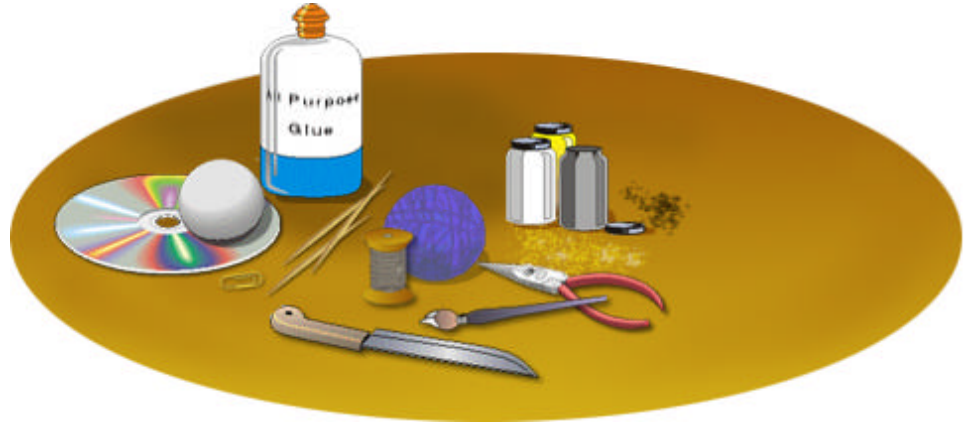




How to make a Model Saturn

You can make a lovely model of Saturn and her rings. You can hang your model Saturn from the ceiling and watch it gracefully turn with the air currents. Or your Saturn will make a beautiful holiday decoration. Our samples are just suggestions. Decorate your Saturn and rings however you want.



You will need:

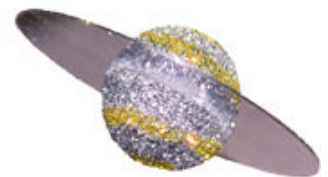
- One unwanted compact disc (CD). (Many people get these free in the mail.)
- One 2-inch diameter styrofoam ball, carefully cut in half with a sharp knife (get adult help, please!)
- White glue
- Wooden toothpicks
- Paint brush, about 1/4 to 1/2 inch wide
- Glitter—silver, gold, black or any other colors you want
- Yarn, black or other colors (optional)
- Needle-nosed pliers (or scissors will do)
- Small paper clip
- Thread

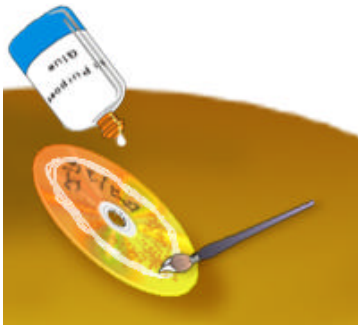


What to do:

First, decorate the rings:

- The CD will be Saturn's rings. Usually one side of the CD has printing on it. This is the side you will decorate with glitter.
- Try not to get glitter in the center part of the CD, where you will be gluing the styrofoam ball.
- Rinse the paintbrush out between uses, so it will stay soft and easy to use.
- Use the paintbrush to carefully spread glue on the CD. If you want to make it look like some of the rings are silver





and some gold, spread the glue only where you want to put the first color, then sprinkle the glitter on the wet glue. Let it dry completely. Then repeat for the remaining areas. You can use as many different colors as you want. Just be sure to let the glue dry completely for each before adding the next color.

- If you want to use yarn also—for example, black to show the gaps in the rings—glue it on and let it dry before adding the glitter.

Decorate Saturn:


- Stick a toothpick into the flat side of each half of the styrofoam ball to give yourself a handle.
- Use the paintbrush to apply glue and glitter on each half, as you did for the CD. Let the glue dry completely.

Put the pieces together:



- Take the toothpick out of one of the styrofoam halves. On the other half, make sure the toothpick is stuck exactly into the center and push it in until it starts to poke out the top.
- Spread glue in the center of the decorated side of the CD. Pick up the CD and place the styrofoam half with the toothpick exactly in the center of the CD, toothpick sticking through the hole.
- Now push the other styrofoam half onto the toothpick sticking out the hole on the other side of the CD. When both halves are flat against the CD, a small part of the toothpick will be sticking out one of Saturn's "poles." Break it off with the pliers.

And hang it up:

- Open a small paper clip so it looks like this: 
- Decide which half of Saturn you want to be the top. Since Saturn's axis is tilted 28 degrees, stick the paperclip into the top about 3/4 inch away from the center (where the toothpick comes through). Angle the paperclip so it passes through the hole in the CD and helps hold the two styrofoam halves together.
- When you hang your Saturn up, and it turns in the breeze, you will see the "rings" from different angles, just as we see the real Saturn at different angles from Earth.
- Tie any length of thread to the paperclip and hang your model wherever you like.

Why does Saturn have rings?



Saturn tips her jaunty hat.



The small color differences in Saturn's rings have been enhanced in this picture from Voyager 2 data.



This Voyager 2 picture shows the gap in the rings called the Cassini Division.



Artist's idea: Cassini releasing Huygens Probe over Titan.

Scientists have ideas about why Saturn has rings, but no one knows for sure.

What are Saturn's rings made of? Are they solid like the CD you used to make your model? Or are they made of many particles dancing in formation around the planet?

Three robotic spacecraft from Earth have already visited Saturn—Pioneer 11, Voyager 1, and Voyager 2. They revealed many surprising things about Saturn's rings.

The rings are about 40,000 kilometers (24,000 miles) wide. That's about three Earths across. But the rings are only 100 meters (330 feet) thick.

They range from particles too tiny to see to "particles" the size of a bus. Scientists think they are icy snowballs or ice covered rocks.

There are actually many rings—maybe 500 to 1000. There are also gaps in the rings. (That's why we put some black rings on our model Saturns.)

A new spacecraft is now on its way to study Saturn much more thoroughly than the earlier spacecraft could. After a seven-year journey, the Cassini (ka-SEE-nee) spacecraft will arrive at Saturn on July 1, 2004. It will go into orbit around Saturn and study its rings, its many moons, and the planet itself.

Cassini also carries a probe, called Huygens (HOY-guns), that will parachute into the atmosphere of Saturn's giant moon Titan. Huygens will send back information on this strange world whose surface we have never seen.

What exciting new discoveries Cassini and Huygens will make!

To learn more about this mission to Saturn and find other "spacey" things to do, see The Space Place web site at <http://spaceplace.jpl.nasa.gov>.

This material is provided through the courtesy of the Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California.

