

Name _____

Date _____

Due Date _____

Science 9

Worksheet 13-1—The Solar System

Read pages 264-287 of SP to help you answer the following questions:

Also, go to a school computer connected to the internet. Go to Mr. Colgur's Webpage at <http://sd67.bc.ca/teachers/dcolgur> Then click "Science 9" and then "Physics". In the second column "Links to Other Sites" you will find a file called "Science 9 Astronomy Sites" Click on that.

Now, go to p. 266 of Science Probe Text:

1. Devise a sentence that will help you remember the names of the nine planets in our solar system.

2. Go to p. 270. Name the **terrestrial** planets _____

What do you think they have in common? _____

3. Name the **outer** planets _____

Which of these are called **gas giants**? _____

4. Now click the "Science 9 Astronomy Sites" at the bottom of the screen and click on Site #1 (<http://www.solarviews.com/raw/misc/ss.gif>) NOTE: You may also have to click on the box that says "http://www.solarviews.c..." at the bottom right of your screen. You should get a picture of the sun and planets drawn to the scale of relative sizes to one another. You will have to scroll to the right to see the outer planets. Draw a simple diagram showing these planets here. Try to keep approximately the same scale as the picture. Label the names of the planets.

Approximately how many “earth’s” do you think would fit into a cross section of Jupiter?

Do you think the planets are actually as close to each other as is shown on the diagram?_____

Go to the “Science 9 Astronomy Internet Sites” and click site #2 (<http://www.solarviews.com/eng/mercury.htm>) . Use it to answer the following questions about Mercury.

5. Name two moons in the solar system which are bigger than Mercury. _____
& _____.
6. What has fallen on Mercury that has affected it’s surface appearance? _____
7. Mercury can only be seen from telescopes in the daytime. Why is this? _____
Name the space probe that gave us most of our information about Mercury _____
8. A day on Mercury is equal in time to _____Earth days. Mercury’s temperature can range from a low of _____⁰C to a high of _____⁰C (see page 269 in SP Text). Suggest why it can get so hot and so cold. (see p. 272 of SP)

Go back to the internet site and scroll back up so that the “Table of Contents” is on the left side of the screen.

9. Get a closer look at Mercury by doing the following: Click “Views of Mercury” in the Table of contents. → Scroll down until you get a picture called “Hills of Mercury” → click that picture. → Scroll down a bit to the box and click “mercter.gif”. This will give you a close-up of Mercury’s surface. You can see more by scrolling up/down/right/left. Have a good look.
What are the circular formations on the image?_____
- Do you see any signs of vegetation or other life?_____
10. Now, go back to p. 272 of the SP Text.
Suggest 2 reasons why Venus appears so bright.

11. The atmosphere of Venus is mainly _____. What affect does this gas have on the surface temperature of Venus? _____

12. The first probe sent to Venus was in _____. What did it show? _____

Suggest why it didn't last long. _____

13. The recent US probe to Venus was called _____. How could it see the surface? _____.

Now, go back to the “Science 9 Astronomy Sites” and click site #3 (<http://www.solarviews.com/cap/venus/venus1.htm>) When it comes up, click “[venus1.jpg](#)” in the box. This gives a planetary image of Venus.

14. Venus is not really the colours that are shown here. The different colours (blue, green, red etc.) would represent different _____ on the surface. There are definitely no oceans or liquid water on the surface of Venus. Suggest why not.

(see p. 269 of SP.) _____

To get an idea of what the surface of Venus looks like, go to “Science 9 Astronomy Internet Sites” and click site #4 (<http://www.solarviews.com/raw/venus/eistla1.gif>)

15. You can “cruise” over the surface by using the scroll bars on the right side and bottom of the screen Describe the surface in your own words. _____

Many mountains on Venus are volcanoes. Would you expect molten lava to travel farther or less far than lava from volcanoes on Earth? _____ Explain _____

Now go to “Science 9 Astronomy Internet Sites” and click site# 5 (<http://earth.jsc.nasa.gov/sseop/efs/photoinfo.pl?PHOTO=STS039-96-64>)

16. Which planet are you looking at now? _____.

Click “Display a Screen Layout for Printing”

17. Find Trout Creek and Penticton. Why can't you see buildings? _____
_____.

18. The pattern of regular white grids on some of the slopes and mountains are what? _____
_____.

Now go to p. 274 of SP Text

19. Give two reasons why scientists have studied Mars more than any other planet except Earth? _____

20. In 1976, which two crafts landed on Mars? _____

Now go to “Science 9 Astronomy Internet Sites” and click site# 6 (<http://planetescapes.com/solar/eng/craft2.htm#mars>) This tells you all the missions sent to Mars.

21. About how many missions have been sent to Mars altogether? _____
Were they all successful? _____.

22. On what date did Mars Pathfinder land on Mars? _____ Why wasn't it destroyed when it bounced? _____. What name was given to the 6 wheeled robotic rover? _____. How many images were taken from the lander? _____. How many from the rover? _____

23. What happened to the Mars Climate Orbiter launched in Dec. 1998? _____

What happened to the Mars Polar Lander launched in Jan. 1999? _____

What happened to the “Deep Space 2 Project”? _____

24. Are any more missions planned for Mars? _____

Now go to “Science 9 Astronomy Internet Sites” and click site# 7

(http://nssdc.gsfc.nasa.gov/planetary/image/marspath_presidential_med.jpg) This site contains a colour image obtained from the Pathfinder Lander.

25. Describe it in your own words.

What colour is the sand? _____. Suggest what makes it this colour. _____

_____ Toward the right side of the screen, you

should see the “rover”. What is the name of the rover? _____ See it’s tracks?_____.

Scroll to the left and down a bit. What spacecraft are you looking at?

_____.

What is the purpose of the big “bags”? _____

_____.

What are the black things covering the surface of the craft? _____

Do you think you would like to live on Mars? _____

Now go to “Science 9 Astronomy Internet Sites” and click site#8

(<http://planetescapes.com/solar/eng/mars.htm>)

26. What were two reasons people originally thought that there was life on Mars?

27. About 95% of the atmosphere of Mars is _____. Could

we live out in the open on Mars? _____. What suggests that water may have once ran on the surface of Mars?

What are the minimum and maximum temperatures recorded on Mars? _____ & _____

If you have time, scroll to the bottom of this page and have a look at some of the “Animations of Mars”

Now go to “Science 9 Astronomy Internet Sites” and click site#9
(<http://marsrovers.jpl.nasa.gov/mission/status.html>)

28. Click “Mission Timeline” in the left margin. The second phase shown is “Launch – Liftoff from Earth. On what date did the “Spirit Rover” (Rover “A” land on Mars?

29. Click “Spacecraft” on the left side of this web page. List the three main things the spacecraft consisted of:

1. _____

2. _____

3. _____

30. What was the purpose of the parachute? _____

31. What was the purpose of the airbags? _____

Go to the left side of the web page again and click “Communications with Earth”

32. Name the three locations for the Deep Space Communications Facilities.

1. _____

2. _____

3. _____

33. Why do you think these facilities are spread around the earth instead of in one place?

Now go to “Science 9 Astronomy Internet Sites” and click site#10
http://nssdc.gsfc.nasa.gov/planetary/image/mera_p2211_med.jpg

Use the scroll buttons to move up and down and from side to side.

34. Describe this area of Mars _____

35. What colour does the surface of Mars seem to be? _____

Is this area flat or hilly? _____

Is the Martian sky blue or reddish? _____

Suggest why. _____

Now it's time to visit Jupiter. See p. 275 of SP Text.

36. What can be said about the mass of Jupiter compared to the masses of the other planets?

How many hours are there in a "day" on Jupiter? _____. What

does this suggest about it's speed of rotation? _____

What is the "hurricane" on Jupiter called? _____

How big is it? _____

Name the four largest moons of Jupiter _____

37. What are the names of the four main space probes that provided information about Jupiter and it's moons? _____

***Now go to "Science 9 Astronomy Internet Sites" and click site#11
(<http://www.solarviews.com/eng/jupiter.htm>)***

38. About how many satellites (moons) does Jupiter have, as far as we know? _____

How were the rings on Jupiter discovered? _____

At great depths, the hydrogen is thought to be in what state? _____

To get a good look at the four main moons of Jupiter, scroll down to "Views of Jupiter" and right near the bottom of that is an image called "Moons of Jupiter" Click it, then select "jupmoon.gif" in the box.

39. The really small moon on the top left is called Amalthea. The one on the top middle is Io. Describe the colour of Io. _____ . What element do you think the yellow colour might be? _____ . The moon on the top right is Europa. Describe it's appearance. _____

What do you think the "lines" might be? _____
On the bottom left are Ganymede and Callisto. Suggest why these two have so many craters. _____.

Which of the four large moons do you think might have active volcanoes on it? _____
Click the "back" button twice and check out any other images of Jupiter you wish to look at.

Now go to "Science 9 Astronomy Internet Sites" and click site#12
(<http://www.solarviews.com/eng/saturn.htm>)

40. Most of the information about Saturn was discovered by the _____ spacecraft in the years _____ .
How long is a "day" on Saturn? _____. How many Earth years is a "Saturn Year"? _____. What is the wind speed at the equator on Saturn? _____
Which 3 gases make up Saturn's atmosphere? _____
The most spectacular thing about Saturn is it's system of _____
The currently know number of satellites of Saturn is _____.

Now go to "Science 9 Astronomy Internet Sites" and click site#13
(<http://www.solarviews.com/eng/titan.htm>)

One of the more interesting moons in the Solar System is Saturn's largest moon, Titan. Scroll down a bit and read the information about Titan. Answer the following questions.

41. What does Titan have around it that other moons don't. _____
Astronomers believed they might find pools of liquid _____ and _____

What did Voyager 1 actually reveal? _____

Titan's atmosphere is rich in the building blocks for _____ and

some scientists think that the atmosphere of Titan resembles the early atmosphere of _____

In what year did the Cassini spacecraft reach Saturn? _____ The probe

called _____ was lowered through the Titan atmosphere.

Scroll down to where it says "Views of Titan" and click the first image, simple entitled "Titan". Scroll down a bit and click the 3rd image "titan1.jpg".

Why can't you see any detail of the surface of Titan? _____

Hit the "Back" button twice to get back to the Titan page. Scroll down until you get to the image called "Huygens" Don't click the image yet. Read the caption beside it.

Is this an actual photo or an artists rendition of what it might look like? _____

The "Cassini" spacecraft was launched on _____

Now go to "Science 9 Astronomy Internet Sites" and click site#14
(<http://saturn.jpl.nasa.gov/overview/index.cfm>)

Click "Cassini at Saturn" in the left margin of this web page.

On what date did Cassini arrive at Saturn and start to reduce it's speed? _____

What did the mission do on January 14, 2005? _____

Now go to "Science 9 Astronomy Internet Sites" and click site#15
<http://www.spaceflightnow.com/cassini/050114pix.html>

This shows the first two images taken from the Huygens probe on Jan 14, 2005.

Describe the surface _____

Now go to “Science 9 Astronomy Internet Sites” and click site#16
 (<http://www.solarviews.com/eng/uranus.htm>)

42. The planet “Uranus” has at least _____ moons. It’s atmosphere is mainly _____, _____ and _____. A “year” on Uranus is about _____ “Earth years”. Uranus appears to be tipped _____.
- The reason for this is thought to be _____
- _____.
- The outer ring of Uranus, called the “epsilon” ring consists of _____
- _____.
- What is the “mean (average) cloud temperature” on Uranus? _____
- Why do you think it’s so cold? _____
- Scroll down to “Views of Uranus” and click the first picture, simply called “Uranus” Select the top “uranus.jpg” in the box (15 K). Describe the appearance of Uranus. _____
- _____

Now go to “Science 9 Astronomy Internet Sites” and click site#17
 (<http://www.solarviews.com/eng/neptune.htm>)

43. The first two thirds of Neptune is composed of a mixture of _____
- _____. The outer third is a mixture of heated gases comprised of _____.
- _____ gives Neptune its blue cloud color.
- The strongest winds of any planet were measured on Neptune. They had a speed of about _____ km/h.
- Scroll down to “Views of Neptune” and click the first one “Neptune” and click the “neptune.gif” in the box. There appear to be thin, wispy, white _____ in the upper atmosphere.

Now go to “Science 9 Astronomy Internet Sites” and click site#18
 (<http://www.solarviews.com/eng/pluto.htm>)

44. Is Pluto always the farthest planet from our sun? _____ .It is now? _____
 Being tidally locked, Pluto and its moon, _____ continuously
 _____ as they travel through space. Much of
 our information about Pluto was determined when it’s satellite passed between the Earth
 and Pluto, causing an _____. Instead of being made up of
 gases, Pluto is made up of a mixture of _____ and _____.
 Methane is in the _____ state on the surface of Pluto. Pluto’s distance
 from the sun is about _____ Km. What do you think the sun
 would look like from Pluto? _____
 Scroll down to “Views of Pluto and Charon” and click the “Hubble Telescope Image”.
 When the little box comes up, click “hstpluto.gif”. You have to scroll to the right to view
 “Charon”. Why don’t they have clear images of Pluto, like they do of the other
 planets? _____

Now it’s time to look at **asteroids**. Turn to page 284 of Science Probe.

45. Where is the asteroid belt located in our Solar System? _____
 What are the two suggestions for how the asteroids were formed?

 How big is the largest asteroid? _____

Now go to “Science 9 Astronomy Internet Sites” and click site#19
 (<http://www.solarviews.com/eng/asteroid.htm>)

46. The smallest known asteroids are about the size of _____. Are all the
 asteroids between the orbits of Mars and Jupiter? _____.

47. Asteroids on a collision course with Earth are called _____
48. What happens to most meteoroids as they fall through our atmosphere? _____
 _____ due to heat caused by _____.
49. If a meteoroid does not completely burn up and strikes the Earth’s surface, it is called a _____.
50. What three materials are most meteorites from asteroids made up of? _____
 _____.
51. The first asteroid to have close-up, high resolution images taken of it was _____, when in the year _____, it was visited by the spacecraft _____.
- Click on “951 Gaspra” highlighted in colour. Read what it says below. Galileo came within _____ kilometers of the asteroid. The dimensions of Gaspra are about _____ x _____ x _____ km. What is the suspected origin of Gaspra? _____
 _____.

Scroll down to “Views of Gaspra” and click the first image entitled “Gaspra in Color” After that, scroll down to the “Download” table and click “gaspra3.gif” Use the scroll bars on the side and bottom of the screen to have a good look at it.

Describe it in your own words. _____

Now go to “Science 9 Astronomy Internet Sites” and click site#20 (<http://www.solarviews.com/eng/tercrate.htm#meteor>) Scroll down until you get to the “Terrestrial Crater Photo Gallery”

Click on the image of the “Barringer Meteor Crater, Arizona”. Scroll to “Download Options” and click “[meteor.gif](#)”

52. What do you suppose formed this crater? _____

Click the “Back” button twice and scroll down to the text next to the “**Chicxulub, Yucatan Peninsula, Mexico**”. Don’t click the picture yet.

53. What is the diameter of this crater? _____ When did it form?

_____ years ago. What do NASA scientists believe caused this huge crater?

How big was the object that caused it? _____ . How did this

impact affect the atmosphere at the time it hit? _____

_____ . Why would it stay dark? _____

_____ . How long did it stay dark? _____

What happened to the global average temperature? _____ .

How did this impact affect life on Earth? _____

Is there any possibility that this could happen again in the future? _____

Suggest why this crater wasn’t discovered until fairly recently. _____

Scroll down the page and have a look at other impact craters that have been discovered. If you want a closer look, click the image and go to the “Download Options” After looking at it, click the “Back” button twice to get back to the page.

Now it’s time to look at **comets**. Turn to page 286 of Science Probe.

54. What is a **comet**? _____

55. What four substances are believed to be contained in comet ice? _____

56. Why do we see a comet only when it is fairly close to the sun? _____

57. What does a comets “tail” consist of? _____

How long can a comet’s tail be? _____

58. Why does a comet’s tail always point away from the sun? _____

59. Halley’s comet was seen in 1910 and in 1986. It returns to our region of the solar system

once every 76 years. What year will it be seen again? _____

Is it likely that you will see it? _____ Is it likely that your parents will see it? _____

Have you ever seen a comet? _____ If so, when? _____

Now go to “Science 9 Astronomy Internet Sites” and click site#21

(<http://www.solarviews.com/eng/comet.htm>)

60. The surrounding cloud of diffuse (cloudy) material around the head of a comet is called it’s

_____.

61. The small, bright object in the middle of a coma is called the _____.

62. Why does a comet form a tail only when it is relatively close to the Sun? _____

To get a closer look at some good comet images, scroll down on this page, click the images and download the “gifs”. If you have access to sound, the “Comet Animation” is also interesting.

The End of the Solar System Worksheet