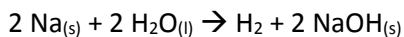


## ST Pretest 2.1

1. An investigator goes into a lab after an explosion. Too large a piece of sodium had reacted with water:



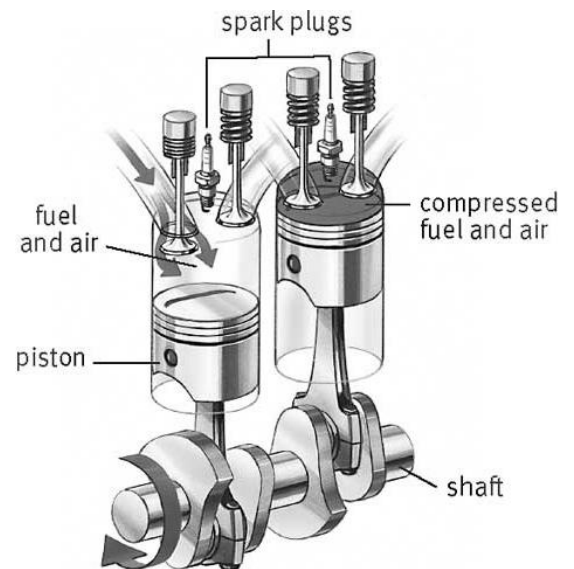
- a) He sees white solid on the ceiling. What test can he carry out to reveal that the substance is a base?
- b) What ion released by NaOH is responsible for its bitter taste?
- c) What substance can eliminate NaOH's bitterness?
- d) Predict what would happen to the conductivity of aqueous sodium hydroxide if we perfectly neutralize NaOH with H<sub>2</sub>SO<sub>4</sub>. Explain why the solution will /won't keep conducting electricity.
2. What two compounds will form if HBr reacts with Ca(OH)<sub>2</sub>? Write a balanced equation.
3. a) From the following list, what is the most acidic substance?
- b) How much more acidic is it compared to the next most acidic substance?
- c) Which is the most basic?

### pH

- 0 - Hydrochloric Acid (HCl) of 1M
- 1.0 - Battery Acid (H<sub>2</sub>SO<sub>4</sub> sulfuric acid)
- 2.0 - Lemon Juice
- 2.2 - Vinegar
- 3.0 - Apples
- 4.0 - Wine and Beer
- 4.5 - Tomatoes
- 6.6 - Milk
- 7.0 - Pure Water
- 7.2 to 7.4 - Human Blood
- 8.3 - Baking Soda (Sodium Bicarbonate)
- 10.5 - Milk of Magnesia
- 11.0 - Ammonia
- 12.4 - Lime (Calcium Hydroxide)
- 13.0 - Lye
- 14.0 - Sodium Hydroxide (NaOH)

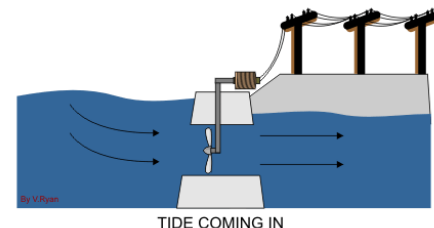
4.
  - a) What kind of solution, like ocean water, allows lightning's electricity to flow through it?
  - b) What characteristic of an electrolyte allows electricity to flow through it?
  - c) What kind of ion attracts electrons?
  - d) What do negative ions do when an electrolyte conducts electricity?
  
5.
  - a) What physical properties is shared by electrolytes and nonelectrolytes?
  - b) Give examples of how non electrolytes and electrolytes are used in winter.
  - c) What chemical property is not shared by electrolytes and non-electrolytes?
  
6.
  - a) What 's the only electrolyte-type that can have a pH of 7?
  - b) Why doesn't a nonelectrolyte conduct electricity?
  - c) What kind of ions will raise the pH from 3.0 to 6.0?
  - d) What does the pH become if a lake originally at pH = 6 becomes 100 times more acidic due to acid rain?

7. Give an example of how a room cannot always be heated by an object whose temperature is very high.
8.
  - a) How do gases within an engine do work on the pistons?
  - b) What form of energy is contained within gasoline?
  - c) What forms of energy are contained within the hot exhaust?



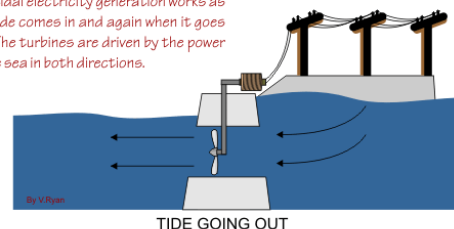
9.
  - a) Is energy always conserved?
  - b) Give three forms of energy that the energy of food turns into after it's been eaten, digested and further broken down by cellular respiration?

10. a) How can tidal energy be used?
- b) If the movement of water represents 5 billion joules and we obtain 4 billion joules of electricity, how efficient is the tidal power plant? (Express as a %)
- c) What percent of the energy is wasted?

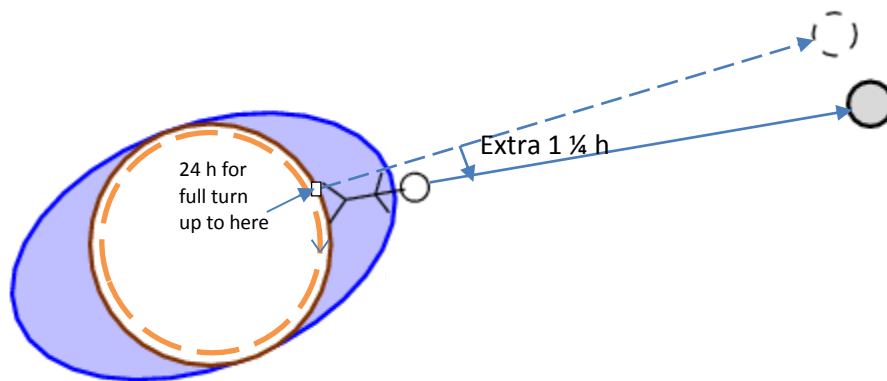


TIDE COMING IN

This tidal electricity generation works as the tide comes in and again when it goes out. The turbines are driven by the power of the sea in both directions.



11. a) How often will the tide be coming in during the day?
- b) What two things are responsible for causing tides?
- c) Why is the tidal cycle of 2 low tides and two high tides almost 25 hours long and not 24?

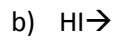


### Flashbacks from your happy past

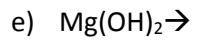
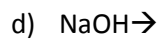
12. Which alkali atom has less than 10 protons?
13. Convert 12 ppm to g/ml.
14. How many electrons are in an ion of chloride?
15. How many dots are there in the dot structure of Xe?
16. What is a chemical characteristic property of alcohol?

17. Write ionic equations for the following electrolytes:

Acids:



Bases:



Salts:

