

Grade 9 - Characteristics of Electricity - Pre-Assessment

Purpose:

This document is for grade 9 teachers to use as a pre-assessment for the “Characteristics of Electricity” unit. It assesses students understanding of the of the end of unit knowledge outcomes from the grade 6 “Electricity” unit.

Curriculum Comparison:

Grade 6 - Electricity	Grade 9 - Characteristics of Electricity
303-31 identify and explain the dangers of electricity at work or at play	308-13 explain the production of static electricity changes in some common materials
*204-4 use the terms attraction, repulsion, electrons, positive charge and negative charge in meaningful context while exploring static electricity	308-14 identify properties of static electrical charges
303-23 compare a variety of electrical pathways by constructing simple circuits	308-15 compare qualitatively static electricity and electric current
300-20 compare the conductivity of a variety of solids and liquids	308-16 describe the flow of charge in an electrical circuit
303-24 describe the role of switches in electrical circuits	308-17 describe series and parallel circuits involving varying resistance, voltage, and current
303-25 compare characteristics of series and parallel circuits	308-18 relate electrical energy to domestic power consumption costs
303-22 compare the characteristics of static and current electricity	308-19 determine quantitatively the efficiency of an electrical appliance that converts electrical energy to heat energy
303-27 describe the relationship between electricity and magnetism when using an electromagnet	308-20 describe the transfer and conversion of energy from a generating station to the home
303-26 demonstrate how electricity in circuits can produce light, heat, sound, motion, and magnetic effects	
303-28 identify various methods by which electricity can be generated	
303-29 identify and explain sources of electricity as renewable and nonrenewable	
303-30 identify and explain different factors that could lead to a decrease in electrical energy consumption in the home and at school	

Rubric Coding:

The purpose of an assessment is not to assign a “Mark” or a “Grade”. Rather, this document demonstrates to teacher the students previous understanding of the outcome. Each question assesses on specific knowledge outcome from the grade 6 unit that precedes the grade 10 “Characteristics of Electricity” unit.

Code 0 - Indicates that students do not understand the concept

Code 1 - Indicates that students understand the basic concept but either cannot elaborate in detail or have not considered more information could of been added

Code 2 - Indicates that students have a mastery of the concept.

*Please note that not all outcomes will allow for a Code 2 based on complexity.

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Grade 6 Electricity

Knowledge Outcomes and Curriculum Focus

303-31 identify and explain the danger of electricity at work or at play

- In grade 6 students should be made aware of electrical dangers like:
 - using electrical devices near water
 - fallen power lines
 - climbing transmission towers
 - flying kites or climbing trees near power lines
 - frayed or exposed wires in the house
 - pulling out plugs by the cord
 - tinkering with devices that have capacitors

*** 204-4 use the terms attraction, repulsion, electrons, positive charge and negative charge in meaningful context while exploring static electricity**

- Focus - students should be able to explain the terms with context to static electricity

***303-23 compare a variety of electrical pathways by constructing simple circuits**

- Students should of explored making a variety of circuit pathways. Students should also be able to draw their circuit diagrams using appropriate symbols for cells, batteries, light bulbs, and switches. Drawings should be make to show the flow of electricity

300-20 compare the conductivity of a variety of solids and liquids

- Students should be using conductivity testers on various materials to determine if their are insulators or conductors

***303-24 describe the role of switches in electrical circuits**

- Students should understand that switches allow a person to control when the circuit is completed, allowing electricity to flow.

***303-25 compare characteristics of series and parallel circuits**

- Students should have practice physically creating different circuits in series and parallel. Students should be able to problem-solve to determine if a battery is dead or if there is a break in the wire.

***303-22 compare the characteristics of static and current electricity**

- Students should realize that current electricity is a charge (electron) that moves along a pathway while static electricity is localized to an object.

303-27 describe the relationship between electricity and magnetism when using an electromagnet

- Students will create an electromagnet to detect magnetism

303-26 demonstrate how electricity in circuits can produce light, heat, sound, motion, and magnetic effects

- Students should be creating authentic circuits that produce an specific effect based on the conversion of energy

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***303-28 identify various methods by which electricity can be generated**

- Students should identify chemical (batteries), mechanical (wind, falling water, steam) and solar energy as forms of energy that can be converted into electrical energy

303-29 identify and explain sources of electricity as renewable and nonrenewable

- Students should have created simple electrochemical cell to realize that once energy has been converted it cannot be reused. Also, students should have work with solar kits to understand that solar is renewable.

303-30 identify and explain different factors that could lead to a decrease in electrical energy consumption in the home and at school

- Students should have collected data and developed a plan to reduce consumption in their everyday lives.

** Please Note that not all knowledge outcomes from grade 6 have been assessed. Only outcomes with a direct connection to the learning in grade 9 have be included.*

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Name: _____

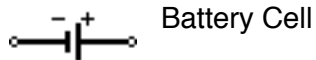
Teacher/Class: _____

1. Both static and current electricity are dependent on charged electrons. Explain how electrons behave differently in static and current electricity.

2. Jimmy decided to take a new balloon from the package and blow it up. He inflated the balloon to the point in which it got hard to keep blowing. Once he tied the balloon shut he rubbed the balloon against his wool sweater to see what would happen.

Use the terms **attraction, repulsion, electrons, positive charge and negative charge** to explain what would most likely happen when Jimmy rubs the inflated balloon against his wool sweater.

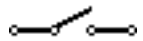
3. Draw a simple circuit using the symbols listed below



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4. Describe the role of switches in an electrical circuit.

5. Use these symbols to draw a circuit diagram for both series and parallel circuits.

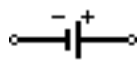


Switch

Series Circuit



Wire



Battery Cell



Lamp

.....
Parallel Circuit

6. An elementary class is learning about electricity. During their inquiries they begin to question where electricity comes from.

Explain to the class three major methods by which electricity can be generated.

1.

2.

3.

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Coding Rubric

1. Both static and current electricity are dependent on charged electrons. Explain how electrons behave differently in static and current electricity.

(303-22)

0 - Any other answer

1 - Students should realize that current electricity is a charge (electron) that moves along a pathway while static electricity is localized to an object.

2. Jimmy decided to take a new balloon from the package and blow it up. He inflated the balloon to the point in which it got hard to keep blowing. Once he tied the balloon shut he rubbed the balloon against his wool sweater to see what would happen.

Use the terms **attraction, repulsion, electrons, positive charge and negative charge** to explain what would most likely happen when Jimmy rubs the inflated balloon against his wool sweater.

(202-4)

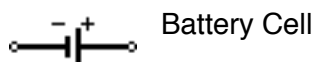
0 - Any other answer

1 - A simple answer that highlights the change of charge from the balloon and sweater (3-4 terms used correctly)

2 - A complex answer that details the change of charge from the balloon and sweater and elaborates on hypotheticals that could arise (uses all 5 terms correctly)

3. Draw a simple circuit using the symbols listed below

303-23



0 - Any other answer

1 - A complete circuit with only one switch and one light (Single Series)

2 - A complete circuit with more than one switch and/or light in wired in either series or parallel

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4. Describe the role of switches in an electrical circuit.

303-24

0 - Any other answer

1 - Simple description that switches allow a person to control when the circuit is completed, allowing electricity to flow.

5. Use these symbols to draw a circuit diagram for both series and parallel circuits.

303-25

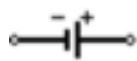


Switch

Series Circuit



Wire



Battery Cell



Lamp

Parallel Circuit

0 - Any other answer

1 - Series Circuit only - circuit completed with a switch, battery, and a lamp that will light up

2 - Both Series and Parallel Circuits - circuit completed with a switch, battery, and a lamp that will light up. Note that parallel will have more than one lamp but does not require more than one switch.

6. An elementary class is learning about electricity. During their inquiries they begin to question where electricity comes from.

Explain to the class three major methods by which electricity can be generated.

303-28

Options:

Chemical (batteries)

Mechanical (water, wind, steam)

Solar

Nuclear

0 - Any other answer

1 - Two completed explanations with an example embedded in the explanation

2 - Three or more completed explanations with an example embedded in the explanation