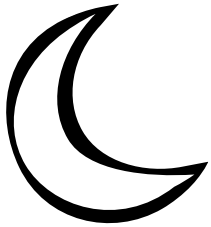
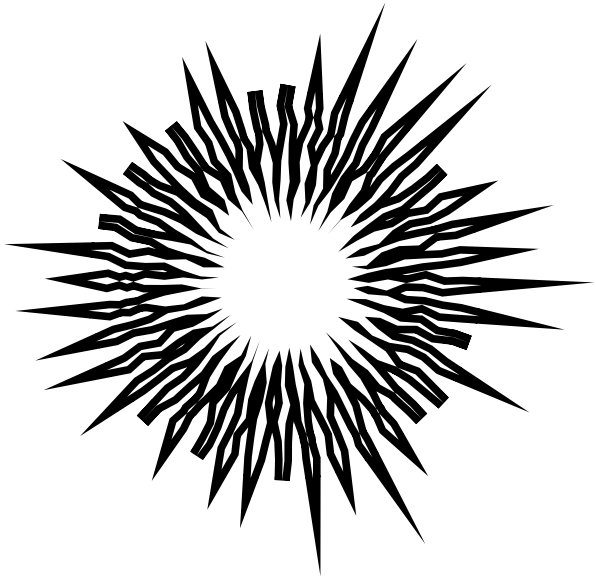
CLASSROOM ACTIVITY

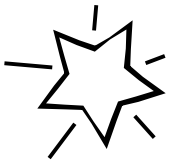




A Magical Sky

Discover the daytime and nighttime sky!

General Information



★ Grade level: Preschool and elementary cycle 1

★ Students per group: Individual activities

★ When: Before the Planetarium visits your school

★ Duration: One or two 50-minute periods

★ Where: In class

★ Type of activity: Discovery

★ Subjects covered: Science and Technology — Visual Arts

★ Essential knowledges:

> **Preschool**: Cognitive and metacognitive strategies (observing, exploring, comparing, questioning); learnings related to cognitive development (the arts, mathematics, science and technology, concepts related to space and quantity).

> **Cycle one**: **Science and Technology** — constellations; stars; Sun-Earth-Moon system; solar system; terminology related to an understanding of living things, the material world, the Earth and the Universe. **Visual Arts** — produce individual works in the visual arts.

★ Subject-specific competencies :

> **Preschool**: To perform sensorimotor actions effectively in different contexts; to communicate using the resources of language; to construct his/her understanding of the world; to complete an activity or project.

> **Cycle one**: **Science and Technology**: To explore the world of science and technology; to become familiar with elements of the language specific to science and technology — **Visual Arts**: To produce individual works in the visual arts.

★ Cross-curricular competencies: To use information; to solve problems; to exercise critical judgement; to use creativity; to adopt effective work methods; to communicate appropriately.

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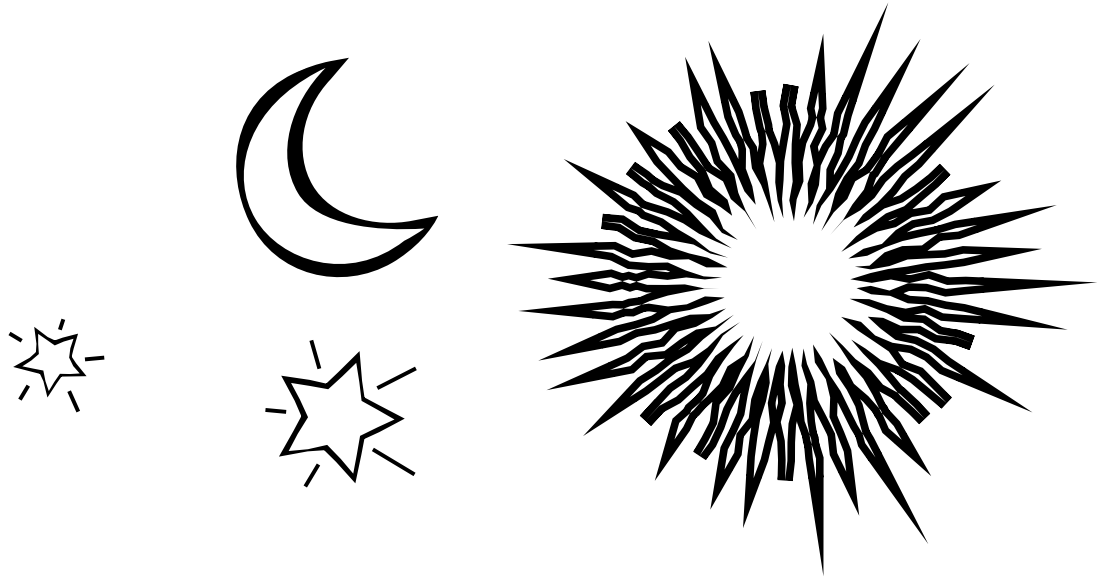


Goals

The aim of our activity *"A Magical Sky"* is to develop children's interest in observing the sky, both during the day and at night. Students will discover the Sun, clouds and rain, as well as the secret of the rainbow. In the night sky, they'll ponder the stars and constellations, examine the lunar phases and meet the planets.

The games and drawing activities in this document explore the different topics covered in the show. These activities can be used to prepare kids for the Planetarium's visit to ypur school.

Steps in the Activity

Advance Preparation

Make enough copies of the activity sheets (one copy per child).

Supplies

For each student:

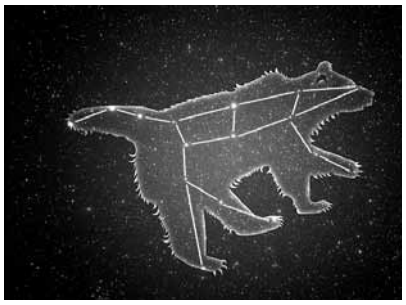
- Copies of the activity sheets
- Crayons

Procedure

Hand out one activity sheet at a time to the class. Introduce the activity by asking what the kids know about each phenomenon or topic addressed. Next, describe the activity and then give the kids enough time to complete it. Those who finish first can colour in the drawings while they wait for the others to wrap up. Repeat the same steps and hand out the next activity sheet.

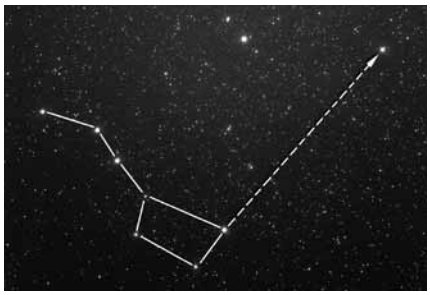
Basic Concepts

★ Activity 1: **The Great Bear and Little Bear** (Ursa Major and Ursa Minor)



In the northern hemisphere, Ursa Major (the Great Bear) is surely the easiest constellation to spot in the sky. But don't confuse Ursa Major with the group of seven stars called the Big Dipper. This "asterism" is only one part of Ursa Major: the dipper's handle and bowl form the bear's tail and hindquarter.

The Big Dipper is helpful for finding the North Star (Polaris). Simply locate the two stars forming the side of the dipper opposite the handle. Extend an imaginary line upward five times the distance between these two stars, and you'll reach the North Star. Polaris is always located directly above the north on the horizon. If the students are observant, they may have noticed that Ursa Major and Ursa Minor sport remarkably long tails whereas earth-bound bears have a very tiny tail. Here's why…

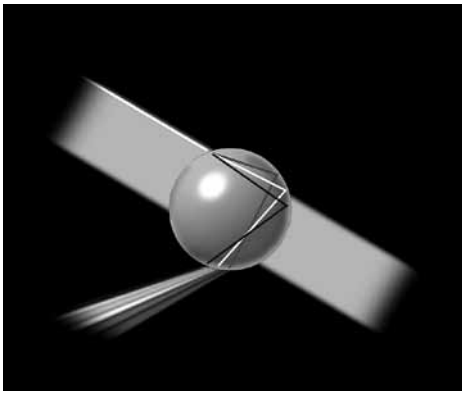


Zeus reigned as the King of Olympus, the the home of Ancient Greek Gods. Despite his love for his wife Hera, he always had a roving eye. One day, he seduced a very beautiful nymph named Callisto and she bore him a son, Arcas. Unfortunately, Hera found out about Zeus' indiscretion with a mere mortal and flew into a violent rage, vowing revenge. To protect Callisto, Zeus changed her into a bear and hid her deep in the woods.

Several years later, Callisto saw her son Arcas walking in the forest. She rushed toward him to kiss him. However, Arcas could not recognize his mother and thought the bear was attacking him. He aimed his bow and arrow at Callisto and was about to kill her when Zeus intervened once again: He changed Arcas into a bear so that mother and son could be reunited at last.

To protect them both from further dangers, Zeus grabbed them both by their tiny tails, spun them above his head and threw them far into the northern sky. This is why the bears' tails are elongated. And that is why we see Ursa Major and Ursa Minor side by side every night above the northern horizon.

★ Activity 2 and 3 : **Rainbows**



Rainbows are a phenomenon in which sunlight is separated into its different coloured components. A similar phenomenon occurs when white light passes through a prism and divides into a colourful spectrum from red to violet. In the case of a rainbow, water droplets suspended in the air after a rainfall act as tiny prisms.

As light enters these raindrops, it bends (a phenomenon known as refraction). Each colour making up the Sun's white light is bent (or refracted) at a different angle. Red is the colour that bends least; blue is the colour that bends most. These different refractions cause the colours to spread out side by side in the rainbow spectrum.

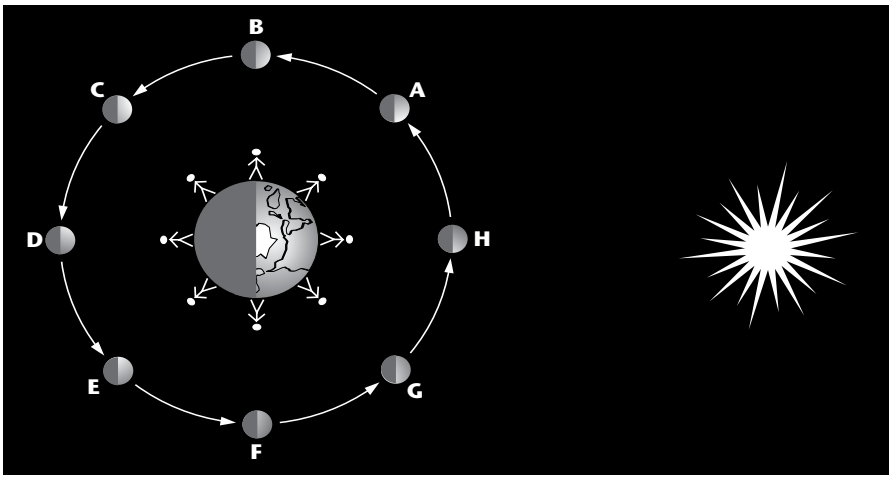
After entering the raindrop, the refracted light is reflected at the back of the drop, exiting almost in the opposite direction from which it came. That's why to observe a rainbow, you must have the Sun behind you and the raindrops in front of you. Also, the Sun must be fairly low on the horizon. This explains why rainbows occur mostly in the morning or late afternoon and rarely in the middle of the day.

Rainbows can form not only after a rainfall but also in the mist created above a waterfall or in the water shooting from a hose fitted with a fine-spray nozzle. In fact, you can easily create a rainbow in your garden: Simply stand with your back to the Sun in the morning or late afternoon and spray a fine mist above your head. A rainbow will appear in the cloud of water droplets.

★ Activity 4: **The Moon's Phases**

As we all know, the Moon's appearance changes nightly. To understand the mechanisms of the lunar phases, bear in mind that the Moon doesn't produce its own light. Instead, it acts more like a ball, reflecting the light cast by the Sun. One half of the Moon is lit by the Sun, while the other half remains in darkness. Yet the lit half isn't always turned exactly toward the Earth. As the Moon orbits the Earth, it reveals its lit side from different angles. How we on Earth see the portion of the Moon lit by the Sun determines the lunar phase.

For example, if the Moon shows us half of its lit hemisphere and half of its dark hemisphere, we see a half Moon in the sky (as in the first and last quarter phases, **B** and **F** in the illustration below). If the Moon presents its lit side fully toward Earth, we see a round disc or a full Moon (**D**). If, however, the Moon presents its dark side toward Earth, it disappears from the sky and forms a new Moon (**H**).



The Earth-Moon system seen from far above the Earth's North Pole.

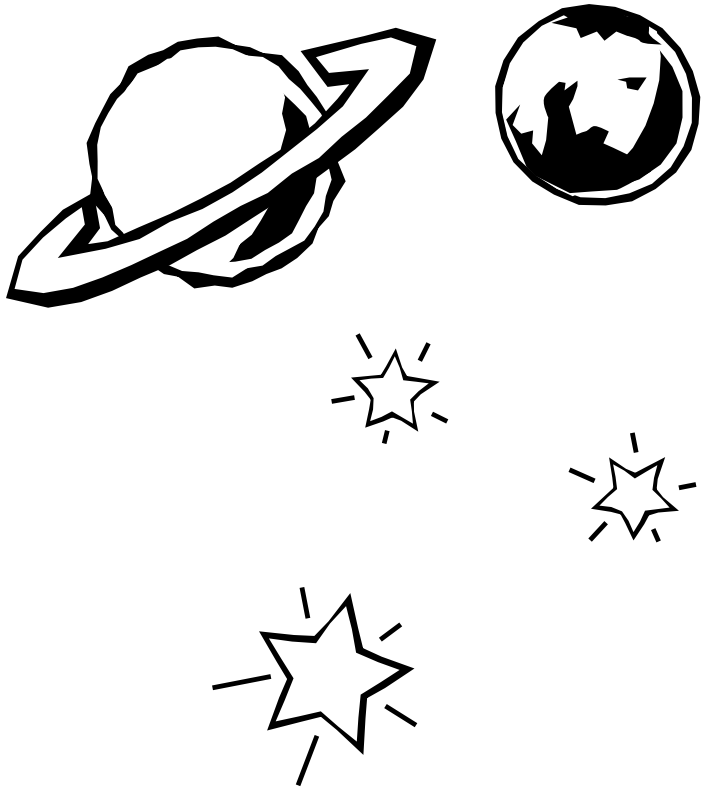
What we see from the Earth.

★ Activity 5: **The Planets**

Our solar system contains one star (our Sun) around which the eight planets revolve. Here's a good mnemonic to remember their order starting from the Sun: **M**y **V**ery **E**xcellent **M**other **J**ust **S**erved **U**s **N**achos! The first letter of each word is the first letter of each planet (**M**ercury, **V**enus, **E**arth, **M**ars, **J**upiter, **S**aturn, **U**ranus, **N**eptune).

The planets are divided into two families depending on their composition. First, there are terrestrial (or **telluric**) planets with characteristics similar to the Earth's. These planets have a hot, dense metal core, a rocky, fairly elastic mantle, and a solid, fairly thick crust. Mercury, Venus, the Earth and Mars are terrestrial planets.

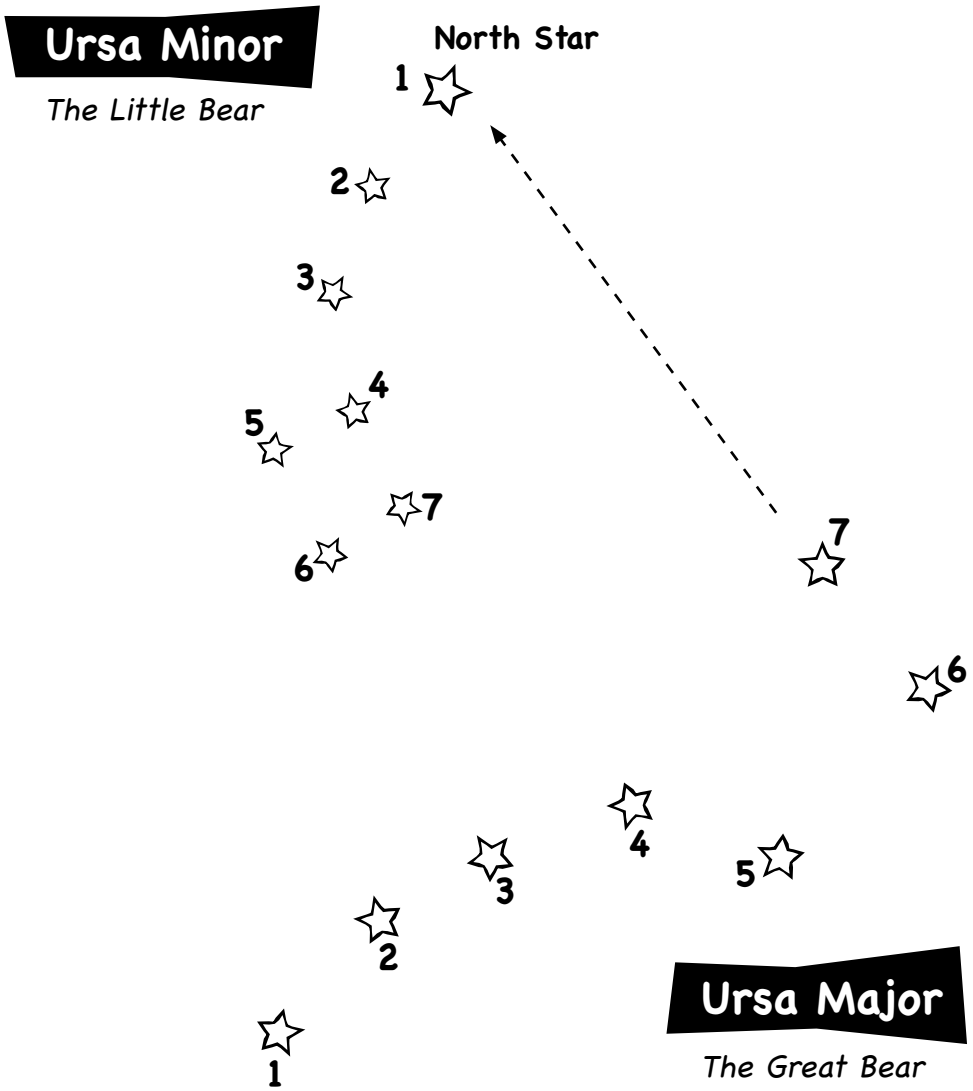
The second group consists of the **Jovian** planets, which have characteristics similar to Jupiter's. These giant planets — Jupiter, Saturn, Uranus and Neptune — are made up mainly of gas, especially hydrogen and helium. Yet they probably have solid cores of rock and ice that are about the size of the Earth. The enormous atmospheres of these planets account for their impressive sizes.



URSA MAJOR AND URSA MINOR

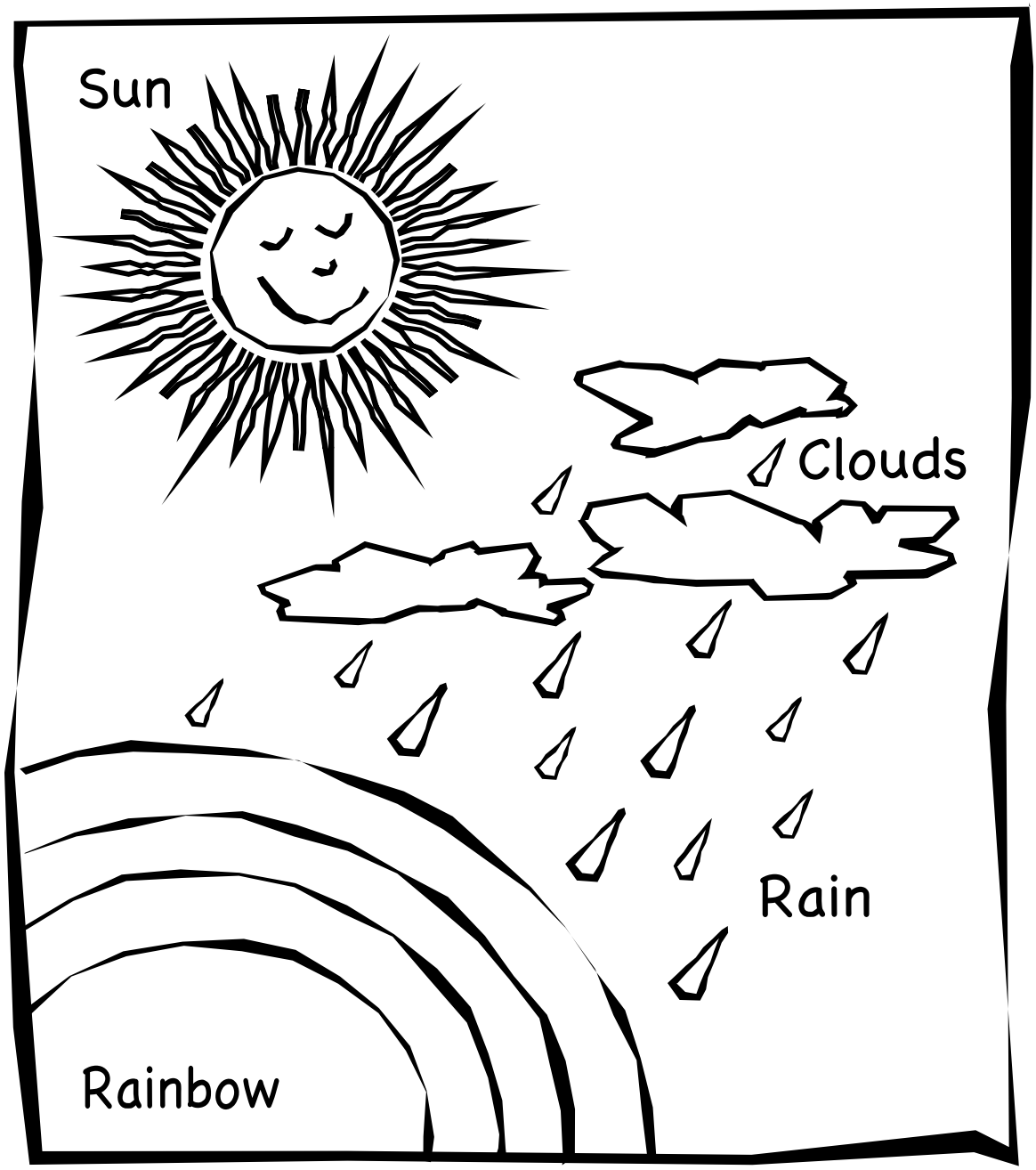
★ Activity 1

Connect the stars 1 to 7 and discover the shape of these two constellations. Can you find Polaris, the North Star?



⋆ Activity 2

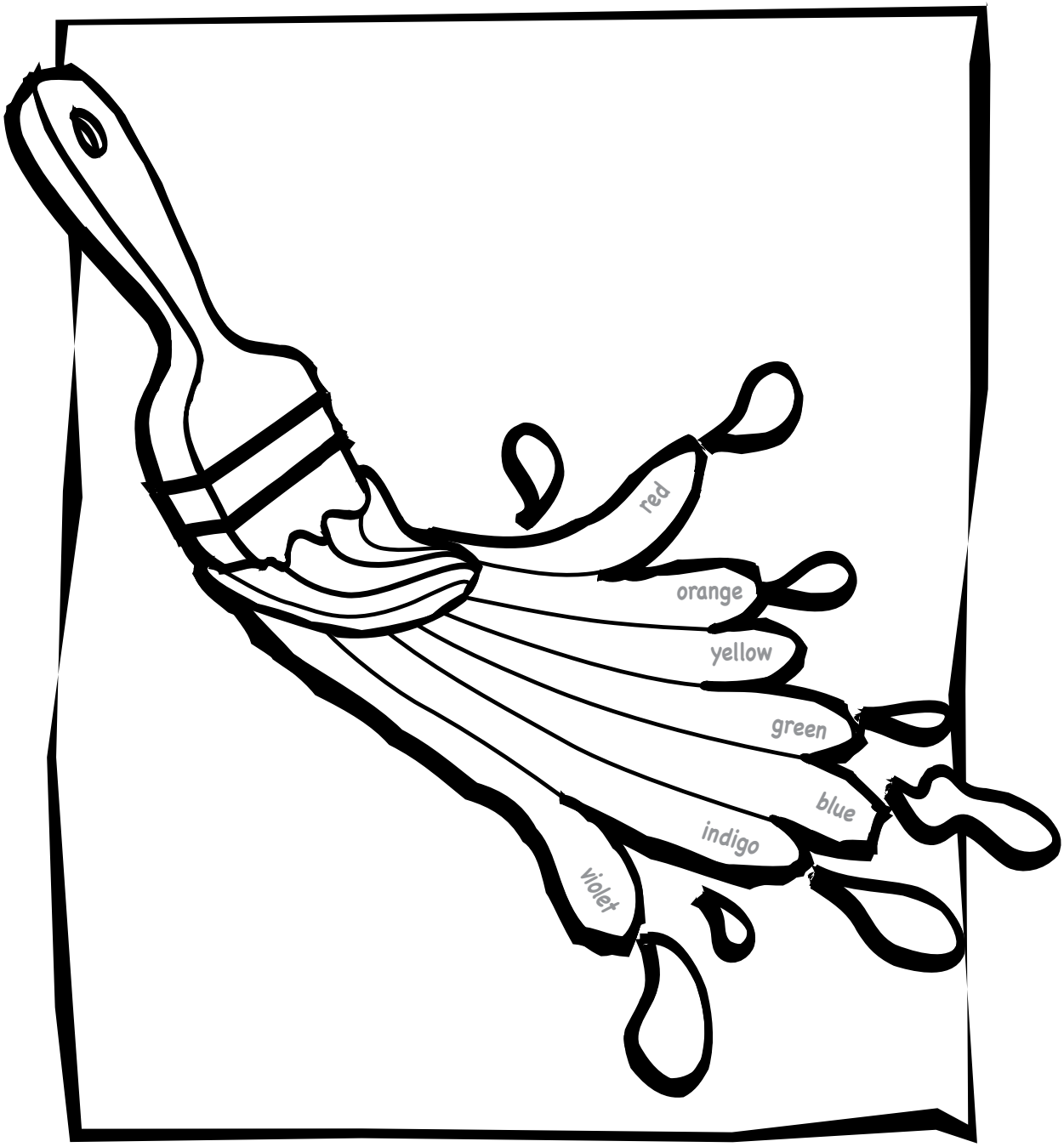
Colour this drawing.



THE RAINBOW'S COLOURS

⋆ Activity 3

Colour this drawing of a rainbow's spectrum.



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LUNAR PHASES

⋆ Activity 4

Match the shape on the right with the phases of the Moon.

Waxing crescent

First quarter

Full Moon

Last quarter

Waning crescent

Chocolate chip cookie

Orange slice

Apple slice

Croissant

Banana

⋆ Activity 5

Complete the names of the eight planets in the solar system with help from the list below. Colour the planets.

Jupiter	Neptune	Venus
Mars	Uranus	Earth
Mercury	Saturn