

# The Safe Explosion

 **Time**  
5 min per demo

## WHAT YOU'LL NEED

(Provided in Primary Science Pack)

- Polycarbonate Container
- Red Cap
- Ice Cage & Loader
- Dry Ice
- Blue Gloves

### You will also need:

- Safety Glasses for the demonstrator

## BACKGROUND

**Don't be put off by the title!** This is very safe and will get a round of applause.....

Here we are going to blow the red plug out of the ice scoop. The red cap will fly up a metre or so in the air with a nice popping sound. This demonstration can be performed indoors.

work well (and also will fail at low pressure).

## What To Do



1. Place the container on a table at the front of the class.
2. Push the loader through the safety valve of the ice cage and scoop 3-4 pellets of dry ice into the ice cage. The easiest way to do this is to scoop the ice directly from the ice box. If you want to place the pieces in by hand please wear the lightweight blue gloves supplied in the pack.
3. Place the ice cage in the container.
4. Push on the red plug firmly. After about 20 seconds the red cap will pop off.



## What's Happening?



The warm air in the room is causing the dry ice to turn to a gas. Gases need more room than solids and liquids and so the pressure increases in the scoop eventually this will push the cap off.

### Make this an experiment



To turn this demonstration into a true experiment ask the junior scientists to answer these questions:

- How would you speed up the bang?
- How could you get a bigger bang?
- How else could you get a "safe" explosion effect?

## TEACHER'S NOTES

Using the equipment supplied and following these instructions means that the demonstration is very safe – as always please read the safety information on dry ice provided with these downloads and available from [www.chillistick.com](http://www.chillistick.com).

The red plug is easy to push on and is easy to pop out – this is all low pressure stuff and is therefore safe. The red plug is deliberately quite large and won't travel very far. Once the red plug is on you can secure it fully by turning the assembly over and pressing down on a flat surface before turning it back so that the red cap is pointing upwards. Time is of the essence as it will probably pop in 10 – 20 seconds and so once in place move away.

Reducing the time needed to pop off the red cap is achieved by making carbon dioxide gas more quickly. The students may consider this and conclude that adding more dry ice will achieve this goal, (the surface area to produce the gas is increased).

Alternatively a small amount of warm water could be added to the dry ice, this will also speed up carbon dioxide gas formation. Please bear in mind that the red cap will pop off in seconds so if you are going to attempt this be aware!

If you wanted to try an alternative; sandwich bags with a zip lock seal work well (and also will fail at low pressure).

