UW Math Circle
Week 3 – Talking About Math

Presentation Tips

1. Start by stating the problem in your own words, and summarize the solution you're about to present.

2. Explain each step clearly and justify everything you say. We should be able to follow your solution even if we haven't worked on the problem ourselves.

3. If something's important, write it down! Write full equations (eg. "$x = 10$", not just "10"). Label your diagrams clearly.

4. Talk to your audience! Face the room, and speak up so everyone can hear you.

Worksheet B

1. Suppose you have 4 coins, but one is counterfeit and will be slightly lighter than the others. You are given a scale (shown below) to compare the weights of the coins. Can you find a strategy that is guaranteed to find the fake coin by using the scale only twice?

2. Three snails – Alice, Bobby, and Cindy – were racing down a road. Whenever one snail passed another, it waved at the snail it passed.

   During the race, Alice waved 3 times and was waved at twice.
   Bobby waved 4 times and was waved at 3 times.
   Cindy waved 5 times. Can we figure out how many times Cindy was saved to? If so, how many times?

3. Ten children arrive at a birthday party and leave their shoes by the door. All the children have different shoe sizes. Later, as they leave one at a time, each child randomly grabs a pair of shoes their size or larger.

   After some kids have left, all of the remaining shoes are too small for any of the remaining children. What is the greatest number of shoes that might remain by the door?

4. To celebrate space exploration, the Science Fiction Museum is going to read Star Wars and Star Trek stories for 24 hours straight. A different story will be read each hour for a total of 12 Star Wars stories and 12 Star Trek stories.

   George and Gene want to listen to exactly 6 Star Wars and 6 Star Trek stories. Show that no matter how the readings are scheduled, the friends can find a block of 12 consecutive hours to listen to the stories together.