

ELECTRICITY

UNIT OVERVIEW

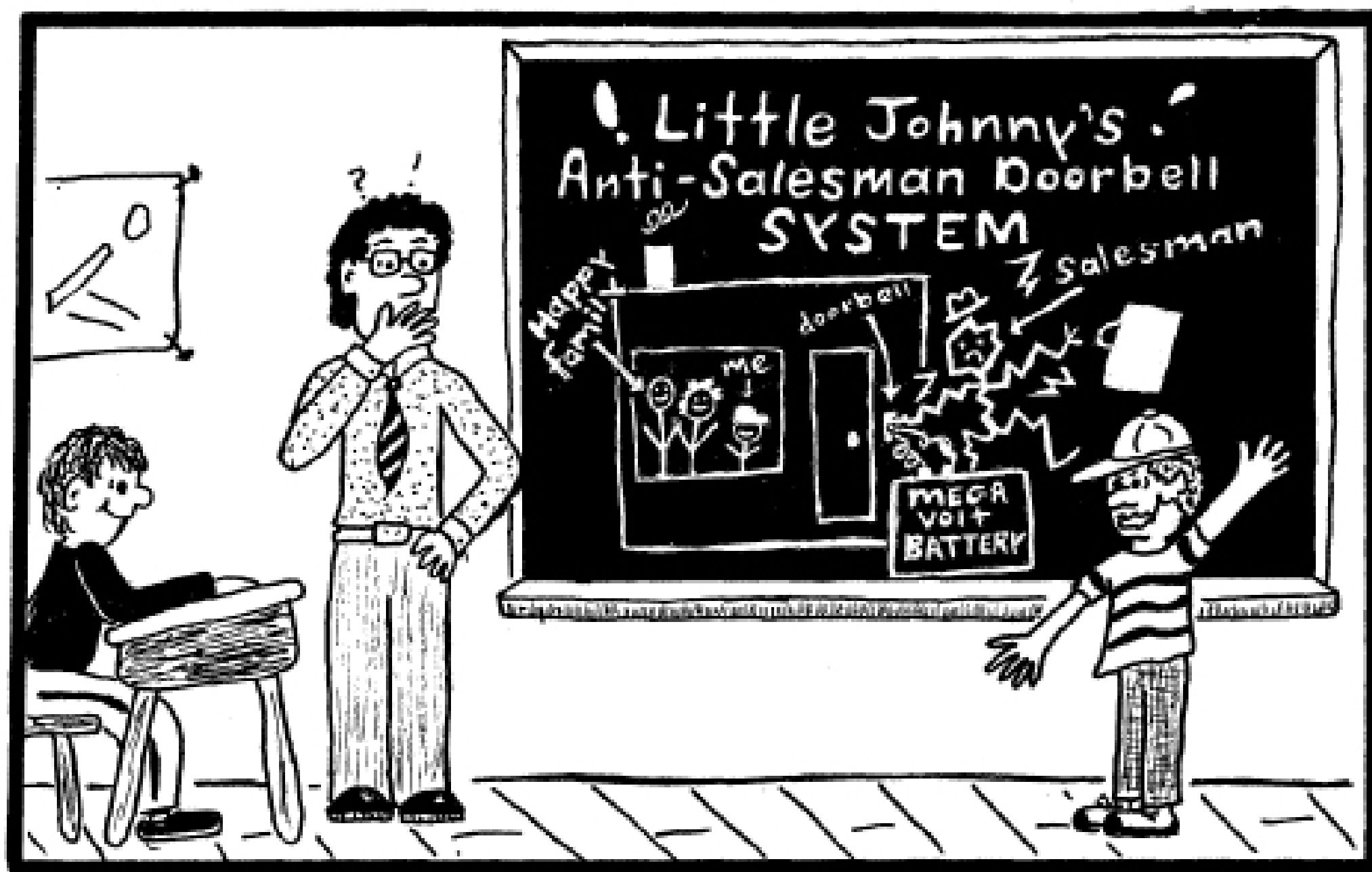
This unit is divided into two parts.

PART I - EVERYTHING YOU WANTED TO KNOW ABOUT ELECTRICITY (But Were Afraid To Ask)

The first part is a knowledge-based presentation of information using notes suitable for an overhead projector. Ten exciting activities and assignments accompany the notes. (70%)

PART II - CLASS PROJECT - Sunshine City Needs Electricity

The second section is a **role play** activity in which students, posing as concerned citizens, discuss what kind of electrical generating station to build for the make-believe community of Sunshine City. (30%)



INSULATOR OR CONDUCTOR?

NAME: _____

Instructions

Using a battery, lightbulb, and wire, invent a circuit that tells whether a substance is an insulator or a conductor. Complete the chart putting an "I" beside insulators and a "C" beside conductors. Draw and label a diagram of your test circuit in the box provided.

SUBSTANCE	I or C
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	
20.	

Diagram



THOMAS EDISON'S INVENTION

NAME: _____

The Impossible Dream

The newspapers said it just couldn't be done. Yet, in 1879, Thomas Alva Edison set out to do the impossible - build an electric light.

Up until that time, the only escape from the darkness of night was by lighting candles or by using oil burning lamps. The flickering light produced was dim and gave off smoke. Edison, who had already made a name for himself as an inventor, took on the difficult problem of the electric light saying that for every problem there was a solution. Thomas Edison would solve the "impossible" problem of the electric light.

First Failures

Early experiments with the electric light showed that if you took a thin piece of wire and passed an electric current through it, it would glow brightly, giving off a steady, even light. The problem was that the thin wire (called a filament) burned up in the air, lasting only a few seconds. Edison tried thousands of different materials as filaments, from aluminum to human hair to gold. He experimented, using trial and error methods for months (sometimes working night and day) but the filaments all burnt up too quickly.

Questions

All questions must be answered in full sentences (A.I.F.S.) unless it says to list the answer.

- List three of Thomas Edison's inventions.
 - 1) _____
 - 2) _____
 - 3) _____
- Why did the filaments burn up so quickly in his early experiments?

- How did Thomas Edison solve the burning filament problem?

- Edison used the process of trial and error to invent things. What does this mean?

- Edison had a hard time in school and yet turned out to be one of the greatest inventors of all time. Why do you think he had problems?

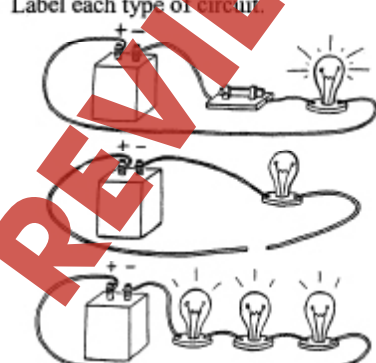
REVIEW QUESTIONS

NAME: _____

All questions must be answered in full sentences (A.I.F.S.) unless it says to list the answer.

- List three things that can tell you if static electricity is present.
 - 1) _____
 - 2) _____
 - 3) _____
- Explain how static electricity is made.

- Explain two differences between current electricity and static electricity.

- Label each type of circuit.


ELECTRICITY CROSSWORD

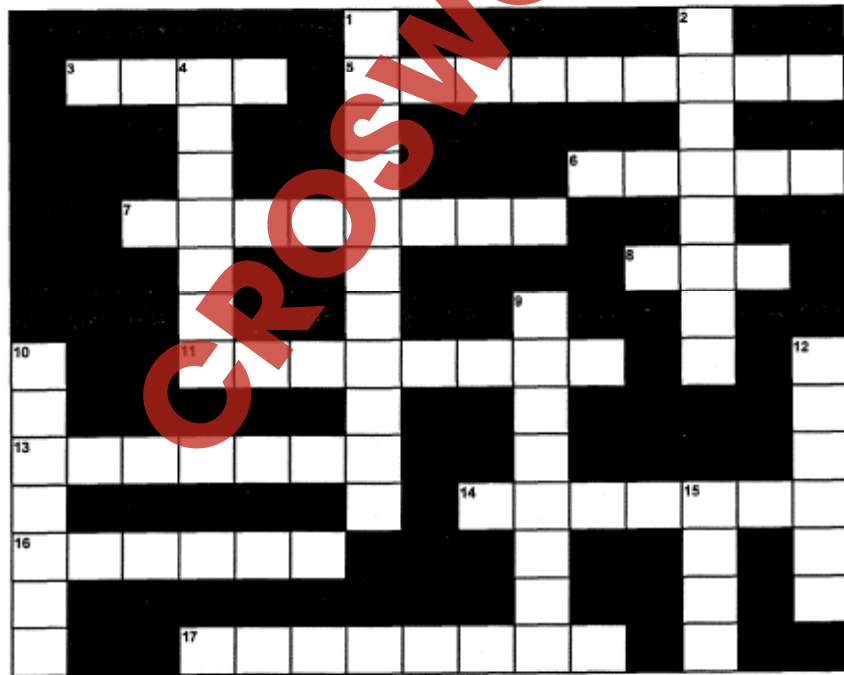
NAME: _____

Across

3. This device will burn out before an appliance is ruined.
5. Static electricity created by friction in the clouds.
6. When a large buildup of electrons "jumps" you get this.
7. Electrons have this type of charge.
8. Is science fantastic?
11. Lightest, mobile part of the atom.
13. Electricity that flows in wires is called _____ electricity.
14. Opposite charges do this.
16. Inventor of the lightbulb.
17. This is the type of wiring found in houses.

Down

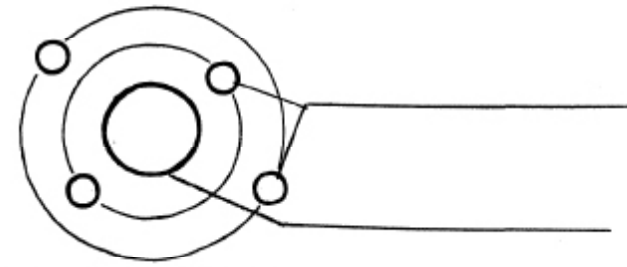
1. A kind of energy that you cannot see, hear or touch.
2. The thin, curly wire that glows in a lightbulb.
4. What is your favourite subject?
9. Objects that have lost electrons have this type of charge.
10. Central, heavy part of the atom.
12. Electricity that is created by friction is called _____ electricity.
15. Basic building block of matter.



THE AMAZING ATOM QUIZZZ

NAME: _____

1. Label the parts of the atom.



2. List important points about each.

Atom 1) _____

Nucleus 1) _____

2) _____

3) _____

Electrons 1) _____

2) _____

3) _____

3. Objects with extra electrons are
- a) Negative
 - b) Positive

4. Draw arrows that show whether the particles attract or repel.

a) + +

b) - +

c) + -

d) - -

PART II - CLASS PROJECT - "Sunshine City Needs Electricity"

In this culminating role play, students tackle complicated issues related to electrical generating stations for Sunshine City. Students discuss the pros and cons of: a proposed nuclear power station, a coal/oil electrical power station, a hydroelectric dam and no power station of any type. There are four activities in the role play:

- Activity 1 - Question and Answer Session
- Activity 2 - Letter Writing To The Mayor of Sunshine City
- Activity 3 - City Council Public Forum
- Activity 4 - Vote.

Begin by explaining what a "role play" is and how it is absolutely necessary to stay "in role" once things have started. Explain to students that the only thing they will be required to hand in for marking is a 150 word letter, written in role. Any other marks will be based on how well students stay in role and play their part.

Assign roles with two or three students representing each group. The following organizations are represented:

- 1) Acme Atomic - a company proposing to build a nuclear reactor to produce electricity.
- 2) Edsel Electric - a large power company wishing to construct a plant that burns coal and oil to produce electricity.
- 3) Hillman Hydro - a power company proposing a hydroelectric dam across the Reindeer river.
- 4) Conservation Connection - an organization that believes Sunshine City does not need any type of new powerplant. City residents should just use less electricity and eliminate the need for a new power station.
- 5) Friends of the Forest - an environmental organization concerned with the possible destruction of the forest and wildlife areas around Sunshine City. All three projects have environmental issues.
- 6) Concerned Citizens Coalition - a group of city residents worried about pollution in and around Sunshine City. Mainly concerned with nuclear waste as well as smog from a coal/oil burning plant.
- 7) W.A.M.A. (We're Not Moving Anywhere) - an organization representing the small village of Cabbagetown (58 residents) which is 10 kilometers upstream from Sunshine City that would be flooded if a hydroelectric dam were built.

LETTER TO THE MAYOR OF SUNSHINE CITY

I am in favour of: (Check one)

- Option 1) Building a COAL/OIL electrical generating station.
- Option 2) Building a NUCLEAR electrical generating station.
- Option 3) Building a HYDROELECTRIC DAM and generating station.
- Option 4) Not building ANY electrical generating station.

My reasons are as follows:

Signature: _____

ELECTRICITY WORDSEARCH

NAME: _____

Find These Words:

ATOM
ELECTRON
NUCLEUS
ENERGY
NEGATIVE
POSITIVE
CHARGE
SERIES

CURRENT
SHOCK
ELECTRICITY
CIRCUIT
SPARK
CONDUCTOR
INSULATOR
PARALLEL

COPPER
WIRE
LIGHTNING
EDISON
BATTERY
BULB
BREAKER
FUSE

E	R	P	A	T	D	I	K	F	S	D	O	N	L	L
L	I	G	H	T	N	I	N	G	U	H	O	Z	S	S
E	P	W	J	W	E	A	T	N	C	S	O	U	U	E
C	O	N	D	U	C	T	O	R	I	Y	E	C	G	R
T	S	V	E	U	N	R	O	D	R	L	H	U	K	I
R	I	T	K	G	T	T	E	E	C	H	A	R	G	E
I	T	E	N	C	A	A	T	U	U	F	L	R	R	S
C	I	T	E	L	S	T	N	E	I	F	T	E	X	T
I	V	L	U	J	A	O	I	K	T	U	K	N	S	B
T	E	S	D	B	N	M	R	V	E	A	B	T	W	Y
Y	N	R	P	A	R	A	L	L	E	L	Z	O	I	T
I	E	H	C	O	P	P	E	R	U	R	S	Y	G	C
B	R	Q	A	S	Z	R	B	B	F	A	M	B	W	M
R	G	Z	B	U	I	O	F	E	D	N	M	B	X	Y
F	Y	X	V	W	B	H	G	Q	P	M	P	F	T	E

ANSWER KEY

ON #7 - REVIEW LESSON - Questions and Crossword

Content Objectives and Activities

Students review material on electricity.

Suggested Teaching Strategies

Insist that students Answer the review questions In Full Sentences (A.I.F.S.) so the answer will make sense by itself without the question being there.

Permit students to do the crossword *after* the questions are done correctly and completely.

Answer Key

