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## **The Story of Astronomy**

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It was dark. The night sky hung clear over the tiny city in the valley; the stars awesome in their brilliance.

A small group of men stood on the top of the hill, looking across the city and the valley to another hill on the other side, some fifteen kilometers away. There, a similar group had assembled, their lights flickering in the distance. "We're ready," said the leader of the first group, a bearded man with intense eyes. "Check your lantern."

What was happening? Was this a covert military operation? A band of thieves and robbers plotting plunder? Actually, it was a scientific experiment. The leader was the great Galileo himself, who would later be denounced for claiming that the Earth revolves around the Sun.

The experiment was simplicity itself: a lantern would be uncovered on one hill. Fifteen kilometers away, a second lantern would be uncovered, shining back to the first. Light would have thus traveled thirty kilometers, twice across the valley where the Italian city of Florence nestled. By timing how long it took the light to travel this distance, Galileo could calculate the speed of light.

He was going to catch the ghost of the universe!

Oral traditions have since time immemorial satisfied generations of children and adults with stories of wonder, fantasy, truth, and mystery. Stories are irreplaceable stimulants for the imagination and an often endless source of entertainment. One of the most intriguing aspects of the story has to do with its explanatory powers. That is, for centuries stories were created and told to explain phenomena that were otherwise inexplicable.

The story of astronomy and astronomy's evolution as a science includes countless tales originally crafted to explain the visible celestial bodies, their motions (regular and irregular), the mysteries behind their existence, and the powers they exert over us on Earth. The names of the planets--Mars, Venus, and Pluto, as examples--all originate from stories. The constellations--including Orion the hunter, followed by his faithful dogs, chasing forever the seven sisters of the Pleiades--stories all. Even the great astronomers--Galileo, Newton, and Tycho Brahe of the silver nose (having lost his in a duel), among them--have fascinating stories. Because of this incredibly rich story history that permeates the science of astronomy, it seems only logical that learning about the fundamental principles and people involved in it, be accomplished through the telling and retelling of stories.

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## Why Teach Astronomy?

There are four reasons for making astronomy a regular feature in an elementary science program. Besides the fact that it's intrinsically interesting to children (and just about everyone else, for that matter), it has a rich set of connections to the rest of science. And because it is a product of different kinds of people from the world over, astronomy provides opportunities for cross-cultural connections among members of any community. Finally, it addresses some of the curricular mandates at the elementary level.



Every star is part of a story. Published in 1661, *Harmonia macrocosmica* by Andreas Cellarius captured the constellations and activity of the heavens in the form of two, large celestial maps. Illustration courtesy of Linda Hall Library, Kansas City, Missouri.

**Interest.** Students repeatedly cite dinosaurs and space (including astronomy) as the two topics in science that are most interesting to them. This is particularly important considering that many teachers are focused on the means through which they can "hook" students into self-motivated learning. With their learning interests and motivational challenges addressed, students are encouraged to actively pursue and construct scientific knowledge. This lessens the teachers' exhaustive burden of trying to make science fun and interesting and leaves them to do what they do best--teach!

**Science connections.** Many of the preliminary concepts that students learn in an elementary astronomy unit build the conceptual foundations for acquiring knowledge that pertains to other areas of science. For example, a discussion of technological advancement may lead to a unit on simple machines-a recommended unit at the elementary level in many jurisdictions. Discussing rock formations on Earth, the Moon, and other planets relates to geology. Pondering life on other planets or elsewhere in the universe compels students to enter the realm of the biological sciences.

**Multiculture.** Astronomy is central to much of the lore and many of the traditions and ceremonies of numerous cultures. As examples, the Chinese New Year, the Islamic holy month of Ramadan, and many First Nations' traditions and ceremonies depend on accurate observations of the lunar cycle. Furthermore, Jewish festivals and religious holy days are still determined by an ancient, ten-month, lunar calendar.

**Curricular mandates.** The Earth and space component of many mandated science curricula is satisfied by bringing astronomy into the elementary-school classroom. Since children are already motivated to learn this science, it seems reasonable to fulfill the mandates in this natural way.

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