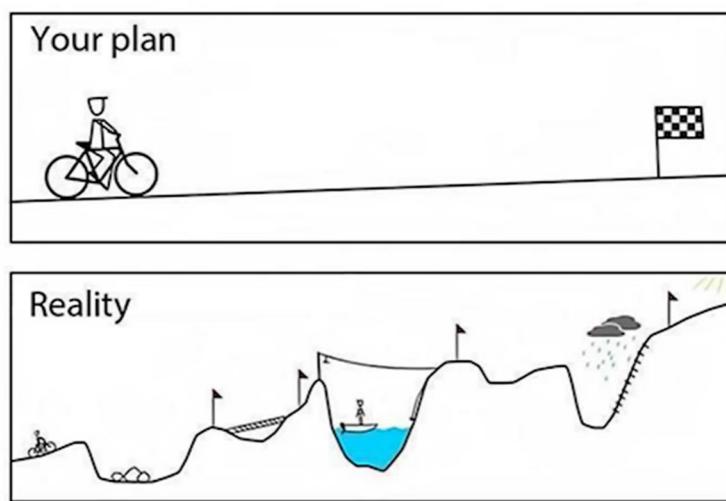
GAME



Now picture it's 1986. How much would you pay me to take this test just for an hour?

So, as a science YouTuber, sometimes I feel people have framed the act of learning science in a negative way. It's been taught poorly, so it feels scary to them. It feels something more like this. And my approach is to take the same physics lessons you might have hated and to try and sort of trick you into learning something through something cool: basically to go from this to this. So for example, in this video, I made a hot tub with liquefied sand. I explain in the video that it's a fluidized bed, and then we talk about the principle of buoyancy and how it makes the whole thing work, and I use several examples, like, you know, the blow-dryer with a ping-pong ball like this.

But by reframing the learning process and focusing on the cool end goal, the fear of failure is often taken off the table, and learning just comes more naturally. I'll close with this thought. Someone came up with this cartoon, and I totally love it.



This is so true, but often in life we tell ourselves that the top version is what we want; that's what we expect. But then something happens. Maybe it's a really bad grade on a test or a meeting with a client that goes horribly wrong. Maybe it's a bad breakup. Maybe we miss a wide-open shot. Some kind of green shell hits you. And so, at that first setback or sign of failure, doubt creeps in. We tell ourselves we're not good enough or we're not smart enough. And yet, if the bottom rectangle here is a game where now your bikes crash and you have to get your bike across to the flag, it's not, "Oh, I hit these rocks. I'm just going to leave my bike here. I'm not good enough," and you quit and walk away. You see that flag to the right, and you're like, "Nah, what did I just learn? OK, next time, I'm going to come out with more speed and lift the front of my bike up." You want to try it again. You're immediately excited to go for it again. We sort of tell ourselves we want our life's challenges to look like the top one, but that's boring. If that were a real video game or a book or a movie and that went out to the market, it would be a total failure. Nobody would buy it. Where's the risk and the reward? Where's the challenge? There's no feeling of satisfaction. The bottom picture is real life, and that's not a bug, that's a feature.

Think about anything that means anything to you in life, whether it's a degree, a relationship with a friend or someone in your family, maybe a professional accomplishment. I can guarantee you it came from something that looks like the bottom and not the top: failing and failing and failing and eventually succeeding to the point that it now holds value, just like the most meaningful high-fives of my adolescence were those when I said, "Dude, I finally beat Bowser last night." I feel like a lot of the successes in my life have come down to the Super Mario Effect, and while framing challenges like this has worked for me, of course, results may vary. Everyone is going to be different, and I don't know exactly what it looks like for you to take this principle and map it into your life. But if we got these very real results from a very different cross-section of very unique people, clearly I'm not alone.

There's some universal principle at play here. By shifting your focus to the princess and treating your life's challenges like video games, you can trick your brain and actually learn more and see more success. Thank you.