I-LOFAR

Lesson Plan: Our Solar System to Scale

Duration: 35-40 mins

Learning objectives:

1. Gain some insight into the correct magnitude of planets and stars
2. Understand the actual distance in space vs condensed images
3. Understand scientific inaccuracies that become mainstream

Links to Curriculum:

- ❏ E&S 1, E&S 3 Building Blocks
- ❏ E&S 8 Sustainability
- ❏ NoS 10 Science in Society

Activity	Procedure	Materials	Time
The Sun	• Introductory conversation about the sun, facts below	up to date sun images	5
Planet size in the Solar System	• Using different balls to represent difference in planets • Assign student to each planet and stand in order	Blue tac, tennis balls, balloons, marbles, bouncy ball Which to use below	5
Estimating distances in the Solar System	• Each student given a thin piece of paper • Mark the Sun on one end and Neptune on the other • Students mark where they believe the planets to be on the paper, in pencil	Thin, long strips of paper Pencil	10
Actual distances in the Solar System	• Use marker for the accurate positions overlayed on top of the student's guesses • Fold paper in half, crease is where Uranus should be • Fold in half between the Sun and Uranus, this new crease is Saturn • Continue folding in half pattern getting closer to the sun for each planet remaining (example below)	Markers Actual distance image Calculating Solar system scale	5-10
Class discussion	• Average solar system poster vs more accurate • Is the actual distance different from what you expected?	More accurate solar system poster if the moon were a	10

	• Why do we think this is?	pixel scroll-able scale	

If the sun projection's diameter is 2m then ...

Planet	Scaled Diameter (mm)	Scaled Diameter (cm)	Suggested object
Mercury	7	0.7	(bluetack)
Venus	17	1.7	Marble
Earth	18	1.8	Marble
Mars	10	1	(bluetack)
Jupiter	205	20.5	Bouncy ball / Volleyball
Saturn	167	16.7	Bouncy ball
Uranus	67	6.7	Tennis ball
Neptune	65	6.5	Tennis ball

Sample paper exercise: