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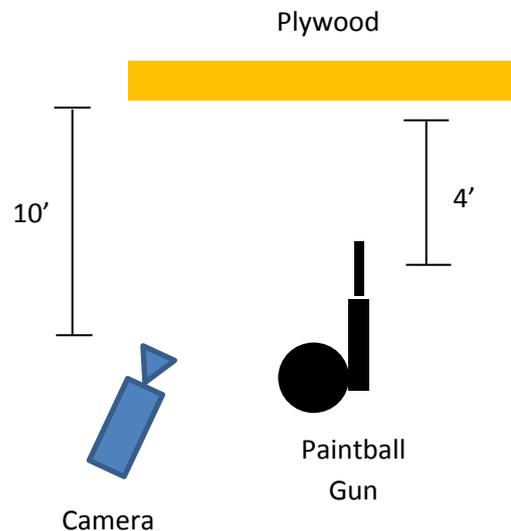
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MCEN 4151

Paintball Explosion

For our second team photo we wanted to use the slow motion camera. We wanted to show a fluid flow phenomenon that was hard to see at high speeds. For this we choose a paintball explosion. For many years I have played paintball and I thought that seeing a paintball explode in slow motion would be interesting. This turned out to be extremely difficult as the high speed camera was at first hard to figure out. For the high speed camera to capture a quality video at a high frame/sec rate it needs to be very well lit. We choose a sunny day for this because we didn't know exactly what frame rate we wanted to use. We initially started out at 1000 frames/sec. This was to slow and could not capture the explosion of the paintball. After a little messing around with the frame rate we found that 6000 frames/sec captured a nice smooth explosion of the paintball. An average speed of a paintball is 300ft/s which is about 200 MPH. This is why we needed such a high frame rate to capture the paintball.

A paintball is a spherical gelatin capsule containing primarily polyethylene glycol, other non-toxic and water-soluble substances, and dye. They are meant to explode upon impact. To capture this video I set up a piece of plywood against a wall so it wouldn't move. I used a piece of plywood because the paintballs didn't break the wood. Also it was a soft background that allowed the paintball explosion to stand out with no distracting features. Here is a setup of how I captured the paintball explosion.



The camera was positioned 10 feet away from the plywood and facing it at a 25 degree angle. The paintball was shot from 4 feet away from the plywood. When the paintball exploded it splashed in a symmetrical circle pattern. Just like the craters on the moon.

The video camera used was a Vision Research Phantom 675. The footage was taken at 6000 frames/sec. The resolution was 1280x800 pixels. I created the video in Windows Live Movie Maker. I combined 4 different video of the paintball exploded to show different explosions. One of the

footages I got happen to have a fly in the video. This ended up being a great way to show just how fast the paintball was really going in relative to the fly's wings.

I feel this video shows an explosion of a paintball very well. The physics behind the explosion are really captured and easily seen. I full filled my intent to the fullest and love what came of it. I wish that the video was a little bit clearer. It was hard to adjust the focus when you get to 6000 frames per sec and the video is a little bit blurry as a result of this. Maybe next time I could try different lense that would focus better with a high frame rate.