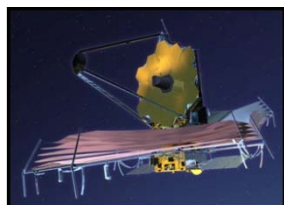




TEACHING ASTRONOMY IN AND OUT OF THE CLASSROOM: MORE THAN A STAR PARTY

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Whether you call it an observing night, star party, or family science night, an evening under the stars provides both education and inspiration. There is no one-size-fits-all format. Plan your program to fit your purpose, your location, and the needs of your students.



girl scouts
of southern arizona

QUESTIONS

Begin your preparations by considering some questions.

1. What is your purpose in presenting an evening of skywatching? Is this event part of formal classroom instruction or informal (club, Scouts, neighborhood)? Is this the introduction to a unit of study, or the culmination of the students' study? Is a class project involved, e.g., light pollution analysis or observing logs or journals? Are students working on one of the Astronomical League's observing programs or a Scout badge? Is your purpose inspirational (i.e., just enjoying the beauty of the night sky), or is there an identifiable, assessable educational goal?
2. Who will be in your audience? Are you working with a small group of dedicated, proficient students? Will your audience include one or more school classes, i.e., a large group with mixed interest levels and abilities? Will your event be a family night including parents, grandparents, and siblings as well as your own students?
3. What is the observing objective of your event? Is your night geared to a special event, e.g., eclipse, comet, or meteor shower? Do you plan to observe the Moon and/or available planets? Will you concentrate on naked eye constellation identification, or are you interested in general interest, telescope-dependent viewing?

DECISIONS

Once you have identified your purpose, audience, and observing objectives, it is time to make some decisions.

1. Set a date for your event. If your program is event-dependent, this decision will be narrowed considerably! If you plan to do constellation viewing, choose a dark night (i.e., closer to New Moon than to Full, or well after Full Moon). If you plan to do telescopic lunar observations, choose a time between the thin, waxing crescent and First Quarter. Features such as craters, peaks, and maria will be easier to distinguish, and the smaller segment of illuminated surface will be more comfortable to look at. If you are interested in particular planets, constellations, or the Moon, be sure they are in the sky at a time of night appropriate for your audience.

2. Will you need assistance at your event? Will other teachers or parent volunteers provide help? Will you need one or more telescope operators? Will you need someone experienced in star, constellation, and planet identification?
3. If your event involves a large group, will you provide alternative activities? One or two telescopes with long lines of students waiting for one quick look at an object can lead to frustration, boredom, and behavior problems. If there are multiple telescopes available, will the volunteer operators be responsible for the choice of objects and explanations of what is being viewed? If your event is a family night or unit culmination, will student projects be displayed? Will there be guest speakers or demonstrators, video or CD presentations, activities, or refreshments? How much organization will your event require?
4. If your location is moderately-to-very dark, the sky's the limit on your observing options. If your location is in an area with street lights, commercial buildings, heavy traffic, etc., you will need to concentrate on the Moon and relatively bright, easy to identify objectives (Venus, Mars, Orion, Big Dipper, etc.). If your geographic location is frequently cloudy and humid, planning an observing night will be more challenging.

RESOURCES

If you have never planned an observing event, there are resources that can help.

1. You (and your students, if this is an end-of-unit event) may have had prior instruction. You and your students may be following one of the Astronomical League's observing programs or the requirements for a Scout badge. Prior experience or written requirements can help to define what you will do.
2. There may be groups and individuals in your area that can assist you with your observing event. There may be science resource personnel or teachers in your school or district who are qualified to lead observations or who have contacts who can assist. Local community college or university staff and students, astronomy store personnel, and amateur astronomy groups can also provide expert assistance. Don't forget parents – they may include amateur or professional skywatchers, too!
3. Information about Sun and Moon rising and setting times, lunar phases, positions and viewing times for stars and planets, and special event information can be found in a variety of places. Local newspapers, television weather forecasts, and weather-related web sites (e.g., The Weather Channel's www.weather.com) provide not only temperature and precipitation forecasts, but often include rising and setting times for the Sun and Moon and the current lunar phase. Astronomy stores and planetariums usually sell lunar phase charts and planispheres (rising and setting times of constellations throughout the year). These facilities, as well as local amateur groups, frequently publish newsletters with viewing suggestions. Magazines such as *Sky & Telescope*, *Astronomy*, and the National Science Teachers Association's *Science Scope* provide monthly and seasonal viewing guides. *Sky & Telescope* magazine also publishes an annual viewing guide (*Skywatch*). In addition there are now apps for most smartphones and iPads that will give you sky maps, point out objects in the sky, and let you know about astronomical events. *Sky & Telescope* and *Astronomy* magazines also have weekly newsletters that one can subscribe to.

The *Heavens Above* web site (www.heavens-above.com) provides detailed viewing information for natural sky objects as well as when to see the Space Station and other man-made objects. Other web sites with viewing information and useful links include www.space.com, www.astronomy.com, and www.skyandtelescope.com.

SAMPLE FORMATS

Over the past 15 years we have been involved in educational observing events ranging from a neighborhood group's monthly social meeting to annual multigenerational family science nights to groups of a dozen to several hundred university students. Several formats are described below.

1. An informal viewing session can be set up in a school yard, state park, college mall, or private residence. A presentation before the viewing may be helpful, or the audience can move from telescope to telescope to see what is available. Informal events work well with small-to-medium groups, as well as large public events (e.g., eclipse viewing, Mars close encounter), and are generally more inspirational and informative than academic. The larger the group, the more telescopes will be needed.
2. Structured viewing nights can feature class-related tasks (e.g., light pollution analysis, observing logs or journals), Scout badge work, or the Astronomical League's prescribed activities. Specific objects will be viewed, measured, drawn, recorded, and/or analyzed.
3. Family Science Nights are usually held as a culminating astronomy unit activity. There is usually an outdoor viewing component, as well as student projects displayed in classrooms or an auditorium. Sometimes a picnic precedes the skywatching, or refreshments may be set up indoors. We have participated in events involving entire schools, all primary grades, all "graduating" fifth graders, several sixth grade classes, and even a third grade sleep-over. Depending on the school size and level of participation, groups can range from dozens to hundreds.

The annual Family Science Night we have been involved with for many years has been a year-end, unit-end event for 4 fifth grade classes in a local elementary school. The event begins with a pizza party for the families. The teachers, student teachers, and guest presenters meet in a classroom for food, conversation, and instructions. There is a formal introduction and a guest speaker for the entire audience outdoors before the families visit four stations. Groups are divided according to the child's classroom teacher, and everyone received a schedule of events. Every 20 minutes a bell is rung and the groups have 10 minutes to change stations, meaning each presenter does four "shows." The four stations include local amateur astronomers setting up telescopes on the playing field, a local expert middle school teacher giving a Space Shuttle presentation, and refreshments and student projects available in the auditorium.

We man the fourth station, unique to two elementary schools in this particular district: a science lab with a curved ceiling and a Star Lab projector! A school volunteer (retired high school science teacher) runs the projector and we provide the programming: skylore storytelling while the lights are dimming and eyes are getting dark-adapted, followed by a journey through the constellations as they move across the domed ceiling. A question and answer session follows, time permitting.

SUMMARY

In conclusion, your observing night can be almost anything you want it to be. The only variable you cannot control is the weather, and the weather can literally make or break your skywatching event. Be sure to have contingency plans, especially if you need to cancel volunteer telescope operators and guest presenters. A telephone or e-mail tree can be helpful for small groups if you have enough advance warning of bad weather. Unfortunately, decisions are usually made at the last minute. For event-dependent nights, there may be no rescheduling option, e.g., once the eclipse is over, it's over! For family science nights, the outdoor viewing can be cancelled without disturbing planned indoor presentations. Handle cancellations and rescheduling on a situation-by-situation basis.

If you invite volunteer telescope operators and/or presenters, be sure someone is in charge of their well-being. Hot coffee, tea or cocoa on a cold observing night or a bottle of water for a guest speaker giving multiple presentations will be appreciated. Any token of appreciation (verbal thanks, letters from students, school certificate, small PTA stipend) will encourage volunteers to be regular presenters at your school functions.

Safety concerns are a high priority at observing nights, especially if the audience includes younger siblings up through grandparents. Obviously a dark site is preferable, but some light away from the telescopes may be necessary. Make arrangements for appropriate outdoor building lights to be turned off, but don't endanger the participants. Running or using flashlights near the telescopes is unacceptable. If participants will be parking near the viewing area, they should use parking lights only until they are away from the telescopes.

Be sure gates are unlocked and that there is building access, if necessary. If the school grounds are watered by automatic sprinklers at night, find out when they turn on (and if they can be turned off). We've had to pick up telescopes and run on several occasions when the water came on! Be sure relevant staff members who may be on the grounds (custodians, security) are notified of your activity. A colleague was stopped by police when she was the last to leave school property after an observing night, as a custodian had reported noise behind the school.

Most of all, encourage your students to get out, look up, and enjoy the night sky!

SUMMARY

Here are two additional links that might be of interest to you. The first is a link to monthly sky charts and the second is a link for making your own planispheres.

This is the Evening Sky Map Main Page. The links to the monthly maps are below the description and Support request:

<http://www.skymaps.com/downloads.html>

Sky and Telescope "Star Wheel" template and instructions:

http://www.skyandtelescope.com/letsgo/familyfun/Make_a_Star_Wheel.html