***How Big? How Far? How Old?***

(an activity from the *Smithsonian – The Universe: An Introduction*)

***How Big? (Smallest to Largest)***

1. Take the following cards out of your bag: ***Earth, Hubble Deep Field, Milky Way, Moon, Pleiades, Saturn, and Sun.***

2. Place the cards, in order, from the smallest to the largest.

3. Complete the *“How Big”* section of the worksheet.

***How Far? (Nearest to Farthest)***

1. Take the following cards out of your bag: ***Hubble Deep Field, Moon, Pleiades, Pluto Saturn, Sun, and Whirlpool Galaxy.***

2. Place the cards, in order, from the nearest to the farthest.

3. Complete the *“How Far”* section of the worksheet.

***How Old? (Youngest to Oldest)***

1. Take the following cards out of your bag: ***Earth, Great Pyramid of Giza, Hubble Deep Field, Moon, Pleiades, Stegosaurus, and Sun.***

2. Place the cards, in order, from the youngest to the oldest.

3. Complete the *“How Old”* section of the worksheet.

***How Big? How Far? How Old?***

(an activity from the *Smithsonian – The Universe: An Introduction*)

***How Big?***

|  |  |
| --- | --- |
| 1. | SmallestLargest |
| 2. |
| 3. |
| 4. |
| 5. |
| 6. |
| 7. |

***Imagine*** that a powerful alien telescope is cruising at the distance of the Pleiades. It has its sights on planet Earth. It is so many light-years away that the planet it sees is our planet in the past. How long in the past?

***Hints:*** *A light year is the distance light travels in a year. The Pleiades are 415 light years away from Earth.*

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***Imagine*** that everybody on Earth has been given an equal number of stars in the Milky Way—to name them, to keep track of them in the sky, whatever. According to the estimate, how many stars do you have?

***Hints:*** *There are 6,000,000,000 people living on Earth & there are 300,000,000,000 stars in the Milky Way.*

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***How Far?***

|  |  |
| --- | --- |
| 1. | NearestFarthest |
| 2. |
| 3. |
| 4. |
| 5. |
| 6. |
| 7. |

***Imagine*** that you’re controlling the Hubble Space Telescope and you want to take a picture of the spiraling arms of a galaxy. You can’t decide between the Whirlpool and the Milky Way. And then you remember: it’s impossible to get a full view of one of them. Which one is it? Explain your answer.

***Hint:*** *The Hubble is in the orbit of Earth, 350 miles above us.*

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***Imagine*** that you live on Pluto and the driving age is 16—in Pluto years. In Earth years, how long would you wait to get your license?

***Hints:*** *A year is one revolution around the Sun & one year on Pluto lasts 248 years.*

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***How Old?***

|  |  |
| --- | --- |
| 1. | YoungestOldest |
| 2. |
| 3. |
| 4. |
| 5. |
| 6. |
| 7. |

***Imagine*** that you are traveling at the speed of light trying to race across our Milky Way galaxy which is a staggering 100000 light years across. How long would it take you to travel from one side to the other.

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***Hint:*** Light can travel at 6

***Imagine*** that you are sitting on a hill and watching a sunset. How old is the image of the sun when it reaches your eye.

***Hint:*** It takes light 8 minutes to travel the distance from the surface Sun to the Earth.

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