Design Thinking with the Moon

School: none
Teacher: NUCLIO
No of students participated: as many as teacher wants
Subject domain:

Contact info

Feel

In this project, students will be invited into connecting to the Moon cycle by observing the Moon appearance and position in the sky during one month. Students will be creative and artistic, creating a Moon journal with drawing made from the moon every single day (with exception of cloudy days) and will compare their results with those of other students from different regions of the world. Throughout the process students will raise questions about the configuration of the Earth-Moon-Sun system, think about eclipses and take some conclusions about the shape of our planet.

In the FEEL phase of a Design Thinking process, students are invited into deeply learning about the topic and the problems associated. It is also the time where student are invited into contacting with their community to evaluate their level of knowledge of the topic or problem and give use to their expertise in order to solve those problems.

STEP 1: Brainstorming about the Moon

Students will discuss about the moon, its appearance, time and position in the sky. Below are a few questions that can be raised:

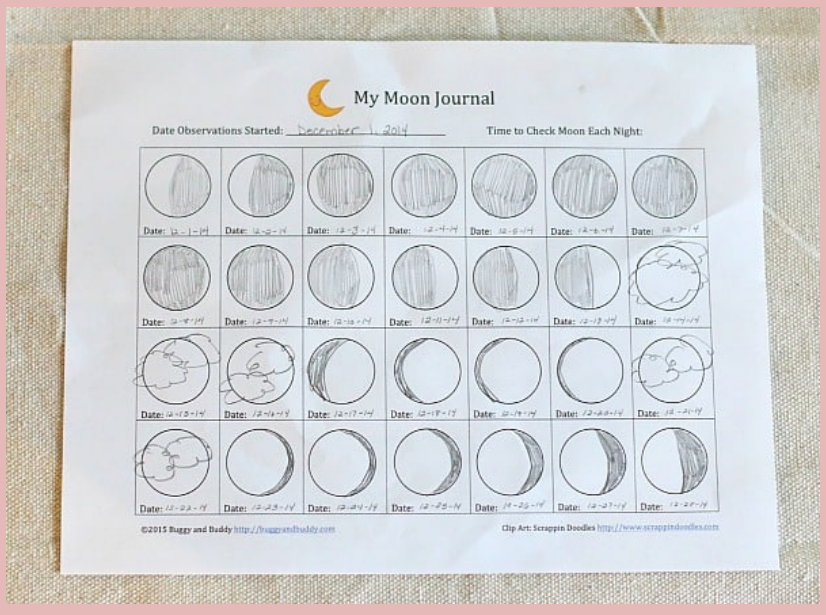
- Is the Moon shape the same everyday?
- When is the Moon visible in the sky?
- Is it possible to discern any features on the Moon surface?
- Does the Moon always show the same face to us?
- What path the Moon traces in the sky?
- How long does it take for the Moon to repeat its cycle?
- Is there night and day in the Moon?
- What is Moonlight?
- What are moon Eclipses?

First, students should try to answer these questions based on their own knowledge. After this first try, students will be invited to discuss these questions with their families and communities. A summary of their findings after this interaction should be posted on the collaborative platform.

STEP 2: Investigation proposal to address such questions

Students will be asked to perform three types of investigation activities:

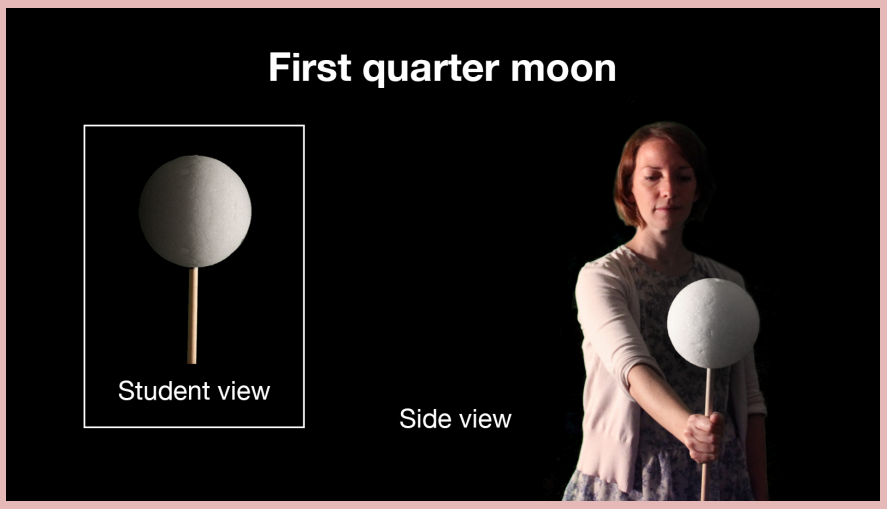
1. The **first activity** is a practical project. During one month, students will keep a daily observation log registering when they saw the Moon in the sky and how was its appearance. The final product will be a Moon Journal with drawings of the moon as they observe it.



You can download a template here

2. The **second activity** discusses Moon phases and can be executed in the classroom. In a dark room, a styrofoam ball representing the Moon, and a light source representing the Sun, students will be able to simulate the changing appearance of the Moon during a full cycle. In

alternative or in addition, they can use the moon phases simulator.



3. In the **third activity**, students will learn how to use astronomical software (such as Stellarium) to simulate a lunar cycle and compare the simulations with their observations.

STEP 3. Collaborating with students from other locations: investigating globally

Globallab is a platform where students can introduce data they have collected, by answering to a form, and then compare it with the same data collected by students all over the world.

Using this platform, students will be able to compare their registers with other participating schools in different regions of the world. It is expected that this comparative study will raise discussions about the different appearance of the Moon in these different locations at the same time, especially locations in different hemispheres.

In case you don't have parent consents, you can create code names for the students and make sure your students use the codes and don't add any personal information in the platform. Each students should create an account and add the information collected.

You can find the project here: https://globallab.org/en/project/cover/my_moon_journal.en.html#.XoYeo4hKg2w

Keeping record

During the process, students should record all the details of their research and make the photographic record and if they want, make short videos of the activity.

Students should keep a constant record of their work here in their OSOS project, including pictures of the whole process and print screens of their most relevant graphics, maps, etc.

Imagine

By now, students have learned deeply about the problem and have gathered all the information they need to start thinking about solutions and creative ways to share their knowledge with the community.

STEP 1. Contacting the community

Students should contact with their families, neighbours, general community members to inquire them about their knowledge on this issue and the shape of our planet. They can create a survey so that all students in the class collect the same data from their families and then create graphics and other materials to showcase the level of knowledge in their community.

STEP 2. Thinking about how to share their knowledge

Students may feel puzzled by the fact that the Moon’s appearance is not identical in different regions of the world and they will probably want to share this discovery with with others. Also, it is expected that they arrive at the conclusion that observations indicate that we live on a spherical planet.

After students have learnet about the topic and the level of knowledge of their community, they should start thinking about how to share this ith others. Here they can be creative and come up with different ways to share. Artistic ways should be encouraged, like thinking about an Earth-Moon-Sun system model that explains these differences as well as the occurrence of eclipses. In this activity, the design of such model is recommended, however together, teachers and students can decide to create something else, if it will be more adjusted to their needs and to their community.

Create

Summarize the findings and build a model

At this stage, students should design a realistic model of the Earth-Moon-Sun system that explains lunar phases and eclipses. They will be asked to build such a model. The teacher and students should decide whether or not they will build a scale model and if so, what conditions will they need to do so. If students decide not to build a scale model, they should pay attention to build the earth, sun and moon in the same size and make it clear that it is not to scale.

As mentioned before, students can choose any other creations to share their knowledge with their community.

Share

Sharing with others

Using the model they have built (and / or other products they have created), students can invite their families and community and share with them their new acquired knowledge about the Moon-Earth-Sun system. Alternatively, they can make a video where they use this model to explain how this system works and the fun facts they have learned, publish it on youtube or other platform of their choice and share it with their families and communities.

Creating a legacy

Students should write the whole process of their projects so others can learn what they did step by step and recreate the process. This will be their legacy for others.