1. Open the cereal box at the top and stick the white card to the inside at the bottom. This will be the viewing area.

2. Remove the two small tabs at the top of the box and cut 4cm from each end of the two larger flaps.

3. Fold the remaining flaps together and stick with tape, leaving two rectangular holes A and B.

4. Place the foil over hole A and secure with tape.

5. Carefully pierce the middle of the foil with a pin – be sure to make only a small hole!

6. Stand with your back to the Sun, allowing the light to enter through the pin hole.

7. Look in through hole B and see an image of the Sun on the bottom of the box!

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**FACTS ABOUT THE SUN**

Gravity: 28 (Earth = 1)
Planets: 8 in orbit
Mass: 333,000 (Earth = 1)
Size: 110 times wider than Earth

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**SOLAR VIEWER**

You should NEVER look directly at the Sun, but using this viewer you’ll be able to see our closest star safely. **You’ll need:** Cereal box, white card or paper (same size as base of box), foil, tape and pin.

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**CARD 1/9**

See the Big Picture, visit bbc.co.uk/stargazing
METEOROID, METEOR OR METEORITE?
Meteoroids are pieces of dust or rock floating through space. If they enter the Earth’s atmosphere and start to burn up, they become a meteor (or shooting star). If they hit the ground without burning up, craters are formed and they become meteorites. Here’s how to make your own crater!

You’ll need: A shallow dish at least 30cm square, flour, cocoa powder, pebbles of various sizes. Warning: This can get messy!

1. Fill the dish with 3-4cm of flour.
2. Sprinkle a little of the cocoa on the surface. (This will make the impacts more visible.)
3. Pick out one of the smallest pebbles and drop it (not throw) from eye level into the flour to make a crater.
4. Next drop a medium-sized pebble from the same height. What is different about the crater formed?
5. Now drop the largest pebble from the same height.
6. Compare the craters made by each pebble.

FACTS ABOUT MERCURY
Gravity: 0.38 (Earth = 1)
Moons: 0
Mass: 0.055 (Earth = 1)
Distance from Sun: 0.4 AU (Astronomical Unit)

CARD 2/9
See the Big Picture, visit bbc.co.uk/stargazing
LOO ROLL SOLAR SYSTEM

Make a scale model of the Solar System using one sheet of loo roll as 10,000,000 miles!

1. The first sheet is the Sun.
2. Unroll 3.6 sheets, here is Mercury! Use a picture of the planet or suggested object to mark the place.
3. Roll out 3.1 more sheets (6.7 in total) – this is Venus. Mark the spot!
4. Keep going until you get all the way to Neptune.

FACTS ABOUT VENUS

Gravity: 0.9 (Earth = 1)
Moons: 0
Mass: 0.815 (Earth = 1)
Distance from Sun: 0.7 AU

CARD 3/9
See the Big Picture, visit bbc.co.uk/stargazing
CAN YOU SEE THE EIGHT MAIN STARS IN ORION (FIG 1)?
If you can see Orion, try counting the stars you can see around the eight main stars.

CAN YOU SEE OUR GALAXY THE MILKY WAY (FIG 2)?
This means your skies are very dark!

TRY THIS AGAIN WHEN VISITING ANOTHER LOCATION AND COMPARSE THE RESULTS.

VISIT BBC.CO.UK/STARGAZING AND FOLLOW THE LINK TO DARK SKY DISCOVERY TO FIND YOUR NEAREST DARK SKY SITE. YOU CAN EVEN NOMINATE YOUR AREA!

FACTS ABOUT EARTH
Gravity: 1
Moons: 1
Mass: 1
Distance from Sun: 1 AU
WALK AMONG THE STARS

Using tealights, brown paper bags and some sand or soil, you can recreate a constellation on the ground.

1. Adult supervision is recommended.
2. Go outside and choose a dark spot – a slight slope is good too.
3. Fill your bags with enough sand to weigh them down.
4. Place a tealight in one bag on top of the sand and light it.
5. When you have completed all eight stars, stand back and admire Orion!
6. Try using the *Stargazing LIVE* Star Guide from the website to create more constellations.

FACTS ABOUT MARS

- **Gravity:** 0.38 (Earth = 1)
- **Moons:** 2 – Deimos and Phobos
- **Mass:** 0.107 (Earth = 1)
- **Distance from Sun:** 1.5 AU

CARD 5/9

See the Big Picture, visit bbc.co.uk/stargazing
PHOTOGRAPH THE NIGHT SKY

Most digital cameras are capable of capturing basic shots of the stars.

1. **Use a tripod** or rest your camera on something solid to stop camera shake.

2. **Set the focus**: Turn off autofocus as it won’t work well in the dark, and set the focus to infinity ($\infty$).

3. **Refine the focus**: Point your camera at a bright star and adjust the focus until it looks sharp.

4. **Adjust the aperture**: If you can, set the camera’s f-number to the smallest possible (this lets in more light).

5. **Set the zoom**: Make sure you are zoomed out to the fullest extent.

6. **Adjust the sensitivity**: Higher ISO number = more sensitivity and easier to capture faint objects. (If the ISO is set too high you may get digital ‘noise’, which can ruin your picture.)

For more advice, download our guide to photographing the night sky from [bbc.co.uk/stargazing](http://bbc.co.uk/stargazing)

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FACTS ABOUT JUPITER

**Gravity**: 2.64 (Earth = 1)
**Moons**: 64 known – the largest are Ganymede, Callisto, Io and Europa
**Mass**: 318 (Earth = 1)
**Distance from Sun**: 5.2 AU

CARD 6/9

See the Big Picture, visit [bbc.co.uk/stargazing](http://bbc.co.uk/stargazing)
MAKE YOUR OWN ROCKET!

Rockets need fuel to power them through the Earth’s atmosphere. Here’s how to make a simple rocket powered by carbon dioxide. **You’ll need:**

A tube of fizzy vitamin tablets (or film canister), water, eye protection.

⚠️ Children should be supervised for this activity. Wear eye protection and go outside – it can get sticky!

1. Remove the lid from the empty tube and pour in two teaspoons (10ml) of water.
2. Drop half a tablet into the canister and close the lid sharpish!
3. Quickly place the rocket on a flat surface **CAP SIDE DOWN** and **STAND BACK** at least 2 metres.
4. After 10 seconds, your rocket should launch into the sky!
5. If not, leave it for at least 30 seconds before retrieving it.

**FACTS ABOUT SATURN**

- **Gravity:** 1.16 (Earth = 1)
- **Moons:** 62 confirmed, including Titan and Enceladus
- **Mass:** 95 (Earth = 1)
- **Distance from Sun:** 9.6 AU

CARD 7/9

See the Big Picture, visit [bbc.co.uk/stargazing](http://bbc.co.uk/stargazing)
around Polaris and never set below the horizon.

3 Use yellow dots to create seasonal constellations (whose visibility vary with the time of year) and join the stars with the long thin stickers and label.

4 Once complete, you can use your mini planetarium to help you stargaze!

**MINI PLANETARIUM**

Make your own guide to the night sky and stay dry! You’ll need a dark six panel umbrella, sticky white and yellow dots, long thin stickers.

1 Open your umbrella. The centre represents the North Star (Polaris).

2 Use the diagram to help mark out constellations with white dots to create Ursa Minor, The Plough and Cassiopeia. These are circumpolar constellations, which appear to rotate around Polaris and never set below the horizon.

**FACTS ABOUT URANUS**

- **Gravity:** 0.89 (Earth = 1)
- **Moons:** 27 known, including Titania, Oberon, Umbriel, Ariel and Miranda
- **Mass:** 14.5 (Earth = 1)
- **Distance from Sun:** 19.2 AU

**UMBRELLA MINI PLANETARIUM**

**CARD 8/9**

See the Big Picture, visit [bbc.co.uk/stargazing](http://bbc.co.uk/stargazing)
HOOP ATMOSPHERE GLIDER

Scientists are looking at new ways to explore other planets, and some probes have been designed to glide through the planetary atmosphere. Try making your own gliding probe!

You will need: A drinking straw (non-bendable), an index card or sheet of stiff paper and a ruler.

1. Cut the card into three pieces that each measure 2.5cm x 13cm.
2. Tape two of the pieces together into a hoop. Make sure you overlap the ends to help make a good hoop shape.
3. Use the last strip to make a smaller hoop.
4. Tape the hoops to the ends of the straw, as shown.
5. Launch your glider into the planetary atmosphere and watch it glide!

FACTS ABOUT NEPTUNE

Gravity: 1.14 (Earth = 1)
Moons: 13 known, including Triton
Mass: 17 (Earth = 1)
Distance from Sun: 30 AU

CARD 9/9
See the Big Picture, visit bbc.co.uk/stargazing