

Exploding Pumpkin

Self-Carving Jack-O-Lantern

Chemicals and Equipment Needed

Carving Pumpkin

- d-H₂O
- Large Pumpkin – round ones with flat bottoms work best
- Cork borer, size 7 – **U2**
- Rubber stopper, size 0 or 00 – **U3**
- Knives and scoopers – **U2**
- Red vis-à-vis pen – **Z**
- Pumpkin Punchers

Performing Demo

- CaC₂ – **E3**
- Weighboat – **A3**
- Small tin can – **N5**
- Towel – **U4**
- Stick lighter – **U1**
- Grill mitts – **U4**
- Flame retardant lab coat – **Near M**
- Goggles – **C2**

Hazards

- Acetylene is a flammable gas. We are making a small explosion inside a pumpkin, so this demo is not without risk. Always protect yourself with goggles, flame retardant lab coat, and grill mitt gloves.
- The Demo Lab is always happy to perform this demo for you

Preparation

- Gut the pumpkin. Wear gloves, since this is gross
- Use the red vis-à-vis pen to draw the face shapes. The marker is easily wiped off and any that seeps into the cuts blends into the orange of the pumpkin.
 - Keep the shapes simple.
 - Pop the shapes out and remove some flesh from the back of the pieces to make them easier to pop out.
 - After carving make sure to put the pieces back right away, otherwise they will shrink
 - Note 2019 – Purchased new “pumpkin punchers” to make this carving process easier
- Use the cork borer to make a hole in the back of the pumpkin near the equator of the pumpkin, and plug with a stopper. (this is where you’ll insert the lighter)
- On delivery, put 4-5 pieces of CaC₂ into a weighing dish for the instructor. Fill the can with ~50 mL d-H₂O, and place the can inside the pumpkin.
 - Don’t leave the CaC₂ out for longer than you have to, as it will react with water vapor in the air.

Presentation

- **Wear goggles, grill mitts, and flame retardant lab coat (blue) for this demo!**
- Set the pumpkin up with the face towards the audience, preferably near an in-bench hood
- Use the weigh dish to drop the CaC₂ into the can.
- Place the lid back on the pumpkin, and hold it down with the towel. It’s very important that you hold this down, and use the towel to protect yourself.
- Wait 20-30 s for the gas to build up, then remove the stopper in the back, **insert the lighter all the way into the pumpkin**, and light.
- BOOM! There’s a big bang and the pieces fly out. Please collect these to re-use the pumpkin.

Clean-Up

- If the pumpkin is still producing acetylene, place in or near a hood. Alternatively, you can remove the can with a pair of tongs or a gloved hand, and leave it in the hood until it stops bubbling. Then rinse it out for re-use

NOTES:

- If the pumpkin is a little wobbly or misshapen, try propping it up on a cork ring.
- Simple shapes work the best. Angles are easier to cut.
- Use a red Vis-à-vis pen to draw the shapes on for easier cutting. Then you can wash it off, and from a distance it looks like the pumpkin is whole.
- The pumpkins can be used several times, as the reaction doesn't hurt the pumpkin. But they will start to get squishy after 2 or 3 days.
- This can also be done with a half size H₂/O₂ balloon. And a blast shield.