STARLAB ALL-SKY PROJECTORS

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Abstract: A simple device that holds a clear plastic cup over the projection lamp allows Starlab operators and students alike to design and to project their own all-sky images.

Starlab operators can use clear plastic drinking cups as miniature clear cylinders. Images drawn on the cups by students can then be projected onto the dome as personal all-sky images and integrated into diverse lesson plans.

For good results I prefer using black markers on hard, clear, 9 oz. tumblers. When drawing on the inverted cup, consider how the projected image will appear. With some practice you can compensate for keystoning and other irregularities. Images tend to project larger than expected, too.

To draw letters so they are oriented properly, hold the cup upside down. Looking through the closer side of the cup, write on the inside surface that is away from you. If the image contains something in motion, such as a fish, draw it so that it moves to the right (consider the Starlab's diurnal motion).

The upside down cup has to be positioned so that the rim is nearly level with the projector's light source. The easiest method is to use the cylindrical lamp protector provided with the Starlab. It looks like a mailing tube a few inches in diameter and about five inches long.

Stick a few pieces of electrical tape tautly across the edges of an end of the tube so that a cup can rest on the non-sticky side of tape without falling into the tube itself. The tape must not span the center of the tube or it will obstruct the light and will itself be projected onto the dome. With the tube positioned around the lamp holder, place the cup on the tape and centered over the lamp.

A second cheap method for holding plastic cups requires much less care in balancing the cup and allows the Starlab user to switch cups rapidly. It also permits you to incline the cup (akin to tilting the cylinder to a non-equatorial latitude).

Conveniently, some metal cans such as those for gourmet popcorn are nearly identical in size to a Starlab cylinder. Cut a circle out of the can's lid so it will fit over the Starlab projector's central stalk and over the aligning device for cylinders. Later the upside down lid will lock securely on the magnets.

Shorten to about five inches a cylindrical Quaker Oats oatmeal box. On the bottom of the oatmeal container, cut out a circle just smaller than the diameter of the plastic cup, leaving a cardboard ledge on which a cup can be placed. Center the upside down oatmeal container over the hole of the upside down popcorn can lid and secure it to the lid (I used some leftover bathtub caulk). When the glue or caulk dries, paint the entire device flat black if you wish to reduce the amount of reflected light.

You are now ready to place the cups with drawings onto the custom cup holder, thereby projecting personalized all-sky images. For the Starlab paper presented at the GLPA Conference, I demonstrate several cup designs. Among the all-sky scenes were the insides of an igloo and an observatory; a sky full of bats; an underwater scene; a GLPA Conference welcome; and a spider in its huge web.

Another design mimics a petroglyph of a hunter pursuing some prey. Before entering the dome, young students can be prepared for an expedition into a cave. With their imaginary headlamps illuminating the way, they crawl into the Starlab tunnel and discover the cave art on the inside wall.

There are unlimited scenes that can be projected onto the inside of a dome to support a wide range of disciplines and lesson plans. Student drawings can dovetail with or diverge from your drawings on a Starlab clear cylinder. I welcome hearing about how you use this activity with your Starlab programs.