

# The *Mix*

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Mishpacha

## A Potpourri of Encounters and Impressions



10 Questions

## Time on

Latest hour for Krias Shema? Ready to leave for the first Maariv? Just look at your watch and see if it's really such a long day

› Rachel Bachrach

# Eliezer Greer

## 10 QUESTIONS FOR

is the creator of the Jewish Halachic Analog Clock, which was recently launched on MyZmanim.com. He is based in Waterbury, Connecticut.

### 1 What is a Jewish halachic analog clock?

Let's start from the beginning: Every halachic day is divided into 12 segments, *sha'os zemaniyos*, based on when the day starts and when it ends. Sunrise, sunset, the time interval separating them, and the sun's angular position from your location are all used to calculate this proportional halachic hour. This special unit of time takes into account the seasonal changes in the length of the day, and it has special meaning in halachah — when we say a certain mitzvah may be performed three hours into the day, we don't mean at 3 a.m. or three 60-minute hours after sunrise, we mean three halachic hours. The data for calculating *sha'os zemaniyos* already exists in various programs and online, but the concept to put it all in analog-clock format with set hours has never been implemented. That was my idea — to create an analog clock interface marking the day's halachic *zmanim*.

### 3 Why do this?

So we can mentally orient our day around the focal halachic times and milestones, rather than the 60-minute, 24-hour cycle. Many mitzvos are time-based and have to be performed before, during, or after specific *zmanim* — tallis and tzitzis, Krias Shema, when fast days, Shabbos, and Yom Tov start and end. These *zmanim* are determined by the position of the sun in the sky and can vary greatly, depending on the time of year and your latitude and longitude — Shabbos in the summer starts several 60-minute hours later than Shabbos in the dead of winter, but halachically, it's the same time. My clock graphically demonstrates how *zmanim* define our connection to Hashem through time-bound mitzvos by marking halachic times and benchmarks throughout the day.

### 2 What does it look like?

Imagine a traditional clock face. On my clock, the *zmanim* remain at set locations — chatzos is at the top, where the 12 would be on a traditional clock, and *alos* and *shkiah* are at the bottom, at the 6 position. The decision about the location of these *zmanim* was an ongoing discussion, but we finally settled on what we think is the clearest, with *chatzos* and high noon in consonance with each other. There are also markings on the clock indicating *zmanim*: *haneitz*, *tefillah*, *plag*, *Minchah ketanah*. Another design feature is that the face changes color between daytime and nighttime hours to help users differentiate between the two.



### 4 How did you come up with the idea?

Last Pesach, we were discussing the different *shitahs* of what should be completed by *chatzos* during the Seder — the first matzah, afikomen, or Hallel. That got me thinking about a clock that calculates this important time for us. I ran the idea by family and close friends at one of the seudos, and our guests urged me to create a prototype, but for me the question really was how to disseminate the idea and the clock to the *tzibbur*. Initially, I wanted to make a *zmanim* clock to hang alongside standard clocks in shuls, but I realized that for users, that could be too costly and complicated to gain traction. I needed to figure out how to best transmit the concept without the idea being lost because of cost or detail.

### 5 When did you get started?

I cogitated for a month or so before sitting down with a paper and pencil. I fused concepts by drawing clocks, numbers, arrows, and *zmanim*. Then the questions arose: how to best graphically convey the daily calculation of an astronomical phenomena, pinpointing the position of the sun in the sky for the user's exact latitude and longitude while synchronizing the hour, minute, and second hands, all while simultaneously accommodating different proportional hours during daytime and nighttime and jiving them with the limitations of a standard clock that operates with a 60-minute hour? Overwhelming, I know! At that point, the analog clock just wasn't ticking for me, so I shelved the idea for a few weeks.

### 7 Did you ask any *sh'eilos*?

Not specifically, but we did have halachic challenges, the biggest being how to demonstrate both major *zmanim* calculations: the Magen Avraham and the Gra. There are two basic approaches to daylight: the Gra, who holds that daylight starts with *haneitz hachamah* — sunrise — and ends with *shkiah* — sunset, and the Magen Avraham, who holds that a day is dawn — *alos hashachar* — until nightfall — *tzeis hakochavim*. According to the Magen Avraham, if the sky lightens at 5 a.m. and stars appear at 7:30 p.m., that day has 14 and a half clock hours, or 870 minutes, and dividing by 12 produces the value for the *sha'ah zmanis* on this date at 72-and-a-half minutes. According to the Gra, this same day would have sunrise at about 6:30 a.m. and sunset at 6:40 p.m., with one *sha'ah zmanis* being almost exactly 60 minutes. Clearly, a Magen Avraham day is longer than a Gra day, so displaying both in one clock is a challenge, which is why the interface offers different options — you can select to view Gra or Magen Avraham.



### 8 What was the toughest part of the process?

Using e-mail to convey halachic concepts that I had imagined visually. I'm a visual person by nature, and clarifying it all in e-mails was tricky. The process was decidedly longer than I expected — it took six months, instead of the few weeks I'd envisioned. Fortunately, my wife gave me the *lebensraum* to venture into this project in addition to my daily job as a property analyst; *bzei'as apecha tochal lechem*.

### 6 How did MyZmanim get involved?

I reached out to multiple organizations that have *zmanim* calendar websites and apps for guidance and direction, including MyZmanim. MyZmanim is an organization that provides detailed *zmanim* information for people worldwide via its website, app, and other services — you type in your zip code, they tell you the *zmanim* for that day in your location. Several weeks later, I spoke with support rep Nachum Adler. We e-mailed back and forth for a while, fine-tuning the idea. MyZmanim copyrighted my concept and design and created a page at [clock.myzmanim.com](http://clock.myzmanim.com) to host it on their site, as well as a page explaining it all.

### 9 What's the next step?

We launched only recently, but there are so many applications for this. It makes a great pedagogical tool, teachers use it to teach the concept of *sha'os zemaniyos* in a visual manner everyone relates to. This past Shabbos, someone told me he wouldn't be surprised if in the very near future, someone takes my concept and makes a wireless *zmanim* clock for shuls.



### 10 Have you gotten memorable feedback?

Whenever I explain this project, the almost immediate reaction is, "I need to see it to understand!" People have a lot of fun with time and clock expressions and sayings and I'm guilty of this too. I tell people the idea clocked in, time was ticking, there are so many! I remember when someone told me, "Time will tell how the *zmanim* clock becomes embedded in our schedule — you have time on your side."

