

# Starry Night<sup>®</sup>

## Prepare Your Students for NCLB Science Testing

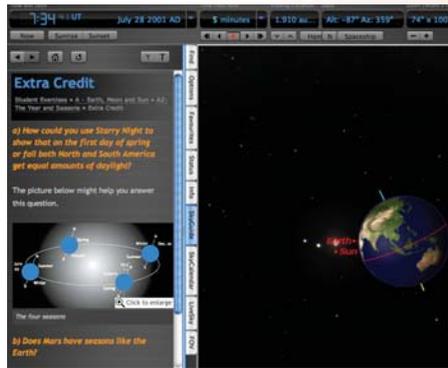


Starry Night gives you and your students engaging simulations and easy-to-follow lesson plans that teach the critical space science concepts in the NCLB science assessments. Written by teachers, for teachers, each unit includes interactive and hands-on activities that will spark your students' curiosity.

The awesome vastness of the universe is fully replicated with Starry Night's desktop planetarium, drawing students into a dynamic world that can be difficult to teach in a classroom setting. The powerful simulation software allows students to position themselves anywhere on Earth or in space at any time – past, present or future.



*The ability to interactively manipulate time and space encourages questioning, experimentation and exploration.*



*Guided inquiry-based learning lets students make their own observations and draw their own conclusions.*



*Each license includes updates with the newest positional data and current space headlines.*

## Aligned to State and National Science Standards

Each lesson plan is aligned to state and national science standards and includes unit by unit formative assessments as well as comprehensive summative assessments for key concepts students need for NCLB.

## Proven to be Effective

Several recent studies have concluded that accurate visualizations of celestial phenomena, such as lunar phases, are key to gaining a correct understanding of astronomical concepts.

# Research Confirms Starry Night is Highly Effective Science Instructional Tool

Studies by professors at Ohio State and University of Virginia have concluded that Starry Night is an effective tool for teaching essential science standards.

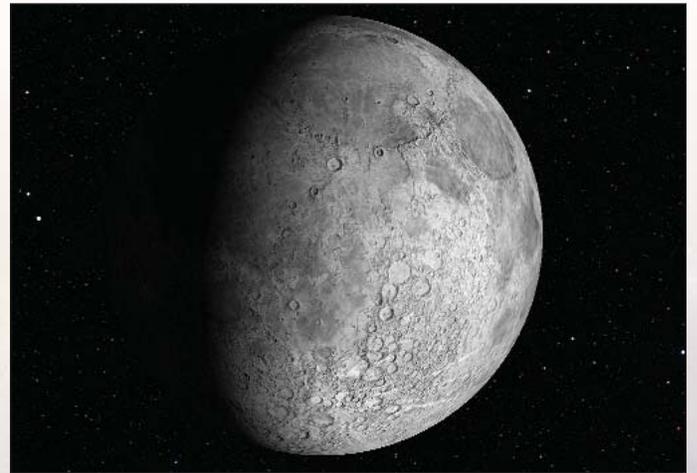
## Starry Night Dispels Misconceptions

For more than 30 years, researchers have known that before elementary school students receive science instruction, they hold fundamental misconceptions about such basic astronomy facts as seasons and moon phases. These misconceptions are shared by most pre-service science teachers. Researchers at the Ohio State University and the Curry School of Education at the University of Virginia recently completed the second in a series of studies concluding that Starry Night software is a highly effective tool for addressing students' misunderstandings and teaching essential concepts in science.

Lunar concepts are an essential component of scientific literacy designated by the National Science Education Standards (National Research Council, 1996).

schedules, observation obstacles and most notably instructional time. Planetarium software programs such as Starry Night allow students to make precise observations of scientific phenomena through computer-generated simulation. By using simulations, students can collect extensive quantities of data in a shorter period of time. They can also immediately assess if the data supports or contradicts their hypothesis and conduct additional observations.

Starry Night's interface offers an easy-to-use representation of both the day and night skies. The software is highly flexible, allowing users to make observations from any location on Earth, over any period of time and from any direction or perspective.



*The scientifically accurate depiction of the night sky advances conceptual understanding of moon phases.*

*Table 1*

### *NSES Earth and Space Science Standards — Fundamental concepts*

#### **Grades K-4**

The position of the moon changes during the course of the night.

The Moon's appearance changes during a four week lunar cycle.

#### **Grades 5-8**

Most objects in the solar system are in regular and predictable motion. Those motions explain such phenomena as the day, the year, phases of the moon, and eclipses.

## Visualization is Key

Using direct student observation to teach concepts of moon phases is frequently complicated by uncontrollable factors including weather, student

## Demystifying Moon Phases

The students participating in Trundle and Bell's 2005 study included 50 pre-service teachers who were enrolled in an early childhood education (PreK-3) Masters of Education program at a major Midwestern research university.<sup>1</sup> Each of these students participated in a pretest to provide a baseline of their knowledge of moon phases.

Students used Starry Night to gather their lunar observations, which were analyzed during the astronomy by sight instructional sequence included

in *Physics by Inquiry* by Lillian McDermott (1996). The instruction was divided into three parts:

- 1) gathering, recording, and sharing moon data,
- 2) analyzing moon data by looking for patterns in the data, and
- 3) modeling the cause of moon phases.

Research methods followed a qualitative design and included both document analysis and structured interviews. Sources of data included student drawings, interviews, and an activity requiring students to sort cards of various moon phases.

## Achievement Gains Up 80%

Results of the study were dramatic. As measured by the pretest, none of the participants had a scientific understanding of the cause of moon phases. After use of Starry Night, most participants (80%) were able to provide scientifically-based explanations for the cause of moon phases.

In addition to the impressive gains in understanding moon phases, using Starry Night also demonstrated efficacy in advancing scientific knowledge of moon sequences and shapes. Across all of the targeted concepts, achievement gains were in the order of 80%. The results of Trundle and Bell's 2005 study demonstrate among the highest rate of conceptual change of any existing research on understanding lunar concepts.

Trundle and Bell's research makes clear that well-designed computer simulation can be a highly effective tool for teaching important concepts in science. This 2005 study is further supported by additional research that reached similar conclusions on the efficacy of Starry Night as an instructional tool.<sup>2</sup>

<sup>1</sup> Trundle, K.C., & Bell, R.L. (2005). The use of a computer simulation to promote scientific conceptions of moon phases. A paper presented at the Annual Meeting of the National Association for Research in Science Teaching, Dallas, TX.

<sup>2</sup> Bell, R.L., & Trundle, K.C. (2006). Shooting for the moon: Using a computer simulation to facilitate conceptual change about lunar concepts. A paper presented at the Annual Meeting of the National Association for Research in Science Teaching, San Francisco, CA.

## Trusted by Experts

“Starry Night has revolutionized my astronomy teaching and energized my students. It has given them a strong foundation in understanding how the universe works. I am certain that you will enjoy using and discovering new things with Starry Night and I know that your students will appreciate putting their hands on the universe.”

*David H. Bradstreet, Ph.D.  
Eastern University, St. Davids, PA USA*

“Starry Night has taught my students how to problem solve, how to use the scientific method and how to think critically about challenging scientific questions.”

*Herb Koller, Former Science Department Chair*

## NSTA Recommended

“...Starry Night® High School is a great choice...”



Starry Night® Middle School and High School are BESSIE Award Winners for Best Educational Software: Science.

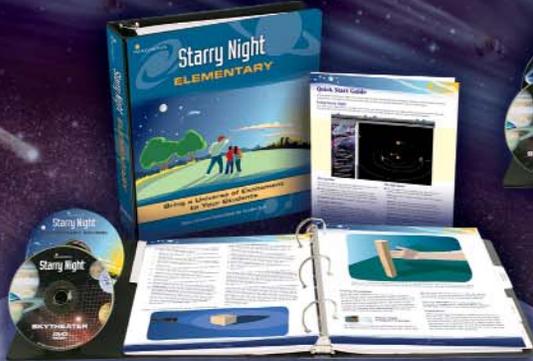
“... such unique and compelling experiences that it is destined to change lives.”



Starry Night® Middle School and High School are CODiE Finalists for Best Instructional Solution: Science

# Inspire Students with Innovative Space Science Curriculum for Grades K–12

SKU # EDUE60-C1U



SKU # EDUHS-60-C1U



SKU # EDUMS-60-C1U



## What's Included:

- Three-ring binder complete with teacher materials, correlations, reproducible student worksheets and assessments
- 9 lesson plans for Elementary; 28 for Middle School; 32 for High School
- Award-winning Starry Night® planetarium software for real-time and accurate simulations
- SkyTheater DVD with more than an hour of dramatic and realistic visualizations of astronomical phenomena
- Starry Night Companion introductory astronomy book (PDF)
- Content updates including positional data of asteroids, comets, satellites and spacecraft and current space and science headlines

## Modular and Easy to Use

Clearly written lesson plans explain each concept and offer step-by-step suggestions and best-practices for how to teach it. Each unit includes interactive computer exercises, hands-on activities and DVD content. Best of all, Starry Night's lessons and assessments are entirely modular, so teachers can choose the lessons that best supplement classroom activities.

## Minimum System Requirements

Windows® XP / Macintosh® OS X 10.3 or higher, 500 MHz or G3 450 MHz processor, 128 MB RAM, 500 MB (1 GB for High School) hard disk space, 32 MB OpenGL® capable graphics card, monitor resolution of 1024 x 769 pixels. SkyTheaterDVD requires DVD player and monitor or computer with DVD player. Internet connection is required for content updates.

Visit [www.StarryNightEducation.com](http://www.StarryNightEducation.com) for **FREE Curriculum Resources!**

## How to Order

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