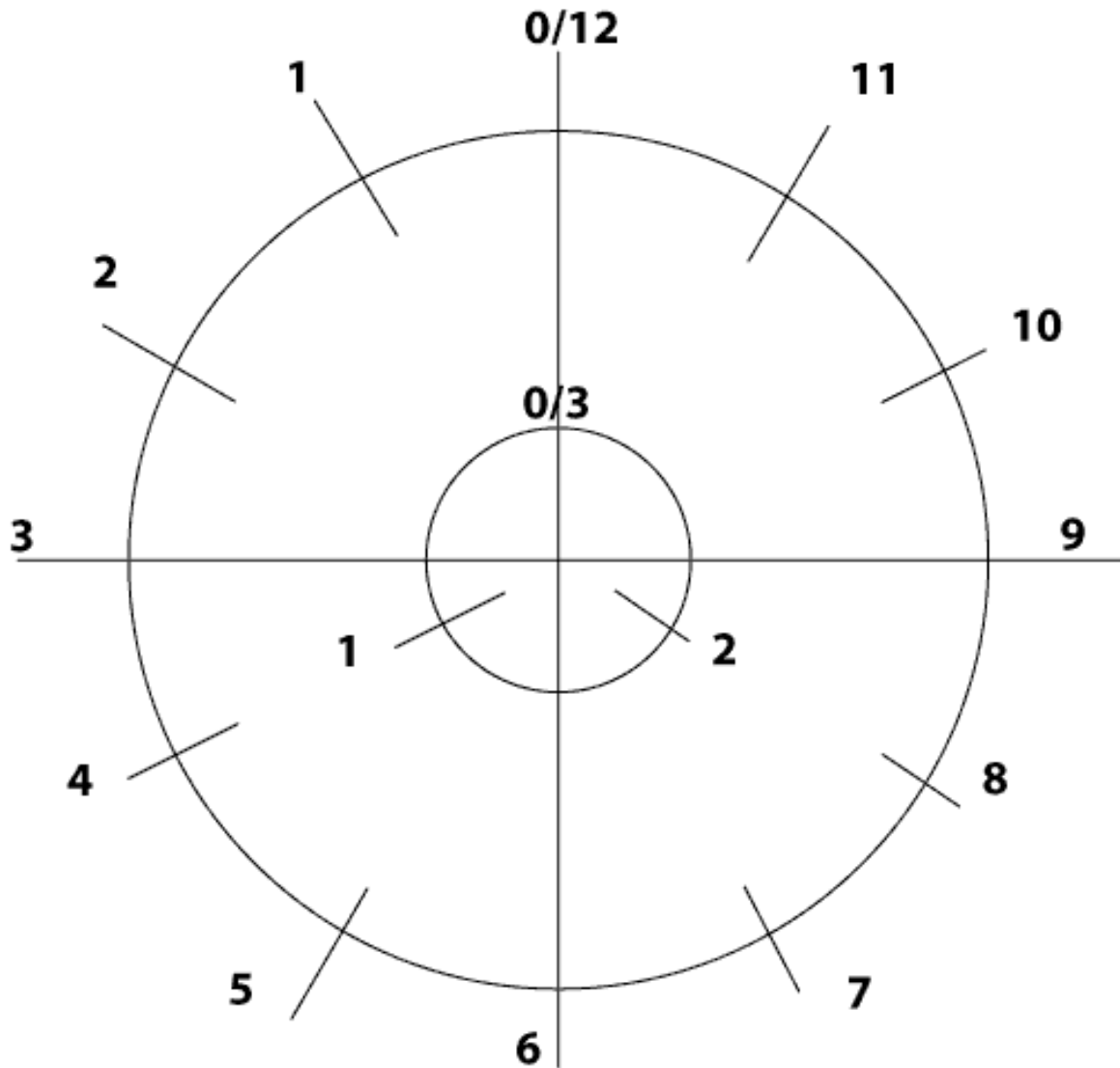


Activity 1: Mercury's orbit compared to Earth's

Mark out two circles on the floor. The large one should be about 9 feet in diameter. Divide it into 12 equal sections like a clock face. The idea is to make the circle big enough, so that a student can take one step to get to each number. This represents the Earth's orbit and each step represents a month, so 12 steps around the circle is a full year.



The inner circle will represent Mercury's orbit and should only be about 3 feet in diameter. Mercury completes one orbit around the Sun in just 88 days. For this model, we'll round that up to 90 days, so in 3 months (or 3 big steps), Mercury will be all the way

around its orbit once.

Clap or beat a drum to indicate when students should take a step. With each clap, students should move to the next number. Have each student start on the "0" for their orbit. Have each practice one orbit. Clap 12 times and Earth will be back to its starting point. Then let Mercury take its turn, 3 claps and it's back to where it started. For each of these planets, that is their year.

Now put both students in motion at the same time, with both starting at their own zero point. Note that they make a straight line with each other and the Sun. Clap once. Stop and notice how far around each is. (Earth is $1/12$, Mercury is $1/3$ of the way around) Since Mercury seems so far ahead of Earth, ask students to predict when they will meet up again and be in a line with the Sun. Clap a second time, each takes one step and note where they are (Earth is $1/6$ and Mercury is $2/3$) Clap a 3rd time, and Mercury has completed one year, but Earth is just changing seasons. Clap a 4th time and see what happens. Mercury has lapped the Earth and is back in line between it and the Sun. Keep clapping and counting and note where Mercury and Earth meet up again.

This would seem to imply that we could have 3 Mercury transits each year. But we don't. See why with Activity 2.