Of Bursting Bubbles and Monster Worms: Time Spent with Kids and a Video

BY JANET SHIELDS

Video cameras can be an interesting experimental tool for creative exploration with young people. They can be used as a tool to understand some of the properties of cameras, and as a tool to understand a wide variety of other phenomena. And, when the work is done, kids love horsing around and seeing themselves on camera.

Most young people will be interested in the video camera itself, and how it works. Some features such as zoom are quite easy to demonstrate through the viewfinder. Others such as auto focus were hard to see until we played the tape on the TV. You can overcome this difficulty by letting the kids provide a running commentary on what they're doing with the camera. That way, they can view the tape on the TV shortly after, and see the results of their changes.

If you are worried about a young child dropping the camera, use a tripod. With any age child doing this for the first time, I also recommend hovering closely. Give them freedom to change the controls themselves, but insist on their treating the camera with respect.

We were able to see the effect of the auto-focus by panning onto a nearby object and then away from it. Auto-Iris was most obvious in going from bright to dark areas and back. A classic trick is to hook the video directly into the back of the TV monitor, then aim the camera at the TV, thus getting a nested set of images, much like you get with parallel mirrors.

The video camera is a great device for science fair projects involving timing. My son wanted to determine which was the "best" paper airplane design. We measured which flew farthest and most accurately. Then, to measure which was fastest, he had a friend tape him throwing the planes. They counted the number of frames to determine flight time by setting the video player in pause and advancing one frame at a time.

It's fun to look at everyday objects to see how they behave in slow motion. We recorded a dog walking (have you ever noticed the order in which they pick up their feet or how fast they wag their tail?). Let the kids have a contest to see who can slash their hand down across the field of view in the shortest number of frames. How many frames does it take for the water to hit the sink after it's turned on, or for Dad to wash a dish?

Bubbles are interesting to look at in slow motion. You can make great ones by getting your hands drippy with water and dish soap so that it runs off your elbows. Then make a large circle with your hands by touching the tips of your thumbs to each other and touching the tips of your index fingers together. Blowing gently, you can make a bubble a foot or two long. (Not as good as the bubble loops, but good for a quick experiment.) In slow motion, you can see the oscillations in the bubble, as it changes shape, and droops and recovers as you blow. You may be lucky enough to see a ragged edge on the bubble in one frame, and then, poof!—it's gone in the next frame.

A couple of my friends (physics professors) have commented that video cameras are great even for experiments on the college level. Doreen Weinberger (Smith College) suggested having students stand on a scale in the elevator, then record the scale on video as they ride up and down the elevator. The students, depending on their level, can do either quantitative or qualitative analysis of the forces and accelerations. Her students also create shapes such as animal cutouts, mark the center of mass, and then videotape the object as it's thrown. To study the motion of the object, one can place a transparency against the screen and mark the location of the center of mass in each succeeding frame.

Letting the kids use the camera for ad lib filming can be a lot of fun. This can be relatively formal—making movies of skits or fake commercials. Or it can be informal, such as filming each other goofing off. For the really informal, just let the kid go wild. For example, my favorite segment was when my son created a mini-horror segment of monster worm expanding to eat the universe. The action was mostly provided by audio dramatic interpretation—the video was actually a roll of gym clothes on the floor, with creative use of zoom.

If you have any similar stories of successful use of video with kids, I'd love to hear from you by phone 619/534-1769 or e-mail to jshields@mpl.ucsd.edu.

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