I must write this column while still looking forward to the August 21 Great American Eclipse, but it will have happened by the time this issue of *Planetarian* is published. Since August 21 is my district’s first day of the school year, I will be staying here in Westlake, Ohio, to view the partial solar eclipse (near 80% coverage) with them instead of traveling to a place of totality.

Already I have distributed eclipse glasses that I obtained with a NASA grant (about 3000 pairs) to teachers with guidance on safe use, timetables, information, and possible experiments. My plan is to go to the six schools and our local library during the eclipse to have interested students and others view a partial phase as well as any visible sunspots with my Sunspotter.

Additionally, I’ll take a box of white cloth napkins for projection with colanders, as well as index cards and hole punchers to create names with holes of solar eclipse projections. Now I just hope we have a clear sky. With a partial, we are less dependent on a particular moment, so it is likely we will see some of the partial phases. In classrooms teachers can go online to see the eclipse occurring from other locations.

I know that many periodicals and books say that one must get on the line of totality to fully appreciate a solar eclipse, but the reality is that not everyone can make a trip. Throughout the years I have seen three totals, an annular, and a number of partials, and I have found them all interesting.

Worldwide, many more students can see a partial eclipse, either directly with the necessary glasses or by projection, introducing them to this wonder of astronomy. So I urge planetarium educators to take advantage of partial eclipses that come to your area. Never let a partial solar eclipse go by without promoting it (along with information for safe viewing).

A summary of Japanese education

Kaoru Kimura has prepared a summary of Japanese education with notations of what happens for astronomy in certain grades. Like Tomas Graf of Czech Republic and Simonetta Ercoli of Italy, Kaoru adds to the development of international understanding of the status of astronomy education worldwide. Her report follows.

The nine years of elementary and lower secondary (middle school) education are compulsory in Japan. Unfortunately, students do not have a lot of opportunity to learn astronomy in these years. It is my hope that all of us working in different countries with different educational systems, after comparing our systems, will be able to plan together for use of our planetariums for public school education.

Japan’s educational system

Kaoru Kimura
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In Japan, the basic national educational policy is set by the Japanese Constitution. The Basic Act on Education was put into effect in March 1947. Since then circumstances surrounding education have changed a great deal. Japan has an aging society with a falling birthrate and lifestyle changes have happened. When the system of modern school education began in 1947 with the 5-3-3-4 plan of years for schooling, it was aimed at realizing the principle of equal educational opportunity for all.

The current National Curriculum Standards is a revised plan aimed at nurturing “competency” in children. A compulsory plan for science and mathematics education is directed by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT).

In elementary schools, all children who have reached the age of 6 are required to attend elementary school for 6 years. The elementary schools aim to give children ages 6-12 education suited to their stage of mental and physical development.

Children study in the lower secondary school to age 15. As in elementary school, the curriculum is matched to this stage of mental and physical development, building on experiences in elementary school.

Science and Astronomy

The Japanese MEXT curriculum has children beginning study of science in 3rd grade, with astronomy included. The astronomy fields listed in the national curriculum are as follows:

Grade 3: Main topic: Life and The Earth (B); Astronomy: “The Sun and the Ground.” (3)

Children’s ideas of the sun and the ground are developed by their exploration of causes of positions of shady locations. It is expected that
by understanding what causes sunny and shady locations on the ground, children will learn that the sun appears to move in the sky from east to west. In the context of learning about the sun's apparent movement with shadows, children learn the four cardinal directions.

Grade 4: Main topic: Life and the Earth (B): Astronomy: "The Moon and the Stars" (4)

Students are required to observe the moon and stars. They explore positions of the moon and stars and their brightness.

Grade 6: Main topic: Life and the Earth (B): Astronomy: "The Moon and the Sun" (5)

Lunar phases are studied. Students observe the positions and phases of the moon with corresponding positions of the sun and develop understanding of the changes in the phase months as viewed from Earth.

Secondary School: Astronomy Topics in "The Earth and the Universe"

The objective in secondary school for astronomy is that students expand their understanding of the universe with topics of the sun, the planets, the moon's movement and phases, and stars. The curriculum specifically includes: "Diurnal motion with Earth rotation and annual motion and Earth revolution" (a) and "The solar system and stars" (b).

Students are expected to discover characteristics of the sun based on their own records and other data. They are expected to fully understand the in-space relationships that cause lunar phases. They are expected to understand characteristics of planets and stars. And they are expected to understand observational methods, including their own, of studying the planets to learn about Solar System structure.

The current role of planetariums in Japan and future investigations

Although not specifically stating “planetariums” for elementary school the National Curriculum Standard recommends use of computers and audio-visual aids as well as observations and experiments. The astronomical topics students are expected to learn in elementary and middle school all are possible in planetariums.

Many schools visit their local planetarium to enhance their astronomy learning. Some planetariums provide only a recorded program, supposedly prepared to match a course of study. However, whether or not these programs really match the course of study has not yet been evaluated. I want to investigate if such programs really do coordinate well with classroom studies. I also want to find what proportion of planetarium programs in Japan for school classes are recorded ones versus live ones. Further, I want to learn if planetariums are collaborating with teachers to develop the educational programs.

Jeannie Bishop is a past president of IPS and chairs the Education Committee. She is retired from full-time planetarium work and teaching, but maintains the position of Westlake Schools Planetarium director.

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