



BLUEBIRD MATH CIRCLE

Alliance of Indigenous Math Circles

Issue 1 Recap

Share your problems, solutions, models, stories, and art at:
<https://aimathcircles.org/Bluebird>

NEWSFLASH Join LIVE Bluebird Math Circle with friends and family.

Monday April 12, 5-6 PM MDT online.

Sign up at
<https://aimathcircles.org/Bluebird>

Perseverance—Ha'ahóni



PROJECT—Design a Martian calendar and Martian clock

There is no official Martian calendar yet. On March 29, students, parents, and teachers gathered for Bluebird Math Circle and discussed:

- **Martian years:** From what point in time do you start your first Martian year?
- **Martian months:** How many months do you plan to have in your Martian year? How many *sols* (Martian days) will be in a month? What will you name those months?
- **Martian clock:** How will you design a clock for the Martian sols? How many hours will go into the sol? Do you plan to use the Martian hours or the Earth hours?

If you played with Flyer 1 at school or at home, Bluebird greets you! If you were among some forty students, parents, teachers, and math friends who gathered live on March 29, Bluebird thanks you for coming and exploring the mathematics of time together. And if you have not started yet, come on over, bring friends, and join the circle!

FROM SMALL GROUP DISCUSSIONS

Here are some of the notes that live circle participants shared after they worked on their calendar projects. Bluebird thanks Alicia Gonzales, Beth Cammarata, Craig Young, Rick Preston, and other teachers and parents for making this happen!

Martian era starts from my birthday!

Since several students shared that they were born in 2008, Josue and Jayshauna decided to start our Martian calendar in that year. Josue suggested that first, so we could call it the beginning of the Josue Era on Mars. Naturally, we wanted to see what year it is on Mars right now. Because it takes Mars twice as long to go around the Sun, we realized that even though 13 years have passed on Earth, only 6.5 years have passed on Mars since Josue's birthday.

Martin suggested an alternative starting year, putting it into the future and starting the Martian Era in November 2021. (Maybe we can call it "Martin Era"!)

The Martian year is twice as long, so we needed to decide what to do with the months. Henry Fowler suggested that we have 24 months: the first 12 months will correspond to the Earth months, and keep Earth month names, and the next 12 months will have Martian names. Unfortunately, we did not have enough time to come up with the names for those Martian months, so we left that as a take-home activity.

The only divisors of 668 are...

We assumed that a Martian year consists of 668 Martian days (*sols*). We wanted Martian months to be of the same length. The only divisors of 668 are 1, 2, 4, 167, and 668, as Justin noted. It didn't seem interesting to have 2, 4 or 167 months. So we decided to break a Martian year into 4 seasons, so that every season would have 167 days. But 167 is a prime number, and it means that we can't divide it into months. To solve the problem, we agreed to have 4 equal months in every season, and 41 days in every month. This would leave 3 extra days in each season, and we simply designated them as Special Holiday Days.

Next, we started thinking about names for the seasons. That led us to the question of what causes seasons on Earth. We haven't quite answered that question, but have agreed that if a similar phenomenon exists on Mars, then it would be appropriate to call Martian seasons the same as those on Earth – Winter, Spring, Summer, and Fall. We wonder if our readers would help to resolve the problem.

FROM SMALL GROUP DISCUSSIONS (continued)

Extra minutes, days, and months

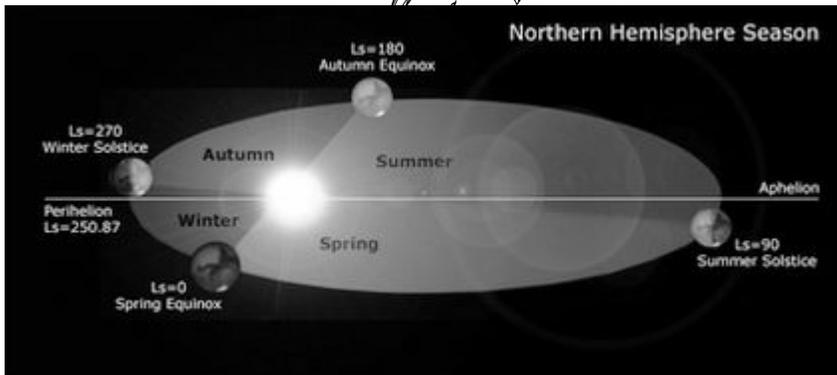
Our group was trying to determine how to add the additional minutes to each day and figure out how many extra days the Earth calendar would have. We then added those extra days onto the Earth calendar. Since Mars days to Earth days was double, the students decided that we should have 24 months in our calendar. Our next step was to decide how many days would be in each month. We started discussing but did not get around to naming the months or deciding how many seasons we would have.

What about weeks?

We decided to do 42 months and eight days a week. And we haven't decided on the name of each month.

Season's durations

We decided to divide the Martian year into four seasons. And then there was a question: what causes seasons on Earth? Then the question would be: does a similar situation exist on Mars? Does Mars have four seasons similar to those on Earth? Like, one has the shortest days and one was the longest days, and so forth. That was a question. We could probably come up with some names for those seasons. But, but before giving names, we would like to know what seasons are, and whether they're the same duration, right? Proportionally or not. Right?



BLUEBIRD SAYS—Mars has four seasons just like Earth, but they last about twice as long. That's because it takes about two Earth years for Mars to go around the sun.

However, Martian seasons are not the same length as each other, and quite different between the northern and the southern hemispheres. How different? If we decide to have 24 months in the Martian calendar, the longest season will be about 7 months and the shortest, about 4 months!

The southern hemisphere has “harsher” seasons than in the north. During Southern winter, Mars is farthest away from the Sun in its elliptical orbit around the Sun. That's different from Earth, because our planet has a near circular orbit. Winter in the southern hemisphere is worse, because Mars is the farthest away from the Sun and moves more slowly in its orbit. Going from a winter to warmer spring can be quite dramatic.

A little extra from the chat

Hannah Baheshone: *In space there is no time*

Tami Dugi: *Thank you from a parent!*

Beth Cammarata: *This was a fun flyer and activity, thanks students and teachers! And parents!*

Share your designs with other Bluebird Math Circle participants at <https://aimathcircles.org/Bluebird>