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ONTARIO
DEPARTMENT OF EDUCATION



A Suggested Course of Study
FOR
Girls in Vocational Schools

This course is planned to meet
the requirements for admission
TO
Approved Training Schools for Nurses
IN
The Province of Ontario

VOCATIONAL EDUCATION BRANCH

Bulletin No. 4

TORONTO

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FOREWORD

This course has been prepared by a Committee representative of each of the following groups:—

The Nursing Profession,
The Department of Health,
The University of Toronto,
The Collegiate Institute,
The Vocational School, and
The Department of Education.

The objectives which have been kept in mind in the preparation of the course may be summarized as follows:—

- (a) To raise the general standard of education of the students proposing to enter the profession of nursing.
- (b) To prepare a course acceptable to Vocational Schools and to Training Schools for Nurses.
- (c) To prepare a course acceptable to the Universities for admission to any of the courses offered in Nursing, in Occupational Therapy, in Physiotherapy, and in Social Science.

The course as outlined is intended to cover a period of four years' intensive study and should be completed wherever possible. Principals should advise students who propose to enter the Nursing Schools of the Province that they complete at least the first three years of this course.

The Home Economics Department of Vocational Schools of the Province has been kept in mind in the preparation of this course, and the work, as outlined, can be efficiently undertaken by such departments with their present accommodation and equipment.



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SUGGESTED COURSE OF STUDY AND ORGANIZATION

The subjects in the course of study are divided into two groups:

- (A) General
- (B) Vocational or Special

Those in (A) are primarily academic in character while those in (B) are practical, and are intended to be undertaken in rooms or laboratories specially equipped for such purposes. In the suggested outline which follows, the time allotted to these groups has been arrived at in accordance with "Recommendations and Regulations for the Establishment, Organization and Management of Vocational Schools of Ontario." Departmental Circular No. 52 provides a list of approved and recommended text-books which will meet the requirements of this course.

First Year	Periods	Second Year	Periods
A.		A.	
English Literature.....	4	English Literature.....	4
English Composition.....	2	English Composition.....	2
Spelling and Penmanship.....	2	Spelling and Penmanship.....	2
Algebra.....	5	Arithmetic.....	4
British History and Current Events...	4	Canadian History, Elementary Econo-	
French (Conversational).....	5	mics and Current Events.....	4
Physical Education.....	2	French (Conversational).....	4
		Elementary Business Practice.....	2
		Physical Education.....	2
	<hr/>		<hr/>
	24		24
B.		B.	
Physiography.....	4	Chemistry.....	4
Household Science.....	12	Household Science.....	8
	<hr/>	Typewriting.....	4
	40		<hr/>
			40
Third Year	Periods	Fourth Year	Periods
A.		A.	
English Literature.....	4	English Literature.....	4
English Composition.....	2	English Composition.....	3
Canadian History and Current Events	3	Psychology and Economics.....	4
Arithmetic.....	5	Algebra.....	5
Physics.....	4	Physics.....	5
French.....	4	French.....	5
Physical Education.....	2	Physical Education.....	2
	<hr/>		<hr/>
	24		28
B.		B.	
Chemistry.....	4	Zoology.....	4
Household Science.....	8	Household Science.....	8
Zoology and Bacteriology.....	4		<hr/>
	<hr/>		40
	40		

NOTE:—Students who are looking forward to University courses in Nursing, in Occupational Therapy, in Physiotherapy, and in Social Science should obtain Middle School standing in the following subjects:—

English (Literature and Composition).
 Mathematics (Algebra and Arithmetic).
 History (Canadian). Zoology (Special).
 French (Authors and Composition).
 Physics and Chemistry.
 Household Science.

The Principal should consult the Calendars of the Universities for information respecting the additional Upper School standing which may be required.

DETAILS OF THE SUBJECTS OF STUDY

English Literature

I and II.—Intelligent reading by the pupils of suitable authors, both prose and poetry, systematic oral reading by pupils of the texts studied in class, memorization and recitation of choice selections in prose and poetry.

NOTE:—The object of the course in the first two years is the cultivation of a taste for reading good literature. It should include the extensive reading, both at home and at school, of a wide range of authors whose works will quicken imagination and present a strong element of interest. Such authors should be chiefly narrative, descriptive, and dramatic, and works of modern and of Canadian writers should be well represented on the list of books chosen for each year. Books chosen for class work should include short stories or prose selections, poetry, a modern or Shakespearian play, and a novel, which should be read rapidly at school and at home to sustain interest. Emphasis should be laid upon the pupils' supplementary reading which should accompany and supplement the class work. Each pupil should be encouraged to read several books during the year, and the school librarian should work in close co-operation with the teachers of literature in aiding the pupils to make suitable selections from a wide range of authors.

III and IV.—Intelligent and appreciative study of suitable authors both prose and poetry. Where pupils are writing matriculation examinations, the authors prescribed for the Departmental and University examinations will be chosen. Supplementary reading should be provided by the pupils themselves or supplied by the school or public library. Time should be provided for memorization and recitation of choice selections in prose and poetry presented by the Department or the teacher.

NOTE:—At this stage the pupils should begin to appreciate literature as such.

English Composition

I.—Oral and written composition, elements of narration and description.

Letter writing.

Oral and written reproductions.

Class debates.

Systematic and careful application of the principles of good English to the correction of mistakes made by the pupils in speaking and writing.

II.—The course of the first year continued; the elements of exposition and argumentation.

The study of models in prose for vocabulary and style.

Debates.

III and IV.—The course of the first and second years in written and oral work extended with greater attention to the development of individual capacities in literary attainment.

The study of models of prose writing.

Special attention should be given to the acquisition of a sound English vocabulary. The work in spelling in the first and second years is intended to lay a satisfactory foundation for this objective.

The following list of books is suggested from which to select part of the supplementary reading:

TITLE	AUTHOR
A Corner of Harley Street.....	H. M. Bashford
The Mind that Found Itself.....	Beers Clifford
Hunger Fighters.....	DeKruif
Microbe Hunters.....	
Martin Chuzzlewit.....	Charles Dickens
A Short History of Nursing.....	Dock & Stewart
Life of Edward Jenner.....	Drewitt
Immigrant Backgrounds.....	Fairchild
Jeanne Mance, Her Life.....	Foran
The Light that Failed.....	Kipling
History of Medicine.....	Libby
The Magic Mountain.....	Thomas Mann
The Story of San Michele.....	Munthe
Life of Florence Nightingale.....	Nash
(abridged from Sir Edward Cook's life—k v.)	
Notes on Nursing.....	Florence Nightingale
The Roll Call of Honour.....	Quiller Couch
Sir William Osler.....	Ethel G. Reid
(1 v. abridged from Dr. Cushing's life.)	
A Tenement in Soho or Two Flights Up.....	George Thomas
The Elephant and Other Stories.....	Sir Frederick Treves
The Life of Pasteur.....	Valery-Radot
Florence Nightingale—A Biography.....	Irene C. Willis
The Beloved Physician, Sir James MacKenzie.....	Wilson
Lord Lister, his life and work.....	Wrench

Spelling

I.—Spelling, pronunciation and syllabication of words in common use, with special attention to their meaning and proper use. The review lists of the Public School Speller will be found helpful. The proper use of a standard dictionary should be considered an essential part of this work and an inexpensive hand dictionary should be in the hands of every pupil.

II.—First year course continued. Professional and technical words and expressions common to the nursing profession may be introduced at this stage to advantage. Some knowledge of the most common and frequent Latin and Greek roots with their derivatives and influence on English should be studied.

Penmanship

The work of the Public School in this course should be continued. Freedom of movement and correctness of form of the figures and letters of the alphabet should be stressed. The outline as contained in Book 3 of the Ontario Writing Course may be used to advantage.

Typewriting

The purpose of this course is to give the students sufficient training and instruction in the use and operation of the typewriter to enable them to prepare any common forms necessary or, in other words, to use the typewriter intelligently. Stress should be put on the practical side rather than on the development of speed.

The following is a suggested outline of the work for the course in typewriting:

1. Touch method; mechanism and care of the machine.

2. Typewriting letters on letter, memorandum, and note-size paper.
3. Elementary tabular work to include accounts, invoices, and general business forms.
4. Folding, inserting and addressing envelopes and wrappers.

Algebra

Elementary work; factoring; H.C.F. and L.C.M.; fractions; simple equations of one, two and three unknowns; solution of easy problems.

NOTE:—The course covered should include at least the following portions of the Ontario High School Algebra: Chapters I to X, with articles 89 to 100 of Chapter XI, and articles 106, 107, 108, 109, 110 and 113 Chapter XII, and Chapter XIV.

Lower School course reviewed and extended; extraction of roots; simple graphs; simple ratio and proportions; indices and surds; quadratics of one and two unknowns, with solutions of problems; theory of quadratics.

The course is covered in the High School Algebra. The following, however, may be omitted: Articles 228, 229, 230, 242, 243 and Chapter XXVI.

Arithmetic

I. Regular practice in rapid calculation—exercises to cover the four simple rules, extensions of bills and invoices, percentage, interest and discount, exchange and commission.

Vulgar fractions, decimal fractions, practical measurements, percentage, trade discount, profit and loss, commission, insurance, taxes, simple interest, duties and customs, bank discount, storage, marking goods, square root.

Metric system, Apothecaries' system, arithmetic of solutions.

Mensuration—the square, the triangle, and the circle.

II.—Regular practice in rapid calculation continued. Money systems of other nations, duties and customs, depreciation, cost-keeping, partnership, compound interest, present worth, true discount, exchange, stocks.

Physiography

This course, taken in the first year, should be an experimental and practical one carried on in the science laboratory by teachers who are skilled in laboratory technique. The experiments should be performed by pupils working in pairs or in small groups. Each experiment should be an inductive solution to a problem, and when the principle involved has been established, it should be applied to everyday natural phenomena or given an industrial application.

MEASUREMENTS

Metric units of length, area, volume and mass; comparison of metric and British units; the balance; practice in weighing; thermometers, Centigrade and Fahrenheit scales; freezing and boiling points.

ATMOSPHERE

Experiments to show that air has weight and occupies space.

Constituents: preparation and properties of oxygen; combustion in air;

rusting of iron in air and the resulting gas remaining; preparation and properties of carbon dioxide; effect upon burning; detection of carbon dioxide and water vapour in air.

Moisture in air: experiments to illustrate evaporation and condensation, formation of dew; frost, fogs, clouds, rain and snow.

Air pressure: experiments to show that air exerts pressure, that changes of temperature affect the volume of a gas, that air is compressible and expansible; the barometer and common pump.

Weather and climate: experiments to show transference of heat by conduction, convection and radiation; rates of heating and cooling of land and water; wind and wind systems; conditions affecting climatic weather instruments and their uses; weather maps; areas of high and low pressure; movements of storms.

Air and health: dust, bacteria, moisture, respiration, ventilation.

WATER

Simple experiments to show that water seeks its own level; that pressure in water increases with the depth; Pascal's law; application to water systems; Archimedes' Principle, applications; flotation; specific gravity of a solid and a liquid.

Experiments to show the removal of suspended matter by filtration and settling; effect of adding brine to water containing suspended clay particles; solvent power of water; distillation, effect of a solution of carbon dioxide on limestone; lime deposits; purification of water for drinking purposes; freezing and boiling points of water and the effect of pressure of each; expansion of water on freezing; high heat capacity of water computed with that of an equal weight of sand.

Rivers, lakes; underground water; springs; rapids and waterfalls; glaciers; evidences of glacial action in Canada.

The ocean; sea-water; sea-floor; waves; currents; tides, shore lines.

LAND

Composition: minerals, examination of samples of quartz; feldspar, calcite, mica; rocks, examination of granite, trap, sandstone, shale, limestone, conglomerate, quartzite, marble, slate, gneiss; formation and classification of rocks.

Weathering: work of frost, changes of temperature, winds, oxidation, solution, running water, ice, plants and animals; classes of soils and their chief characteristics.

Movements of the Earth's Crust: volcanoes; earthquakes.

Land Masses: mountains, plateaus and plains.

THE EARTH AS A PLANET

Shape of earth: daily and yearly motions; variation in the length of day and night; the seasons; latitude and longitude; standard time.

Other members of the solar system; the moon; phases of the moon, experiments to show that light travels in straight lines; eclipses of the sun and moon.

British History

This subject should deal in a simple and interesting way with the story of the social, the economic and, very briefly, the political development of the British people. Emphasis should be placed upon the customs and manner of life of the people, the rise and growth of British institutions, the extension of

the Empire and the development of trade and commerce. The main material of the story should be obtained from the class-use of suitable history readers and from the pupils' supplementary reading. From these various sources the teacher should develop topics such as those suggested in the syllabus which follows, and should endeavour to add interest to the course by using lantern films in class and by encouraging pupils to make collections of suitable pictures.

I. EARLY ENGLAND

The mingling of the races previous to the Norman Conquest and their contributions to the social and political development of the British people; survivals of racial characteristics in modern British life; effect of the Roman occupation; social life of the early English.

II. MEDIAEVAL ENGLAND

Changes effected by the Norman Conquest; the manorial system of agriculture; social life on a manor; Domesday book; growth of towns; merchant and craft guilds; beginning of trade, domestic and foreign; life in the towns; administration of justice; changes introduced by Henry II; rise of the nobles, Magna Charta; rise of the commons, Simon de Montford; model parliament of Edward I; effect of the Black Death on wages and prices; the Peasants' Revolt; the breakdown of the manorial system.

III. ENGLAND AND THE COMMERCIAL REVOLUTION

The discovery of new trade routes; the importance of Britain's geographical position; beginnings of a colonial empire; Henry VIII, the Cabots, Newfoundland; Elizabeth, the struggle with Spain, importance of Britain's naval supremacy; nationalism; early colonization, New England, Virginia, Maryland; the mercantile system and its effects on English policy; navigation acts; rise of trading companies; banking.

Life in the Tudor and Stuart periods; increase of wealth, knowledge, and comforts; rise of the middle classes; printing, learning and literature; dress, travel, coffee houses, amusements, etc.; the effect of the translation of the Bible.

IV. THE AGRICULTURAL AND INDUSTRIAL REVOLUTION

Improvements in agriculture, rise of sheep farming; mechanical inventions, coal and power, iron and steel; rise of factories; large industrial centres; changes in social life and problems resulting from the industrial revolution; developments in facilities for transportation and communication; roads, canals, railways, steamships, post office, telegraphs, cables; progress towards social betterment: Factory Acts, 1833, 1847; reforms in the administration of justice and prison life; Elizabeth Fry, John Howard; religious awakening, the Wesleys; education; trade unions and labour legislation.

V. POLITICAL DEVELOPMENT

A brief and simple treatment; significance of the Bill of Rights; rise of the party system; the cabinet system; the Prime Minister; rise of democratic government and universal suffrage: Reform Bills, 1832, 1847, 1918, 1930; Parliament Act, 1911.

VI. THE BRITISH EMPIRE

How the Empire was acquired; review of early explorations and colonization; New England Colonies, Newfoundland, Hudson Bay; Stories of the growth of

the Empire: Canada, India, Australia, New Zealand, South Africa; loss of the American Colonies; the British Navy and its contribution to the growth and maintenance of the Empire; extension of self-government; the Empire and the Great War.

VII. CONTRIBUTION OF THE BRITISH PEOPLE TO THE WORLD OF LITERATURE, ART AND SCIENCE

Chaucer, Shakespeare, Milton, Burns, Wordsworth, Scott, Dickens, Tennyson, Browning, etc.; Reynolds, Gainsborough, Turner, Wren, etc.; Bacon, Darwin, Thompson, etc.

Current Events

Current Events affecting the various parts of the Empire or which show the part played by the Empire in international affairs. This should be taken concurrently with the more formal study of history, and should continue throughout the year.

NOTE:—A scrap book of current events will add to the interest of the topics studied. Only an elementary study of current events should be attempted by pupils in a first year class.

A systematic and intelligent study of current events should be an integral part of the study of formal history and should be continuous throughout the year and taken concurrently with the topics under discussion.

In the British History this study should include all current events which affect the various parts of the Empire with special stress on those which affect international relations throughout the Empire or in the world generally.

Economics

Economics is the science of business, and not the science of getting money. It is the science of welfare and shows how individuals and associations of individuals can provide their necessary food, clothing, shelter, and whatever else is necessary to maintain a proper standard of living. The treatment of the subject should not be confined to one text-book, and the topical method alone may lead to vague and indefinite results. The approach should be concrete, descriptive, and based on the observations of the student and an accumulation by the class of familiar industrial and commercial facts. The most natural approach is through a study of the place and meaning of commercial employments in modern social life. In the final year, there should be a study of economic laws and principles as applied to problems of money, banking, Government regulation of business and commerce, transportation, etc.

HUMAN NEEDS AND WANTS

Human needs—food, clothing, shelter, education, protection, money, organization; comforts, luxuries, standard of living; satisfaction of wants; production and consumption; free goods, economic goods; utility of form, place and time; diminishing and marginal utility.

SUPPLYING HUMAN NEEDS AND WANTS

(a) *Through Work.*

Nature of work, mental and physical work; work as a source of satisfaction; co-operative work; specialization of the worker and division of labour, conditions favourable to specialization, advantages and disadvantages.

(b) *Through Personal Thrift.*

Definition of thrift, extravagance; cost of thriftlessness; spending intelligently; thrift as to time, talent, energy, effort, material, food, health, money, savings, life insurance, wise investments; effect of thrift upon character.

(c) *Through National Conservation.*

Meaning of conservation of natural resources; conservation of the resources of our forests, waters, land, and mines; conservation of human life, use of by-products.

(d) *Through Industries with Special Reference to Agriculture.*

Processes involved in producing and distributing farm products; essential factors in production—land, labour, enterprise, capital, machinery, transportation, middleman, markets, credits, Government legislation; organized exchanges, insurance; supply and demand in relation to price; price and value.

(e) *Through Communication and Transportation.*

Development of transportation with special reference to Canada; effects of modern facilities; railways, canals and roads; problem of control and administration.

(f) *Through Money, Credit and Banking.*

Origin of money, free coinage, gold as money, Government and bank notes, token money, legal tender; gold standard, bimetallism; credit—short term and long term, bills of exchange, travellers' cheques, etc.; banking, bank reserves, clearing-house; interdependence of money, credit and banking; inflation.

(g) *Through Community and National Enterprise.*

Why taxes are necessary, characteristics of a good tax, excise taxes, internal revenue, direct and indirect taxation; income taxes, surtax; public expenditure and sources of revenue in municipality, Province and Dominion; public utilities; Government Ownership.

INDUSTRIAL AND ECONOMIC ORGANIZATION

Interdependence of capital, enterprise and labour; types of business organization, single proprietorship, partnership, corporation, co-operative; localization of industries; control of industry concentrated in the hands of the few, combination, monopoly, monopoly price; interdependence of city and country, interdependence of nations, balance of trade, rate of exchange, tariffs, boycott.

SHARE OF THE WORKERS IN MANAGEMENT

Relation of workers and employers, laissez-faire, trade unions, employers' associations, collective bargaining, open and closed shops, relation of workers and employers to the public, strikes and lock-outs, arbitration; labour, legislation, minimum wages, hours of labour; profit-sharing, unequal distribution of wealth.

French

The course in French is intended to cover a period of four years. The first two years should cover a practical course in Conversational French by the use of the direct method throughout. This method should be continued in the

third year, but at the same time sufficient foundation in grammar and syntax should be laid to enable any, who wish, to write the Junior Matriculation examinations in the fourth year.

The prescribed texts in French Authors (e.g., Selections from the French Reader) may be begun in the third year.

Bacteriology

Dust, yeasts, molds and bacteria of the air—source, tests, living materials, dependent plants.

Food preservation—growth and relation of bacteria to decay.

Useful work of bacteria and yeasts.

Means of distribution, protection and transmission of bacteria.

Sources of bacteria in lakes and rivers.

Pure milk and water supplies.

Life history of housefly, mosquito.

Bacteria of the soil.

Psychology

Historical introduction; value of psychology; elements of behaviour; mechanism of action; instincts, feeling, emotion, sensation, perception; images, ideas, intelligence; attention, interest, association; love of learning; nature of intelligence; concept, judgment, inference; character.

Zoology

I.—The course for the Lower School as outlined in "Courses of Study and Examinations of the High Schools, Collegiate Institutes, and Continuation Schools."

The course in Zoology as outlined below is based on the authorized textbook, Zoology for High Schools.

Arthropods—Insects: (a) Study of the main external features and of the life-history of a grasshopper.

(b) Comparison of a grasshopper with a spider as to main external features.

(c) Description, life-history, relation to man, and methods of combating six harmful insects: Colorado potato beetle, codling moth, cabbage butterfly, tent caterpillar, mosquito, house fly.

(d) Description, life-history and relation to man of the following beneficial insects: Honey bee, dragon fly, silk worm.

(e) Recognition-characters of the principal orders of insects.

Crustaceans: Crayfish, external features with special reference to the organs and modes of breathing, walking, swimming and securing food.

Earthworms—External features, food, habits, economic importance.

Molluscs—Clams: The composition and internal and external markings of the shell, gills, foot and siphons, observation of live specimens.

Slugs or Snails: External features, observation of live specimens.

Fishes—External features, gills and mode of breathing, feeding habits. Economic importance of fish, chief food fish of Canada, fish-hatcheries, protection of fish.

Amphibians—Frogs: Life-history, external features, economic importance of toads and frogs.

Reptiles—Chief external features of turtles and snakes. Discussion of the habits and economic importance of snakes.

Birds—External features; study of feathers; adaptations for flight, including those of the skeleton; importance of birds; protection of birds; migration of birds; recognition of twenty common birds, including some winter birds (i.e., how to know them when they are seen); comparison of the bills and feet of different types of the birds of Ontario as related to their life habits.

Mammals—External features of a cat or a rabbit; skeleton of cat or rabbit; teeth of the following mammals as related to their life habits (a general idea of position and form): cat, rabbit, bat, horse, cow; feet of the following mammals in relation to their life habits; cat, dog, bat, mole, beaver (or muskrat), horse; uses of mammals to man from pupil's experience and reading (food, clothing, work, etc.); recognition of ten common wild mammals of Ontario and discussion of their habits.

II.—Practical study of the external form of all types, and the dissection or the study of prepared specimens (or models), as specified below. Observational drawings are essential.

Mode of life of the various types. Reasons for including these types in their respective groups.

PROTOZOA

Amoeba (or paramoecium): Practical study of the living animal—habitat, movements, structure, functions and life history.

MOLLUSCA

Fresh-water clam: Practical study of the living animal—habitat, habits, movement of shell, locomotion, action of siphons. Structure and markings of shells. Dissection to show mantle, foot, gills, muscles, digestive system, heart, cloaca. Life history.

VERMES

Earthworm: Practical study of the living animal—habitat, habits, external features, locomotion. Dissection to show internal organs. Study of a cross-section posterior to the gizzard. Mode of respiration.

AMPHIBIA

Practical study of a living frog—locomotion, breathing, circulation of blood through the web of the foot. Practical study of the external features and skeleton. Dissection to show organs of respiration, circulation, digestion and excretion, and the central nervous system. Life history of a frog and a toad.

MAMMALIA

Practical study of (a) chief features of the skeleton, (b) organs of respiration, circulation, digestion and excretion, of a rabbit or a cat.

Comparison of the brain of a rabbit (or cat) with that of a frog.
Study of a mammalian eye from a specimen or from a model.

NOTE 1.—Except in the case of the clam, the earthworm and the frog, where dissection is required, prepared specimens or models may be used. The cross-section of the earthworm should be studied with the low power microscope.

NOTE 2.—The order in which the above topics are to be studied should be determined by the supply of materials, the local conditions, etc.

Chemistry

I.—Brief outline of the history of Chemistry with reference to the development of the scientific method. Meaning of the scientific method. Its significance to medicine, and to the nursing profession.

MATTER

The three states of matter. Classification of substances. Definition of an element. Experimental study of mechanical mixtures, solutions, and compounds—their characteristics, resemblances and differences. Solutions of different strengths—unsaturated, saturated, supersaturated. Gases of the air dissolved in water. Factors affecting solubility. Experiments illustrating precipitation, filtration, crystallization. Osmosis with practical applications. Suspensions and colloids. Hydrates. Deliquescent and efflorescent substances. Drying agents.

Conservation of matter: The law of conservation of weight.

Energy: Forms of energy. The law of conservation of energy.

Percentage composition of mercuric oxide. Uses of balances. Law of definite proportions. Atoms. Molecules, (a) those composed of similar atoms, (b) those composed of unlike atoms. Physical properties—physical change. Chemical properties—chemical change. Chemical activity. Chemical affinity in the formation of compounds.

CHEMICAL SYMBOLS AND FORMULAE

Names and symbols of common elements (a) in the body, (b) in common use; mentioning the physical state, and classifying as metal or non-metal.

OXYGEN

Occurrence, preparation and collection. Action of a catalyst. Catalytic agents in the body. Physical properties of oxygen. Its chemical conduct with several non-metals, and with several metals. Oxidation, oxidizing agents, combustion. Reactions of oxides with water; anhydrides and basic oxides; equations. Metals and non-metals—chief properties of each. Importance of oxygen: oxyhaemoglobin, oxidation in the cells. Use as a stimulant: method of administering. Use with anaesthetics. Use in the disposal of sewage. Aeration of water supply. Tests for oxygen.

HYDROGEN

Sources, preparation and collection, physical properties, chemical conduct. Reduction as the complement of oxidation; reducing agents. Uses of hydrogen. Tests for hydrogen.

WATER

Occurrence, composition (electrolysis and synthesis), properties, tests. Physiological importance of water; principal ingredients of all body fluids, enters into chemical composition of tissues, distributes body heat, is the liquid medium

in the blood and lymph, assists in preventing friction and discomfort by keeping mucous membranes moist. Hard water; temporary and permanent hardness. Methods of softening. Experimental work in testing for dissolved solids. Purification of water by boiling, distillation, filtration.

SPECIFIC GRAVITY

Definition. Hydrometers--description, principle of operation, uses (a) in preparing solutions of definite strength; (b) in determining the amount of solid in solution. Use of balances for these same purposes. Lactometers. Urinometers.

HEAT

Heat units, heat of chemical reaction. Temperature as contrasted with quantity of heat. Thermometers, Fahrenheit, Centigrade, and absolute scales. The clinical thermometer.

NITROGEN

Occurrence, preparation and collection, properties, importance (reference to proteins). Bacteria and nitrogen. The nitrogen cycle.

THE ATMOSPHERE

Essential and non-essential constituents. Use of each of the essential constituents. Percentage composition of air. Ventilation. Humidifying air. Testing percentage of humidity.

FUNDAMENTAL LAWS AND PRINCIPLES

Conservation of weight and definite proportions recalled. Multiple proportions. Combining weights. Combining volumes. Avogadro's hypothesis. Boyle's law. Charles' law. Kinetic theory of gases. Atomic weights and molecular weights. Simple problems to illustrate these laws and principles.

SYMBOLS AND FORMULAE

Definitions, facts represented by formulae. How to find formulae. Molecular formulae. Problems.

CHEMICAL EQUIVALENT

Definition, determination of the chemical equivalent of a metal (sodium, magnesium, or zinc). Valency: significance, definition, experimental determination, use in the writing of formulae. Radicles: definition, illustrations, valency of radicles.

Chemical nomenclature: rules, practice in writing chemical names and formulae.

EQUATIONS

What they record, how to write them, quantitative meaning (a) in terms of weight, (b) in terms of volume. Practice in writing equations. Simple problems based on equations.

Molecular and atomic theories. Definition of a molecule, an atom.

ACIDS, BASES, SALTS (NORMAL, ACID AND BASIC)

Characteristic properties, composition. Salts in the human body: their importance. Static electricity; kinds, electrons. Electric spark. Electric current, production of current by the voltaic cell. Ionization of acids, bases, and salts in solution. Conductivity apparatus. Blue colour of copper salts in solution due to copper ions: illustrate by gradually adding water to (a) anhydrous copper sulphate, (b) copper chloride, (c) copper bromide, with constant stirring. The electro-chemical series or displacement series; deposition of metals when ions give up their electrical charge, illustrated by such experiments as (a) placing an iron nail in a strong solution of copper sulphate, placing a strip of tin in mercuric chloride solution, (c) suspending a piece of zinc in a solution of lead acetate. Electrolysis of acids, bases, and salts in solution: chemical action in solution, the interchange of ions. Neutralization: definition, nature of neutralization, the formation of water and a salt. Value of knowledge of neutralization to nurses in the treatment of burns, and in cases of poisons and their antidotes.

THE HALOGENS

Chlorine, bromine, and iodine: occurrence, preparation, physical properties including sublimation of iodine, chemical conduct, uses, tests. Their more important compounds, e.g., chloride of lime; preparation, composition, properties, uses (a) disinfectant, (b) bleaching. Similarly—hydrochloric acid, sodium chloride, ammonium chloride, ferric chloride, calomel, bichloride of mercury, sodium bromide, potassium bromide, potassium iodide.

NITROGEN COMPOUNDS

Nitric acid; preparation, properties, uses, test. Sodium nitrate and potassium nitrate; properties and uses. Other important nitrates, including silver nitrate. Test for any nitrate. Preparation and properties of nitrous oxide, nitric oxide, nitrogen peroxide, ammonia. Uses of ammonia and nitrous oxide especially as related to the nursing profession. Nitrogen fixation.

If time permits, the Chemistry of carbon should be commenced, but it should not be carried farther than the study of ethylene. (See organic chemistry of the second year.)

II.—Chemistry of the first year reviewed with special attention to the fundamental laws and principles, valency, nomenclature, and problems.

An experimental study of the following elements and their more important compounds: sodium, potassium, calcium, magnesium, zinc, aluminium, carbon (see organic chemistry), phosphorus, arsenic, oxygen, sulphur.

Hydrolysis: partial and complete.

Properties and uses of the following important substances and of other related substances of particular interest to nurses:—washing soda, baking soda, cream of tartar, Rochelle salts, caustic soda, sodium nitrate, sodium nitrite, sodium hypochlorite, potassium permanganate, potassium chlorate, calcium carbonate, lime, calcium hydroxide, plaster of Paris, magnesium hydroxide, magnesium sulphate, zinc oxide, aluminium sulphate, aluminium hydroxide, alum, boracic acid, disodium phosphate, hypophosphite of lime, white arsenic, bismuth hydroxide, sulphuric acid, copper sulphate, ferrous sulphate, zinc sulphate, sulphur dioxide, hydrogen peroxide, ozone.

Experiments to illustrate the action of a poison, and the result of its antidote. Why certain antidotes are used.

The reading of prescriptions.

Organic Chemistry

NOTE—The nursing schools of the Province may require that the student, in addition to obtaining Middle School standing in Chemistry, present a statement from the principal of the Vocational School attended, to show that the following course in Organic Chemistry has been successfully completed.

History of the word "organic."

Carbon: preparation of the different forms of carbon, their properties and uses, allotropism.

CARBON DIOXIDE

Sources, preparation, physical properties, chemical conduct, the composition and properties of soda-water; baking soda and baking powder; health salts, fruit salts.

Conditions which affect the rate of chemical reaction, reversible reactions, chemical equilibrium.

Carbon monoxide: preparation, properties, action as a poison, uses; water-gas.

HYDROCARBONS

Meaning of the term, groups of hydrocarbons, fractional distillation, more important products of fractional distillation of petroleum.

Methane: preparation, properties, uses; important halogen derivatives: chloroform, ethyl chloride, iodoform.

Acetylene: preparation, properties, uses.

Ethylene: preparation, properties, uses as an anaesthetic and for colouring fruit.

Benzene or benzol: source, properties; the benzene ring and its relation to carbolic acid, benzoic acid, salicylic acid, methyl salicylate, aspirin; the uses of these substances in medicine.

THE SOURCES, PREPARATION, PROPERTIES AND USES OF:

1. Alcohols—comparison of alcohols to basic hydroxides; methyl alcohol, ethyl alcohol, glycerol.

2. Ethers: di-methyl; di-ethyl.

3. Aldehydes: formaldehyde, chloral; chloral hydrate.

4. Organic acids; formic, acetic (enzymes and ferments). stearic, lactic, tartaric, citric, tannic, oxalic, salicylic.

CARBOHYDRATES

Definition, sources, composition, classification (monosaccharides, disaccharides, polysaccharides); isomerism; properties of each group, uses and tests; hydrolysis of starch with an acid, with saliva; microscopic examination and comparison of polysaccharides; general test for carbohydrates; function of carbohydrates in plants and in animals, the "carbon cycle."

FATS

Occurrence, uses in the body, composition, classification of the more common fats, lipoids, hydrolysis, emulsions, saponification, soap (explain the cleansing properties of soap), simple tests for fats.

Colloids: importance in the body and in foods.

PROTEINS

Definition, occurrence, function, formation and composition, physical and chemical properties, classification, tests, the "nitrogen cycle."

COMPOSITION OF FOODS

Classification of food constituents (1) Inorganic—water and mineral salts, (2) Organic—carbohydrates, fats, proteins; vitamins; testing of common food substances to discover whether they contain proteins, carbohydrates, fats.

CHEMISTRY OF DIGESTION

Conditions which affect digestion; digestion of starches (salivary, pancreatic), sugars (maltose, sucrose, lactose), fats (pancreatic—steapsin), proteins: (gastric—pepsin, pancreatic—trypsin, intestinal—erepsin); action of bacteria—the use of buttermilk and of yeast.

Lymph: its properties and function.

Blood: composition, function of each part, the carrying of food and of waste material, the excretion of waste.

Metabolism: what happens to carbohydrates, fats, and proteins.

Urinalysis.

Removal of stains by solvents, absorbents, and chemical reagents.

Elementary Business Practice

Business Papers—Invoice, Cheque, Note, Draft, Deposit Slip, Statement of Account, Receipt.

Blanks may be provided and a large amount of practice can be obtained in filling in these blanks.

Banking—Savings and Current Accounts, Depositing, Bank record on stubs of cheque book, Bank books, Reconciliation Statements.

Filing—(General and definite systems of filing with definite instructions on three or four methods in common use).

If each pupil has a box to hold 3×5 or 4×6 guides, a great deal of practical work can be done. The guides may be bought or made and slips of paper may be used for cards and folders.

Bookkeeping—Simple cash book with columns for Bank Account.

Ledgers with special attention to modern loose-leaf and card systems—suitable to doctor's and patient's accounts, Petty Cash—records and handling.

Debits and credits as applied to personal accounts.

Simple balance sheets.

Canadian History

The course is the same as that required for pass matriculation and should be followed as outlined in the Ontario High School History of Canada. This will include the chapter on Government.

The course in the History of Canada will include also the geography relating to the history prescribed. A more detailed and comprehensive study of Canadian history as a whole should be attempted in this course and stress should be laid on the social, economic and political development of the Canadian people. Special attempts should be made to develop the interest factor by discussions, reference work—oral and written—and single period debates.

CURRENT EVENTS

As already suggested in the detail for British History, the study of current events should be an essential part also in the study of Canadian History and should be continuous throughout the year and taken concurrently with the

topics under discussion. The time and study devoted to current events in Canadian History should deal with important developments as they affect Canada in her relationship to the British Empire and the world, but in addition to this, more time can be spent to advantage in dealing with current problems, topics, and developments which affect our people locally and have a municipal, provincial, or federal significance, as well as those which have a social or economic bearing on our development as a nation.

NOTE:—A scrap book of Current Events, prepared by each pupil, will add to the interest of the topics studied. Generous use of classroom bulletin boards will provide suggestions and stimulus in this direction.

Physics

The course in Physics is the regular course for pass matriculation and may be extended over a two-year period at the discretion of the Principal.

This course is defined as follows with mathematical applications simple and direct in character.

SOUND

Vibration and Wave Motion:

Experiments to illustrate vibratory motion of the pendulum, strings and plates; transverse and longitudinal vibrations of a brass rod; wave motion in water, a rope, and coil spring.

Production, Transmission, Reflection and Velocity of Sound.

Experiments to show that sound originates in a vibrating body (tuning forks, violin strings) and that sound travels in wood, water, air, etc., but not in a vacuum; to show consonance and reflection of sound (echoes).

Methods of determining the velocity of sound in air.

Distinguishing Features of Sound.

Experiments on intensity, pitch and quality.

Experiments on the law of lengths and the law of tensions of vibrating strings and simple problems on these two laws; the four laws of vibrating strings.

Vibration of Air Columns.

Experiments on organ pipes (or other tubes) and resonance jars. Determination of pitch and velocity by means of resonance. Sympathetic vibrations.

Nodes and Loops.

Experiments with vibrating strings, plates and organ pipes.

Interference Phenomena.

Experiments on interference and the production of beats.

HEAT

Nature and Sources of Heat.

Experiments to show the production of heat by mechanical action, by chemical action and by electrical action.

Heat from the sun.

Kinetic theory.

Temperature.

Experiments to show—the expansion and contraction of solids, liquids and gases due to changes in temperature; the different rates of expansion of (1) solids; (2) liquids; the temperature at which the density of water is at a maximum.

Construction and graduation of Centigrade and Fahrenheit thermometers.
Charles' law; absolute zero.

Quantity of Heat.

Quantity of heat as contrasted with temperature; heat unit (the calorie); specific heat.

Experiments to find the specific heat of a metal and of a liquid.

Change of State Due to Heat.

Fusion. Experiments to determine the heat of fusion of ice.

Vaporization. Experiments to determine—the heat of vaporization of water, the effect of pressure on the boiling point of water, the rates of evaporation of water and of ether; cooling by evaporation; dew point.

Transference of Heat.

Experiments to show—conduction and convection of heat, the absorption and the emission of heat by different surfaces.

Radiant energy.

LIGHT

Nature and Sources of Light.

The transmission of light.

Experiments to show—that light travels in straight lines, the forming of an image through a pin hole, the forming of shadows; the methods of measuring the intensity of light by means of (1) the shadow, (2) the grease spot, (3) the diffusion photometer.

The wave theory.

Reflection of Light.

Experiments to show—the law of reflection, the formation and the position of images in plane and spherical mirrors.

Drawing images of objects in any position.

Refraction of Light.

Experiments: To show refraction; to measure the index of refraction; to illustrate the first law of refraction; to show total reflection.

Relation between velocity of light and index of refraction.

Experiments: To show the converging and the diverging of light by means of lenses; to determine the focal length, conjugate foci, and the formation of images by lenses.

The drawing of images formed by lenses and the relation between the size of the image and the size of the object.

Optical Instruments.

Simple microscope, camera, and projection lantern.

Colour.

Experiments with prisms to show the decomposition of white light and the combining of coloured lights to form white light, and with Newton's disc to illustrate complementary colours.

Experiments to show the effect of the transmission, the reflection and the absorption of light in producing colours.

The rainbow.

MAGNETISM AND ELECTRICITY

Magnetism.

Experiments to show—the laws of magnetic attraction and repulsions, magnetic lines of force, magnetic field, magnetism by induction, magnetization, magnetic permeability, terrestrial magnetism, inclination and declination of the magnetic needle, evidence that each particle of a magnetized body acts as a magnet.

Static Electricity.

Experiments to show—electrical attraction and repulsion, the two kinds of electrification, conductors and non-conductors, electrification by contact and by induction, the residence of electric charges on the surfaces of conductors, the distribution of an electric charge on a surface, the escape of electric charges from points (lightning rods).

Experiments with the gold leaf electroscope, the electrophorus electrical condenser and the Leyden jar.

Simple notions of electrical potential.

Current Electricity.

Experiments to show the production of an electric current by using cells having plates of different kinds.

Methods of determining the presence and the direction of electric currents (the galvanoscope), the effects of polarization of plates.

The Leclanche, dry and gravity cells.

Simple ideas of electromotive force, current strength and resistance

Experiments on the electrolysis of water, electroplating, the measurement of current strength by the water and the copper voltameters.

The storage cell.

Experiments to show—the magnetic effects of an electric current, the electromagnet, the magnetic field due to an electric current.

Construction and action of the D'Arsonval galvanometer, the electric bell, the telegraph key and sounder, the D.C. motor.

Experiments to show the transformation of electric energy into heat (the electric iron, the incandescent lamp).

Induced Currents. Experiments to show—the production and direction of induced currents (Lenz's Law), the relation of primary and secondary currents, the electromotive force of induced currents, the construction and action of an induction coil, self-induction, the construction and action of the step-up and step-down transformer.

Long distance transmission of electricity as illustrated in the Hydro-Electric System of Ontario.

Electric measurements.

The volt, ohm, watt, and watt-hour.

Ohm's Law.

Construction and action of the ammeter, voltmeter, and Wheatstone bridge.

Special forms of radiation.

Electric waves as related to heat rays, light rays, ultra-violet and X-rays.

Physical Culture

The object of a course in Physical Culture is the symmetrical development of the body, securing at the same time strength and grace with correct and prompt obedience to the will.

Too often mere "physical exercise" takes the place of Physical Culture. A systematic and graded course should be insisted upon, accompanied by a short lecture course in Hygiene. Prevailing defects should be studied and exercises and directions given to correct them.

Progress in the development of the pupil physically and the correction of defects should be noted. An inexpensive card filing system recording weight, height, age and history, annually, will aid materially in this objective.

Full details of the course to be covered, with lists of apparatus and reference books recommended will be found on pages 12, 13, 14, 15 of the "Courses of Study and Examinations for High Schools" or on page 9 of "Suggested Courses of Study for Commercial High Schools and Departments."

Household Science

The purpose of the course in Household Science is to teach pupils

1. To understand the principles and methods of selection, care, planning, preparation and serving of everyday foods.
2. To form right habits in regard to work, sanitation, and personal cleanliness.
3. To understand the selection, use and care of household equipment.
4. To understand the nature and function of the important structures and organs of the human body.
5. To develop judgment in the choice, use and care of clothing and household fabrics.
6. To understand the fundamental principles and methods of clothing construction.
7. To understand the use of personal accounts and budgets.

The course is divided into the following groups:

- I. Clothing and Textiles.
- II. Home Management.
- III. Foods.
- IV. Hygiene and Physiology.

The general scope of the course is as follows:—

1. Clothing and Textiles to include theoretical and practical work.
 - (a) Textiles—source, structure, durability, care—simple tests.
 - (b) Selection of clothing.
 - (c) Construction of clothing.
 - (d) Care of clothing.
 - (e) Household fabrics and furnishings.

II. Home Management to include theoretical and practical work.

- (a) Household Equipment
 - selection (materials, uses, etc.).
 - care and cleaning.
 - cost.
- (b) Economics of the household.
- (c) Household Furnishings.
- (d) Laundering.

III. Foods to include theoretical and practical work.

- Foods—classification, general composition, properties, source, selection, care, preparation and serving.
 - individual requirements.
 - dietetic value of types of foods.
 - menu planning and meal preparation to meet requirements.

IV. Hygiene and Physiology.

- (a) Elementary Physiology.
- (b) Personal Hygiene.

I. Clothing and Textiles.

(a) Theoretical.

1. Textiles.

- I. fibres—source, structure, properties and care.
- II. materials—source, composition, weave, selection and cost in relation to clothing and household fabrics.
- III. Materials used for cleaning in the home and the action of each on textile fibres.

2. Clothing.

- I. Selection—effect of clothing on personal appearance.
 - basis of selection, hygienic aspect, economy, suitability (colour, line style, occasion, durability).
 - accessories such as shoes, stockings, gloves, collars and cuffs, handbags, etc.
- II. Care and renovation of clothing—daily, weekly, occasional.
- III. Design and decoration related to outer wearing apparel.
- IV. Budget—individual concerning cost of types of clothing studied.
 - family in relation to individual allowance.

3. Household Fabrics—selection, suitability, durability, cost. (Towels, table linen, bedding, curtains, draperies, etc.)

(b) Practical.

- 1. Textiles—simple tests for fibre, quality, colour, laundering, etc.
- 2. Clothing—measurements, making simple drafts.
 - patterns—use, alterations, modifications.
 - choice of materials.

- construction of undergarments and simple dress.
 - fundamental stitches and processes, decorative stitches and finishes for use on garments and household fabrics.
 - cost of garments and household fabrics.
 - care such as shaking, brushing, sponging, pressing, darning, patching.
 - application of various home processes of cleaning on materials.
3. Preparation of budget for individual.
 4. Textile Crafts—simple embroidery, knitting, etc.
 5. Household furnishings—choice of materials and construction of household linens.
 6. Equipment—care and use (sewing machine and attachments, tape-line, rules, etc.).

II. Home Management.

(a) Theoretical.

1. Household Equipment.
 - Materials—metals, woods, rubber, leather, pottery.
 - principles underlying use and care.
2. Construction of such household working equipment as—electric iron, vacuum cleaner, toaster, taps, traps, refrigerator, sink, etc.
3. Selection—relation to use, durability, care, cost.
4. House Planning—standard principles involved in sanitation, lighting, heating, plumbing.
5. Economics of the household—
 - I. renting, leasing a home (time, taxes, water rates, lighting, etc.); payment of bills; record of expenditures, cash vs. time payment.
 - II. Budgets—planning use of time; planning use of money.
6. Laundering—
 - I. Equipment and arrangement for the home laundry.
 - II. Materials used and action of each on textile fibres.
 - III. Steps in the process of cleaning.
 - IV. Principles involved in the removal of stains.
 - V. Study of mechanical devices used.

(b) Practical.

1. Application of cleaning processes and principles underlying the work studied under (a).
2. Time record for operations.
 - development of speed and thoroughness.
3. Laundering processes and use of mechanical appliances.

III. Foods.

(a) Theoretical.

1. Foods.

- I. Study from standpoint of classification, source, general composition, properties, selection, care of beverages, fruit, vegetables, milk, cereals, eggs, cheese, meats, fish.
- II. Study of the nutritive value and place in the diet of the foods mentioned above.

2. Health.

- I. General functions of food.
- II. Factors affecting health, weight, and height.
- III. Principles involved in planning and serving breakfasts, luncheons, and suppers—to meet the requirements of pupil.
 - to meet the varying conditions in the home.
 - to meet the requirements for family on social agency supplies.

(b) Practical.

1. Planning, selection, preparation and serving of foods from standpoint of meals (breakfasts, luncheons and suppers).
2. Comparison of weight and height of each pupil with standard, also of her health and activity with normal.
3. Preparation and serving of food for patient in home.
4. Preparation and serving of food sent out by social agency.
5. Budget and calculation of cost of food prepared.
6. Menu construction with relation to
 - I. Nutritive value.
 - II. Time and preparation.
 - III. Cost.

IV. Hygiene and Physiology.

(a) Theoretical.

1. Laws of Health.
2. General structure and care of skin, hair, teeth, nails, eye, ear, nose, throat.
3. Clothing—suitability for health, etc.
4. Elementary Physiology.
 - I. Structural elements of the body—bones, ligaments, cartilages, joints, muscles.
 - II. Respiratory system.
 - III. Circulatory system.
 - IV. Digestive system.
 - V. Excretory system.
 - VI. Reproductive system.

(b) Practical.

1. Application of processes of care and cleaning on hair, hair brushes, nails, teeth, tooth brush, etc.

