Set up Your Science Notebooks!

5 Tab Dividers:

1st: Class Work

2nd: UNIT 1 or Space Science

3rd: UNIT 2 or Earth Science

4th: UNIT 3 or Weather-Climate

5th: UNIT 4 or Human Impacts

Sep 28-6:42 AM

How many students got to read Lesson 1 in the Space Science workbook after the pretest?

Stars in the universe? There are between

10,000,000,000,000,000,000 and

1,000,000,000,000,000,000,000 stars in our universe!

So, how **BIG** is our universe.

The size of our solar system is one measure of the vastness of space!

Sep 28-6:42 AM

Stars in a Galaxy

Stars in Dwarf Galaxy

Stars in Giant Galaxy

Galaxies in Universe

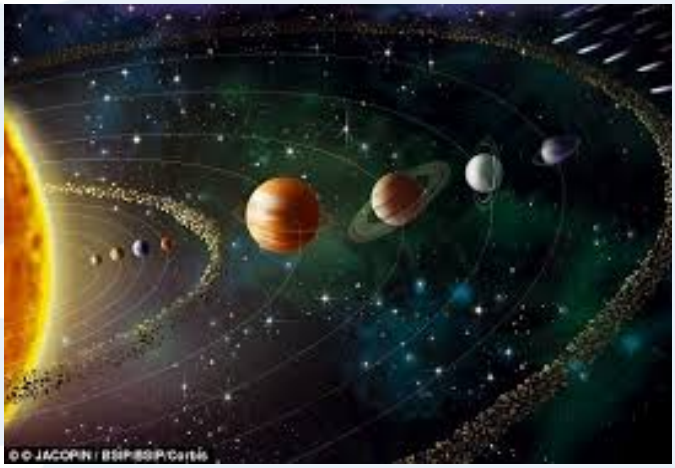
stars if all Dwarf Galaxies:

stars if all Giant Galaxies:

Sep 1-7:46 AM

Scale of the Solar System

video clip



(Link to the above video:

https://www.youtube.com/watch?v=zR3Igc3Rhfg)

Sep 28-6:42 AM

Making a Scale Model of Our Solar System

Name Class Date

Making a scale model takes a bit of planning. That planning requires a lot of math!

One of our 6th grade learning objectives states that students will be able to "**construct models with accurate scale that represent the orbital position of the Earth relative to the sun and to other planets, comets and asteroids.**"

After viewing the Khan Academy video about the scale of our solar system, we learned that we can scale the distances between objects in our solar system or we can scale the sizes of objects in our solar system. However, we cannot accurately do both. We decided to scale the distance between objects to meet the learning objective and use a different scale for the size of our sun, planets and other celestial bodies.

Together, we converted the 35 ft. 8 in. length of the science classroom to 1087.1 cm and determined that equaled the 30 Astronomical Units (AU) of distance from the sun to Neptune. (As a refresher, please look at the previous lesson on http://mrsmorin.weebly.com/6th-grade-science.html.)

Planet Name	Distance from the Sun (km)	AU	Distance from "Sun" Wall (cm)
Mercury			
Venus			
Earth	150,000,000	1	36.3
Mars			
Asteroid Belt			
Jupiter			
Saturn			
Uranus			
Neptune	4,497,000,000	30	1087.1

Name Class Date

Now that you have determined the distances from the sun to each of the planets and other important celestial bodies in our solar system, you need to think about how to represent the relative size of the planets. You learned from the Khan Academy video, Scale of the Solar System, that Earth would be microscopic using the limited distance available in our classroom. Therefore, you will not be able to use the same ratios used for distances on the reverse side. However, you will need to make each planet relate to its neighbors in a meaningful way so that everyone can see each planet and how different each is when compared to the other in the solar system.

Brainstorm with your table partners how you will approach this problem (set up the ratios). Remember, objects in your scale model of the solar system must be visible but not interfere with any other table group's model or block any student's ability to see the Smart Board from anywhere in the classroom.

Planet Name	Actual Celestial Object Size (km)	Scaled Down Size (cm)
Mercury		
Venus		
Earth		
Mars		
Asteroid Belt		
Jupiter		
Saturn		
Uranus		
Neptune		
Halley's comet		

Sep 25-6:22 AM

Size of Mrs. Morin's Science Class: 35 ft 8 in

Convert to inches: 1 ft = 12 in **428 in**

Convert to centimeters: 2.54 cm = 1 in

How many cm? **1087.1 cm**

What will that distance represent if we are trying to scale our solar system?

4,497,000,000 km

Sep 17-11:35 AM

The distance from the sun to Earth is 1 Astronomical Unit.

1 Astronomical Unit = x Km **150,000,000 km**

How many cm will that be in our classroom?

How many AU will the total length of our classroom represent?

Sep 28-6:42 AM

Now, I will distribute the handout.

Work with a partner at your table or as a group to calculate all of the distances on the chart on the front page (Distance from the Sun, AU and Distance from "Sun" Wall).

Sep 28-6:42 AM

Planet Name	Distance from the Sun (km)	AU	Distance from "Sun" Wall (cm)
Mercury			
Venus			
Earth	150,000,000	1	36.2 ~~36.3~~
Mars			
Asteroid Belt			
Jupiter			
Saturn			
Uranus			
Neptune	4,497,000,000	30	1087.1

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Planet Name	Distance from the Sun (km)	AU	Distance from "Sun" Wall (cm)
Mercury	58,000,000	0.4	14.5
Venus	108,000,000	0.7	25.3
Earth	150,000,000	1	36.2 ~~36.3~~
Mars	228,000,000	1.5	54.3
Asteroid Belt			
Jupiter			
Saturn			
Uranus			
Neptune	4,497,000,000	30	1087.1

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Planet Name	Distance from the Sun (km)	AU	Distance from "Sun" Wall (cm)
Mercury	58,000,000	0.4	14.5
Venus	108,000,000	0.7	25.2
Earth	150,000,000	1	36.2
Mars	228,000,000	1.5	54.3
Asteroid Belt	550,000,000		
Jupiter	778,000,000	5.2	188.2
Saturn	1,427,000,000	9.5	343.9
Uranus	2,871,000,000	19.1	691.4
Neptune	4,497,000,000	30	1087.1

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Based on the video, can we use the same scale as the "distance model" and still see the various important celestial bodies in our solar system?

Let's think about a different scale for the planets by using the relationship of our sun and one of the planets. Which one makes the best sense?

Sep 28-6:42 AM

$$\frac{1\,AU}{150{,}000{,}000\,km} = \frac{x\,AU}{4{,}497{,}000{,}000\,km}$$

$$\frac{1\,AU}{x\,AU} = \frac{150{,}000{,}000\,km}{4{,}497{,}000{,}000\,km}$$

$$\frac{1\,AU \cdot 4{,}497{,}000{,}000}{150{,}000{,}000} = \frac{x\,AU \cdot 150{,}000{,}000}{150{,}000{,}000} \cdot 1$$

$$29.98 = x\,AU$$

$$30 = x\,AU$$

Sep 28-6:42 AM

Sep 2-12:07 PM

Attachments

To Scale- The Solar System.mp4