

Smithsonian

The Culture of Calendars



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It's About Time

The sun rises and sets, spring turns to summer, babies are born and grow old, new stars are formed, and old stars die. These changes are all cycles in nature that happen over and over again. And as they do, we mark them as passages of time. We say that time moves forward, marches on, is wasting, and waits for no man.

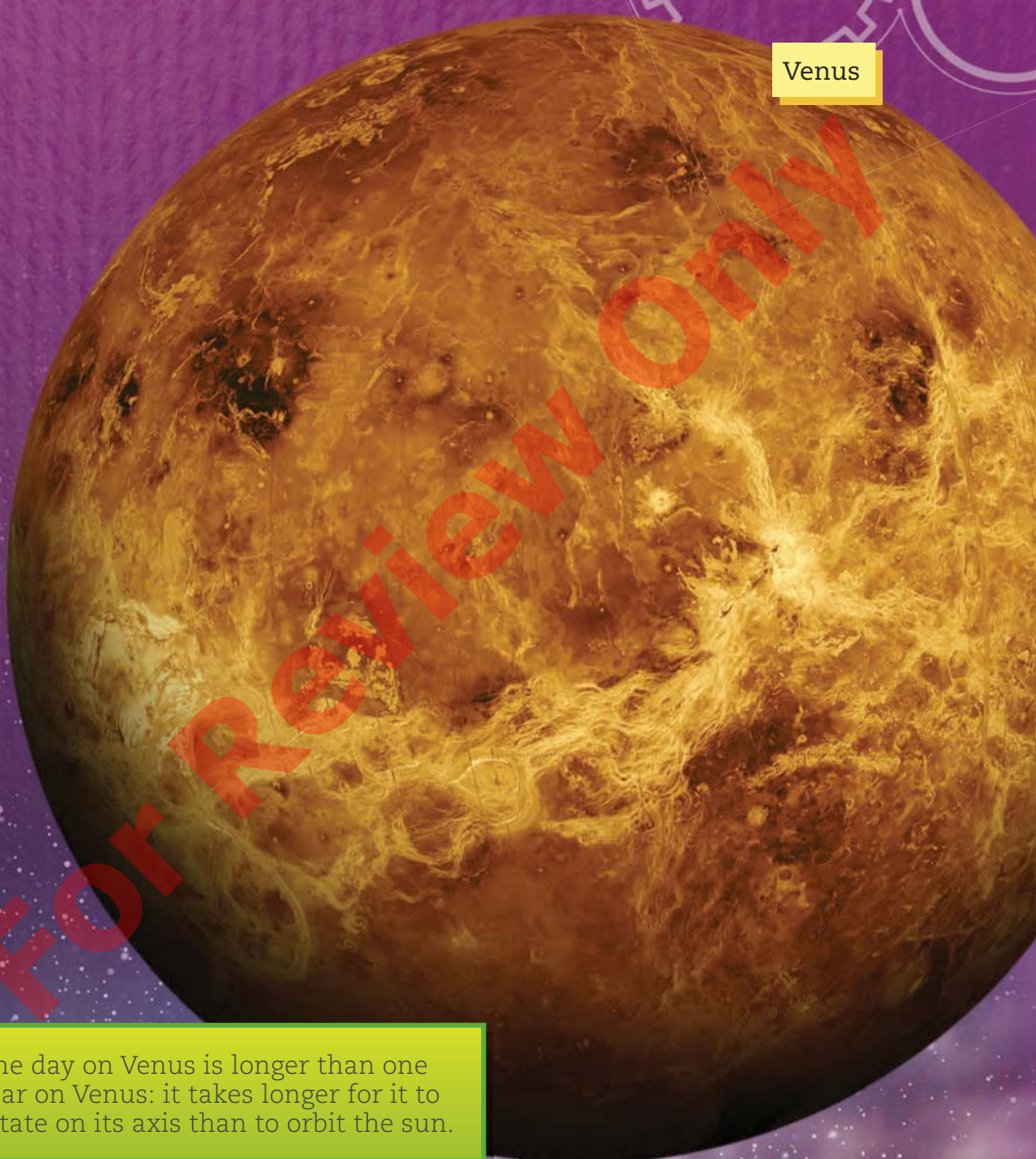
Time isn't something that we can see, touch, or smell. But it can be measured. It can be measured in minutes and hours, days and years. We measure it daily with clocks, and we mark it across years with calendars. We even use changes that we observe in nature to mark the passage of time.

But why are we driven to record time, and what would happen if we did not? Who created the concept of calendars? How have calendars changed and evolved?

Why do different cultures use different calendar systems? And why are calendars so important to us?

It is about time we found out.





Venus

One day on Venus is longer than one year on Venus: it takes longer for it to rotate on its axis than to orbit the sun.

Why Timekeeping Matters

As each new day dawns, people around the world wake up. They may need to get to work or school at certain times. They may have to catch trains or buses or meet with carpools. Throughout the day, they may keep appointments, have meetings, attend classes, or take breaks—all by schedule. In the evening, they may return home and share meals with their families. They may watch scheduled television programs or share bedtime stories.

Day by day, many people live their lives according to clocks and calendars. The day of the week and the time of day tell them what to do and where to be. Many people even develop a sense of time known as an **internal clock**.



But we can't always trust our internal clocks. We need tools to measure time. Most people use some kind of timepiece every day. It may be a watch or a cell phone. Seeing a movie or ball game, going to a piano lesson, visiting a doctor, or flying on an airplane are all done according to schedule. If you do not know the day and time, you miss the event. Keeping track of time matters.



A **solar** year is the time it takes Earth to travel around the sun one time.

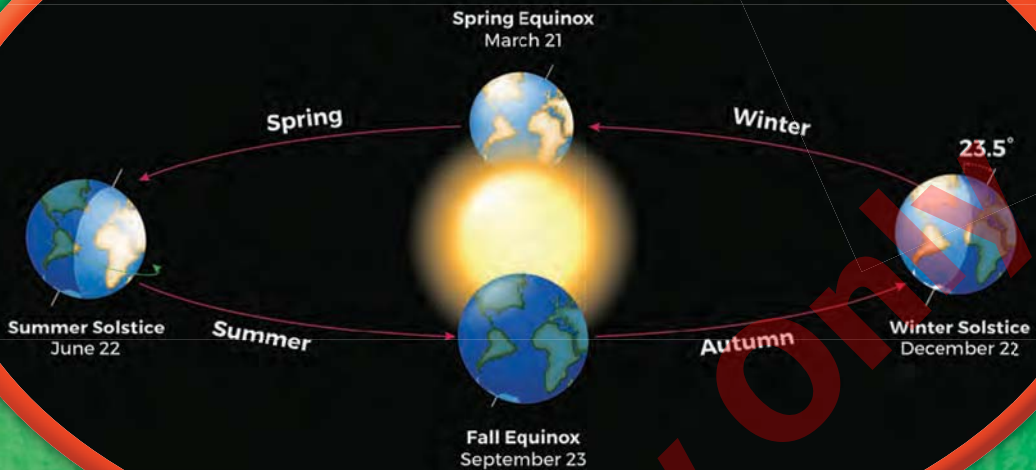
Life Itself

Keeping track of time matters beyond day-to-day events. It is also important to life itself.

To survive, every living thing must be nourished, or fed. For most of history, humans have used the cycle of seasons to farm the land and **reap** its **bounty**. People had to learn when to plant and when to harvest. Spring and summer are **often** planting and growing seasons. Autumn is harvest **season**. Winter is often a time when plants die or rest. **Missing** the key moments in the seasonal cycle could **mean** the **difference** between life and death.

Over time, people learned to look for **changes** in the sun, moon, and stars. These changes helped **them** know when seasons would start and end. They **knew** that the changes repeated in cycles. And they **could** **count** on the effects of those changes. Using these **cycles** **as** a guide gave them a way to know what to expect and **when**.

Earth's Seasons



SCIENCE

There Is a Season

Seasons are caused by Earth's movement around the sun. Earth is tilted on an imaginary axis from north to south. It tilts toward the sun during summer in the Northern Hemisphere. (This is winter in the Southern Hemisphere.) This tilt provides more sunlight to the northern part of the planet. Earth tilts away from the sun during the North's winter. This results in less sunlight.

Lettuce is grown in spring and summer.

STEAM CHALLENGE

Define the Problem

An earthquake has cracked the city's stone sundial. City planners would like to replace it with a more visually pleasing sculpture that can also be used to tell the time of day based on the shadow cast by the sculpture. Your task is to create a model of such a sculpture.



Constraints: Your model can be no more than 30 centimeters (12 inches) tall by 30 centimeters (12 inches) wide. Your model must represent your city in some unique way.



Criteria: Your sculpture will work like a sundial that can be easily read and that tells time to the nearest half hour. (Note: A flashlight can be used to represent the sun if time or actual sunlight is limited.)





Research and Brainstorm

How does a shadow change throughout the day? What is the position of the sun in the sky at different times of day? What types of objects make good shadows? Why do those objects make good shadows? How will you “read” the sculpture’s shadow to tell the approximate time?



Design and Build

Sketch your design. Make sure to include the materials that will be used to make the full-sized sculpture. Build the model.



Test and Improve

Place your sculpture in the sun and track its shadow throughout the day. Did your sculpture create a clear shadow? How can you improve it? Modify your design and try again.



Reflect and Share

How easy would it be for someone else to tell the approximate time with your model? How large would your actual sculpture be? Can you test the model in a new way?

