

Lesson 2 “The Solar System”

Work Sheet

School: Class: Date:

Activity 1: Video projection (3 minutes)

Please watch the video.

Activity 2: Questions of the students (2 minutes)

Please formulate your questions based on the video projection:

1.	
2.	
3.	

Activity 3: Questions of the lesson-teacher (2 minutes)

Why do the planets revolve around the Sun? Which is the main factor for the formation of the structure of the Solar system?

1. Which celestial bodies can we observe in the Solar system, besides the planets?
2. Which professions are related to Astronomy?

Activity 4: Answers-hypotheses of the students (5 minutes)

Please write down your answers-hypotheses to the above questions.

1.	
2.	
3.	

Activity 5: Investigation of the 1st question (10 minutes)

The construction presented by your teacher is a model for representing the trajectories of the planets around the Sun.

1. **Trajectory of the little sphere on the plane. What kind of trajectory does the little sphere follow?** Please write down your observations.

2. **Trajectory of a small sphere in curved space.** We place the weight sinker in the ring. **What kind of trajectory does the small sphere follow?** Please write down your observations.

3. The same sphere rolls with a small initial velocity, but with an angle of 90° , in relation to the previous step. **What kind of trajectory does the small sphere follow now?** Please write down your observations.

4. We use 4 spheres. **What kind of trajectories do the small spheres follow now?** Please write down your observations.

² This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 710577

5. **CONCLUSION: Which is the main cause for the trajectories of the small spheres?**

Activity 6: Investigation of the 2nd question (10 minutes)

1. Please classify the planets of the Solar system according to the number of their satellites, by making use of the data in the cards handed to you.

TABLE OF PLANETS-SATELLITES

PLANET	NUMBER OF SATELLITES

2. Please watch the video with the simulation of the orbit of Halley's comet and the simulation of the asteroid belt. Please fill out the gaps in the following text:

The Solar system comprises the Sun, around which the planets and the other celestial bodies revolve. More specifically, units of the Solar system are the..... which revolve around most of the planets, the which follow "elongated" elliptical orbits, and the which are concentrated within

a zone between Mars and Jupiter. Indeed, the 98,8% of the almost 50.000 meteorites found on Earth come from asteroids ¹.

Activity 7: Comparison between the initial answers – hypotheses of the students and the final conclusions of the lesson (5 minutes)

The students in their working groups compare their initial answers with the final conclusions.

Activity 8: Application of the conclusions (2 minutes)

Please choose the right answer based on today's lesson:

Why do the planets have a spherical shape?

- a) Because of gravity
- b) Because of the solar radiation
- c) Because of their atmosphere
- d) Because of the presence of the oceans

Activity 9: Connection of the lesson with vocational guidance (10 minutes)

We want to prepare the foundation of a colony on Mars, which will have to sustain itself. This means that it will have to provide on its own for own of food, water, oxygen etc. Which 4 STEM specialties do you believe that are necessary for such an undertaking and what kind of work do you think that each of them will have to carry? After this, present your proposals to the rest of your schoolmates in the classroom.

STEM specialties (such as physicist, chemist, biologist, technologist, engineer, mathematician)	Work on Mars
1.	
2.	
3.	
4.	

¹ Source: https://www.nasa.gov/sites/default/files/files/Meteors_Meteorites_Lithograph.pdf

⁴ This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 710577