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Dear Amplify,

I am writing to apply for your Curriculum Manager, Grades 6-12 position. I am currently a math teacher at an independent school in NYC, teaching grades 6, 9, 10 and 11. I love using Desmos as a central part of my teaching, and have made many of my own graphs, activities and math games. A sampling is here. Math can often seem forbiddingly abstract to students, but Desmos can make it wonderfully tangible. Students can literally push and pull mathematical objects around, and poke them to see what happens.

As an illustrative example, here is a math game which could potentially serve as part of a Desmos Classroom Algebra 2 curriculum: snakes on trig graphs. Through a series of levels, progressing from easy to more advanced, students see snakes moving sinusoidally across a graph on which some apples are scattered. There is a math-equation input box, and the snake follows the path of whichever function the student types into it. Their task is to figure out the equation that will make the snake eat all the apples. In the first level, only the amplitude varies, but by Level 4 they need to choose the correct amplitude, period and midline. I have used this game in my own classes, and my students have told me that they find it to be engaging and fun. Several of my other Desmos games and activities can be found in this collection.

The existing Desmos Curriculum up to Algebra 1 is already wonderful, and contains many playful elements. Moreover, marbleslides are a very popular Desmos Classroom game. However, I think there is a lot of room for growth in math games beyond marbleslides, perhaps along the lines suggested above. Moving "under the hood" of Desmos into javascript, I have recently explored making a web-based math game, inspired by Candy Crush. It can be found here. It uses p5js and also the p5play javascript library, which incorporate a physics engine similar to the one that powers marble-slides.

Games are of course not the only way of engaging students. Above all, any graph or activity should serve as a catalyst for understanding, and to build up intuition. One example is this Desmos graph that I created to try to make percentage changes more concrete and intuitive. Another is this animated visual proof of the Pythagorean theorem, using area-preserving shearing. That graph reaches a potentially wide audience by being part of the Wikipedia page for that theorem, here.

The question of how to improve math education is longstanding and urgent. I truly believe that Amplify Desmos Math offers the most powerful set of tools anywhere for achieving that. This has been further enhanced by the recent incorporation of Mathigon's Polypad, a tool that I frequently use with my 6$^{th}$ grade (I especially like the fraction bars and the balance scales). On the small scale of a single classroom, I have direct experience of these tools' great potential, and also of the some of the practical issues that can arise in a classroom setting. I believe that my skillset could allow me to help Amplify in its quest to improve math education on a much broader scale. It would be a thrilling opportunity, and an inspiring challenge.

Sincerely,

RDSRaizada

Rajeev D. S. Raizada, Ph.D.