



# TanglIn

**Tangible Programming & Inclusion**

## TanglIn Toolbox

### Characteristics of celestial objects

9-12 years old

Astronomy

Science



[www.tangin.eu](http://www.tangin.eu)

 /tanginproject



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## Summary

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Learn that there are 8 planets in Solar system and know their order according to Sun and memorize the most common characteristics.

Expected duration: **50 min** (the lesson plan duration is flexible, and teachers can adapt them accordingly to their needs and class duration).

## Learning Outcomes

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At the end of the session, students are expected to:

- Better recognize the names of the planets of the solar system;
- Know the order of the planets:
- Name the most common characteristics of celestial objects
- Value STEM areas
- Develop transversal competencies such as problem-solving, communication and reasoning;
- Develop group work skills, namely, to respect and favor the inclusion of all elements, regardless of gender, culture, etc.

## Links With Curriculum Topics

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Covered Curriculum Topics	
Subject	Topics
<b>Engineering</b>	<b>Science</b> Natural sciences <ul style="list-style-type: none"> <li>• Solar System - Planets names and their relative position</li> </ul>
	<b>Mathematics</b> Geometry <ul style="list-style-type: none"> <li>• Localization and orientation – itineraries</li> </ul>
	<b>Technology</b> Programming <ul style="list-style-type: none"> <li>• Concepts of programming</li> <li>• Programs – Results, errors, and troubleshooting</li> </ul> Robotics <ul style="list-style-type: none"> <li>• Programming objects to solve challenges</li> </ul>



## Notes for Teachers

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The teacher should prepare, in advance, all the materials that are needed and the classroom space according to the activities to be developed.






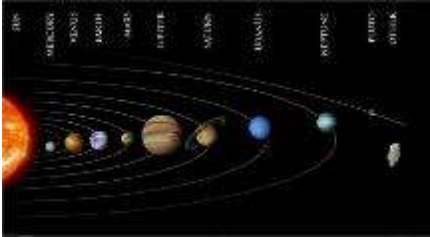
The teams should be as heterogeneous as possible to foster the integration of all students. It's important that clear rules are established in terms of group work. This way, it avoids the most active children assuming the lead and the quitter ones only observing.

To discuss the concept of planets and stars, the solar system and its order (relative position of planets in relation to the sun). The teacher can use several internet resources available - images, videos, etc.






The teacher must circulate through the various groups to support the activities and the dynamics of each one. In the end, it should promote a collective discussion of the main issues focused and the constraints and difficulties experienced.

## Lesson Plan






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Intro	10'	Class	<p>Today's mission is to teach MI-GO that in Solar system there are 8 planets with their own characteristics and to know the earth's nearest Star and introduce who are observing celestial bodies.</p> <p>Explain to class, that in Solar system there are 8 planets which are rotating around the Sun. They are displaced in specific order and on a certain distance from Sun. Introduce class to Earth companion and nearest star. Inform about science which is studying celestial bodies.</p>	



				
Prep.	10'	Group	<p>Divide the class in groups and every group in two teams.</p> <p>Every group get the grid with numbers 1 to 3, question and answer cards and cards with celestial bodies and their names on them. All have to be displaced under the grid. The groups get also the paper for calculations where to calculate points got in one move.</p> <p>The question cards are placed face down and placed on the side of grid. The answer cards are placed face down too so that only question number can be seen (number is on the back side of card)</p>	
Play	10'	Group	<p>Teams decide which one will start and place the robot on the start point.</p> <p>While the first team picks a question, read it, give their answer and tell the number of the question card; the second team take the corresponding answer card and check if it is right. If the answer is right than team programme the bot to reach its goal and register the number of moves If the answer is wrong, than opposing team tell the correct answer, and the failing team programs the bot but it will get 5 penalty points.</p> <p>When the first team finish their move, the second team is taking a second question (a new one, putting aside the question cards that are used).</p> <p>When the end point has been reached, teams are summing up points they got.</p>	



				
Play	10'	Group	<p>Every team is travelling to 6 objects.</p> <p>When all questions have been answered, than teams count their points.</p> <p>Team with smallest count of points – win.</p>	
Sharing	10'	Class	<p>At the end, all groups are sharing their experience and review the planets order together. You can introduce the concept of distance as well.</p>	

## Resources List & Support Material

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### Per each group:

- A robot Kit with drawing capabilities;
- Transparent scenario with a 6x6 grid.
- Question cards (Annex)
- Answer cards (Annex)
- Cards with celestial objects (Annex)
- Numbered field
- Calculations paper (Annex)



MERCURY



VENUS



EARTH



MARS



JUPITER



SATURN



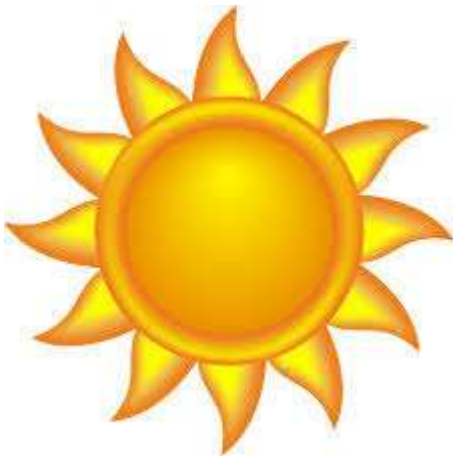
URANUS



NEPTUNE



SUN



MOON



TELESCOPE



ASTRONOME





**START**



QUESTION CARDS.

<p>1.</p> <p>The star placed in the center of solar system and is nearest star to Earth.</p>	<p>2.</p> <p>Only planet inhabited by people.</p>
<p>3.</p> <p>Earth companion.</p>	<p>4.</p> <p>Nearest to the Sun and smallest planet in solar system. It travels around Sun in 88 days.</p>
<p>5.</p> <p>Eighth planet from Sun. Plane tis named after Roman sea god.</p>	<p>6.</p> <p>Second planet from Sun. I tis the third brightest object in solar system after Sun and moon.</p>

7.

Fourth planet from Sun, which is also called "The red planet". It is named after Roman god of war. Planet is described as cold and dry deserts planet.

8.

Fifth planet from Sun. It is gas giant, just like Saturn, Uranus and Neptune. Biggest planet in solar system.

9.

Sixth planet from Sun. It is second largest planet in solar system. Main characteristic is its rings, which contain from ice and dust.

10.

Seventh planet from Sun. It has rings system made of at least 13 thin rings. This planet mainly contains of gas and is usually shown in blue colour.

11.

Scientist who is observing celestial objects.

12.

What is the name of device which helps scientists to observe celestial objects?

ANSWER CARDS.

1. SUN	2. EARTH
3. MOON	4. MERCURY
5. NEPTUNE	6. VENUS
7. MARS	8. JUPITER
9. SATURN	10. URANUS
11. ASTRONOME	12. TELESCOPE

CALCULATION PAPER.

<b>Moves</b>	<b>Calculations</b>	<b>Points got</b>
1. move		
2. move		
3. move		
4. move		
5. move		
6. move		
<b>POINTS COUNT</b>		

GRID DISPLACEMENT.

2 MOON	3	2	1 VENUS	3	1 TELESCOPE
3	2	1 SATURN	3	1	3
2	1	2 SUN	1	3 NEPTUNE	1
1 URANUS	3 EARTH	1	2	1	2 JUPITER
3	1	3	1 MERCURY	2	3
1 ASTRONOME	3	1 START	2	3	2 MARS