

What Can Kesler Science Do for You?

4th - 8th grade science teachers love our Life, Earth, and Physical Science materials! With these easy and engaging materials, teachers can save planning time and put their focus back on the teaching that really matters.



5E LESSONS

Two-week lessons with over 100 topics



ESCAPE ROOMS

Engaging activities for review



INQUIRY LABS

Three different levels to fit every student



AMAZING ANCHORS

Anchoring phenomenon to book-end your lessons



SUB PLANS

Never worry about planning for a sub again.



WARM-UPS

Bellringers for the entire year



STATION LABS

Student-led exploration



INTERACTIVE NOTEBOOKS

Bring science journals to life.



WIKI TICKETS

Quick formative assessments



STEM CHALLENGES

Real-world STEM problem-solving



GRAPHING

Table and charts and graphs ... OH MY!



SCIENCE READING COMPREHENSION

Leveled reading passages with mini-activities



SPANGLER COLLABORATION

Exclusive Steve Spangler lessons and videos



WRITING PROMPTS

Writing activities covering 100+ topics

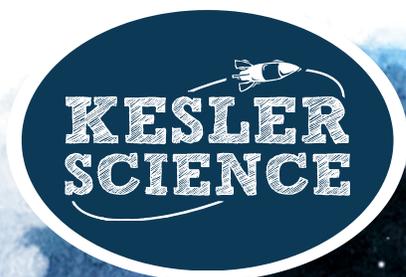


EXPLORIES

Story-driven units with integrated activities



The Kesler Science Professional Learning Network (PLN) group on Facebook has a huge community of engaged and supportive science teachers - come join us!



Aurora Borealis in Texas?



The aurora borealis, or northern lights, above Bear Lake, Alaska

Our little, life-filled planet is pretty amazing. For one, it sits in the habitable zone, the distance from the Sun that allows water to stay liquid. It also has abundant water and much more. But there's one vital characteristic of our home planet that is super-important for supporting life: the magnetosphere.

The magnetosphere is a protective magnetic force field created by Earth's rotating iron core. If we didn't have it, all life would have been zapped out of existence many times over. What does this force field protect us from? Charged particles called coronal mass ejections, or CMEs, that shoot into space from the Sun!

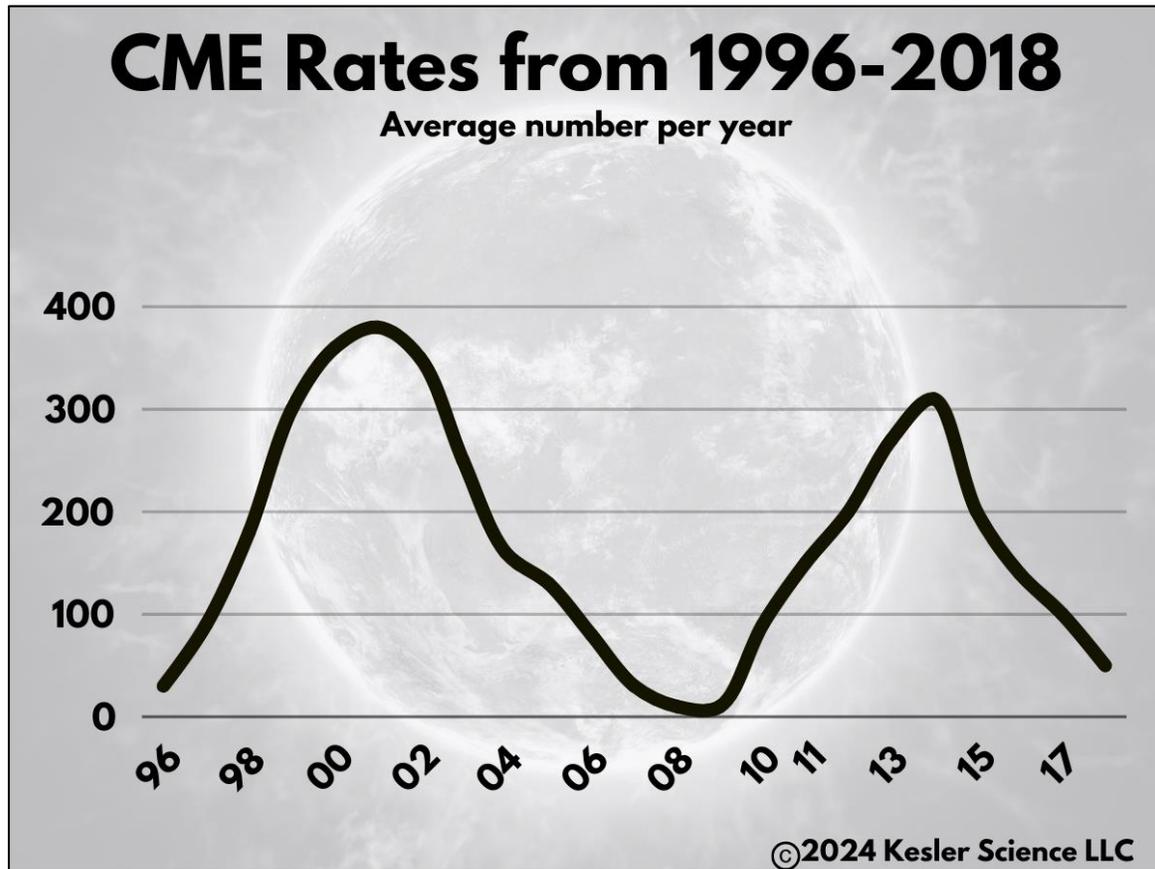
If we were floating in a space station above the magnetosphere and NASA knew

that a big solar flare had happened recently, they'd tell us to hunker down in a heavily fortified section of the craft and power down the electronics to prevent damage. On Earth, we don't need to hide; the magnetosphere creates a buffer between us and the charged particles blasting out from the Sun. When this energized solar wind and our magnetic shield collide, it can create a beautiful light display above the north and south poles: the auroras.

So why is it that locations that are not near the poles, like Texas and New Mexico, saw an arctic light show in October of 2024? As strange as it might sound, our Sun has its own cycles. Right now, we're in the part of the cycle of solar activity where our Sun flings off a lot of charged particles, known as Coronal Mass Ejections, or CMEs.

Does this mean you can expect to see an aurora every night? Unfortunately, no. Viewing conditions have to be right, the particles need to align with the magnetosphere, and the solar wind needs to reach us during nightfall.

The odds are still pretty good that we could see more auroras during this active solar period, though, so fingers crossed! Here's a graph showing how the CME rate changes over the course of many years:



1. During what years was the CME rate the lowest? How many CMEs happened during those years?

2. What is the highest number of CMEs shown on this graph? When did this occur?

3. What trends can you identify based on this graph? What could you predict about this year?

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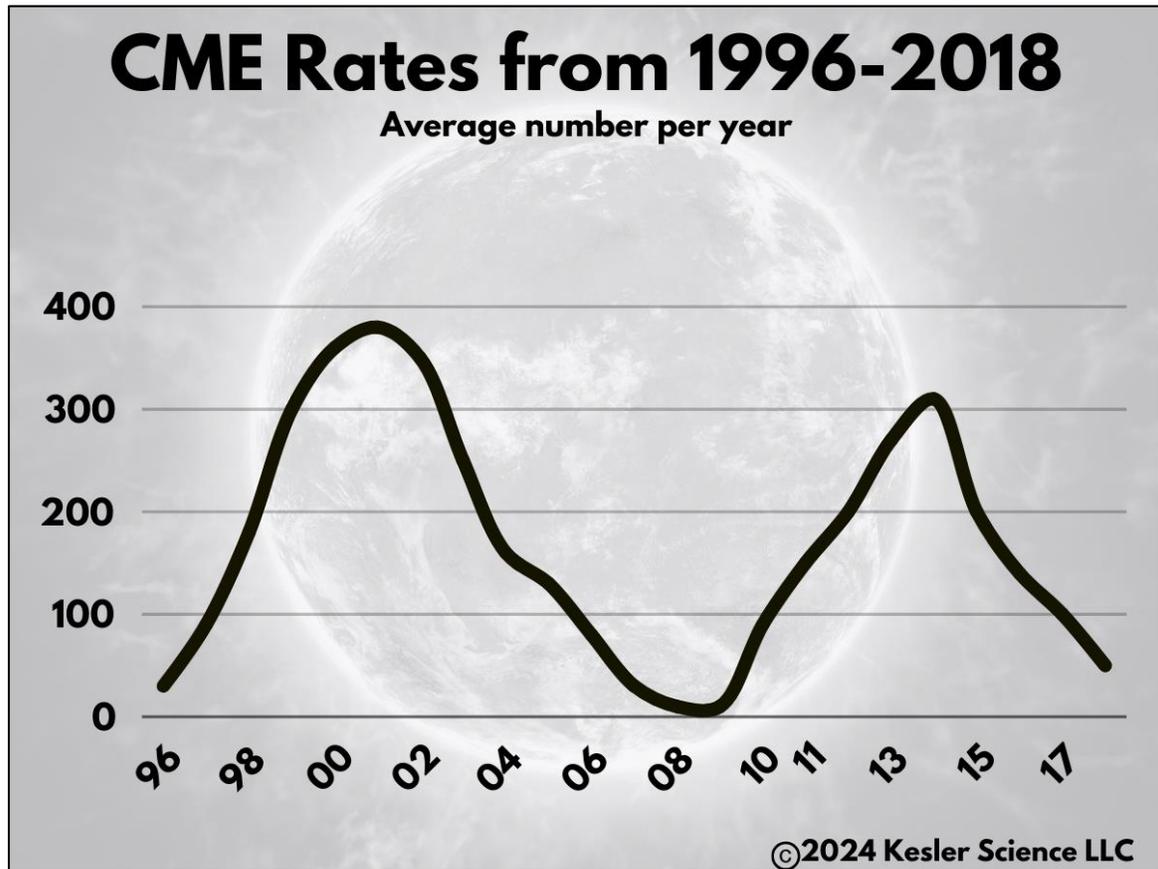
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Here are some questions I'd ask my students when sharing this graph:

1. During what years was the CME rate the lowest? How many CMEs happened during those years?

The CME rate was lowest during 1996, 2008 and 2018. There were fewer than 50 happening per year according to the graph.

2. What is the highest number of CMEs shown on this graph? When did this occur?

The highest number of CMEs is about 390 during 2001.

3. What trends can you identify based on this graph? What could you predict about this year?

The cycle repeats, and 2024 is a high-activity year. Note: officially, the cycle is "about" 11 years long, but it isn't precise.