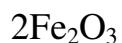


# Eighth Grade Second Semester Study Guide

## Elements and Compounds

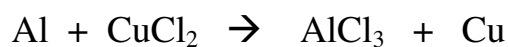
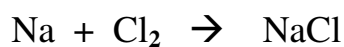
1. You should be able to compare and contrast elements and compounds. Are He, OH, Pb, PB, H<sub>2</sub>SO<sub>4</sub>, HCl, Na, C, CO<sub>2</sub>, Fe, CO, NaCl and B compounds or elements?
2. Counting atoms. How many atoms are there in each compound? How many different elements in each compound?



3. What is the difference between a mixture and a compound? Give examples.
4. What happens when a chemical reaction has taken place? What are the signs and what does each sign mean or look like?
5. What are the chemical make-ups of several known compounds? Water, ammonia, hydrochloric acid, carbon dioxide, carbon monoxide, sulfuric acid.

## Chemical Reactions and Conservation of Mass

6. If we place 5 grams of Zinc metal into a beaker with 10 grams of Hydrochloric Acid and the container is sealed so that nothing can escape, what will be the final mass of the Zinc Chloride and Hydrogen gas that is produced?
7. An ice cube sealed in a container has a mass of 32.9 grams. After the ice cube has melted into liquid water, what will the mass be?
8. What are the reactants and products in the below reactions? Balance each of the chemical reactions.



## Acids, Bases, and Neutrals

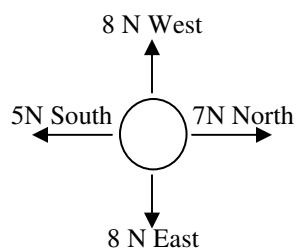
9. When we mix Hydrochloric Acid with Sodium Hydroxide (Base), what are some of the products always going to be?
10. A pH of greater than 7 is considered to be a(n) \_\_\_\_\_. A chemical that has a pH of 9 is considered to be a(n) \_\_\_\_\_. A chemical that has a pH of 2 is considered to be a(n) \_\_\_\_\_.
11. What are the characteristics and uses of acids?
12. What are the characteristics and uses of bases?

## Distance, Time, and Speed

13. A baseball player throws a baseball. The ball traveled 35 yards before it landed on the ground. The ball stayed in the air for 3.8 seconds. What is the average speed of the ball?
14. Mike hit a long fly ball to left field. The left fielder picked up the ball and threw it 125 feet to the third baseman. The ball was in the air for 4 seconds. Then the third baseman relayed the ball to the catcher to make the play at home plate. Home plate was 97 feet away and the ball was in the air for another 3 seconds. What was the average speed of the ball?
15. If a dog is running at 22 feet per second, how far will he travel after 1 minute of running?
16. If a giraffe runs for a half of an hour at a speed of 40 miles per hour, how far will the Giraffe run?

## Unbalanced Forces and Mass and its Effect on Force

17. What is the net force of the ball taking into account all four forces that are being exerted on the ball?



18. Johnny locked himself in the closet and the closet door is now stuck. Fred heard him yelling for help and went to his rescue. As Johnny was pushing on the door with a force of 48 Newton's, Fred pulled on the outside of the door with a force of 51 Newton's. What is the net force being placed on the door?
19. If a jogger jogs around the block at a speed of 5.4 miles per hour, what has happened to his velocity?
20. A 8,000 kilogram truck requires a larger engine than a 1,500 kilogram car because:
21. A bowling ball that has a mass of 20 kilograms will knock down pins more easily than a bowling ball that has a mass of 15 kilograms because:
22. Which of the following examples has more momentum? Rank them from most momentum to least momentum. A mouse running 2 MPH, a dog walking at 4 MPH, a bowling ball rolling at 9 MPH, an elephant running at 8 MPH.

### **Forces of Gravity and Friction**

23. What determines how much gravity an object has? Mass, Volume, Length? Example: The Earth has much more gravitational pull than the moon. Why?
24. What is friction? What does friction have to do with shoot stars? In Apollo 13, why did the capsule get hot when it was entering the Earth's atmosphere?
25. What did Galileo prove by dropping two balls of different masses off of the tower of Pisa? Why doesn't paper fall at the same speed as a rock on Earth?
26. A sail boat is sailing against the current, up river. The river is flowing South with a force of 39 Newton's. The boat's engine is pushing the boat North with a force of 48 Newton's. What is the net force of the boat and in which direction?

### **Acceleration and Mass and its Effect on Force**

27. What are two of the ways that the velocity of a car can change?
28. If you went for a jog around the block and jogged at a constant speed of 7 miles per hour, what is happening to your velocity? Why?
29. Fred and Sue are trying to move a couch. Fred is pushing on the couch with a force of

30. Newton's and Sue is pulling on the couch with a force of 29 Newton's. Assuming the forces are in the same direction, what is the net force being placed on the couch?

31. Isaac and his mom were driving to the store when their car ran out of gas. Since the gas station was just around the corner, they decided to push the car. Isaac pushed on car with a force of 45 Newton's. Isaac's mom pushed on the car with a force of 42 Newton's. The car wouldn't move. A man driving by saw them struggling and stopped to help. He pushed on the car with a force of 49 Newton's. Now there were three forces all pushing in the same direction. What was the net force being pushed on the car?

32. An object that is accelerating is an example of a \_\_\_\_\_. (Forces?)

33. How does mass and speed affect an objects ability to accelerate?

## **Stars and Galaxies**

34. What are the different classifications of stars? How are they classified? What do the different star colors mean?

35. What is the life cycle of a star? It starts as a \_\_\_\_\_ and then changes to a \_\_\_\_\_ and then a \_\_\_\_\_, etc.

36. Be able to identify all the moon phases. (Waxing, Waning, Crescent, Gibbous, Quarter, Full, and New Moons)

37. How are the Earth, Moon, and Sun aligned when a Solar and Lunar eclipse are happening?

38. Where do the moon and planets get their light?

39. What are the planets, in order, starting from the Sun? (Nine)

40. Which planets are solids, which are liquids, and which are gases planets?

41. When measuring distances in our solar system, what unit do we use? How about measuring distances in our galaxy or universe?

42. What is rotation? What is revolution? What do each of these terms have to do with a day and a year?