

Background information

Title: “The Moon phases”

Brief Description: Through this inquiry-based activity students will understand the Moon phases and how this phenomenon is affected by the position of the Earth and the Sun.

Keywords: Moon phases, Earth, Sun, shadow, rotation

Target audience: 6th grade Primary school students

Age range: 11-12 years old

Context(s): School

Time required: 45'-60'

Technological tools required: MetAclass app, tablet/smartphone, model markers

Authors background: General education Primary school Teacher

Connection with the curriculum: This scenario is aligned with “Unit A: The Earth as a celestial object” of the new curriculum for 6th class of Primary School.

Learning objectives:

- Understanding the phases of the Moon and the reasons behind them.
- Exploring the orbit of the Moon

Materials:

- Three-dimensional models of the Earth, the Sun and the Moon
- Mobile phone or tablet with augmented reality application.
- AR markers
- Pictures the Moon in different phases

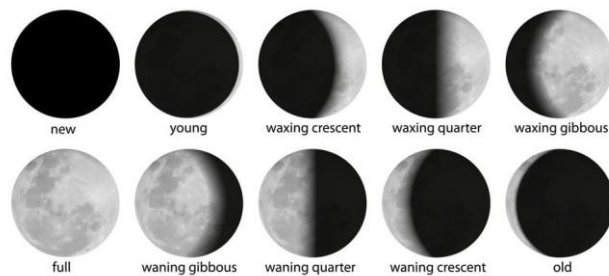
Guidance for preparation: upload scenario to student’s devices, follow the steps of this guide.

THE MOON PHASES

1. Setting the scene

Begin with a brief discussion about the phases of the Moon and how the appearance of the Moon changes during the month. (Sample Questions: How many times have you seen a full moon? How often you can observe a full moon? What does the night/moon look like when a full moon occurs?)

Display images that illustrate the various phases of the Moon.



Spark student's curiosity by providing teams with the Moon's marker to explore using the AR application.

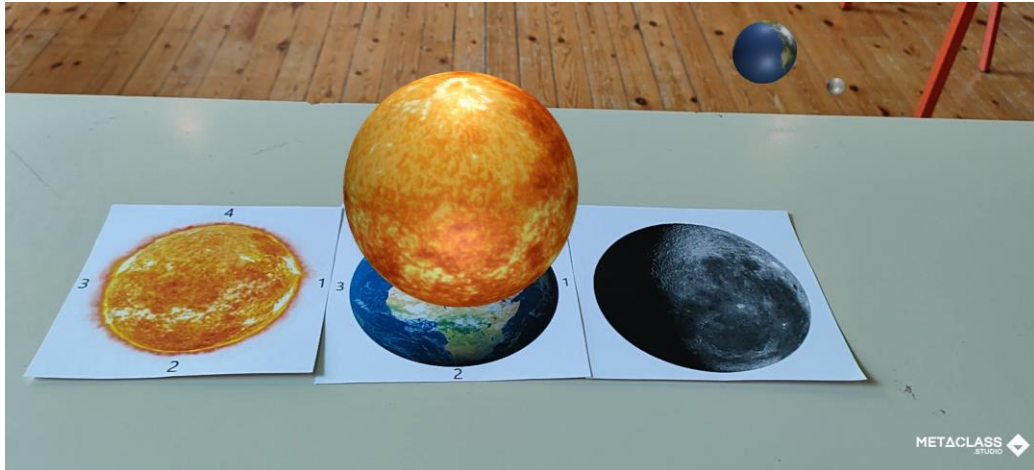
2. Look around

Provide student teams with the marker of the Earth and the Sun.



Start a discussion about the Moon's movement around the Earth and ask students to simulate that movement by combining markers of the Earth and the Moon.

Ask teams to combine the three markers and observe the new system of the Sun-Earth-Moon model, with a focus on the Moon. Discuss how our perspective changes as the Moon orbits the Earth.



3. Investigation

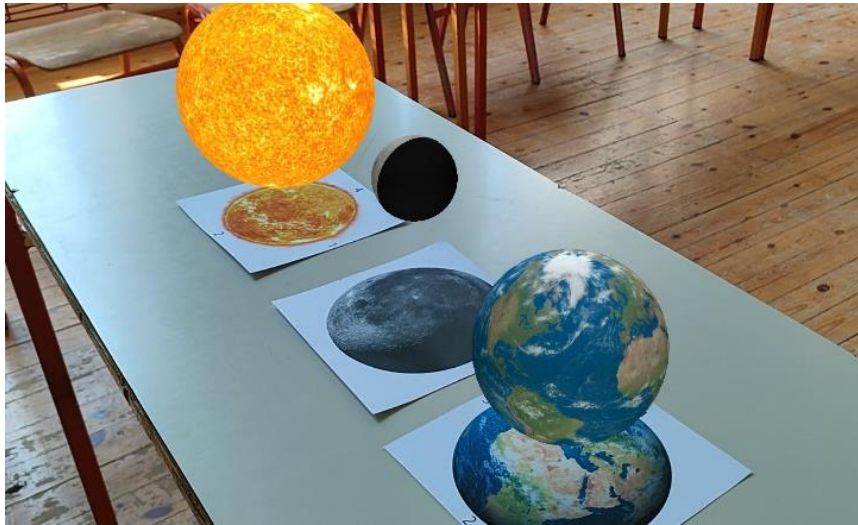
Part 1

Have students in groups use the augmented reality application to align the 3D models of the Earth and the Sun (Earth's number 3 on marker faces Sun's marker). Place the Moon's marker (use half-moon model) in position number 1 on the Earth's marker aligning the Sun with the bright side of the Moon. Ask students to change their view and observe the Moon from the Sun. Ask them to observe how the Moon looks from the Sun (bright, dark, half-bright). Continue by asking them to change their view again and observe the Moon from the Earth. How does the Moon look from the Earth? Choose the right image from the Moon's phases collection images.



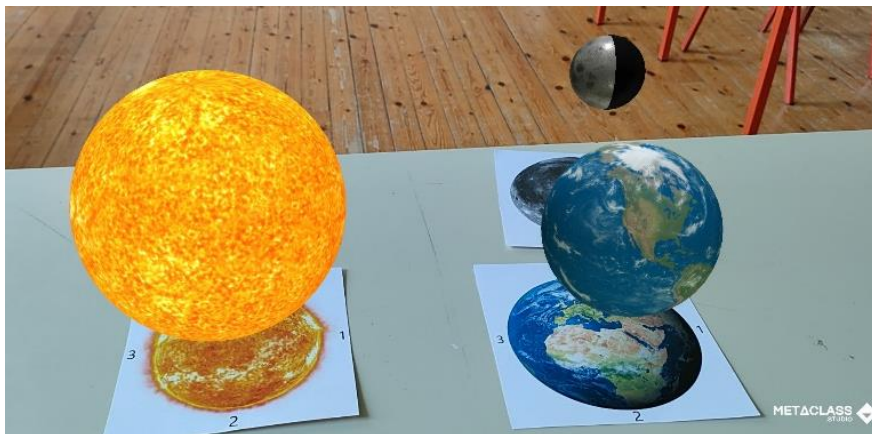
Part 2

Ask students to rotate the Moon around the Earth and place the marker between the Sun and the Earth (position number 3 on Earth's marker). Encourage them to observe the Moon from the Sun and describe how the Moon looks like. Ask them to observe the Moon from the Earth and select the correct image from the Moon's phases collection images.



Part 3

Have students rotate the Moon around the Earth and place the digital model in position number 2 and in position number 4 on the Earth's marker and note how the Moon looks like when observed from the Earth.



Ask students to gather evidence about different views of the Moon while rotating the Earth, by capturing images of the digital models and demonstrate them in an image canvas.

4. Communication and discussion

Start a discussion about the different views and how our perspective changes as the Moon orbits the Earth.

Discuss how the phases of the Moon are affected by its position in relation to the Sun and the Earth, along with the role of shadows in the Moon phases.

Have each group share their creations and explain how they used the models to replicate the phenomenon.

Conclude the lesson by highlighting the importance of experimental learning and exploration for understanding natural phenomena.