# Fall 2017 Math Circle

A Note to Families

Thank you for participating in the Fall 2017 Shippensburg Area Math Circle. This session marks the beginning of our 4th year of Math Circle and we were thrilled to have 19 students registered and regularly attending Saturday morning math sessions. We really liked seeing students collaborating and working together alongside our Shippensburg University student leaders (Brad, Sarah, and Crystal). We really hope this was a positive experience for your child.

We will continue to build the Shippensburg Area Math Circle, though this coming Spring 2018 will be a slight change. In the spring, we will focus primarily on pencil and paper problem-solving, with the hopes of getting students ready for a mathematics competition. For more information about the Shippensburg Area Math Circle visit us at `http://webspace.ship.edu/lebryant/mathcircle`. In addition to family contributions, we thank our sponsors: Grace B Luhrs University Elementary School PTO, Shippensburg University Department of Mathematics, and the National Association of Math Circles.

Below we include some notes about the activities we did, along with some links to learn more.

Activities

Möbius Strips One of the more interesting objects to study when thinking about changes is the Möbius strip, because it does some very wild and unpredictable things when changed (cut). Everyone in the math circle tried to guess what would happen before we did one of our cutting experiments and then we would try to understand why our guess was *right* or *wrong*. A short video about "wind" and "mr.ug" showed us that a Möbius strip is a very wild place to live!
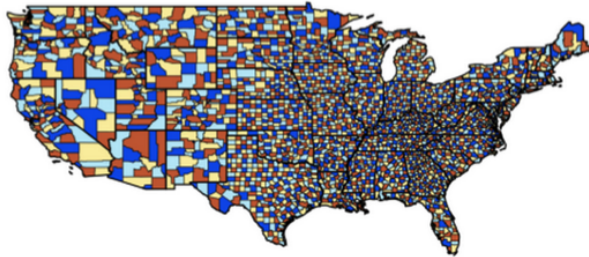
Map Coloring In this activity, students explored how many different colors it would take to color maps with the rule that no two areas that share a border should be the same color. For maps drawn with lines edge to edge on a paper, the number is 2. For any map drawn on a flat piece of paper, at most 4 colors are needed. For the Möbius strip with 6 regions we needed 6 colors. This activity encouraged trial-and-error, reasoning, and visualization.

MatheMAGICAL tricks! Sometimes math can be so mysterious it seems like MAGIC. Like: how can an index card be cut so that it has a hole large enough to pass a basketball through? By noticing some patterns, we were able to impress and amaze with our ability to form Fibonacci sequences and then add up the first ten terms in no time at all. And that magic gopher? Well, he is cute but it turns out he's not magical at all. If you want to retry the Magic Gopher mind reading, go to `http://www.learnenglish.org.uk/games/magic-gopher-central.swf` and see if you can explain how he always knows the symbol.
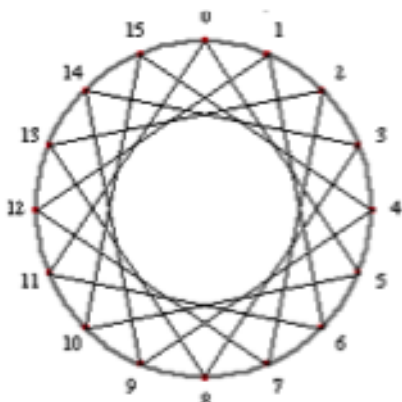
Circles and Dots We used this activity to make observations and conjectures about what happens when we make shapes by moving around a circle. The students made conjectures about how the same shape can be made when looking at multiples of a number. Some students got creative and made circles with lots of dots and wild jump patterns. By recording their work and thoughts, students got a taste of what mathematics research is like!

SOME RECOMMENDATIONS

Interesting websites with great math content:
Math Pickle `http://mathpickle.com/`
Math for Love `http://mathforlove.com/`

There are *many* games & books that promote mathematical and logical thinking.