

Make a Comet

Students enjoy watching comets being made from crushed dry ice, water, mud and some other things. They are mixed with insulating gloves in a big strong plastic bag. You end up with a steaming ugly mass with many properties similar to comets.

This is from an instruction video by Science North in Sudbury Ontario: <https://www.youtube.com/watch?v=yLgwEy6ANP0>



Comets are actually darker than fresh asphalt. This group added some charcoal, but many don't bother with that messy ingredient.

Local sources of dry ice can be found in most cities from a web search. Get pellets rather than blocks. It's easiest to carry it in a food cooler. Do not store it for a long time in a small enclosed space like a car. It makes us sleepy so while driving so keep the

car ventilated. If you let it sit for a whole day before the demonstration, it's easier to break it into a powder. Dry ice is at -78°C and care must be taken.

You can see lots of videos by googling "Make a Comet" including https://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=258

There's a written description at

<http://dennisschatz.org/activities/Make%20a%20Comet.pdf>

Once made, let each student look closely at it. As ice sublimates when the comet is near the sun, dust is released to form the tail. Little dust will be released in a room so we can't exactly see a comet tail.

Many other fascinating aspects of comets can be shown after making the model. These involve moving around the classroom.

Makes something to represent the Sun - a yellow balloon or basketball, a student wearing a yellow hat or T shirt. Move the chairs back so you can walk quickly close to the "Sun", then go far out moving slowly as comets with very elliptical orbits do. Make the point that comets spend decades or centuries far from the Sun and speed up when close so we can see them only for a few months.

Mention the Sun pushes the tail away, so as you pass the Sun ask which way the tail is pointing. It actually goes ahead of the comet as it leaves.

Then ask what happens to the mass of the comet as it passes near the Sun. Much water and CO₂ and dust blows off each visit to the inner solar system. Some comets which get into the inner solar system only last a few hundred trips. So where do new comets come from? That's why astronomers think there are reservoirs of comets far from the Sun.

When a distant comet passes near some heavy object, it can be directed inward and eventually after several close passes comes to the inner solar system. The Kuiper belt reservoir is in the plane of the planets. The more distant Oort cloud of comets is in all directions.

There is a Powerpoint covering similar topics which can be shown instead or at the same time.

www.rasc.ca/sites/default/files/CometPaths.pptx

So far two objects have been detected which move too fast to be orbiting the Sun and came from another star. This is shown on the Powerpoint.

Naked eye comets come along every decade or so. Many more can be seen with binoculars. Ideas on finding them are at:

www.rasc.ca/sites/default/files/ObserveAComet.pdf