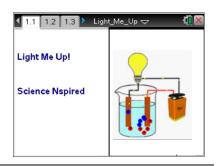


Name	
Class	

#### Open the TI-Nspire document Light Me Up.tns.

Why does the lifeguard order you out of the ocean when there is a lightning storm? Why is it dangerous to use a hairdryer or other electrical appliance while you are in the bathtub? Why are sports drinks advertised to replenish the electrolytes in your body? These questions and others will be answered in this simulation.



Atoms of an element have equal numbers of protons (positively charged) and electrons (negatively charged) and, therefore, are neutral in charge. Atoms that have lost one or more electrons have a positive charge and are called cations. Atoms that have gained one or more electrons are called anions. Electrolytes are substances whose aqueous solutions conduct electricity. Nonelectrolytes are substances whose aqueous solutions do not conduct electricity.

Soluble ionic compounds such as sodium chloride (NaCl) dissociate completely to produce many ions in aqueous solution and therefore conduct electricity well. NaCl in aqueous solution dissociates into two ions: Na<sup>+</sup> and Cl<sup>-</sup>. MgCl<sub>2</sub> dissociates into three ions—one cation and two anions. These compounds are strong electrolytes. If an ionic compound is not soluble in water, then the solution will not conduct electricity.

Covalent compounds are neutral, but certain covalent compounds will ionize when placed in water. These compounds are often acids. An example is hydrochloric acid, HCl. If these covalent compounds ionize completely, or nearly so, they produce many ions in solution and are strong electrolytes. Some covalent compounds like acetic acid ionize slightly, producing few ions in solution. They conduct electricity poorly since there are few ions to carry charge.

Most covalent compounds do not produce ions (ionize) in water. An example is sucrose,  $C_{12}H_{22}O_{11}$ . Without ions, solutions formed from these compounds do not readily conduct electricity.

#### Move to pages 1.2-1.6. Answer the following questions here or in the .tns file.

Q1.	An electrically neutral atom has an equal number of		
	A. protons and neutrons	C. protons a	and electrons
	B. neutrons and electrons	D. protons,	electrons, and neutrons
Q2.	Positively charged atoms have	one or more elec	trons.
	A. lost	C. reduced	
	B. gained	D. formed	
Q3.	The charge on a molecule is		
	A. positive	C. negative	
	B. zero	D. undefine	b



### Student Activity



Name \_\_\_\_\_

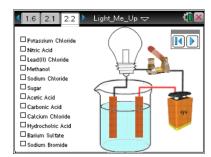
Q4.	A substance in aqueous solution that conducts electricity is	
	A. an atom	C. an electrolyte
	B. a compound	D. a nonelectrolyte
Q5. A substance that ionizes only slightly in aqueous solution is called a		eous solution is called a
	A. nonelectrolyte	C. weak electrolyte
	B. strong electrolyte	D. compound

#### Move to pages 2.1 and 2.2.

On page 2.2 choose a compound from the list to investigate.
Molecules will appear without a charge. lons appear with charges (+ and –).

**NOTE**: You will need a copy of solubility rules for these compounds to answer the questions.

2. Press the play button ( ) to begin the simulation.



- 3. Observe carefully whether ions exist, whether the bulb burns, and if there is a flow of electrons. Also note the movement of the particles (ions or molecules) and think about what it means if nothing in the solution is moving.
- 4. Press the reset button ( ) to reset the simulation.
- 5. Then choose a new compound.

#### Move to pages 2.3-2.5. Answer the following questions here or in the .tns file.

	to pugge and another mercaning que		
Q6.	If LiCl were dissolved in water, the solution wo	uld _	·
	A. not conduct electricity	C.	generate electricity
	B. conduct electricity poorly	D.	conduct electricity well
Q7.	An aqueous solution of HBr would		
	A. not conduct electricity	C.	generate electricity
	B. conduct electricity poorly	D.	conduct electricity well
Q8.	Predict what would happen to the light bulb if s	solid	CaCO <sub>3</sub> were placed in the water and stirred.
	Explain.		
Move	to pages 3.1-3.11. Answer the following qu	estic	ons here or in the .tns file.
Q9.	HCl(aq) is considered to be a		
	A. nonelectrolyte	C.	strong electrolyte
	B. weak electrolyte	D.	nonconductor



## Light Me Up!

# Student Activity



Name	
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Q10.	An aqueous solution of sucrose (table sugar) is	s co	nsidered to be a
Δ.σ.	A. nonelectrolyte		strong electrolyte
	B. weak electrolyte		conductor
Q11.	Sodium bromide would have ions i		
~	A. zero		some
	B. a couple		many
Ω12	An aqueous solution of nitric acid would cause		•
~	A. remain unlit		burn brightly
	B. light up dimly		burn out
Q13	An aqueous solution of methanol consists of _		
α.σ.	A. molecules		anions
	B. cations		cations and anions
O14	An aqueous solution of calcium chloride (CaCl		
<b>α</b> 1 <del>1</del> .	A. half as many		twice as many
	B. the same number of		none of the above
O15	Given equal molar solutions of sodium chloride		
Q1J.	would contain the greatest number of ions? (H		
	A. sodium chloride		aluminum chloride
	B. calcium chloride		all 3 would contain the same number of ions
O16	Referring to the previous question, which solut		
Q IU.	A. sodium chloride		aluminum chloride
	B. calcium chloride		all would conduct equally well
O17	Why does the lifeguard order you out of the oc		
Q17.	willy does the illeguard order you out of the oc	ean	when there is a lightning storm?
040	Mile to to to be a considered and the form of the		
Q18.	Why is it dangerous to use a hair dryer or othe	r eie	ectrical appliance while you are in the bathtub?
<b>.</b>			
Q19.	Why are sports drinks advertised to replenish t	he e	electrolytes in your body?
000			
Q20.	Barium sulfate is an ionic compound. Explain v	vhy	it does not conduct electricity.