Science and Technology

Grade 10

Personal Study Guide

Name:

- ☐ **Part 1: Chemistry** — **due APRIL 14**
- ☐ **Part 2: Electricity / Magnetism** — **due APRIL 23**
- ☐ **Part 3: Technology** — **due APRIL 30**
- ☐ **Part 4: Environment** — **due MAY 12**

Part 1:
Chemistry

due APRIL 14

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 1

Atoms and atomic models

ST

PAGES 6–15

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

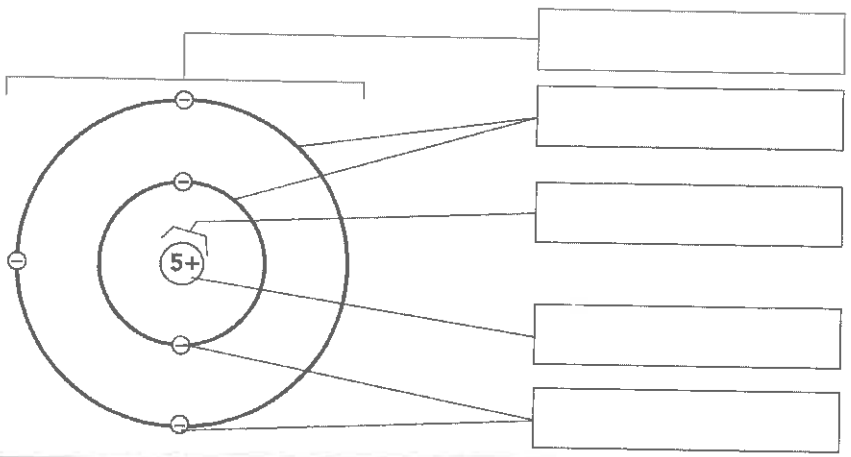
- An atom is _____
- The electron is _____
- The proton is _____
- The Rutherford-Bohr atomic model is _____

Rutherford's observations and consequent conclusions

Observation	Conclusion

Parts of the atom

Rutherford-Bohr atomic model



Name: _____ Group: _____ Date: _____

Evolution of the atomic model

(1808) Dalton's atomic model

According to Dalton, the atom is

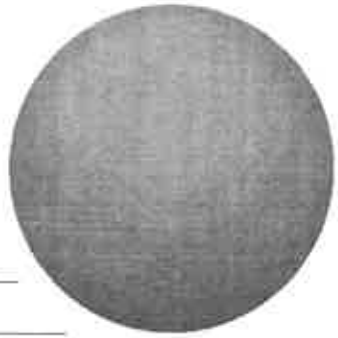
_____

_____

_____

_____

_____



(1911) Rutherford's atomic model

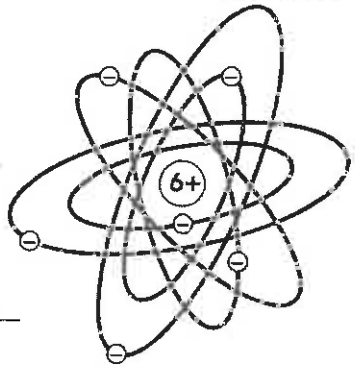
Rutherford modified Thomson's atomic model by

_____

_____

_____

_____



1800 1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010

(1897) Thomson's atomic model

Thomson modified Dalton's atomic model by

_____

_____

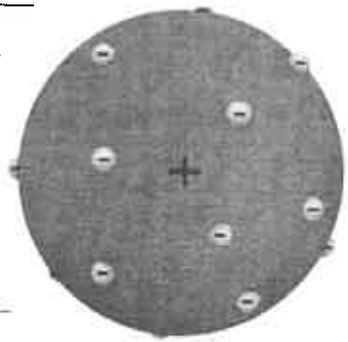
_____

_____

_____

_____

_____



(1913) Rutherford-Bohr atomic model

Bohr modified Rutherford's atomic model by

_____

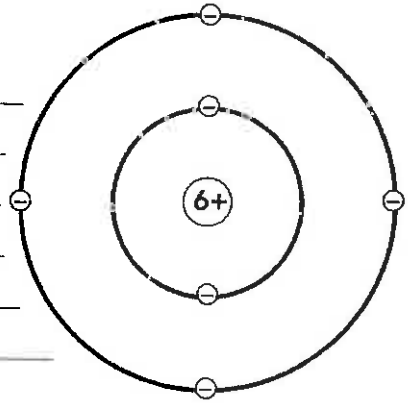
_____

_____

_____

_____

_____



Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 2

The periodic table

ST

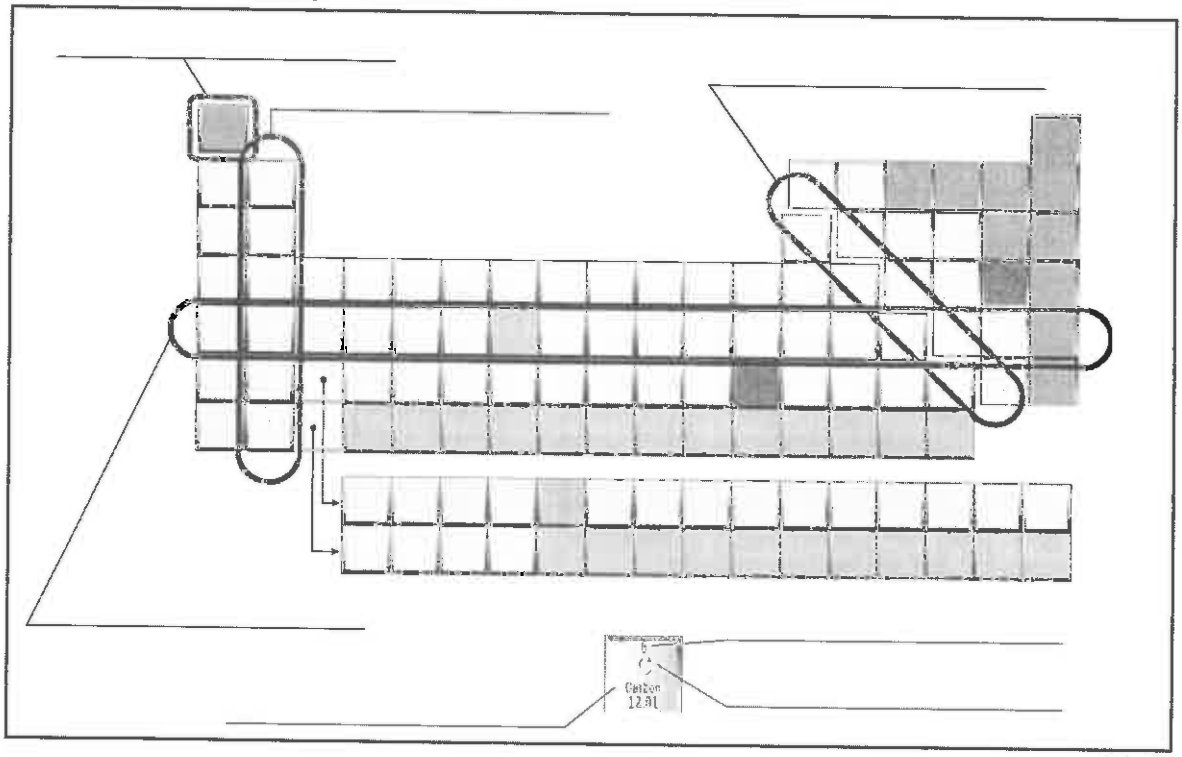
PAGES 17–23

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- A periodic classification is _____
- The periodic table of the elements is _____
- A valence electron is _____
- A group corresponds _____
- A period corresponds _____

Organization of the periodic table



Name: _____ Group: _____ Date: _____

Properties of the categories of elements

Category (location)	Properties
Metals (to the left of the staircase)	

Properties of certain groups of elements

Category (location)	Properties
Alkali metals (1st column)	

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 3

Representing atoms

ST

PAGES 26–29

Complete this Concept Review so you can keep a record of what you have learned.

How the periodic table and the Rutherford-Bohr atomic model are linked

Information obtained from the periodic table	How it corresponds to the Rutherford-Bohr atomic model
Period	
Group	
Atomic number	

Three ways of representing atoms

• _____

_____

_____

_____

Representation of the atom showing the number of protons, electrons and electron shells.

Nitrogen

• _____

Representation in which the atom is depicted as a ball, and its bonds with other atoms are shown with sticks. The size of the ball is generally proportional to the number of electron shells in the atom.

Nitrogen

• _____

Nitrogen

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 5

Molecules and ions

ST

PAGES 40–44

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- A molecule is _____
  _____
- An ion is _____
  _____

Some characteristics of ions

	Negative ion	Positive ion
Loss or gain of electrons		
Number of electrons to protons		
Charge		

Tendency to gain or lose electrons for group A elements, and examples of possible ions

Group number	I A	II A	III A	IV A	V A	VI A	VII A	VIII A
Number of valence electrons								
Tendency		Lose $2\ e^-$						
Example of possible ion			B^{3+}					

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 7

Solubility and concentration

ST

PAGES 50–53

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- A solution is _____
- An aqueous solution is _____
- Solubility is _____
- The concentration of a solution is _____
- The concentration in PPM ("parts per million") is _____

Effects of various changes on the concentration of a solution

Change	Effect on the concentration
Dilution (addition of solvent)	
Dissolution (addition of solute)	
Evaporation (reduction of solvent))	

Mathematical formulas and units of measurement

Formula for calculating concentration in g/L:

where _____

Equivalences for 1 ppm:

$$1\ \text{ppm} = \frac{\text{g}}{\text{g}} = \frac{\text{mg}}{\text{g}} = \frac{\text{mg}}{\text{kg}}$$

In aqueous solutions:

1 ppm ≈ _____ ≈ _____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 8

Electrical conductivity and pH

ST

PAGES 55–61

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- An electrolyte is _____
- The electrical conductivity of a solution is _____
- Electrolytic dissociation is _____

Characteristics of the types of electrolytes

Type of electrolyte	Acid	Base	Salt
Definition			
Chemical composition			
Reaction to litmus paper			
Examples			

Name: _____ Group: _____ Date: _____

pH scale

If the pH < 7, the solution is _____

If the pH = 7, the solution is _____

If the pH > 7, the solution is _____

pH of some common substances

pH	Acidity or basicity in comparison to a pH of 7	Examples of substances
	10 000 000 times more acidic	
	1 000 000 times more acidic	Gastric juices
	100 000 times more acidic	
	10 000 times more acidic	
	1 000 times more acidic	
	100 times more acidic	Rainwater
	10 times more acidic	Milk
	Neutral	
	10 times more basic	
	100 times more basic	
	1 000 times more basic	
	10 000 times more basic	
	100 000 times more basic	Lime
	1 000 000 times more basic	Oven cleaner
	10 000 000 times more basic	

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 15

Balancing chemical equations

ST

PAGES 108–112

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

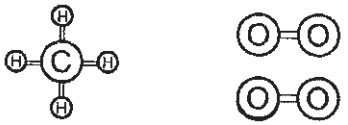
- A physical change alters _____
- A chemical change alters _____
- The law of conservation of mass states that _____
- Balancing a chemical equation consists _____

Signs pointing to the occurrence of a chemical change

- _____
- _____
- _____
- _____
- _____

Example of conservation of mass

Before the reaction

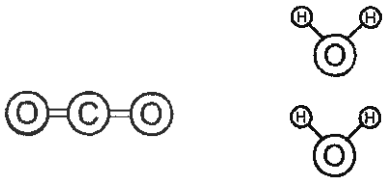


$CH_{4(g)}$ + $2\ O_{2(g)}$

16 g + 64 g

_____ g

After the reaction



$CO_{2(g)}$ + $2\ H_2O_{(g)}$

44 g + _____ g

_____ g

Name: _____ Group: _____ Date: _____

Example of interpreting a chemical equation

Chemical equation	$CH_{4(g)}$	+	$2\ O_{2(g)}$	→	$CO_{2(g)}$	+	$2\ H_2O_{(g)}$
Interpretation	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____

Total number of atoms of each element before and after the reaction

Before the chemical reaction		After the chemical reaction	
Reactants	Number of atoms	Product	Number of atoms
$N_2 + 3\ H_2$	_____	$2\ NH_3$	_____
	_____		_____

Rules to apply when balancing chemical equations

- _____
- _____
- _____
- _____
- _____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 17

Chemical changes

ST

PAGES 117–124

Complete this Concept Review so you can keep a record of what you have learned.

Chemical change

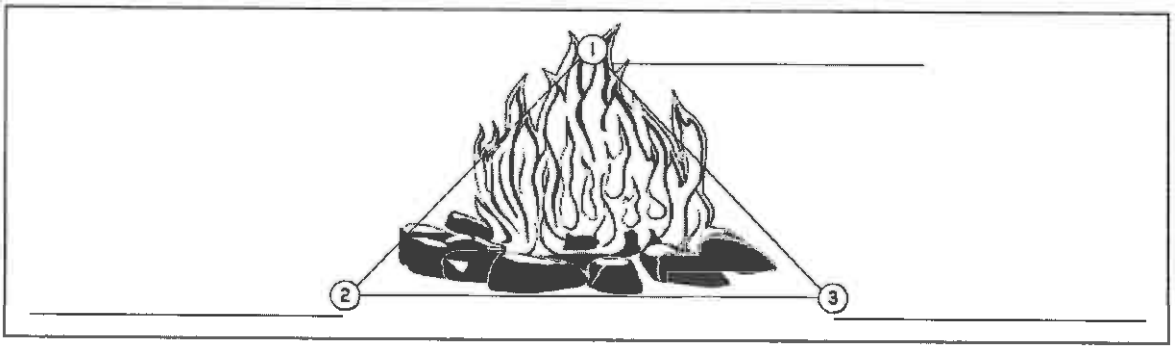
Chemical change	Description or definition
	Generic formula: _____
	Generic formula: _____
	Generic formula: _____

Name: _____ Group: _____ Date: _____

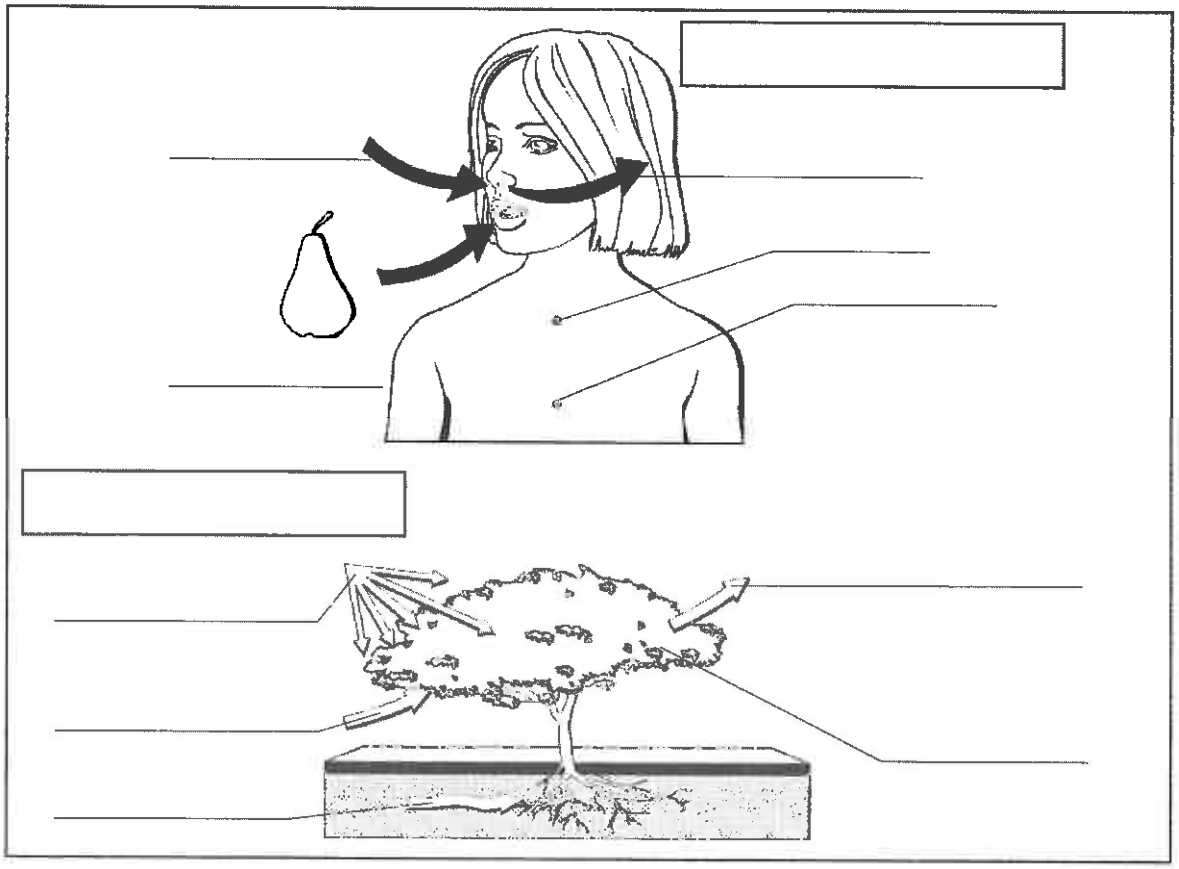
Types of combustion and characteristics

Type of combustion	Characteristic
Rapid combustion	Releases a great deal of energy within a short period of time.
	_____ _____
	_____ _____

Conditions necessary for combustion



Cellular respiration and photosynthesis



Part 2:

Electricity / Magnetism

due APRIL 23

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 19

Electricity and electrical charges

ST

PAGES 140–143

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Electricity describes _____
- Electrical charge is _____
- The coulomb is _____

Symbol: _____

Electrical forces of attraction and repulsion

- Electrical charges of like signs _____
- Electrical charges of opposite signs _____
- The law of conservation of charge states _____

Conductors and insulators

Category of object	Definition	Examples
Conductor		
Semiconductor		

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 20

Static electricity

ST

PAGES 145–148

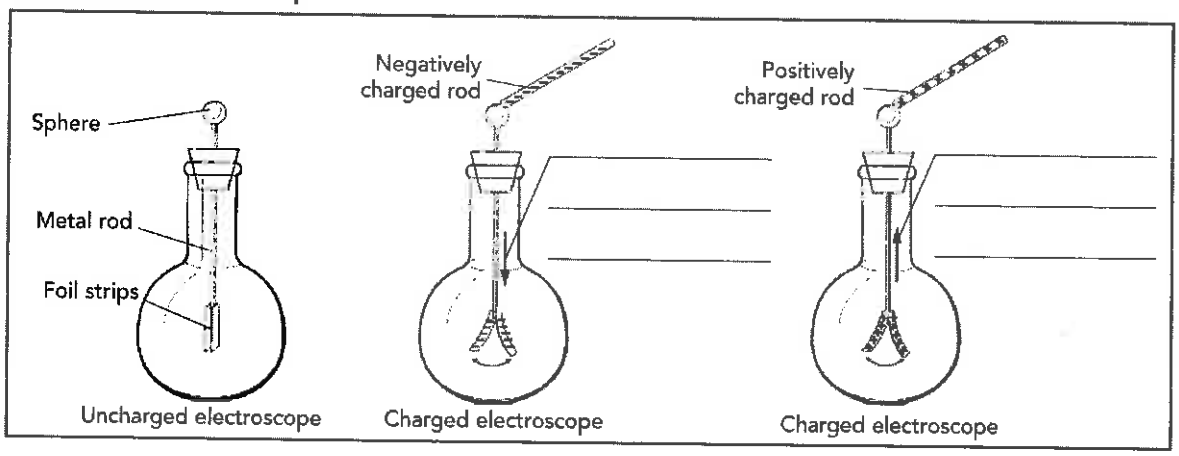
Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Static electricity describes _____

_____

How an electroscope works



Three methods of charging an object

Method	Before	During	After

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 21

Electric current and electrical power

ST

PAGES 150–156

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Dynamic electricity describes _____
- Electric current is _____
- Ohm's law states _____
- Electrical power is _____

Unit of measurement: _____ Symbol: _____

1 W =

Characteristics and forms of electric current

Characteristic (symbol)	Definition	Unit of measurement (symbol)	Equation
Current intensity (I)			$1\ A = \frac{1\ C}{1\ s}$

Name: _____ Group: _____ Date: _____

Mathematical formulas and units of measurement

Formula for determining the current intensity in a circuit:

where _____

_____

_____

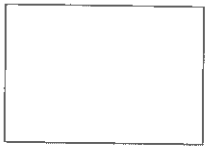
Formula for determining the potential difference between two points in a circuit:

where _____

_____

_____

Formula for Ohm's law:



where _____

_____

_____

Formula expressing electrical power as a function of potential difference and current intensity:

where _____

_____

_____

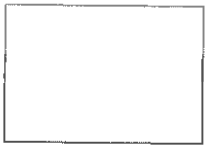
Formula expressing the relationship between electrical power and electrical energy:

where _____

_____

_____

Formula expressing the relationship between electrical power and electrical energy:



where _____

_____

_____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 22

Electrical circuits

ST

PAGES 156–159

Complete this Concept Review so you can keep a record of what you have learned.

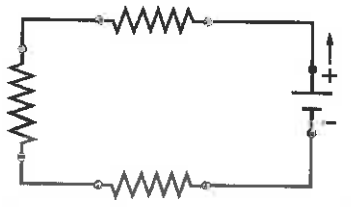
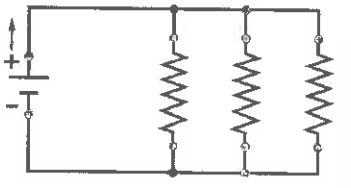
Definitions

- An electrical circuit is _____

Minimal components of an electrical circuit

Component	Function
Electrical resistance	

Types of circuit

Type of circuit	Definition	Example
		
		

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 23

Magnetism and electromagnetism

ST

PAGES 163–168

Complete this Concept Review so you can keep a record of what you have learned.

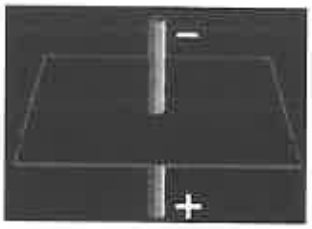
Definitions

- A magnet is _____
- Magnetism describes _____
- The north pole of a magnet is _____
- A magnetic field is _____
- Electromagnetism describes _____

Magnetic forces of attraction and repulsion

- Opposite magnetic poles _____
- Like magnetic poles _____

Magnetic fields

Magnetic field of a bar magnet	Magnetic field of two bar magnets	Magnetic field of a live wire
N S	S N	
	N N	

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 60

Electricity, electronics and electrical circuits

ST

PAGES 458–462

Complete this Concept Review so you can keep a record of what you have learned.

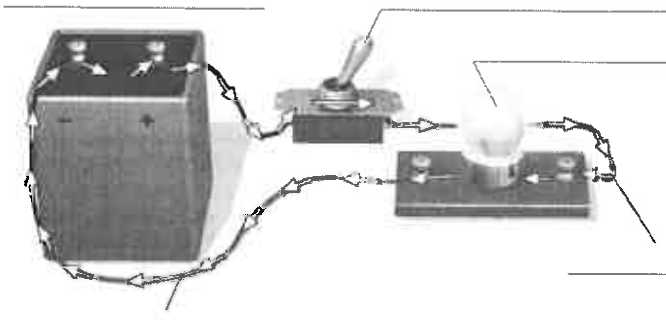
Definitions

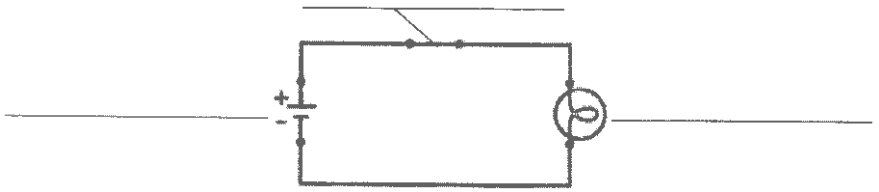
- Direct current is _____
- Alternating current is _____

Differences between electricity and electronics

Characteristic	Electricity	Electronics
Materials used		
Power of the current		
Size of circuits		

Components of an electrical circuit





Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 61

Power supply, conduction, insulation and protection

ST

PAGES 462–467

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- An electrical function is _____
- Power supply is _____
- Conduction is _____
- Insulation is _____
- Protection is _____

How two protective devices work

Fuse	Breaker

Name: _____ Group: _____ Date: _____

Various power supplies

Source	Description	Advantages	Disadvantages
Battery			
Electrical outlet			
Photovoltaic cell			

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 62

Control and transformation of energy

ST

PAGES 469–472

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- A closed circuit is _____
- An open circuit is _____
- Control is _____
- The transformation of energy is _____

Electrical components that are used to transform energy

Component	Description	Form of energy obtained

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 9

Energy and energy efficiency

ST

PAGES 70–72

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Energy is _____

  _____

  Unit of measurement: _____ Symbol: _____

  1 J = _____

- The law of conservation of energy states _____

  _____

  _____

  _____

- Energy efficiency is _____

  _____

  _____

Mathematical formula for calculating energy efficiency

Some forms of energy, with possible sources

Form of energy	Description	Examples of sources
Radiation		
Chemical energy		
Wind energy		

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 10

Thermal energy

ST

PAGES 73–74

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Thermal energy is _____
- Heat is _____
- Temperature is _____

Factors affecting the thermal energy of a substance

Factor	Factor variation	Result

Mathematical formulas and units of measurement

Formula for indicating the relationship between heat and thermal energy:

[ ] where _____

Part 3:
Technology

due APRIL 30

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 55

Linking in technical objects

ST

PAGES 426–428

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Mechanical engineering is _____
- A link _____
- In mechanics, a component is _____
- Linking is _____

Characteristics of links

Characteristics	Description
Direct	• Two parts hold together without a linking component.
Indirect	• Parts require a linking component to hold them together.
_____	_____
_____	_____
_____	_____
_____	_____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 56

Guiding controls

ST

PAGES 431– 432

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Guiding is _____

_____

_____

- A guiding component or control is _____

_____

_____

Main types of guiding

Type of guiding	Description
	_____ _____ _____
	_____ _____ _____
	_____ _____ _____ _____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 57

Motion transmission systems

ST

PAGES 435–441

Complete this Concept Review so you can keep a record of what you have learned.

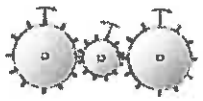
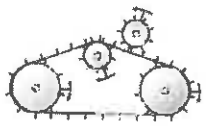
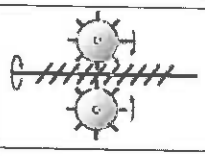
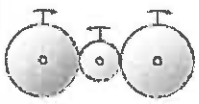
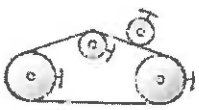
Definitions

- Motion transmission is _____
- A motion transmission system is _____

Types of components in a mechanical system

Type of component	Description
Driver component	

Characteristics of motion in motion transmission systems

Motion transmission system	Symbol	Direction of rotation of components	Reversibility
			
			
			
			
			

Name: _____ Group: _____ Date: _____

Elements to consider when building motion transmission systems

System	Elements to consider

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 58

Speed changes in motion transmission systems

ST

PAGES 442–444

Complete this Concept Review so you can keep a record of what you have learned.

Definition

- A speed change occurs in a motion transmission system when _____

Speed changes in worm and worm gear

On a gear, the greater the number of teeth, _____

Speed changes in other motion transmission systems

Speed change	Friction gear systems Belt and pulley systems	Gear trains Chain and sprocket systems
	Motion is transmitted _____	Motion is transmitted _____
	Motion is transmitted _____	Motion is transmitted _____
	Motion is transmitted _____	Motion is transmitted _____

Calculation of speed ratio in a motion transmission system

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 59

Motion transformation systems

ST

PAGES 445–449

Complete this Concept Review so you can keep a record of what you have learned.

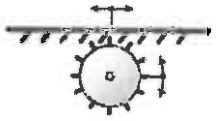
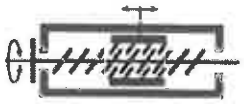
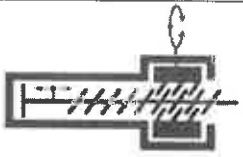
Definition

- Motion transformation is _____

_____

_____

Characteristics of motion in the most common motion transformation systems

System	Symbol	Possible transformations	Reversibility
Rack and pinion system			
_____			
_____			
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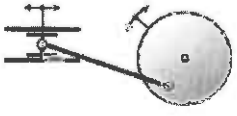
_____			

Name: _____ Group: _____ Date: _____

Elements to consider when building motion transformation systems

System	Elements to consider			
Screw gear system, type I				
Screw gear system, type II				

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 48

Constraints and material deformations

ST

PAGES 386–387

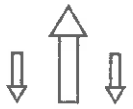
Complete this Concept Review so you can keep a record of what you have learned.

Definition

- A constraint describes _____

_____

Main types of constraints materials are subjected to

Type of constraint	Description	Symbol
Compression	_____	
	_____	
	_____	
	_____	
	_____	

Types of material deformation

Type of deformation	Description
	_____
	_____
	_____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 49

Properties and material degradation and protection

ST

PAGES 388–390

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- The mechanical properties of a material describe _____
- The degradation of a material is _____
- The protection of a material is _____

Mechanical properties of materials

Mechanical property	Definition
	Ability to resist indentation or abrasion

Other properties of materials

Property	Description

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 50

Wood, modified wood, ceramics, metals and alloys

ST

PAGES 390–395

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Wood is _____
- Modified wood is _____
- A ceramic is _____
- A metal is _____
- An alloy is _____

Wood and modified wood

Properties

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Degradation and protection

Examples of causes of degradation:

_____

_____

_____

Examples of means of protection:

_____

_____

_____

Name: _____ Group: _____ Date: _____

Ceramics

Properties

- _____
- _____
- _____
- _____
- _____
- _____

Degradation and protection

Examples of causes of degradation:

_____

_____

Examples of means of protection:

_____

_____

Metals and alloys

Properties

- _____
- _____
- _____

Degradation and protection

Examples of causes of degradation:

_____

_____

Examples of means of protection:

_____

_____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 51

Plastics and composites

ST

PAGES 396–401

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- A plastic is _____
- A thermoplastic is _____
- A thermosetting plastic is _____
- A composite is _____

Degradation and protection of plastics

Cause of degradation	Description	Example of protection

Name: _____ Group: _____ Date: _____

Main matrices and reinforcements used in composites

Matrix or reinforcement	Properties sought
Plastic matrix	• Durability • _____ • _____ • _____
	• _____ • _____ • _____
	• _____ • _____
	• _____ • _____
	• _____ • _____
	• _____ • _____ • _____

Degradation and protection of composites

The degradation of composites usually takes one of two forms:

- _____
- _____

To protect materials, it is important to:

- _____
- _____

Part 4:
Environment

due MAY 12

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 37

Population size

ST
PAGES 292–296
Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- In ecology, a population is _____
- Population size refers _____

Factors affecting population size

- _____
- _____
- _____
- _____

Methods for measuring the size of a population

Method	Description
Counting individuals	

Formula:

Formula:

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 38

Population density and biological cycles

ST

PAGES 297–302

Complete this Concept Review so you can keep a record of what you have learned.

DENSITY AND DISTRIBUTION

Definitions

- Population density refers _____

_____

Mathematical formula:

- Population distribution is _____

_____

Patterns of distribution

Pattern of distribution	Description	Example

Name: _____ Group: _____ Date: _____

ECOLOGICAL FACTORS

Definitions

- An ecological factor is _____
- Abiotic factors are _____
- Biotic factors are _____
- A limiting factor is _____

Examples of ecological factors

Abiotic factors	Biotic factors

BIOLOGICAL CYCLE

Definition

- The biological cycle of a population is composed _____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 39

Communities and biodiversity

ST

PAGES 303–309

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- A community is _____

_____

- Biodiversity describes _____

_____

Main components of biodiversity

Component	Description
Species richness of a community	_____ _____
_____ _____	_____ _____

Main types of interaction between individuals of a community

Interaction	Description
Competition	_____ _____ _____
	_____ _____ _____ _____
	_____ _____ _____
	_____ _____ _____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 4.0

Ecosystems and trophic relationships

ST

PAGES 318–322

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- An ecosystem is _____
- Trophic relationships are _____
- Producers are _____
- Consumers are _____
- Decomposers are _____

Categories of matter

Category	Description	Examples

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 41

Ecosystem dynamics and disturbances

ST

PAGES 323–329

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

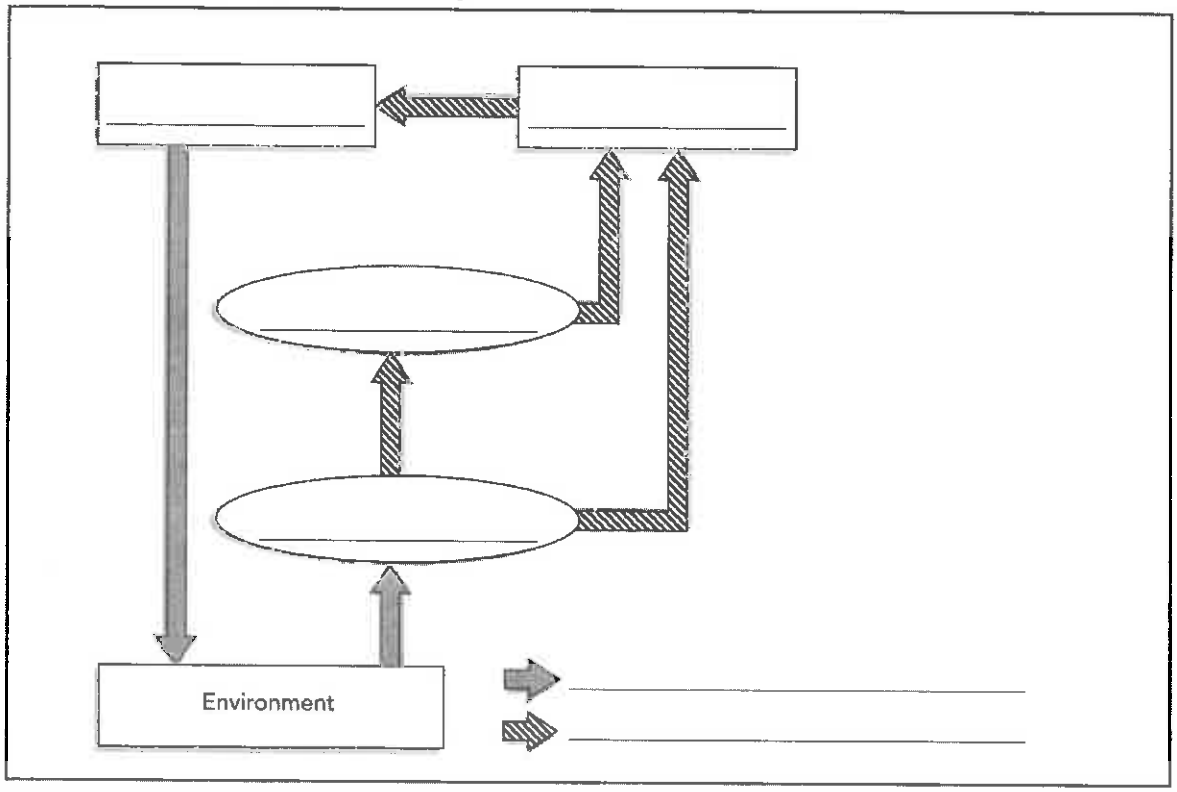
- The material and energy flow is _____
- Chemical recycling is _____
- The biomass is _____
- The primary productivity of an ecosystem is _____
- A disturbance is _____
- Ecological succession is _____

Factors influencing primary productivity in an ecosystem

- The amount of light
- _____
- _____
- _____

Name: _____ Group: _____ Date: _____

Chemical recycling in an ecosystem



Types of disturbances

Type	Definition	Examples

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 24

The lithosphere: minerals and rocks

ST

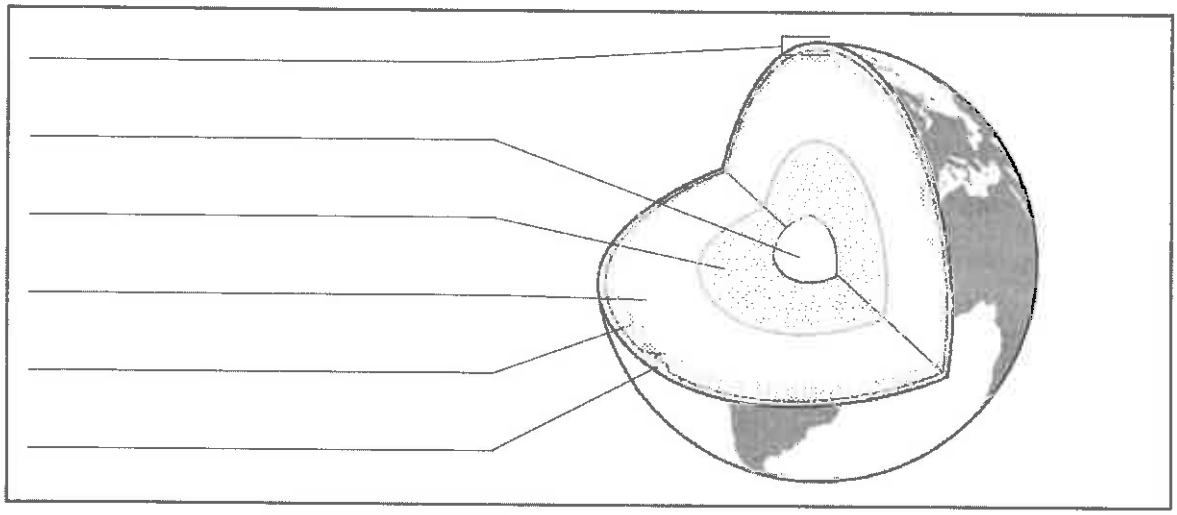
PAGES 184–191

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- The lithosphere is _____
- Minerals are _____
- Rocks are _____

Internal structure of the Earth



Some of the main minerals mined in Québec

Mineral	Possible uses
Gold	Jewellery, electronic equipment, trade

Name: _____ Group: _____ Date: _____

Distinctive features of minerals

• Inorganic substances	• _____
• _____	• _____

Some physical properties of minerals

Property	Description
Colour	_____ minerals: The element that gives them their colour is part of their chemical composition. _____ minerals: The impurities they contain give them their colour.

Types of rock

Type of rock	Formation
Igneous rocks	The result of the cooling of magma. _____ igneous rocks are formed on contact with the air. _____ igneous rocks are formed before reaching the surface.

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 25

The lithosphere: soil

ST

PAGES 192–195

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

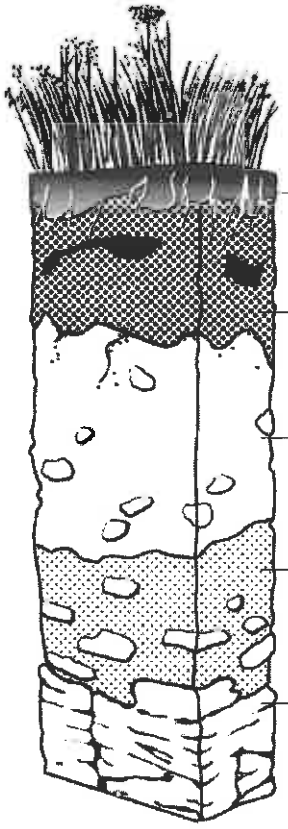
- Soil horizons are _____

_____

- Permafrost is _____

_____

Soil horizons



_____

_____

_____

_____

_____

Conditions necessary for soil to be fertile

1- _____

2- _____

3- _____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 26

The lithosphere: energy resources

ST

PAGES 195–199

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Fossil fuels result _____
- Nuclear energy is _____
- Geothermal energy is _____

Energy resources

Type of energy	Renewable (R) or nonrenewable (NR)	Advantages	Disadvantages
Fossil energy			
Nuclear energy			
Geothermal energy			

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 27

The hydrosphere and energy resources

ST

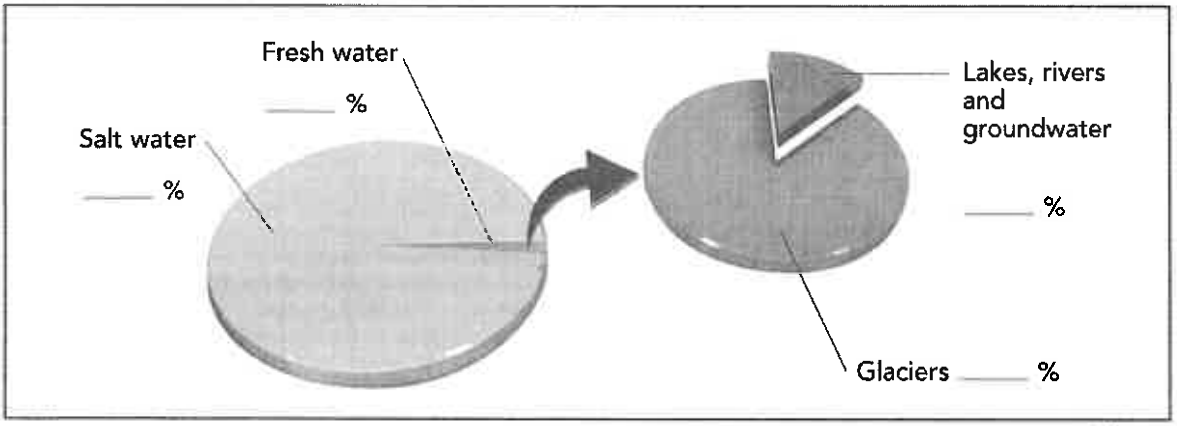
PAGES 200–210

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- The hydrosphere is _____
- A watershed is _____
- An ocean current is _____
- Ocean circulation is _____
- The cryosphere consists _____
- Pack ice is composed _____
- A glacier is _____
- Hydraulic power (hydropower) is _____
- A hydroelectric dam _____

Distribution of water on Earth



Name: _____ Group: _____ Date: _____

Factors affecting how water flows within a watershed

- _____
- _____
- _____
- _____
- _____

Important parameters in the study of oceans

Parameter	Factors influencing these parameters
	• _____ • _____ • _____
	• _____ • _____

Ocean currents

Ocean current	Characteristics
	_____ _____ _____
	_____ _____ _____
Thermohaline circulation	_____ _____ _____

Hydraulic power

Moving water	Facilities for transforming it into electricity
• Waterfalls • _____	• _____
• Waves • _____	• _____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 29

The atmosphere: atmospheric pressure

ST

PAGES 222–225

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

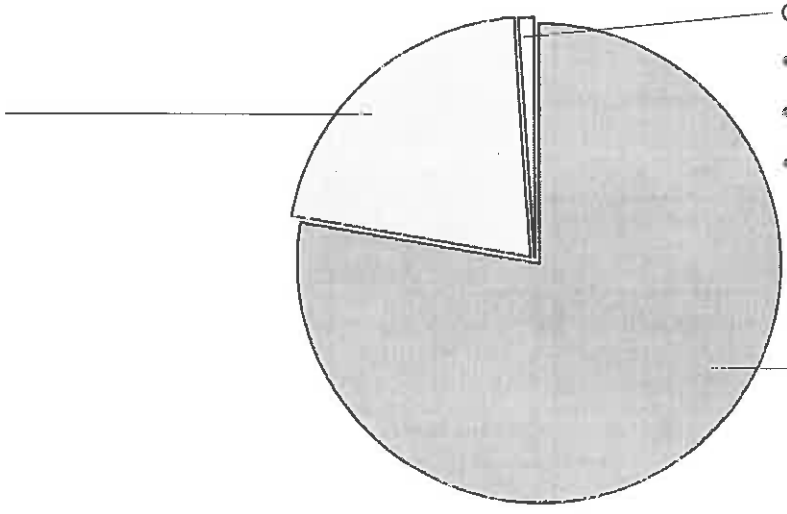
- The atmosphere is _____
- Air is _____
- Atmospheric pressure is _____

Unit of measurement: _____ Symbol: _____

Role of the atmosphere in maintaining life on Earth

- _____
- _____
- _____

Composition of the atmosphere



Name: _____ Group: _____ Date: _____

Layers of the atmosphere

Layer	Altitude	Distinctive features
		• _____ • _____
Thermosphere	80–500 km	• The hottest layer of the atmosphere: up to 1800°C • Shooting stars and polar auroras form here.
		• _____ • _____
		• _____ • _____
		• _____ • _____

Factors affecting atmospheric pressure

Factor	Variation in the factor	Effect
Number of air particles		• _____
		• _____
Temperature of air particles		• _____ • _____
	Decrease	• Particles move closer together and the air tends to fall. • A high-pressure area (anticyclone) forms.

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 30

The atmosphere: atmospheric circulation

ST

PAGES 226–232

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Atmospheric circulation is _____
- An air mass is _____
- A cyclone is _____

Characteristics of fronts

Name	Formation	Movement of air	Meteorological conditions
		The warm air rises rapidly above the cold air.	• Formation of puffy clouds (cumulus) • Probability of wind and heavy rain

Anticyclones and depressions

Name	Formation	Movement of air	Meteorological conditions
	Surrounds a high-pressure centre		

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 31

The atmosphere: the greenhouse effect and energy resources

ST

PAGES 233–239

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- The greenhouse effect is _____
- Climate change is _____
- Wind energy is _____

Factors leading to the intensification of the greenhouse effect

Greenhouse gas	Factors of natural origin	Factors linked to human activity
	• Forest fires • Volcanic eruptions • Cellular respiration	
	• Digestion in wild animals • Decomposing plants • Swamps	
	• Bacteria in the soil and oceans	

Advantages and disadvantages of wind turbines

Advantages	Disadvantages

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 32

Energy from the Sun

ST

PAGES 239–242

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- Solar energy is _____

_____

Characteristics of the Sun

- Composition: _____
- Temperature at the centre: _____
- Form of energy emitted: _____

Types of solar ray making their way to the Earth's surface

- _____ • _____ • _____

Technologies that put solar energy to use

Technology	Use	Characteristics
	Heating of homes	• Positioning of windows toward the Sun _____ _____
Photovoltaic cells	_____ _____ _____	_____ _____ _____
	_____ _____ _____	_____ _____ _____

Advantages and disadvantages of solar energy

Advantages	Disadvantages
_____ _____ _____ _____ _____	_____ _____ _____ _____ _____

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 33

The Earth-Moon system and the tides

ST

PAGES 243–245

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- A tide is _____
- Tidal energy is _____

Characteristics of the Moon

- Average diameter: _____
- Theory on its origins: _____
- Duration of the Moon's rotation on its axis: _____
- Duration of the Moon's revolution around the Earth: _____

Tidal range

Definition	Factors influencing tidal range
	•
	•
	•

Advantages and disadvantages of tidal power plants

Advantages	Disadvantages

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 34

The biosphere: biogeochemical cycles

ST

PAGES 254–259

Complete this Concept Review so you can keep a record of what you have learned.

Definitions

- The biosphere is _____
- A biogeochemical cycle is _____
- The carbon cycle is _____
- The nitrogen cycle is _____

Layers of the Earth

Layer	Corresponds to
Lithosphere	The solid surface

Processes involved in biogeochemical cycles

Process	Examples
Biological	• Respiration • Digestion

Name: _____ Group: _____ Date: _____

Carbon and nitrogen cycles

Element	Biological utility	Transformations
	• Makes up the tissues of living organisms.	• Photosynthesis
		• Nitrogen fixation

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 35

Biomes: distribution factors and terrestrial biomes

ST
PAGES 262–272
Complete this Concept Review so you can keep a record of what you have learned.

Definition

- Biomes are _____

Factors determining biome distribution

Terrestrial biomes	Aquatic biomes

Main terrestrial biomes

Biome	Location	Climate	Flora

Name: _____ Group: _____ Date: _____

Main terrestrial biomes (*cont.*)

Biome	Location	Climate	Flora
Alpine biomes			• Vegetation zones: Submontane (deciduous forests and grain crops), montane (conifers), subalpine (highest zone), alpine (bushes and grasses), nival (lichen)

Name: _____ Group: _____ Date: _____

CONCEPT REVIEW 36

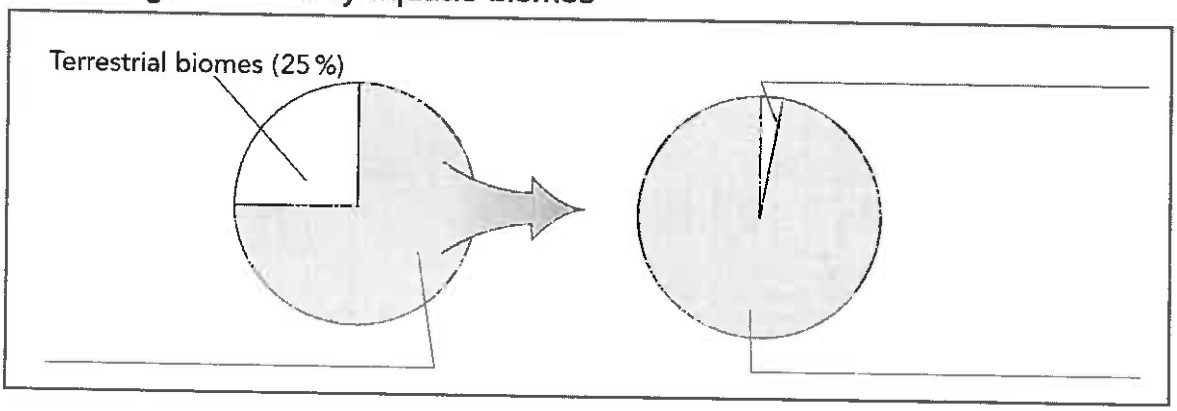
Aquatic biomes

ST

PAGES 272 –279

Complete this Concept Review so you can keep a record of what you have learned.

Percentage covered by aquatic biomes



Salinity of water

Freshwater: _____ Salt water: _____

Freshwater biomes

Biome	Definition	Examples of organisms living there
Wetlands: • Marshes • _____ • _____	Areas permanently or temporarily covered with water	Plants that grow in water-saturated soil.

Name: _____ Group: _____ Date: _____

Marine biomes

Biome	Definition	Examples of organisms living there
	Bodies of water that are subdivided according to the depth of the water.	
	Environments characterized by the presence of calcium carbonate produced by coral	Between 500,000 and two million plant and animal species species live there.