



ACTIVITY BOOK

by

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1. Exploring the tactile Moon model.

Objective:

With this activity participants will explore the tactile Moon model and learn how to use it.

Age: Any

Duration: 10 minutes

Materials: Tactile Moon

Activity Description:

a. Procedure:

- *Step 1:* Present the tactile Moon to the participants and let them feel it.
- *Step 2:* Demonstrate how to find the North Pole by locating the “T” shape.
- *Step 3:* Demonstrate how to find the separation structure between one side of the Moon and the other.
- *Step 4:* Demonstrate how to follow the separation line and find the opposing pole on the bottom of the Moon without the “T” shape. (*That is the south pole of the Moon.*)
- *Step 5:* Guide the participants to return to the North Pole (stress again the “T” shape) and demonstrate how to turn the “|” in the “T” shape towards them. Tell them to consider this as the near side of the Moon (side facing towards Earth).

b. Let's analyse:

Take the Moon and turn it around, then present it back to the participants and ask them:

- Where is the North Pole located?
- Which side of the Moon is turned towards us (Earth)?
- Which side of the Moon is turned away from us (Earth)?

Introductory ideas to tell the participants:

- The Moon is our only natural satellite. Other planets, such as Jupiter have about 67 Moons or none at for planets Mercury and Venus.
 - The Moon is at a distance of about 384 400km – about 30 Earths fit in that space!
 - It has a diameter of 3 474km – a bit less than 1/3 of the Earth.
 - Moon goes around the Earth in 27.33 Earth days, same time that takes to turnaround itself! That is why we always see the same side of the Moon from Earth.
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2. The Moon - Surface

Objective: This activity shows the Moon geography and its main characteristics. The participants will explore the tactile Moon model and learn how to recognise craters, mountains and *maria* by touching.

Age: 6 – 12

Duration: 15 minutes

Materials: Tactile Moon Model

Activity Description

a. Procedure:

- *Step 1:* Present the tactile Moon to the participants and ask them to turn the near side of the Moon towards them.
- *Step 2:* Demonstrate how to find the first feature: a crater. (Examples: *Aristarchus, Kepler or Copernicus*)
- *Step 3:* Demonstrate how to find the second feature: a *mare*. (Example: *Mare Serenitatis, Mare Imbrium, Mare Tranquillitatis or Oceanus Procellarum*)
- *Step 4:* Demonstrate how to find the third feature: a *mountain*. (Example: *Monte Carpatius near Mare Imbrium, Monte Caucasus between Mare Imbrium and Mare Serenitatis*)

1. Let's analyse:

Take the Moon and turn it around, then present it back to the participants and ask them:

- Can you pinpoint other craters and *maria*?

Introductory ideas to tell the participants:

- There are different features at the surface such as craters, *maria* and mountains.
- The Apollo crater on the south pole of the far side of the Moon is the largest with 135km in diameter.
- When Galileo observed the Moon through the telescope back in 1610 he distinguished bright and dark regions and concluded *maria* were the dark regions and craters were the bright regions.
- Due to dark lava from ancient volcanic eruptions, some regions look dark in colour. The bright regions are more elevated and with a lot of craters. The craters are depressions/holes formed by the impact of meteorites or volcano eruptions.

- We can also find in the surface of the Moon mountain chains. These project shadows by being lighted on the Sun surface.
 - Mare Tranquillitatis was the first landing spot on the Moon back in 1969 by the first astronauts from the Apollo. The second one was Oceanus Procellarum.
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3. The Moon - Phases

Objective: With this activity the participants will explore the tactile Moon model and learn about the Moon phases and how they occur.

Age: 10+

Duration: 20 minutes.

Materials: Tactile Moon Model, Black (wool) cloth (or any kind of fabric that can cover the Moon partially or completely).

Activity Description

1. Procedure:

- *Step 1:* Present the tactile Moon to the participants and let them explore it.
- *Step 2:* Ask the participants to find the near side of the Moon (as explained on a prior activity) and stress the idea that they can feel the entire surface as we can see on a full Moon from Earth.
- *Step 3:* Cover half of the Moon with a black cloth and stress the idea that now they can only feel half of the Moon. This is a Moon phase as we see from Earth when a part of the Moon is lit up by the Sun.
- *Step 4:* Take the wool cloth and cover the Moon sequentially showing the different phases of the Moon and stress the Sun position at each time.

2. Let's analyse:

Introductory ideas to tell the participants:

- We do not always see the same full face of the Moon. The Moon goes through different phases where we can see more (or less) of its surface. This is due to the fact that the Moon, just like Earth, is illuminated by the Sun.

- As the Moon revolves around the Earth the half that is illuminated varies. But the illuminated part isn't always faced toward us.

4. The Moon - Eclipse

Objective: With this activity the participants will explore the tactile Moon model and learn about the Moon eclipses.

Age: 10+

Duration: 15 minutes

Materials: Tactile Moon Model, Black (wool) cloth, Red (linen) cloth (or any kind of fabric that can cover the Moon partially or completely and can be distinguished by touch from the black wool cloth used for Moon phases).

Activity Description

1. Procedure:

Step 1: Present the tactile Moon to the participants and let them explore.

Step 2: Ask the participants **to find the near side of the Moon** (as explained on a prior activity) and stress the idea that they can feel the **near side** as we can see on a full Moon from Earth.

Step 3: Take the **wool cloth** and cover the Moon sequentially to show the beginning of the eclipse.

Step 4: Remove the **wool cloth** and cover the Moon completely eclipse with the **linen cloth** to show the total eclipse.

Step 5: Remove the **linen cloth** and place the **wool cloth** again over the whole Moon. Uncover the other half of the Moon sequentially to show the end of the eclipse, uncovering the moon gradually.

2. Let's analyse:

Introductory ideas to tell the participants:

- A Moon eclipse occurs when the Moon, Sun and Earth are in a straight line. Then the Earth covers the Sun light and shadows the Moon.

- Three types of Moon eclipses: total, partial and penumbral.

- Earth's shadow consists of two parts: an umbra which is the central region of shadow and the penumbra which is the outer region of the shadow.

- A partial lunar eclipse occurs when a part of the Moon enters the central region of the shadow.

- A penumbral eclipse occurs when the Moon passes through Earth's outer region of the shadow.

- During a total lunar eclipse, the Moon turns red at its maximum (**linen cloth** used to cover the moon).

5. The Sky in your Hands

Objective: This is a Voyage across some of the most famous constellations in the Northern Hemisphere and the mythological beings that the Greeks invented for them.

Age: Any

Duration: 45 minutes

Materials: CD player or Script and half sphere

Activity Description

1. Procedure:

Step 1: Keep the half sphere on your lap with the rough square facing you

Step 2: Play the CD or read the script aloud

Step 3: Follow the instructions from the narration

2. Let's analyse:

- Which constellation did you like best?
 - What did the constellations drawing reminded you of? Try to come up with other names for the constellations.
 - What happens to biggest stars in the sky, how do they die?
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6. Create an Astronomical Story

Objective: Introducing the mythological characters in 7 constellations of the half-sphere and creating new constellations stories.

Age: All ages

Duration: 15 minutes

Material: half-sphere and/or the pictures of constellations in this booklet, the planetarium show's CD, and high contrast photos of constellations (if available).

Activity Description:

1. Procedure:

Step 1: Select one constellation, touch it on the half-sphere or on this booklet, look at the pictures.

Step 2: Listen to its story on the CD.

Step 3: Invite participants to make up their own characters and stories about the constellation.

2. Let's analyse:

The figures we see in constellations are reflections of the myths in different cultures.

- The constellation characters vary among different cultures. Which ones do you know from your cultural tradition?
 - Tell some of the mythological stories in your sky
 - What kind of characters are predominant in the constellations seen by your people? Are they warriors, animals, rivers or mountains? What do they tell you about your society, culture and traditions?
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7. 3D Constellations

Objective:

When we see or touch stars of the constellations, they appear in the same distance. But these stars are not at the same distance. Some are near and others are very distant from Earth.

Age: All ages

Duration: 20mins

Materials: Half-sphere and/or this booklet's pictures of constellations, and the kit's 3D constellations.

Activity Description: In this activity we are going to compare the apparent constellations shape on the half-sphere or pictures with their real one in the 3D models.

1. Procedure:

Step 1: Place the half-sphere or picture on a table. Let the participants explore it by touching.

Step 2: Choose one of the 3D constellation models provided in the kit, and let the participants explore it by touching.

Step 3: Compare the 3D constellation with the same one in the half-sphere or picture.

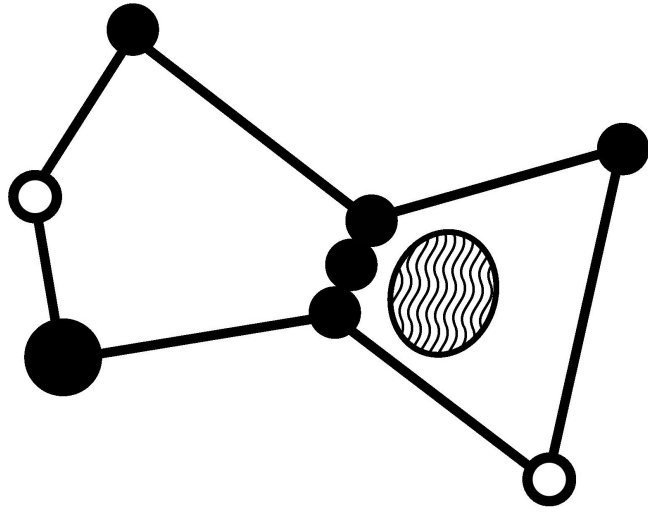
2. Let's analyse:

- Are the constellation shapes in the 3D models the same as the ones you feel on the half-sphere?

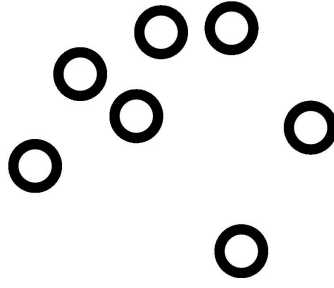
- What is the difference? Why?

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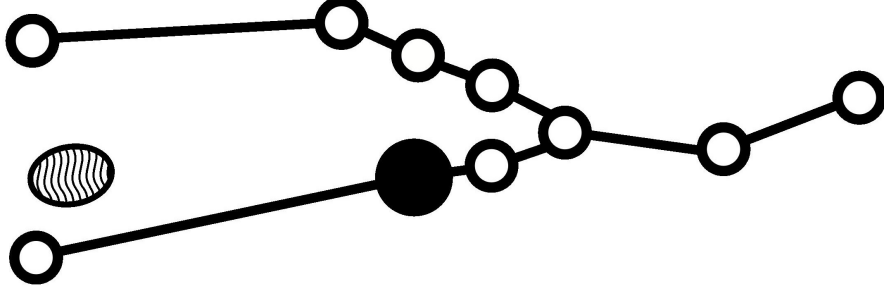
ORION



PLEIADES



TAURUS



● Brighter stars

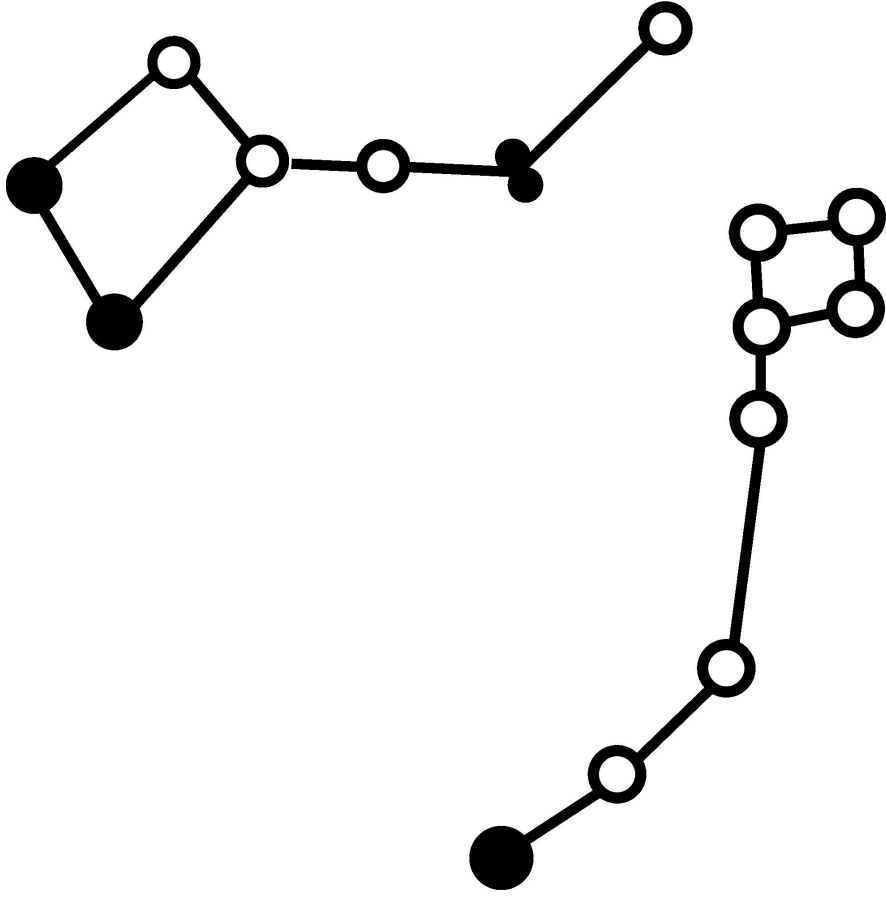
○ Dimmer stars

☉ Nebula

— Constellation connecting lines

URSA
MINORIS

URSA
MAJORIS

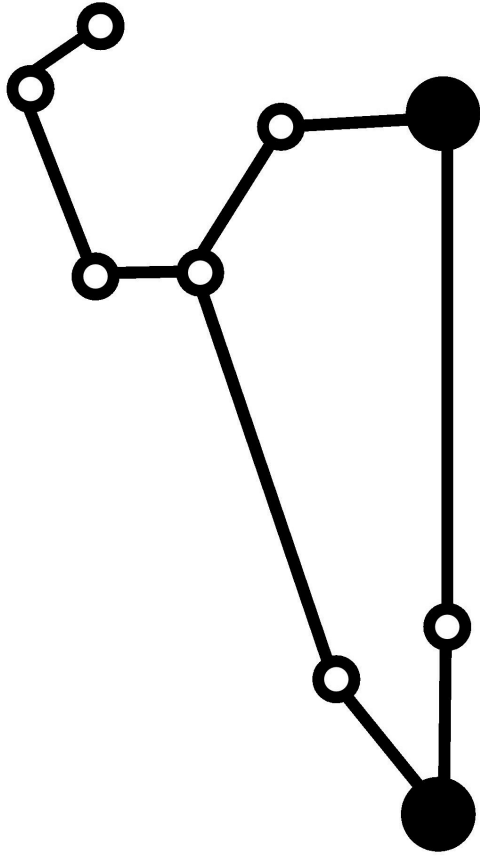


● Brighter stars

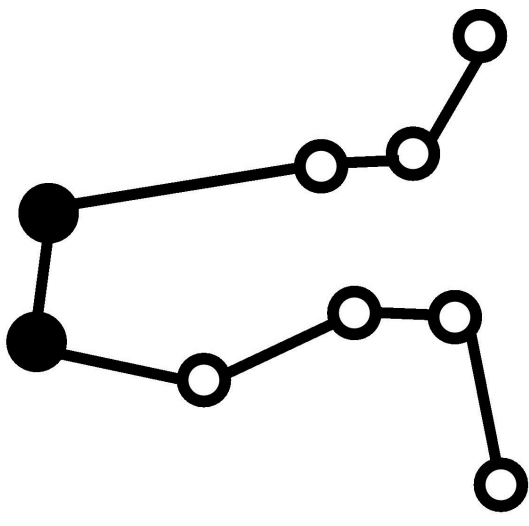
○ Dimmer stars

— Constellation connecting lines

LEO



GEMINI



Brighter stars



Dimmer stars



Constellation connecting lines