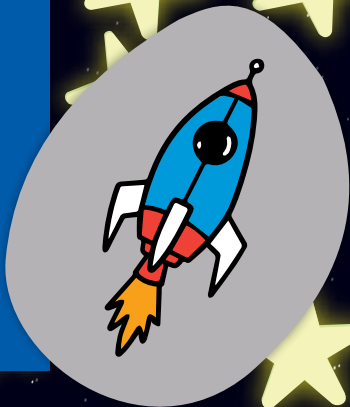




NATIONAL
GEOGRAPHIC

OUTER SPACE

ADVENT CALENDAR



INSTRUCTIONS

ADULT SUPERVISION RECOMMENDED

WARNING! Do not aim at eyes or face.



WARNING:

CHOKING HAZARD — TOY CONTAINS A SMALL BALL.
NOT FOR CHILDREN UNDER 3 YRS.

WARNING: THIS SET CONTAINS CHEMICALS THAT MAY BE HARMFUL IF MISUSED. READ CAUTIONS ON INDIVIDUAL CONTAINERS CAREFULLY. NOT TO BE USED BY CHILDREN EXCEPT UNDER ADULT SUPERVISION.

WARNING: THIS SET CONTAINS CHEMICALS THAT MAY BE HARMFUL IF MISUSED. READ THE INFORMATION IN THE INSTRUCTION MANUAL. IF SPLASHED IN THE EYES, OR ON SKIN, FLUSH THOROUGHLY WITH WATER. GET MEDICAL ATTENTION IMMEDIATELY IF SPLASHED IN EYES. NOT TO BE USED BY CHILDREN EXCEPT UNDER ADULT SUPERVISION. NOT RECOMMENDED FOR CHILDREN UNDER 8 YEARS OF AGE.

AVERTISSEMENT. CE NÉCESSAIRE CONTIENT DES PRODUITS CHIMIQUES QUI PEUVENT ÊTRE NOCIFS S'ILS SONT MAL UTILISÉS. LIRE LES INDICATIONS DE LA BROCHURE D'INSTRUCTIONS. EN CAS D'ÉCLAUSSURES SUR LA PEAU OU DANS LES YEUX, BIEN RINÇER À GRANDE EAU. RECOURIR IMMÉDIATEMENT AUX SOINS DU MÉDECIN SI LES YEUX ONT ÉTÉ TOUCHÉS. NE DOIT PAS ÊTRE UTILISÉ PAR DES ENFANTS QUI NE SONT PAS SOUS LA SURVEILLANCE D'UN ADULTE. CONTRE-INDIQUÉ POUR LES ENFANTS DE MOINS DE 8 ANS.



DON'T THROW IT AWAY

Save all your components for future activities!

TIPS FOR PAINTING SUCCESS



Set up a workstation by laying down some paper towels, newspaper, or other surface covering. Consider wearing old clothes too as the paint may stain clothing.

Have some additional paper towels and a cup of water nearby while painting to help clean your paintbrush when necessary. **Always thoroughly clean and dry your paintbrush after each painting activity.**

Let the initial paint layers dry completely before adding other colors for the best results.

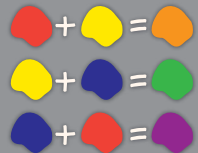


DID YOU KNOW?

The primary colors (red, blue, and yellow) can't be created by mixing two different colors.



The secondary colors are made by mixing two primary colors.



Adding white or black to a color will make it lighter or darker.



DAY 1

Earth Dig Brick

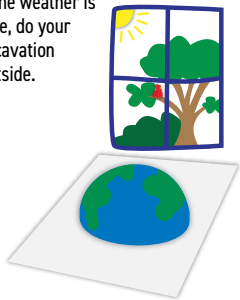
CONTENTS

- Earth dig brick
- Dig tool

WHAT TO GET

- Water
- Paper plate or newspaper

- 1** Prepare your work station. This science dig can get messy, so place your dig brick on a sturdy paper plate or a newspaper. If the weather is nice, do your excavation outside.



- 2** The specimen is buried **INSIDE** your digging brick. Dig into the brick with the tools provided. If the digging brick is too hard, soften it by adding some water. Just pour a little onto the brick and let it soak in.



- 3** When you find the specimen, make sure to excavate all the way around it. Patience is key, so as not to damage the fragile specimen. **Note:** Do not try to pry out a specimen that is only partially excavated or it may break.



- 4** Rinse your specimen in water to remove any remaining dirt.



- 5** Identify and learn about your discovery.



DID YOU KNOW? "Fool's Gold" (aka Pyrite)

The shiny yellow/gold color of pyrite crystals often led people to believe they had found gold, and so it was nicknamed "fool's gold." In fact, most pyrite deposits do contain some gold, so those fools may have been on the right track.

Pyrite gets its name from the Greek word for "fire," because it could create sparks when struck against metal. It is found worldwide in many different kinds of rock. Pyrite forms glistening crystals in a variety of shapes, including perfect cubes.



DAY 2

Paint the Sun

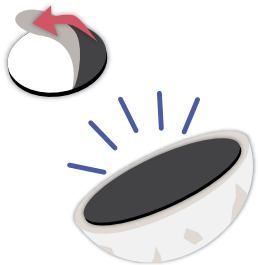
CONTENTS

- Paint pots
- Paintbrushes
- Sun
- Round magnet

WHAT TO GET

- Cup of water
- Paper towels
- Paper plate or newspaper

1 Peel the backing off the round magnet and stick the magnet to the backside of the Sun/planet. Hold the magnet in place firmly for 30 seconds to ensure a tight bond.



2 Dip your paintbrush in a paint pot and begin to paint the surface. Repeat until you have completed your design!



DID YOU KNOW?

The Sun is a yellow dwarf star made of hydrogen and helium gases that sits in the center of the solar system. It is so huge that it makes up 99.8% of all the mass in that system. Its gravitational pull holds the entire solar system together, and its energy makes life possible on Earth.



DON'T THROW IT AWAY

Save all your components for future activities!

DAY 3

Make a Bouncy Meteor

CONTENTS

- Cup
- Bouncy meteor ball mold
- Polymer powder

WHAT TO GET

- Cold water
- Paper towels

- 1** Fill the cup with enough cold water to fully submerge the mold.



- 2** Assemble the bouncy meteor ball mold by snapping it together.



- 3** Fill the mold with polymer powder to the bottom of the rim.

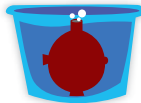
Note: It's helpful to fill your mold over a paper towel or plate to avoid mess.



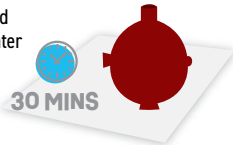
- 4** Submerge the powder-filled mold in the cup of water and hold it underwater to allow the air to escape. Let the mold sit underwater for 10 minutes.



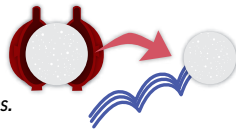
10 MINS



- 5** Take the mold out of the water and let it sit on a paper towel for 30 minutes.



- 6** Carefully open the mold to remove your bouncy ball. **Note:** If your ball sticks to the mold when opening, let the mold sit for a few more minutes and try again. If your ball releases from the mold and is still sticky, let it rest on a plate for a few minutes.



DID YOU KNOW?

Polymers are large molecules made up of repeating units. Depending on the type of molecules and how they are attracted, polymers can do amazing things. They can stretch and bend, like polyester, or be stiff and durable, like glass.

The polymers in your ball, for instance, relax their bonds when they hit a hard surface. Those bonds quickly snap back into their original shape, sending your ball back into the air.



STOP

DON'T THROW IT AWAY
Save all your components for future activities!

DAY 4

Paint the planet Mercury

CONTENTS

- Mercury
- Round magnet

WHAT TO GET

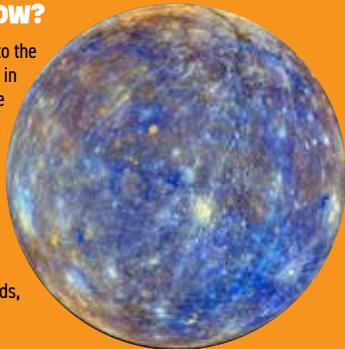
- Paintbrush
from Day 2
- Paint pots
from Day 2
- Cup of water
- Paper towels
- Paper plate or newspaper

See Day 2 for magnet application and painting instructions.



DID YOU KNOW?

Mercury is closest to the Sun and the smallest planet in the solar system (just a little larger than Earth's moon). It has no atmosphere, so the Sun's radiation can bring the planet's surface temperature up to as high as 800° F (430° C). Mercury was named after the speedy messenger of the Roman gods, since it travels so fast around the Sun.



DAY 5

Create Canis Major

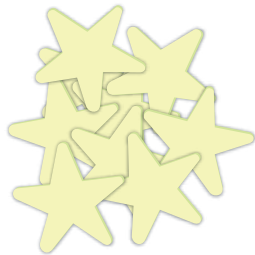
CONTENTS

- Constellation card
- Glow-in-the-dark stars
- Double-sided stickers

WHAT TO GET

- ADULT SUPERVISION
If applying the stickers up high on a wall or the ceiling

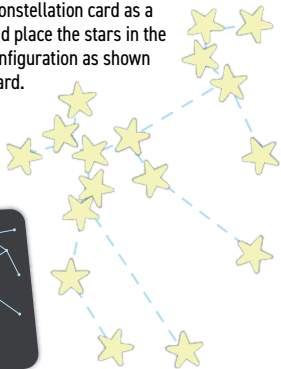
1 Select an area where you can apply your star stickers. If you decide to apply them to the ceiling or high on a wall, be sure to have an adult's help.



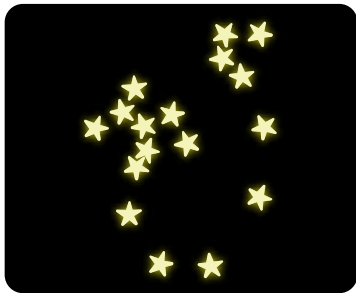
2 Select a star and place one of the double-sided stickers on the side you'd like to adhere to the wall or ceiling. Peel off the white paper on the double-sided sticker before attaching the star.



- 3** Use the Canis Major constellation card as a guide and place the stars in the same configuration as shown on the card.



- 4** The stars will "charge" during the day in natural light or while the room light is on. When it's dark enough, turn off the lights and see your constellation glow!



DAY 6

Paint a Rocketship

CONTENTS

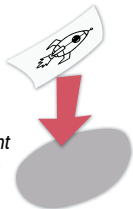
- Black paint
- River stone
- Rocket transfer sticker

WHAT TO GET

- Paintbrush from Day 2
- Paint pots from Day 2
- Paper towels
- Cup of water
- Wet sponge or towel

APPLY YOUR TRANSFER STICKER

- 1** Choose a position on the rock where you'd like to apply your transfer sticker, then peel the plastic cover off the sticker.
- 2** Place the sticker on the rock, with the image side on the surface of the rock. Apply pressure evenly. **Note:** You may reposition your sticker at this point if needed. Even if the sticker is no longer sticky, it will still transfer.



- 3** Once you're happy with the sticker's position, use a wet towel or sponge and dab the top of the sticker paper, covering the entire sticker.



- 4** The water will release the sticker from the paper, so ensure it's completely saturated. Let the sticker sit for 30-60 seconds, then peel the paper off.



PAINT YOUR ROCK SURFACE

Once the rock surface is dry, select the paints you'd like to use and apply paint using your paintbrush. **Note:** *It's helpful to rinse your paintbrush in a cup of water and dry it with a paper towel before switching to another color of paint.*



TRY THIS! *You can also apply the transfer sticker after you paint your river stone. If you choose to paint first, make sure the paint is completely dry before applying the sticker.*



DID YOU KNOW?



Have you ever blown up a balloon and then let go of it without tying it off? The balloon moves forward as the air escapes, right? Well, rockets work in the same way. In its most basic form, a rocket is a device that contains pressurized gas that, when released through a small opening, pushes the device in the opposite direction.



DON'T THROW IT AWAY
Save all your components for future activities!

DAY 7

CONTENTS

- Agar agar powder
- Yellow coloring
- Sun mold

WHAT TO GET

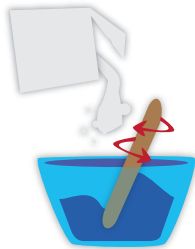
- Water
- Measuring spoons
- Measuring cup
- Microwaveable cup or bowl
- Microwave
- Stirring utensil
- Scissors
- ADULT SUPERVISION

Mold the Sun

- 1** Measure $\frac{1}{4}$ cup (60 mL) of water and add it to the microwavable cup or bowl.



- 2** Have an adult help you open your packet of agar agar powder with scissors. Add $\frac{1}{4}$ teaspoon (0.63 g) of agar agar powder to the water and stir well.

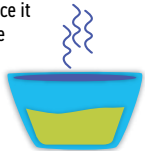


- 3** Add 5 drops of yellow coloring to the mixture and stir well.



- 5** Have an adult remove the mixture from the microwave and place it on a heatproof surface. Let the mixture sit for 5 minutes to settle and cool.

 **5 MINS**



- 4** Have an adult microwave the mixture for 60 seconds. Watch carefully to be sure the mixture does not bubble up and spill out of the bowl or cup.



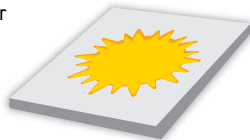
 **60 SECONDS**

- 6** Have an adult carefully fill the sun mold with the hot mixture. (You might want to put the mold onto a plate in case some of the mixture spills over.) Save the extra agar agar powder to make more suns later!

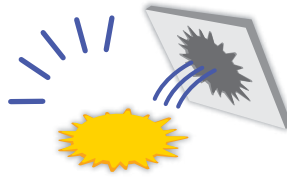


- 7** Chill the solution in the refrigerator for 1 hour. The sun is ready when the gel is very firm to the touch.

 **1 HOUR**



- 8** Flip the mold over to remove the sun. You may need to use your fingers to help remove the sun from the mold.



DID YOU KNOW?

Agar agar is a gelatinous substance that is derived from the cell walls of red seaweed. According to Japanese legend, agar agar was discovered by an innkeeper who found that some seaweed soup had gelled after being discarded outside on a cold winter's night.



DON'T THROW IT AWAY
Save all your components for future activities!

DAY 8

Paint the Planet Venus

CONTENTS

- Venus
- Round magnet

WHAT TO GET

- Paintbrush
from Day 2
- Paint pots
from Day 2
- Cup of water
- Paper towels
- Paper plate or newspaper

See Day 2 for magnet application and painting instructions.



DID YOU KNOW?

Venus has a dense atmosphere of carbon dioxide that traps heat on the planet's surface, making it the hottest planet in the solar system. Temperatures can reach as high as 880° F (471 C°)! It's similar in size to Earth and is named after the Roman goddess of love.



DAY 9

Glow-in-the-Dark Stickers

CONTENTS

- Glow-in-the-dark stickers

These awesome space stickers glow in the dark! To make the stickers glow brighter, "charge" them by letting them sit in sunlight or under a lamp for at least 2-3 minutes.



DID YOU KNOW? The Milky Way

It takes our solar system 250 million years to complete one revolution around the center of the Milky Way Galaxy, which is thought to have formed around 14 billion years ago.



The ancient Greeks created a myth about the white streaky blur of stars they saw in the sky (one of the Milky Way's arms), calling it a "river of milk." The ancient Romans continued the trend, referring to the stars as *Via Galactica*, which roughly translates to "road of milk." This is how we came to refer to our galaxy as the Milky Way!

DAY 10

Paint the Planet Earth

CONTENTS

- Earth
- Round magnet

WHAT TO GET

- Paintbrush
from Day 2
- Paint pots
from Day 2
- Cup of water
- Paper towels
- Paper plate or newspaper

See Day 2 for magnet application and painting instructions.



DID YOU KNOW?

One of the main reasons there's life on Earth is because of water. Earth sits at exactly the right distance from the Sun, in what astronomers call the "Goldilocks Zone." If it was any closer to the Sun, all the water on Earth would evaporate, and if it was any farther all the water would freeze. It's thought that the name Earth came from English and German words for "ground."



DAY 11

Paint a Comet

CONTENTS

- River rock
- White acrylic paint
- Comet transfer sticker

WHAT TO GET

- Paintbrush
from Day 2
- Paint pots
from Day 2
- Paper towels
- Cup of water
- Wet sponge or towel

See Day 6 for transfer sticker application and painting instructions.



DID YOU KNOW?

Comets usually have two tails. The heat from the sun vaporizes some of the comet and creates a dust tail. Ultraviolet light from the sun creates electrically charged ion particles that form the ion tail, which glows blue.



DON'T THROW IT AWAY
Save all your components for future activities!

DAY 12

Mold a Star

CONTENTS

- Star mold

WHAT TO GET

- Agar agar powder
from Day 7
- Yellow coloring
from Day 7
- Water
- Measuring spoons
- Microwaveable cup or bowl
- Microwave
- Stirring utensil
- Scissors
- ADULT SUPERVISION

See Day 7 for molding instructions.



DID YOU KNOW?

There are billions and billions of stars in the universe, and almost all stars we know of are made of hydrogen gas. The intense pressure and heat at the core of a star will change some of the hydrogen gas to helium. This process creates huge amounts of energy and is why stars shine. Stars can vary in temperature, size, color, and brightness. The Sun at the center of the solar system is a star, and it is considered average in size and brightness compared to other stars, which can be much larger or smaller.



DAY 13

Paint the Planet Mars

CONTENTS

- Mars
- Round magnet

WHAT TO GET

- Paintbrush
from Day 2
- Paint pots
from Day 2
- Cup of water
- Paper towels
- Paper plate or newspaper

See Day 2 for magnet application and painting instructions.



DID YOU KNOW?

Named after the Roman god of war, Mars is the fourth planet from the Sun. It's a rocky planet with clouds and wind similar to Earth, but its thin atmosphere and distance from the Sun mean that the average temperature is -80°F (-62°C). Mars has the largest volcano in the entire solar system, Olympus Mons. Mars also has the largest dust storms in the solar system, which can cover the entire planet and last for months!



DAY 14

Create Orion

CONTENTS

- Constellation card
- Glow-in-the-dark stars
- Double-sided stickers

WHAT TO GET

- ADULT SUPERVISION
If applying the stickers up high on a wall or the ceiling

See Day 5 for constellation instructions



DAY 15

Paint the Planet Jupiter

CONTENTS

- Jupiter
- Round magnet

WHAT TO GET

- Paintbrush
from Day 2
- Paint pots
from Day 2
- Cup of water
- Paper towels
- Paper plate or newspaper

See Day 2 for magnet application and painting instructions.



DID YOU KNOW?

Jupiter is the largest planet in the solar system and is made primarily of hydrogen and helium. It is known as a gas giant and doesn't have a solid surface. Astronomers have discovered that the atmospheric pressure and temperatures are so intense that hydrogen gas is compressed into a liquid, creating the largest ocean in the solar system.



DAY 16

Make a Bouncy Sun Ball

CONTENTS

- Polymer powder

WHAT TO GET

- Bouncy ball mold
from Day 3
- Cup
from Day 3
- Cold water
- Paper towels

See Day 3 for bouncy ball-making instructions.



DID YOU KNOW?

Life on Earth depends on the light, heat, and energy from the Sun, but did you know that it takes 8 minutes and 20 seconds for the Sun's light to reach Earth? That short amount of time is even more impressive when you consider the Earth is about 93,000,000 miles (150,000,000 km) from the Sun!



DAY 17

Create Ursa Major

CONTENTS

- Constellation card
- Glow-in-the-dark stars
- Double-sided stickers

WHAT TO GET

- ADULT SUPERVISION
If applying the stickers up high on a wall or the ceiling

See Day 5 for constellation instructions



DAY 18

Paint an Astronaut

CONTENTS

- River rock
- Astronaut transfer sticker

WHAT TO GET

- Paintbrush
from Day 2
- Paint pots
from Day 2
- Paper towels
- Cup of water
- Wet sponge or towel

See Day 6 for transfer sticker application and painting instructions.



DID YOU KNOW?

The large backpack astronauts wear contains life support systems. Radio communicators, fans, and cooling systems are also powered by this highly specialized piece of equipment.



DAY 19

Paint the Planet Saturn

CONTENTS

- Saturn
- Round magnet

WHAT TO GET

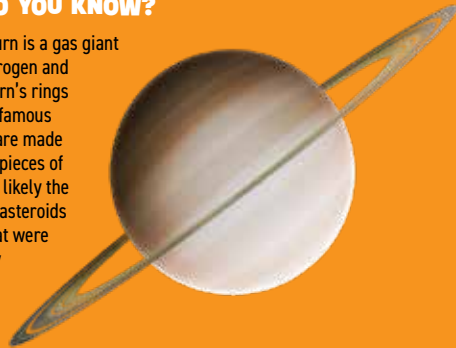
- Paintbrush
from Day 2
- Paint pots
from Day 2
- Cup of water
- Paper towels
- Paper plate or newspaper

See Day 2 for magnet application and painting instructions.



DID YOU KNOW?

Saturn is a gas giant made of hydrogen and helium. Saturn's rings are its most famous feature and are made of countless pieces of ice and rock, likely the remnants of asteroids or moons that were destroyed by the powerful gravity of the planet.



DAY 20

Mold the Moon

CONTENTS

- Moon mold

WHAT TO GET

- Agar agar powder
from Day 7
- Water
- Measuring spoons
- Microwaveable cup or bowl
- Microwave
- Stirring utensil
- Scissors
- ADULT SUPERVISION

See Day 7 for molding instructions.



DID YOU KNOW?

Scientists believe that the Moon formed about 4.5 billion years ago—some 100 million years after our planet was formed—when something about the size of Mars crashed into the Earth. The impact threw huge amounts of debris into orbit, and that debris gradually came together to form the Moon. For the first half a billion years of its life, meteorites, and asteroids bombarded the Moon, forming many of its most recognizable surface features.



DAY 21

Create Ursa Minor

CONTENTS

- Constellation card
- Glow-in-the-dark stars
- Double-sided stickers

WHAT TO GET

- ADULT SUPERVISION
If applying the stickers up high on a wall or the ceiling

See Day 5 for constellation instructions



DAY 22

Paint the Planet Uranus

CONTENTS

- Uranus
- Round magnet

WHAT TO GET

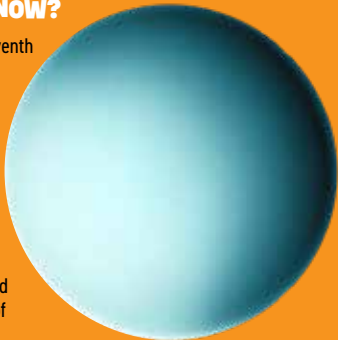
- Paintbrush
from Day 2
- Paint pots
from Day 2
- Cup of water
- Paper towels
- Paper plate or newspaper

See Day 2 for magnet application and painting instructions.



DID YOU KNOW?

Uranus is the seventh planet from the Sun. It's considered to be an ice giant because most of its mass is made of swirling icy fluids that include water, methane, and ammonia. Uranus is the only planet in the solar system named for a Greek deity – the sky god Ouranos. It has two sets of rings and 27 moons.



DAY 23

Glow-in-the-Dark Stars

CONTENTS

- Glow-in-the-dark stars
- Double-sided stickers

WHAT TO GET

- ADULT SUPERVISION
If applying the stickers up high on a wall or the ceiling

1

Select an area where you can apply your star stickers. If you decide to apply them to the ceiling or high on a wall, be sure to have an adult's help.

2

Select a star and place one of the double-sided stickers on the side you'd like to adhere to the wall or ceiling. Peel off the white paper on the double-sided sticker before attaching the stars.

TIP: Try filling in some of the areas between the constellations you've created to make a stunning outer-space scene!



DID YOU KNOW?

Stars that emit a bluish color are burning at hotter temperatures than stars that give off a reddish color. The Sun, with its yellow and orange glow, burns at a temperature somewhere between stars that are visibly blue or red.



DAY 24

Paint the Planet Neptune

CONTENTS

- Neptune
- Round magnet

WHAT TO GET

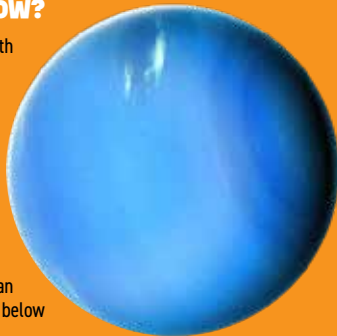
- Paintbrush
from Day 2
- Paint pots
from Day 2
- Cup of water
- Paper towels
- Paper plate or newspaper

See Day 2 for magnet application and painting instructions.



DID YOU KNOW?

Neptune is the eighth planet in the solar system. It's an ice giant like Uranus and is named after the Roman god of the sea. It has the strongest winds of any planet, pushing clouds of frozen methane gas at speeds over 1,200 miles per hour (2,000 kph). Scientists also believe that an ocean of boiling water rests below its thick, frozen atmosphere.





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