# THE EVOLUTION OF STEM FROM AN EDUCATOR'S PERSPECTIVE

## AN INTERVIEW WITH BILL CHURCH

Bill Church is the Executive Director of White Mountain Science, a STEM outreach and curriculum development organization in New Hampshire, US. With a passion for teaching, physics, and engineering, he is the ultimate STEM specialist.

Bill previously worked as a public school physics teacher and has used computer science, engineering design challenges, inquiry, and technology toolsets in classrooms for over twenty years.

He has presented his work on project-based learning at many national and international conferences, and has co-authored a book of classroom activities, *Physics with Robotics*.

We were delighted to chat to Bill recently about the evolution of STEM education.

Arduino Education: Hi Bill, thank you for talking to us today. We definitely want to hear your opinions on all things STEM - but first, what makes you feel inspired?
BC: Lots of things inspire me - my family and our different pets, hiking, biking, and climbing. We live in a beautiful place in northern New Hampshire, and so just walking outdoors is truly inspiring. But in these tricky pandemic times, I would have to say what inspires me is connecting with people and creating something, even if it's just a doodle.

AE: Nature, creating, and connections. We love that. What about one common myth about your profession that you'd like to set straight?
BC: I hope it's not common, but I fear that it still might be. An old myth about teaching is that you go home at three o'clock, your day ends early, and you had summers off and all these vacations. I would try to help people understand that the teachers work likely more than a year's worth of hours during the semesters.

AE: So let's get onto STEM - could you tell us what STEM education is?
BC: So the acronym itself was coined about 20-odd years ago, and I actually had the chance to speak to someone who was in the room when it happened! This gentleman was

at a meeting where they were working on ways to make education connected to the workforce and to make it more integrated. That's what, prior to rearranging the letters to form STEM, this meeting was about - the initiatives to have our students do math, engineering, science, and technology in an integrated fashion.

AE: Can you give us an idea of the landscape in both pre and post-STEM times in education?
BC: Not really - not because I don't want to but because it wasn't as black and white as that. It was already being taught, just not in the STEM sense! I think of education everywhere as a sort of pendulum - sometimes it swings right to one end, but then it can swing back. It's always moving.

AE: How would you tell parents to teach their children that it's okay to fail?
BC: Well, the word failure is just so loaded. Words are powerful, poetry words are powerful. So the word failure is powerful. One way I would encourage people to teach children about failure is to not use the word failure itself. Swap it out for something else like "try out". For example, you go to a store to get a new shirt, and you try it on, and it's okay if it doesn't fit - you go get another shirt. That way, our parents and our families and our schools and teachers encourage students and themselves to try on ideas. And if they don't fit? Try on the next one. That's okay, it doesn't have to fit the first try.

AE: That's a great way to look at it. Any other final tips or resources for our audience?
BC: Even just by looking around you, you'll find so many. Online though, I think what you have done at Arduino is awesome. The entry level for Arduino in a very technical world is amazing. And so looking out there for resources like Arduino that back up an exceptional product with a lot of resources is the best way.

For example, I've worked with so many students who are struggling with a project or just exploring it, and they go on Reddit or YouTube and there's a whole host of helpful information. The print industry has so many magazines, too. So I think it's a bit of a search to find what style fits you, like with books, music, art - you find which one you like. Really, I don't have any specific resources, but I guess the tip is to just start looking and really look for the things that click with you. I hope that was a good answer!

## INSPIRED? HERE'S WHAT YOU NEED TO GET STARTED WITH ARDUINO EDUCATION

The *Arduino Student Kit* can be used for both home learning and classroom teaching. It will help you get started quickly and easily with robotics, electronics, and coding.

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