

## Activity 1 - The Earth in the Solar System

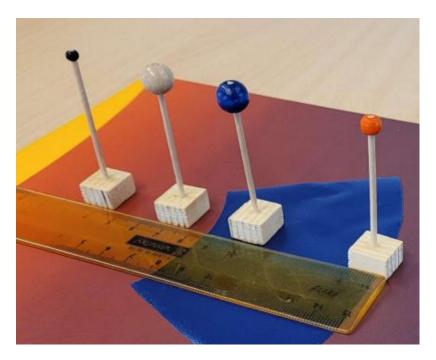
What makes our Earth a habitable planet?

## Part 1: Where is the Earth located in the Solar System?

→ Enter the distances of the planets to the Sun and the position of the habi-table zone into the table.

Planet	Distance from the Sun in AU	Distance in the model in cm
Mercury	0,4	4
Venus	0,7	7
Earth	1,0	10
Mars	1,5	15
Jupiter	5,2	52
Saturn	9,5	95
Uranus	19,2	192
Neptune	30,1	301
Habitable zone (inner edge)	0,85	8,5

→ Place the light-yellow disc on the floor and place the planetary spheres, the habitable zone, and the gas giants at the correct distance along a line on the floor.



## Part 2: What role does mass play in the habitability of the Earth?

## ? Where is the Earth model located in relation to the habitable zone?

Planet	Distance from the Sun in AU	Distance in the model in cm
Mercury	0,4	4
Venus	0,7	7
Earth	1,0	10
Mars	1,5	15
Jupiter	5,2	52
Saturn	9,5	95
Uranus	19,2	192
Neptune	30,1	301
Habitable zone (inner edge)	0,85	8,5

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? Now place Mars on the spot of the Earth. Discuss whether Mars would then be habitable. Compare the mass of Mars  $(6.4 \cdot 10^{23} \ kg)$  with that of the Earth  $(5.9 \cdot 10^{24} \ kg)$  and consider how the density of a planet's atmosphere is related to its mass (and gravity). Think of our Moon  $(m=7.35 \cdot 10^{22} kg)$ . Is there an atmosphere there?

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Calculation of air	den	sity:	$\rho =$	рМ RT																	
p: (Air) pressure																					
M: Molar mass																				 	
R: Gas constant																					
T: Temperature																					
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