Name: _____ **Date:** _____

Planet Facts Worksheet – Answer Key

Planet	Distance from the Sun (AU*)	Approximate Distance from the Sun (km)	Radius (km)	Diameter (km)
Mercury	0.387	57,910,000	2,440	4,879
Venus	0.723	108,200,000	6,052	12,104
Earth	1	149,669,000	6,378	12,756
Moon	1	150,072,000	1,737	3,474
Mars	1.524	228,096,000	3,397	6,794
Jupiter	5.203	778,400,000	71,492	142,984
Saturn	9.537	1,429,725,000	60,268	120,536
Uranus	19.191	2,870,980,000	25,559	51,118
Neptune	30.069	4,498,250,000	24,764	49,528
Pluto	39.481	5,906,370,000	1,195	2,390
Distance from the Earth to the Moon = 403,000 km (or 40,300,000,000 cm)				
Distance from the Earth to Mars = 78,000,000 km (or 7,800,000,000,000 cm)				

*AU=Astronomical Unit, which is the average distance from the Earth to the Sun (149,669,000 km)

Scale: For every Centimeter in our Scale Models there are 63,800,000 centimeters in the Real World

Instructions

1. Earth balloon students: inflate your model to approximately 20 cm (7¾"). Use a ruler to measure your balloon (be careful not to puncture the balloon with sharp ruler edges). Tie off your balloon when the appropriate size is reached.

2. All students: What is the scale of the model that was just made? 1:63,800,000

   (Teachers: The Earth is approximately 63,800,000 times larger than 20 cm Earth model. Using the table above, students should divide the diameter of Earth, in centimeters, by the size of their balloon. They must first convert the diameter to centimeters, because their model is in centimeters. To convert to centimeters, they multiply their number by 100,000; 1 km = 100,000 cm.)

3. All students: Using the same scale of the Earth (blue balloon) model, calculate the size that the Moon and Mars should be.

   (Teachers: Students will need to divide the planet's diameter by their scale. Remind them to convert the listed diameter to centimeters, because their scale is in centimeters.)

   The equations should look like:

   Moon: 347,400,000 (cm) ÷ 63,800,000 = 5 cm
   Diameter (in centimeters)

   Mars: 679,400,000 (cm) ÷ 63,800,000 = 11 cm
   Diameter (in centimeters)

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4. White and Red balloon students: Inflate your Moon and Mars models, according to your answers in Question #3.

5. All students: Demonstrate how far apart you think the Earth and the Moon are by holding your balloons in the air. What is your estimate?

   (Teachers: The diagrams seen in common textbooks might lead many of the students to believe that the Moon balloon should be held less than a meter from the Earth balloon.)

   Estimated distance between the Earth and the Moon: varies by group
   Group's estimate

6. All students: Calculate the actual distance between the Earth and the Moon (at the same scale you used to determine their size). Hint: divide the distance between the Earth and the Moon by 63,800,000.

   Write the equation here: 40,300,000,000 (cm) ÷ 63,800,000 = 600 cm (*or* 6 m)
   Actual distance between the Earth and the Moon

   (Teachers: Students should divide the actual distance from the Earth to the Moon, 40,300,000,000, by their scale, 63,800,000.)

   Was your group's estimate close to the actual number? ____ yes ____ no

7. All students: Compare the size of your Mars model with your Earth and Moon models. Hold your Earth and Moon models at their actual distance apart (as calculated in Question #6 above).

   How far away do you think Mars will be at the same scale? Hold your balloons in the air where you think Mars lies. Measure the distance.

   Estimated distance between the Earth and Mars: varies by group
   Group's estimate

8. All students: Calculate the actual distance between the Earth and Mars (at the same scale you used to determine their size). Hint: divide the distance between the Earth and Mars by 63,800,000.

   Write the equation below:

   7,800,000,000,000 (cm) ÷ 63,800,000 = 122,300 cm (or 1.2 km)
   Distance between Earth and Mars — Actual Calculation

   (Teachers: 122,300 cm or 1.2 km, in more familiar terms, approximately ¾ of a mile! Have students identify a local landmark that is about ¾ of a mile away).

   Was your group's estimate close to the actual number? ____ yes ____ no