

# EXTENSION: PLASMA

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**Directions:** Go to [dixiemiddlescience.weebly.com](http://dixiemiddlescience.weebly.com) and click on "8.1 Matter" Scroll to today's date. Watch the playlist of videos on plasma and answer the questions for each video. You will also need to draw a colored picture of the 3 forms of naturally occurring plasma as well as the 3 forms of man-made plasma. There are two stations to complete. Your teacher will call you up by table to complete the stations.

## Video #1: What is Plasma- FuseSchool

1. What is the fourth state of matter? \_\_\_\_\_
2. A liquid still has a fixed volume, but \_\_\_\_\_ their container.
3. What is the change of state that occurs when water is heated to 100 degrees C? \_\_\_\_\_
4. These substances go from a state of gas to a state called \_\_\_\_\_.
5. When heat is sufficiently strong the electrons are \_\_\_\_\_ from their respective atoms.
6. Plasma is \_\_\_\_\_ overall.
7. Substances in plasma form can \_\_\_\_\_.
8. What separates gas from plasma? \_\_\_\_\_
9. What are 2 forms of naturally occurring plasma ON EARTH?  
a. \_\_\_\_\_ b. \_\_\_\_\_
10. Stars are really just hot balls of \_\_\_\_\_.
11. Plasma can be found in: a. \_\_\_\_\_ b. \_\_\_\_\_
12. What gas is heated in a fluorescent light bulb? \_\_\_\_\_
13. What kind of technology is made possible by plasma? \_\_\_\_\_

## Video #2: Plasma, The Most Common Phase of Matter in the Universe- The Sci Show

14. The blue glow of plasma on the mast of a ship is called St. \_\_\_\_\_ Fire.
15. Which scientist discovered "radiant matter" using a glass container with electrodes in it?
16. Which scientist named it "plasma" because it looked like the plasma in blood?
17. Which is a better conductor of electricity... gas or plasma?
18. What compounds are in a fluorescent bulb?
19. \_\_\_\_\_% of the normal matter in the universe is strewn around between galaxies in the intergalactic medium.

## Video #3: How microwaving grapes makes plasma- Veritasium

20. Name 3 devices that the National Academy of Sciences used to study grapes in the microwave.  
a. \_\_\_\_\_ b. \_\_\_\_\_ c. \_\_\_\_\_
21. What is the frequency of a typical microwave?
22. If you don't cut the grape in half, the microwaves become \_\_\_\_\_ inside the grape.
23. With the very strong electromagnetic fields at the intersection of two grapes you get \_\_\_\_\_. The electric fields are strong enough that they \_\_\_\_\_ the air creating sparks and that leads to \_\_\_\_\_.
24. What two elements make up the plasma? A. \_\_\_\_\_ B. \_\_\_\_\_

## Video #4: The Science of Lightning- National Geographic

25. \_\_\_\_\_ is one of the most incredible natural phenomenons.
26. Worldwide, lightning occurs \_\_\_\_\_ times a second.
27. Lighter particles moving toward the top of clouds and become \_\_\_\_\_.
28. Heavier particles heading toward the bottom become \_\_\_\_\_.
29. The path (of lightning) reaches temperatures of around \_\_\_\_\_ degrees Fahrenheit.

Draw & Color 3  
forms of naturally  
occurring plasma

Draw & Color 3  
forms of man-made  
plasma

30. If caught in the open what should you avoid? a. \_\_\_\_\_ b. \_\_\_\_\_

### **Video #5: All About Auroras: Aurora Borealis (Northern Lights) and Aurora Australis for Kids - FreeSchool**

31. What is an aurora? (also known as a polar light) \_\_\_\_\_

32. What is an aurora around the North Pole called? \_\_\_\_\_ or \_\_\_\_\_

33. What is an aurora around the South Pole called? \_\_\_\_\_ or \_\_\_\_\_

34. This stream of particles (from the Sun) is called the \_\_\_\_\_.

35. As these \_\_\_\_\_ charged particles strike the atmosphere, they excite the \_\_\_\_\_ and \_\_\_\_\_ atoms causing them to light up in beautiful \_\_\_\_\_ of an \_\_\_\_\_.

36. They are a \_\_\_\_\_ reminder of the connection our \_\_\_\_\_ has to the sun.

### **Video #6: Should I do it? King of Random**

37. How much did he pay for his plasma ball?

38. The plasma ball converts \_\_\_\_\_ volts at \_\_\_\_\_ amps of power.

39. What is the center tower of the plasma ball?

40. What do you do to get the spark to come outside of the plasma ball?

41. Is the dome made of plastic or glass?

42. Describe what happens when he breaks the glass with a hammer. \_\_\_\_\_  
\_\_\_\_\_.

43. Did it implode or explode?

44. What interesting observation did he make about the glass?

45. Do you think the glass inside was pressurized?

46. Does it still work to make sparks and purple glow after the glass is gone?

47. Does the King of Random suggest doing this experiment at home?

# PLASMA STATIONS

Your teacher will send your table to each of the following stations. Instructions are at the station. After completing the activity, answer the following questions:

## **Station 1: Plasma Ball**

48. Describe what happens when you bring the light bulb near the plasma ball? Why do you think this happens?

\_\_\_\_\_

49. What happens to the light bulb when someone puts their hand on the plasma ball? Why do you think this happens?

\_\_\_\_\_

## **Station 2: Making Plasma from Grapes in the Microwave**

50. Describe what you saw happen to the grape in the microwave.

\_\_\_\_\_

\_\_\_\_\_