Is it 2017 or 1899?

Here at Princeton Friends School we are big on recycling. We recycle paper, cans, bottles, even CS themes and musicals! Did you know that we can also recycle calendars? It's true. In fact the calendar for 2017 matches up with the calendar for 1899 (at least in terms of dates and days of the week). How is that possible? What's going on? Can we figure out any patterns to predict when a calendar from 2016 might be used again? As we start a new calendar year, let's take a look at this useful tool and discover some of the secrets and math found within.

1) Let's do some calendar basics! How many days are in a week? How many days are in a year? How many months? How many days does each month have? What is the shortest month? Is there a longest month?

2) Can you estimate how many days are in each month on average? How about how many weeks in a month? Check your estimate by finding the averages mathematically. How did you do? Were you correct or did you over or underestimate? If you did, why do you think that happened?

3) Many people have a favorite day of the week. Can you determine the least and most times that day can occur in a month? How about in a year? In any given month, how many days of the week will occur more than the average?

4) If John's birthday, May 14th, fell on a Saturday in 2016, what day of the week will it fall on in 2017? Is there a reliable pattern to figure this out or is there something that could alter it?

5) If there are seven days in a week, shouldn't there be seven different calendars, each one starting with January 1st on a different day of the week? If not, why not?

6) How many unique calendars are possible? Ignore things like holidays and events that change from year to year and focus on dates and days of the week.

7) When will the 2016 calendar next be valid (able to be used accurately)?

8) Can you chart a cycle showing when different calendars will be valid? Lable the calendars A, B, C, etc… and show the cycle over 50 years. If you're feeling ambitious, show the cycle for 100 years.

9) Some holidays are always on the same date, like the 4th of July. Some holidays are always on the same day of the week, such as Memorial day. Can you make a list of each type of holiday and determine which is more common? Please note that sometimes we observe a holiday on a different day than it occurs in order to make sure people can have a day off from work.

10) We use a type of calendar called the Gregorian Calendar, but not all holidays follow the Gregorian calendar. Can you list some examples of holidays that don't follow the Gregorian calendar and name which calendar they follow instead?

11) Speaking of the Gregorian Calendar, why do we use it? When was it created, by whom, and why? Why is it called the "Gregorian Calendar?" Do some research and write a bit explaining the origins of this invention.

12) What other calendars are still in use? How do they interact with the Gregorian Calendar, if at all? Are there any antiquated calendars that are no long used by anyone? Please be sure to cite your sources for any information you provide.

13) Perhaps you find this whole calendar business to be too confusing. Using the parameters of our current understanding of how many days are in a year and the need for leap year, can you design your own calendar system? Be sure to explain how it would work and what the advantages or disadvantages of such a system would be.

14) Do you know on what day of the week you were born? Use what you've learned to figure out which days of the week have been your birthday and make a chart. Which day has been your birthday the most and which has been the least?

15) Have fun!