Astronomy is Awesome Computer Simulations

Part I: Solar System

Go to http://kidsastronomy.com/

a. Click on “Solar System”. Draw a picture of our solar system with the sun in the middle. Label each planet and draw an arrow to show the direction of revolution.

b. What is a revolution?

______________________________________________________________________________

______________________________________________________________________________

c. All the planets start in the same line…but then slowly some fall behind others. Why?

______________________________________________________________________________

______________________________________________________________________________

d. Click on the Sun and each planet. Answer each question about the Sun and each planet.

Sun:
1. What elements make up the Sun?

2. Why is it considered the King of the Solar System?

______________________________________________________________________________

______________________________________________________________________________

Mercury:
1. Why does Mercury have less gravity than Earth?

______________________________________________________________________________

2. Is there air on Mercury? Why?

______________________________________________________________________________

Venus:
1. Why is Venus a hostile planet?

______________________________________________________________________________

2. Why is Venus called Earth’s sister planet?

______________________________________________________________________________

Earth:
1. What is the name of Earth’s moon?

2. What does Comparative Planetology mean?

______________________________________________________________________________

______________________________________________________________________________

Mars:
1. Why is Mars more like Earth than any other planet?

______________________________________________________________________________

2. What is Olympus Mons?

______________________________________________________________________________

Jupiter:
1. How many moons does Jupiter have?

______________________________________________________________________________

2. Where did Jupiter’s giant red spot come from?

______________________________________________________________________________
Saturn:
1. How many rings does Saturn have? What other planets have rings?
2. Why would you weigh more on Saturn than on Earth?

Uranus:
1. What changed the direction of Uranus’ spin?
2. What do scientists think is underneath Uranus’ clouds?

Neptune:
1. What is the Great Dark Spot?
2. Where does the name Neptune come from?

Pluto:
1. Pluto was once considered a planet. Why don’t scientists consider Pluto a planet?

Part II: Comets

- Click on Comets on the left hand column underneath the list of our planets and their moons.
1. What are Comets?
2. Where do Comets come from?
3. Is a comet’s tail safe to fly through? Why?
4. A comet’s tail can be behind OR in front of the comet? Why? (include the term Solar Wind)

Part III: “Moon & Tides”
Go to http://www.harcourtschool.com/activity/moon_phases/ and push play to see the moon revolve around earth. Answer the following questions.
1. Why does the moon look like it is changing shape as it revolves around earth? (Hint: Click on background information)
2. It takes ____________ days for the moon to complete a cycle of phases.
3. Where is the moon positioned when it is a New Moon?

Go to http://oceanservice.noaa.gov/education/kits/tides/media/supp_tide06a.html & answer the questions.
1. What is a Spring Tide?
   Draw a picture to represent it based on the animation. (include the moon, earth and sun)
2. What is a Neap Tide?
   Draw a picture to represent it based on the animation. (include the moon, earth and sun)
Part IV: Universe, Galaxies & Stars
Go to http://www.cosmos4kids.com/ and answer the following questions.

a. Click on "Universe" written in orange.
   1. Everything that exists, exists in the _______________________.
   2. There are millions of ______________ in our galaxy and thousands of ______________ in the universe.
   3. Click on “Origins” on the right hand column. What is the **Big Bang Theory**?

b. Click on Astronomy on the lower right hand side of the website. You will see the original site. Then, click on “Galaxies” written in green.
   1. Right now, you're sitting on a planet that orbits a star in the ______________ galaxy.
   2. Organized galaxies are made of millions of ______________ and ______________. While we can't take a picture of our galaxy, astronomers use a variety of ______________ to study nearby galaxies. They use several ______________ in the EM spectrum to see which stars are closer and further away.
   3. As astronomers have studied galaxies in detail, they have determined that there is more than dust, stars, and systems. They currently believe that about ______ % of the matter in galaxies is called ______________.

b. Click on Astronomy on the lower right hand side of the website. Click on "Stars" written in red.
   1. ______________ are the objects that heat and light the planets in a system.
   2. Stars are huge ______________. That fire is from a constant number of ______________.
   3. A star is usually made of ______________ and ______________. That ball of fire also gives off ______________. All kinds of light! There are ______________, ______________, ______________, & ______________ constantly emitted into space.
   4. Click on “Requirements” on the right hand column. What color is our sun?

5. Some systems have ______________ stars. Others have a ______________ tint. The color of a star depends on its ______________. Bluer stars have a ______________ surface temperature. Lower temperature stars give off a lot of ______________.
6. Astronomers look at three main characteristics of stars. They study:
   1. ______________, ______________, and ______________
7. The yellow color of our Sun tells you it has a ______________ temperature.
8. On Earth, the Sun may seem bright. Compared to other stars it is only a candle. Astronomers consider our Sun to be in the ______________
9. Click on “Development” on the right hand column. Just like living organisms, stars have a ______________.
10. Stars are born from huge clouds of ______________ and ______________.
11. What is a Nebula?
12. Slowly, over millions of years, gas particles start to cling to each other and then they attract other particles and molecules. The nebula begins to _______________ and form a _______________. That ball is called a _______________. "Proto" is a prefix that means _______________ or _______________.

13. A proto star is the first step in becoming a _______________.

14. After the star finished the proto star phase, it becomes even _______________. The heavy elements move to the center of the star while the light gases stay in the star's atmosphere. Those gases are usually _______________ and _______________. Then something amazing happens, the _______________ begins. The star _______________ and the gases _______________. This step in the development process is called the _______________.

15. Click on “Development II” on the right hand column. After the _______________, stars become what astronomers call _______________. This is the time when the star begins to die.

16. As with anything in nature, stars need _______________. Well there is only so much hydrogen to fuel a star's fusion reactions. Eventually that fuel runs out. When the star begins to cool, it _______________. The cooling takes the color of the star and drops it into the _______________ range, leaving a red giant.

17. As the star cools and the fire is burning out, there comes a point where the star's reactions _______________ and an _______________ occurs. That boom is the _______________.

18. Astronomers call the nebula after the explosion a _______________.

19. The final stage of a stars life is when it becomes a _______________. The core of the star is left, some fires still burn, but there is very little _______________ left.

20. What is a Black Hole?
__________________________________________________________________.

Part V: Eclipses and Weight on other Planets

Go to the following website:  http://www.MrEclipse.com/Special/LEprimer.html

1. What is the only lunar phase in which a lunar eclipse can occur?

2. Sketch the lunar eclipse geometry:

3. What are the three different kinds of lunar eclipse? Briefly describe each.
_______________:
_______________:
_______________:

4. On average, how many total lunar eclipses are there every year? _______________ Why?

5. Moon's orbit around Earth is actually tipped about _______________ to Earth's orbit around the Sun.
6. Why does the Moon appear to take on a colored hue during an eclipse?

Go to the following website:  http://www.MrEclipse.com/Special/SEprimer.html

1. What is the only lunar phase in which a solar eclipse can occur? ________________________________.

2. Sketch the Solar Eclipse Geometry.

3. The Moon’s shadow consists of three parts. What are they? Briefly describe each.
   ________________:
   ________________:
   ________________:

4. How long does the total phase of a total solar eclipse last? ________________________________.

5. The path of the Moon’s shadow across the Earth’s surface is called __________________________.

6. What are the key differences between total and annular eclipses?_____________________________________________________________________________________
_____________________________________________________________________________________

Go to the following two websites:
https://ca.pbslearningmedia.org/resource/ess05.sci.ess.eiu.totaleclipse/total-solar-eclipse-animation/#.WbF6orKGOUk and

https://ca.pbslearningmedia.org/resource/npls12.sci.ess.eiu.luneclipse/lunar-eclipse-essentials-nasa-planetary-sciences/#.WbF7CbKGOUk

Watch the video/animations and draw a picture to represent each in the boxes below. Title each animation and write two sentences that describe what is happening in each type of eclipse.

Type of Eclipse: ___________________________________

Summary of what is happening:

_____________________________________________________________________________________

Type of Eclipse: ___________________________________

Summary of what is happening:

_____________________________________________________________________________________
Part VI: Finding your Weight and Age on Different Planets.

Go to: http://starchild.gsfc.nasa.gov/docs/StarChild/solar_system_level2/activity/planet_hop.html

1. What is gravitational pull?

2. What are the two factors that affect the pull of gravity? _______________ and _______________.

3. What is the definition of Revolution?

4. If the planet has a gravitational pull 2.5 times greater than that of Earth, then a 220 pound earthling would weigh _______________ pounds on that planet. (2.5 x __________ = 550)

5. It only takes the Earth 365.24 days to revolve once around the Sun. Due to their great distance from the Sun, some planets may take _____________________________________ to complete the same journey.

6. Look at the table and answer the questions below.
   a. Jupiter has a gravitational pull of 2.54 and Mars has a gravitational pull of .38. Does that mean Jupiter or Mars is the bigger planet? ____________________________.
   b. Do you think you would weigh more on Jupiter or Mars?

   c. What is your weight and age on Earth? Weight: ____________________  Age: ____________________.

7. Figure out your weight and age in the online table and check your answers. Once you have the correct answers, copy the info below.

<table>
<thead>
<tr>
<th>Planet</th>
<th>Gravitational Pull</th>
<th>Revolutionary Period</th>
<th>Weight (pounds)</th>
<th>Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>.38</td>
<td>87.9 Earth days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venus</td>
<td>.91</td>
<td>224.7 Earth days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mars</td>
<td>.38</td>
<td>686.9 Earth days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jupiter</td>
<td>2.54</td>
<td>11.86 Earth years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturn</td>
<td>.93</td>
<td>29.46 Earth years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uranus</td>
<td>.8</td>
<td>84.01 Earth years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neptune</td>
<td>1.2</td>
<td>164.79 Earth years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pluto</td>
<td>.04</td>
<td>248 Earth years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Based on the gravitational pull of the above planets, which two planets do you think are closest in size? ____________________________ and ____________________________

9. How do you know? __________________________________________________________________

10. How much would you weigh on the sun? ____________________________