# Pokémath: The Mathematics of Pokémon GO

Pokémath is a foundational level math class taught in the Spring at the University of Iowa. It was designed by Dr. Colleen Mitchell and updated by Kitrick Fynaardt. The class uses the mobile game Pokémon GO as a context and motivation for learning pure and applied math concepts. Students in the class play Pokémon GO and use their journey through the game as a platform for learning as they apply what they learn in class.

**Info for Teachers**: All the files used for the class can be found in this folder. The idea is for teachers to have full access to everything from the course so they can pick and choose notes, assignments, or ideas that might be applicable in their classroom. Pokémon GO is a free mobile game, so it is highly accessible for students of all ages. We believe the elements of Pokémath can be modified to fit almost any classroom.

**Contents**: This folder contains a subfolder for each element of the class. In a typical week the class goes over two days of notes, a day is spent working in pairs on the Group Work, and either a Homework or Project stage is assigned. The folder also contains an example syllabus, instructions for an optional extra credit project, and a page dedicated to the damage formula. Each subfolder contains PDF versions of all the relevant files needed for each element of the class. The folders also contain the raw files for each element of the class, which are “.m” files. These were created in Wolfram Mathematica and can only be edited if you have Wolfram Mathematica. If you don’t have access to Mathematica, don’t worry. You are free to screenshot whatever elements of the PDF elements you like and use in whatever format you are most comfortable with in the classroom. The Notes subfolder also includes a notated version of each of the note sheets. The idea is that the class begins with the day’s notes blank, and the instructor and students work together to fill out the sheet with notations during class. You are free to keep this style or change the presentation of notes to fit your classroom.

**Unit 1**: I Choose You! The first unit encompasses Notes 1.1-1.9, Homework 1-3, Group Work 1-4, and the Variable Comparison Project. This unit introduces the many properties that Pokémon have in the game, including Type, region, HP, CP, Attack, Defense, and others. Students sort through their Pokémon and organize them using set theory concepts. Functions are then introduced as a way to manipulate sets and calculate the statistics of each Pokémon.

**Unit 2**: Gotta Catch Em All! The second unit encompasses Notes 2.1-2.9, Homework 4-6, Group Work 5-8, and the Spawn Rate Project. This unit uses the context of catching and collecting Pokémon as motivation for studying probability.

**Unit 3**: To be the Very Best. The third unit encompasses Notes 3.1-3.7, Homework 7-9, Group Work 9-12, and the Battle Project. This unit sets students to battle each other and train their Pokémon as the context for studying the complexities of the battle formulas, linear models, and rates of change over discrete time. Students learn to interpret the change of a Pokémon’s HP and Energy over the course of a battle as a linear model.

If you have any questions about Pokémath: the Mathematics of Pokémon GO, email Kitrick Fynaardt at kfynaardt@uiowa.edu