Exploration Problems - Summer 2026

National Math Camps - Camp Conway & Camp Sierpinski

Introduction

These math exploration problems consist of two parts, plus a few reflection questions. We encourage you to spend about 1–2 hours on each part, including writing up your solutions, and to take a break in between the two parts. (We'll take lots of breaks at camp!) If possible, we strongly prefer that you handwrite your solutions.

If you're worried that we'll have trouble reading your handwriting, you're welcome to also submit a short (max 5 minutes) video explaining what you did on one of the problems—we're not looking for high production quality or a rehearsed presentation; we just want to hear your thought process and what you figured out!

Here's what to expect:

- **Part 1** (pp. 3 - 4) includes two unrelated problems (#1–2). You're welcome to work on both or just focus on your favorite. We're looking for strong work (which does not necessarily mean a full solution!) to at least one of them.
- **Part 2** (pp. 5 - 6) includes one more problem (#3), plus an invitation to ask and explore your own questions related to it (#4). We don't expect you to fully solve all of the parts of Problem #3, or to answer all (or any) of the questions you pose in Problem #4. But we're really interested in seeing what you're able to figure out, and where your mind takes you!
- Last but not least are the **reflection questions** (bottom of p. 6).
- We've also included a few types of grid paper at the end of this document, in case you find them helpful.

Continue to the next page for some reminders before starting on Part 1.

Things to Remember

- **Work independently!** These problems are meant to showcase your thinking, so please work on them solo. Don't use ChatGPT, web searches, books, or outside help—we really want to see how **you** think and what **you** come up with. Please don't share these problems online or with others—we want to keep them fair for everyone.
- **Calculator? Optional!** You're welcome to use a basic four-function or scientific (non-graphing) calculator, but we don't expect it to be necessary. A pencil, paper, and your awesome brain should be enough.
- **Organize your work!** Work on a different sheet of paper for each problem, and label the top of each page "Problem 1, Page 1", "Problem 1, Page 2", "Problem 2, Page 1", etc. Indicate clearly which part of each problem you're working on.
- **Document your thinking!** When you write up your solution, don't just give your final answer but tell us how you got there. For example, you could use phrases like:
  - First, I tried…
  - Then, I realized…
  - But that didn't work because…
  - So next, I…
- **Don't throw out your scratch work!** We want to see **all** of it—even your mistakes and dead ends. It's okay if it's unorganized, and if multiple problems are mixed together—you can just write "Scratch Work" at the top of each page.
- **Don't forget to reflect!** We want to hear about your experience working on the problems! These should be on a piece of paper labeled "Reflection Questions".

These problems are a taste of what we do at camp: exploring, experimenting, and discovering together. If you enjoy tackling these challenges, you'll love the math adventures waiting for you at camp. We can't wait to see what you come up with!

Ready for Part 1? Proceed to the next page!