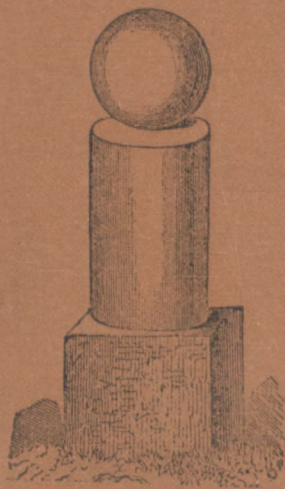


HANDBOOK
FOR
TEACHERS OF INFANTS' SCHOOLS
AND
JUNIOR CLASSES

With over 100 Illustrations



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monument upon Fröbel's grave at Schweina,
near Bad-Liebenstein, Germany.

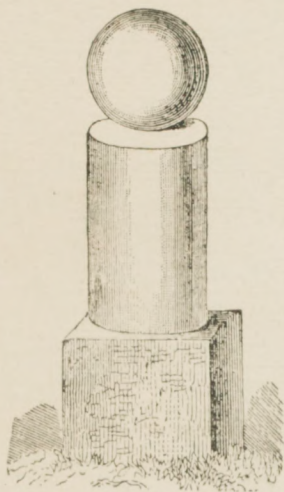
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1898

Dr. Mitchell

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NOTE BY THE PUBLISHERS.

This handbook meets the requirements of the New Standard of Proficiency, and contains all information on Kindergarten Work, Object Lessons, Drawing, Drill, Form, and Colour necessary for Infants' Schools and First Classes in ordinary Public Schools.

We are indebted to Colonel Paul, of the Cadet Staff, for the detailed Lessons on Drill, and to Miss Banks, Fort-street Kindergarten, Sydney, for the Drawing Lessons.

We are permitted to say that the whole matter has been submitted to, and approved by the Chief Inspector.

ANGUS & ROBERTSON.

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STANDARD OF PROFICIENCY FOR INFANTS' SCHOOLS.

First Half-year of Enrolment.

READING.—To read Primer, Part I. (one-third of the whole).

WRITING.—To write on slates i, u, n, m, v, r, w.

ARITHMETIC.—To count and read up to 10; to know ball-frame exercises in Addition, and addition of other concrete quantities as far as 10.

First course of easy Kindergarten exercises in singing, drill, drawing, object lessons, form and colour to be given in combination with the pupils in their second half-year.

SCRIPTURE.—Narratives and Moral Lessons.

Second Half-year of Enrolment.

READING.—To read Primer, Part I., to the end.

WRITING.—To write on slates all the letters of the alphabet, with easy combinations.

ARITHMETIC.—To count and read as far as 20; Addition in single column, to 20; to add and subtract mentally numbers not involving results higher than 20.

KINDERGARTEN EXERCISES.—As in first half-year.

SCRIPTURE.—Narratives and Moral Lessons.

Third Half-year of Enrolment.

READING.—Primer, Part II., to the end.

WRITING.—To write on slates from copies.

DICTATION.—Words from lessons read.

ARITHMETIC.—To read and notate as far as 100; Addition to three places—three lines; Mental Arithmetic up to 30; Tables to "4 times."

Second course of easy Kindergarten exercises in subjects prescribed for first and second half-years.

SCRIPTURE.—Narratives and Moral Lessons.

Fourth Half-year of Enrolment.

READING.—Reader I., to the end.

WRITING.—On slates from copies.

DICTATION.—From lessons read, eight lines.

ARITHMETIC.—To read and notate up to 1000; Addition, four places, four lines; mental operations in Addition and Subtraction; Multiplication Tables to "7 times."

KINDERGARTEN EXERCISES.—As in third half-year.

SCRIPTURE.—Narratives and Moral Lessons.

Values of Subjects taught in Infants' Schools.

	Marks.
Reading	200
Writing	100
Arithmetic	100
Dictation	100
Kindergarten Lessons	100
Scripture	30

NOTE.—The enrolment of each pupil in the several classes of an Infants' School must show the time of such pupil in the school and not in the class.

MEMORANDUM TO MISTRESSES OF INFANT SCHOOLS.

Herewith I forward a copy of the new Standard of Proficiency which will come into full operation from the beginning of next year. I have to call your attention to the grouping of subjects as Kindergarten exercises, and to furnish the following explanatory memorandum for your guidance.

(a.) KINDERGARTEN EXERCISES.—These lessons should be given daily; each lesson occupying half an hour. The course should be taken as follows:—

FIRST HALF-YEAR—1ST CLASS.

GIFT I. Woollen Balls }
Bead Threading } *Lower First.*

GIFT I. Woollen Balls }
Stick Laying } *Upper First.*

SECOND HALF-YEAR—2ND CLASS.

GIFT II. Sphere, Cube and Cylinder }
GIFT VII. Tablet Laying (squares) } *Lower Second.*

GIFT III. Building Box }
GIFT VII. Tablet Laying (squares) } *Upper Second.*

THIRD HALF-YEAR—3RD CLASS.

GIFTS III. and IV. combined (Building Boxes) }
Tablet Laying (triangles) } *Lower Third.*

Paper Plaiting }
Tablet Laying (triangles) } *Upper Third.*

FOURTH HALF-YEAR—1ST QUARTER.

Paper Plaiting }
Pea Work } *Lower Fourth.*

Paper Folding }
Tablet Laying } *Upper Fourth.*

FOURTH HALF-YEAR—2ND QUARTER.

GIFTS V. and VI. }
Paper Plaiting } *Lower Fifth.*

Embroidery }
Modelling in Clay } *Upper Fifth.*

NOTE 1.—The full course is intended for the large Infant Schools only, that is, those with an average attendance of over 300 pupils. The work of the ordinary Infant School may be regarded as completed at the standard prescribed for class Lower Fourth.

NOTE 2.—It cannot be too strongly emphasised that the Gifts in themselves have no educational value. Their value lies only in the spirit in which the Teacher presents them to the child.

(b.) OBJECT LESSONS.—Two half-hour lessons should be given each week, and not fewer than *ten* or *twelve* subjects treated each quarter, according to the number of school weeks. The following are suitable subjects:—A slate, a pencil, a tea cup, a kettle, a knife, pins, needles, an apple, an orange, a potato, tea, coffee, sugar, water, milk, coins of various kinds, lock and key, a brick, clay, the cat, the horse, the cow, a house, a comb, a fire, coal, lead, copper, iron, glass, a lamp.

(c.) FORM.—*First Half-year*—Lines - upright, level, slanting, curved.
Second Half-year—Lines and angles.
Third Half-year—Triangles, circle.
Fourth Half-year - Four-sided figures, common solids.

NOTE.—In teaching *Form*, the jointed lath should be used.

(d.) COLOUR.—*First Half-year*—Distinguishing common colours—
white, black, blue, green, red,
yellow.

Second Half-year—Colours of first and second classes.
Third Half-year—The three classes of colours.
Fourth Half-year—Tints and shades.

NOTE 1. In teaching both *Form* and *Colour*, the Kindergarten Gifts should be freely used.

NOTE 2.—The lessons in *Form* and *Colour* need not occupy more than half an hour each week.

(e.) DRAWING.—*First Half-year*—Vertical and horizontal lines ; combination of vertical and horizontal lines ; patterns made from the combination.

Second Half-year—Vertical, horizontal, and easy oblique lines ; patterns made by combining these lines ; elementary objects.

Third Half-year—Vertical, horizontal, and oblique lines (more difficult) ; patterns made by combining these lines ; elementary objects more advanced

Fourth Half-year - Parallel lines -vertical, horizontal, and oblique ; patterns made by combining these lines ; objects more advanced.

Fifth Class - Advanced patterns and objects ; freehand exercises.

F. BRIDGES,

Chief Inspector.

Department of Public Instruction,
Sydney, 8th August, 1898.

KINDERGARTEN COURSE

FOR

INFANTS' SCHOOLS

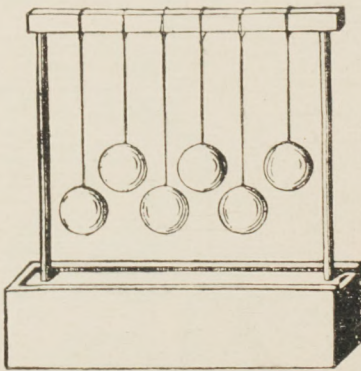
WITH

HINTS AND SUGGESTIONS FOR THE GUIDANCE
OF TEACHERS

THE FIRST GIFT.

THE BALLS.

AIM : To teach colour (*primary* : red, blue, yellow ; and *secondary* or *mixed* : purple, green, orange) ; direction (forward and backward, right and left, up and down) ; to train the eye ; and to exercise the hands, arms, and feet in various plays.



The teacher should distribute the balls, then call the attention of the pupils to their colour, shape, and softness, then lead the pupils to distinguish one colour from another, to point out objects of the same or a similar colour, to note the difference between the *soft* ball and the *hard* box, to name other *hard* and *soft* things. By means of movements very useful and

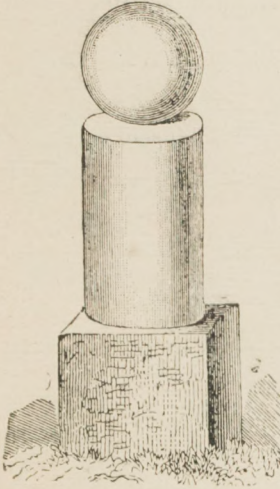
interesting lessons may be given. The ball may be placed *on* the hand, or *under* the hand ; it may be at rest or in motion. It may be rolled along the desk in various directions, the pupils naming the direction—*right*, *left*, *backward*, *forward*, *across*, &c. By means of the string the ball may be moved up and down or swung round

and round, the pupils describing the motion by the words *high, low, upward, downward, round, sideways, &c.* The pupils should be **trained to observe** similar motions, as the swinging of arms and legs, the swaying of trees by the wind, &c.

THE SECOND GIFT.

SPHERE, CUBE, AND CYLINDER.

AIM: To teach form, to direct the attention of the child to similarity and dissimilarity between objects. This is done by pointing out, explaining, and counting the sides, corners, and edges of the cube; by showing that the properties of the sphere, cylinder, and cube are different on account of their difference of shape; by pointing out that the *apparent* form of the sphere is unchanged, from wherever viewed, but that the apparent forms of the cube and cylinder differ according to the point from which they are viewed. The contrast between the firm position of the cube and the ease with which the ball can be moved should be made clear. The cube must be pushed along or turned over and over, the cylinder can be



rolled in one position only, the ball is easily rolled in any position. It should be shown that the corners of a cube are right angles, that its surfaces are squares, that the cylinder and sphere have no corners, and that the ends of the cylinder are circles. Attention should be drawn to objects of similar shape, as a box, a cricket ball, a lead pencil, &c.

Gifts III., IV., V., and VI.

It is not practicable in a small work like this to give in detail the exercises comprised in these gifts, nor is it necessary to do so. Much must be left to the judgment and inventiveness of the teacher. All these gifts consist of cubes divided in various ways, arranged on the sound principle of proceeding from the easier to the more difficult. They show oblong solids on bricks, triangular pieces on prisms, and fractional parts, halves, quarters, &c.

By means of Gift III. the pupils may be taught lessons of **symmetry**, and enabled to develop **constructive power**. The cubes may be so arranged as to form many common objects, such as a table, steps, door, window, chair, &c. After the teacher has shown the pupils how to construct a particular object, she should leave them to their own devices and allow them to **exercise their own ingenuity** in building.

The more advanced gifts, having more minute subdivisions, yield a greater variety of combinations and afford a wider scope for construction.

Teachers are advised to study good books on Kindergarten work, such as:—

Principles of the Kindergarten—*Miss Lyschinska.*

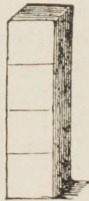
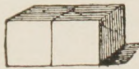
The Kindergarten and Child-culture—*Henry Barnard.*

Kindergarten Songs and Games—*Myers.*

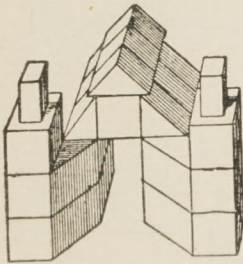
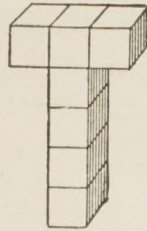
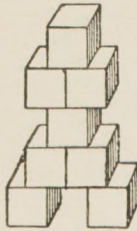
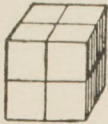
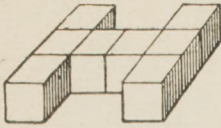
Kindergarten Guide—*Lois Bates.*

THE THIRD GIFT.

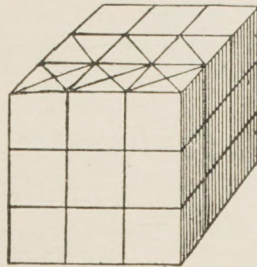
FRÖBEL'S FIRST BUILDING BOX.



Large Cube, divided into eight small cubes of equal size. Aim: To illustrate **form and number**; also to give the first idea of **fractions**.

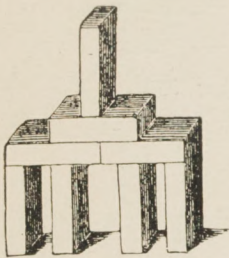


GATEWAY.



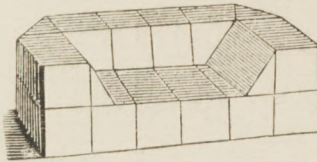
THE FOURTH GIFT.

FRÖBEL'S SECOND BUILDING BOX.

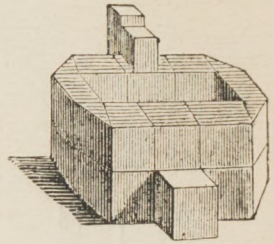


BRANDENBURG GATE, BERLIN.

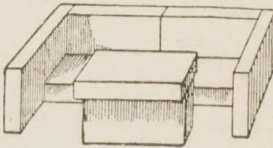
Large Cube, divided into eight oblong blocks. The points of similarity and difference between this and the Third Gift should be indicated.



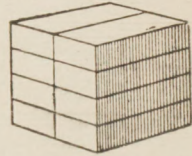
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WELL.



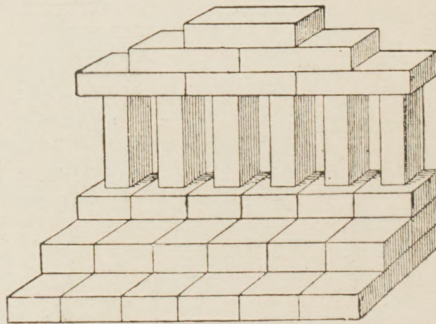
RUSTIC SEAT AND TABLE.

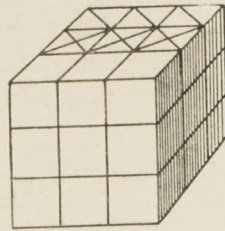
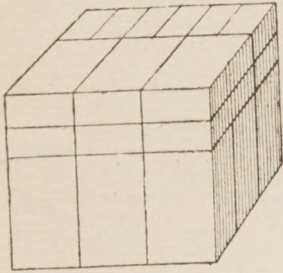


THE FIFTH GIFT.

FRÖBEL'S THIRD BUILDING BOX.

This is a continuation of, and a complement to, the Third Gift; it admits of more extended application than the Third and Fourth.

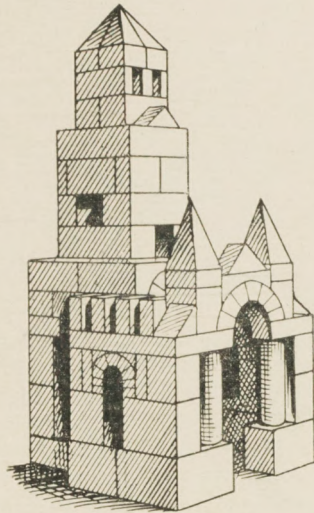
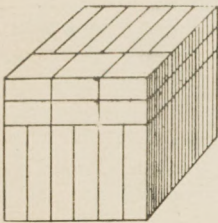




THE SIXTH GIFT.

FREBEL'S FOURTH BUILDING BOX.

This is a continuation of, and a complement to, the Fourth Gift; it admits of a very extended application.



OBJECT LESSONS.

FIVE SPECIMEN LESSONS FOR INFANTS' SCHOOLS IN ACCORDANCE WITH THE NEW STANDARD OF PROFICIENCY.

The full course of Object Lessons, suitable for Infants' Schools and Junior Classes, will be found in "Wiley's Australian Object Lesson Book." (Published by Angus and Robertson, 89 Castlereagh-street, Sydney, and obtainable from all booksellers, price 3s. 6d.)

A Table.

WANTED.—A school table.

PARTS.—Get the class to name the different parts of a table. Pupils can see that it has four legs, a top, sides, corners, &c. **Top**—What form? Generally rounded. Why? Dangerous to have sharp points sticking out. Make the children observe how the sides of the top are moulded to take off the sharp edge. Why? Table covers will not get cut. Looks flat (horizontal, reddish-brown colour, bright (polished), feels smooth. **Legs**—All the same length (equal). Hang down straight (vertical). Keep same distance apart all the way down (parallel). **Frame**—Underneath the top, in four pieces; joins the legs. **Drawers**—In frame, fastened with lock and key.

WHO MADE THE TABLE?—Cabinet maker. What does he make it of? **Wood**. What do we call wood in large pieces? Timber; and the place where it is sold is called a timber yard. What else does the maker want? Glue, nails, polish, locks, and keys. But now he wants something to make it with—**tools**. Name some tools: saw, chisel, hammer. Tables are not all the same size or shape. Name different kinds of tables you have seen.

USE OF THE PARTS OF A TABLE.—**Legs** hold up the frame and top. **Frame** keeps legs together in their proper

places and holds up the top. **Top** finishes the table, but the top alone would be of no use if it had to lie on the floor, nor would the legs and frame be of any use by themselves. Some tables have **castors**. What is their use?

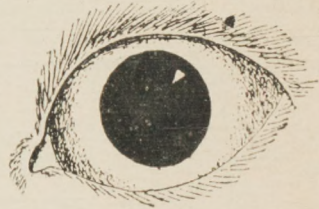
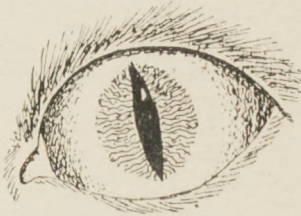
USE OF TABLE.—To place things upon, so that we can easily get them. To rest our slates or books upon. Little boys and girls often use the table for something else. What else? Tables keep things off the floor. We should not like to eat our dinner off the floor, though we do without a table at picnics. In some countries even rich people have no tables. They sit upon cushions placed on the ground; but, if they are poor they do without cushions. On a gold diggings logs of wood and boxes have to do very often instead of chairs.

The Cat.

SHOW the class a real cat if possible, or a coloured picture. Children's toy books often have very good pictures of animals, if better are not at hand.

WHAT A CAT HAS.—**Body**—Look at puss. What is this big part of her called? What kind of a body? Long, round. She can bend it easily. Not heavy and stiff like a cow's body. Cows cannot jump and climb like cats. Why? Their bodies are too heavy and stiff. Can boys jump and climb? Not so well as a cat. **Head**—What kind of head? Round. Yes. Now look at her **ears**. They are pointed. Keep quite still and watch them while I make a very soft noise. Well, what did she do? Yes; when she is listening, she makes them stand upright. Can you move your ears? Puss can hear the least sound. Mice and birds make very little noise, but she can hear them. **Eyes**—What colour? Green. Look, they are half shut. Why? She does not like this bright light; but to-night, when she goes into the kitchen to look for a mouse, they will be wide open. She can see well when it is almost quite dark, and so is able to catch mice, which also come out at night. Teeth very sharp. Why must they be so sharp? So that she may be able to tear the rats and mice to pieces.

What are these long hairs called? **Whiskers.** Yes. The right name for them is feelers. They help her to find her way about in the dark. **Feet**—Feel the soft cushions and the sharp claws on her feet. What are the cushions for? Besides helping her to walk softly they keep her from being hurt when jumping from a high place. **Claws**—How many? Must be kept in a sheath. Can push them out and draw them in. Why does she not keep them out all the time? When does she push them out? What does



she do with them besides scratch? What shape are they? Curved. What is the use of the sheath? Protects their claws. **Tail** is long and, like her body, easily bent. I saw a cat with her tail standing straight up, and quite thick. What was the matter? Only bad children hurt and tease animals (cruel); ought to be kind. **Covering**—Hair. Feel how soft it is. We call this soft hair **fur**. Name some other animals that have fur. What colour? Puss likes her fur stroked the right way. Show me the right way.

WHAT PUSS DOES.—Walks softly, jumps and climbs; kills mice, and our pet birds, too, if she gets a chance. Refer to manner in which she plays with a mouse. Very clean. Washes her face and brushes her coat. Likes to sleep in a warm place during the day. Goes out at night. Does not like to get wet. A duck would not mind. Why? Refer to oil cells. A cat has none. Purrs when pleased. Mews when she wants some food. Likes home better than the people in it. Young ones called? (Tell the class some stories about cats.) Children should not nurse or otherwise handle cats, as they may get scratched, and worse still, may catch from them sometimes very painful and dangerous diseases.

Tea.

WANTED.—Some tea, black and green, and a picture of plant. Unroll some used tea leaves.

QUALITIES.—To get these from the class, proceed as in the lesson on pepper. **Looks** black (or green), dull, wrinkled, opaque. **Feels** dry, light, rough. **Smells** odorless and aromatic. Has a pleasant **taste**.

THE PLANT is a **shrub**. In a wild state grows to a **height** of twenty to thirty feet. Under cultivation, not allowed to grow higher than five to six feet. **Planted** about four feet apart. Three years old before the leaves are fit for **picking**. **Leaves** very like camellia leaves, rather long, and notched like a saw (serrated), shining and tough when fresh. **Flowers** rather large and white, with pleasant smell. Is an **evergreen**. Grows in warm countries—China, India, Ceylon, Japan. Is grown from seeds. Will grow in the district about Sydney.

PREPARATION.—The leaves are **picked** by hand, and both **black and green teas** are prepared from the same kinds of plant, just as black and white pepper are prepared from the berries of the same tree. The difference is in the drying. To prepare green tea, the leaves are **roasted in pans** as soon as they are gathered. This makes them soft and moist. After about five minutes they are taken out of the pans, placed on a table, and **rolled** with the hands. They are

then returned to the pans and **stirred about** with the hands. In about an hour they are quite dry, and of a **green** colour. The black is not prepared so quickly. When **picked**, the leaves are **spread** out in the air for some time on mats, then tossed about until they become limp or soft. They are next **roasted** for a few minutes and **rolled**; then put out in the air again for a few hours; and lastly, they are **dried** slowly over a fire until black.



Both kinds are then ready to be **packed** in chests lined with lead, and sent away to other countries.

GATHERING.

—There are three crops in a year. The best is that which is picked in April, when the leaves are young. The next gathering is in May, and the last and poorest in June.

USE.—A pleasant **drink**. Is **refreshing**. Sometimes good for a headache.

Must be **made**

with boiling water. We use **milk** and **sugar** with tea. The Chinese do not. Let one of the pupils tell the class how to make a cup of tea. We get our tea chiefly from China, Ceylon, and Assam (India).

NOTE.—Strong tea is very bad for one's health. As a rule, people in Australia drink too much tea.

The Orange.

WANTED.—Specimens of flowers, leaves, and fruit (whole and cut open and peeled).

DESCRIPTION.—Almost **spherical**. Deep yellow **colour**. Gives name to a colour—orange. What other colour must be mixed with yellow to make orange? Red. Orange is therefore one of the secondary colours. It **feels** cool, smooth, and heavy. Has an aromatic **smell**. The skin has a bitter **taste**. (Peel orange.) What do we call this outer skin? Peel or rind. It is tough and thick. White inside. If we squeeze the rind a bitter juice comes out. This is a kind of oil. What is its use? It preserves the orange for a long time after it is gathered. Peaches and apples cannot be kept long. Their skins are different. If you look closely at a piece of orange peel, you will see this oily juice stored up in tiny cells. What do we see here **inside the rind**? An inner skin. It is very **thin** and **white**, but rather **tough**. What does it do? It **divides** the orange into parts (wrongly called by children, quarters), and keeps the sweet juice from running out as soon as the rind is taken off. Let us break off one of these parts. How many sides has it? Three. Two flat and one curved. Which side has been covered by the rind? The curved side. Now we break open one of these parts. What do we call this yellow stuff? The **pulp**. What is it full of? **Juice**. Why does not the juice run out? If you look closely, you will see that it is held in tiny cells. We must **squeeze** the orange (burst the cells) before the juice comes out. What are these little white things? The **seeds**. The juice is sweet, cool, and refreshing.

PLANT.—Tree; an **evergreen**; grows about fifteen feet **high**. **Leaves**, bright green, shining, oval and pointed. Have funny stalks. Quite flat (winged). **Flowers** white, very pretty, and have a delicious scent. This beautiful tree has leaves, blossoms, ripe and green fruit, all at the same time. Oranges only grow in **warm countries**. We have **plenty** in **Australia**, particularly

near Sydney. A place where many orange trees grow is called an **orangery** or **orange orchard**. The lemon and citron are fruits of the same kind as the orange.

USES.—Is **refreshing**, not **nourishing** like the banana. Is made into **marmalade**. The juice sometimes made into **wine** (orange wine). The **peel** boiled in sugar called **candied peel**, used for cakes and puddings. One kind of **scent** (Eau-de-Cologne) is made from the flowers. Another perfume is made from the **rind**.

A Child.

INTRODUCTION.—We are going to have a lesson on an animal that runs about the house. Name some animals that we have indoors. Cat, dog. Yes, they belong to the house; but the animal I am thinking of has only two legs and feet. A child. Yes, a child is an animal; it lives and grows and moves about. An animal with two feet is called a **biped**. What are four-footed animals called? **Quadrupeds**. We will talk about a **biped**. (Let a child stand in front and get the class to name the different parts of the child).

HEAD.—Hard, bony, like a box. Has something inside which must be taken great care of. The **brain**—If anything were to hurt that we might die, or lose our senses. The front of the head is the **face, eyes** to see with, **nose** to breath through and smell with. **Mouth** to taste and speak with. Top of face, **forehead**—(front head). Bottom the **chin**. Two **cheeks**, two **eyes**, two **ears** to hear with. **Eyelashes** and **eyelids** to keep light and dust from hurting the eyes. In the mouth, a **tongue** and **teeth**. Children have twenty teeth, grown people thirty-two. Roof of the mouth called the **palate**. Helps us to taste. Tongue rolls the food against the palate and gums, or we should not taste it. If we have to take medicine with nasty taste, we should try and keep it from touching the roof of the mouth, and so we shall not mind taking it at all. Head is covered with **hair**. What for? Helps to keep the brain safe. If we get a knock on the head, the hair protects it a little. Besides, the hair keeps the head warm in winter. Thick hair, too, sometimes

saves us from sunstroke in the very hot weather, when we are so careless as to go out in the sun bareheaded. Boys and girls should never run about in the sun without a hat.

THE TRUNK.—What is this part of the child called? The body. We call it the trunk. Name parts. The **chest** is another kind of box. **Heart** in the middle. **Two lungs**, one on each side. What is this bone running down the back called? **Backbone** or spine. Not all in one piece, or the child could not move so easily. A great many little bones joined together. There are thirty-three of these. Make child bend to show how flexible backbone is.

LIMBS.—Child has two arms and two legs, called limbs. How many limbs? Limbs not all in one piece (Make class name joints). **Shoulders, elbows, wrists, knuckles, hips, knees, ankles, toe joints.** What fastens head to trunk? The **neck**. Front part is the **throat**, the back, the nape of the neck. Some animals carry their young by the back of the neck. Name one. The cat. What is a child covered with? **Skin**, which must be kept very clean, or the child would not be very healthy. Give reasons.

USES OF PARTS.—Brain helps us to think and learn. Lungs enable us to breathe. Must sit up straight, and give them plenty of room to grow. Heart pumps blood all over the body, and keeps us alive. Put your hands on your hearts. Feel how they beat. Legs help us to walk and run. Hands and arms enable us to work. Eyes to see with, ears to hear with, nose to smell with, and mouth to taste with. But what do we feel with? There are tiny threads all over our bodies. These are called **nerves**, and they make us feel. What is the use of feeling pain? To let us know there is something the matter with our bodies. We go to the doctor and tell him where the pain is, and he tries to cure us.

CAUTION.—We should take care of our bodies. Never run about too much in the hot sun, or get our feet wet by walking in water. Never eat unripe fruit or berries that grow in the bush.

COURSE OF INSTRUCTION IN DRAWING.

1st CLASS.

Vertical and horizontal lines.
Combination of vertical and horizontal lines.
Patterns made from the combination.

2nd CLASS.

Vertical, horizontal, and easy oblique lines.
Patterns made by combining these lines.
Elementary objects.

3rd CLASS.

Vertical, horizontal, and advanced oblique lines.
Patterns made by combining these lines.
Elementary objects, more advanced.

4th CLASS.

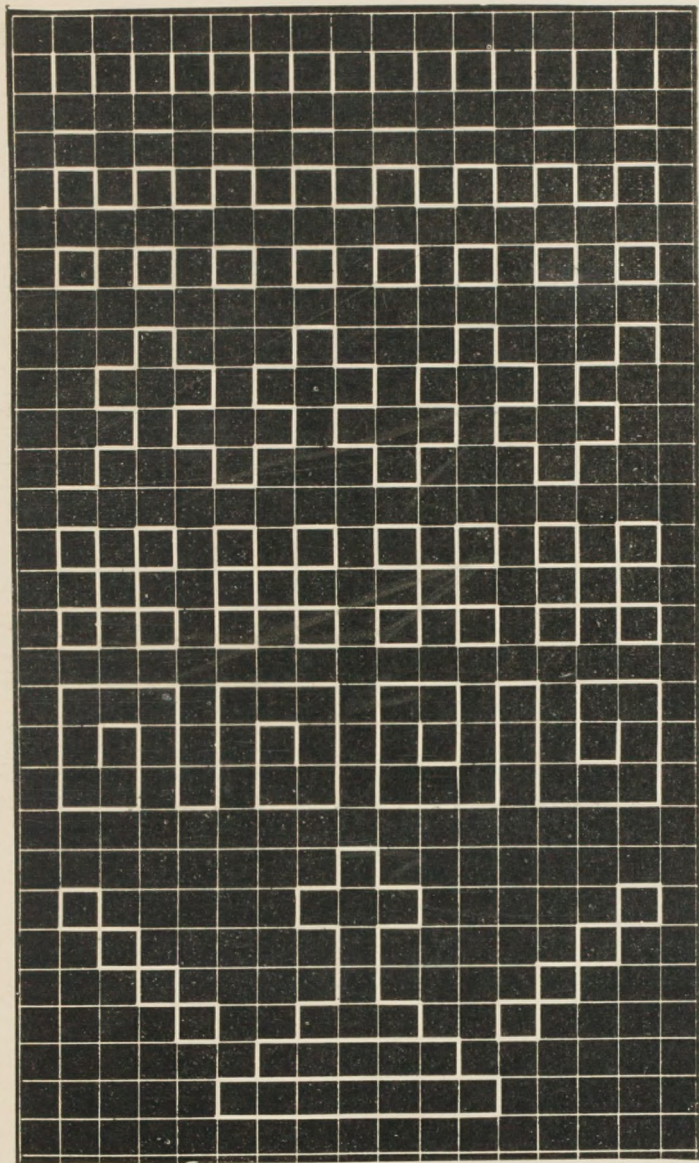
Parallel lines—vertical, horizontal, and oblique.
Patterns made by combining these lines.
Advanced objects.

5th CLASS.

Advanced patterns and objects.
Freehand exercises and tests.

The copies given in the following pages are specimens of the early and of the advanced work suitable for each class.

Teachers are advised to study Woodhouse's Drawing Course for Infant Classes, from which an almost infinite variety of excellent copies can be selected. (Published by George Robertson and Co., 361 George-street, Sydney, and obtainable from all booksellers. Price, 1s.)



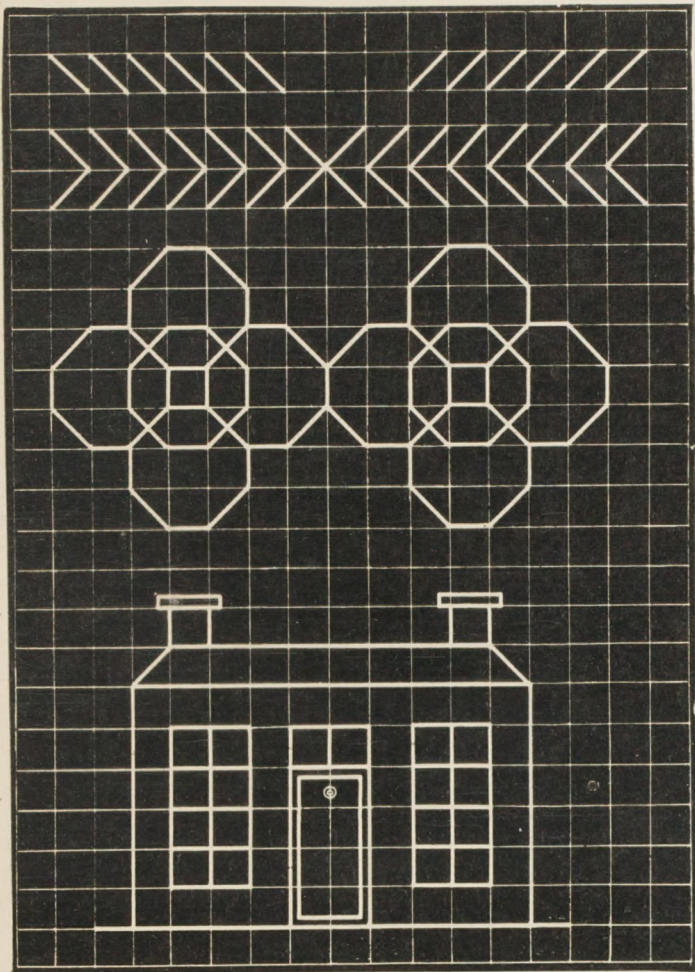
2nd CLASS.

Vertical, horizontal, and easy oblique lines.

Patterns made by combining these lines.

Elementary objects.

CLASS II.

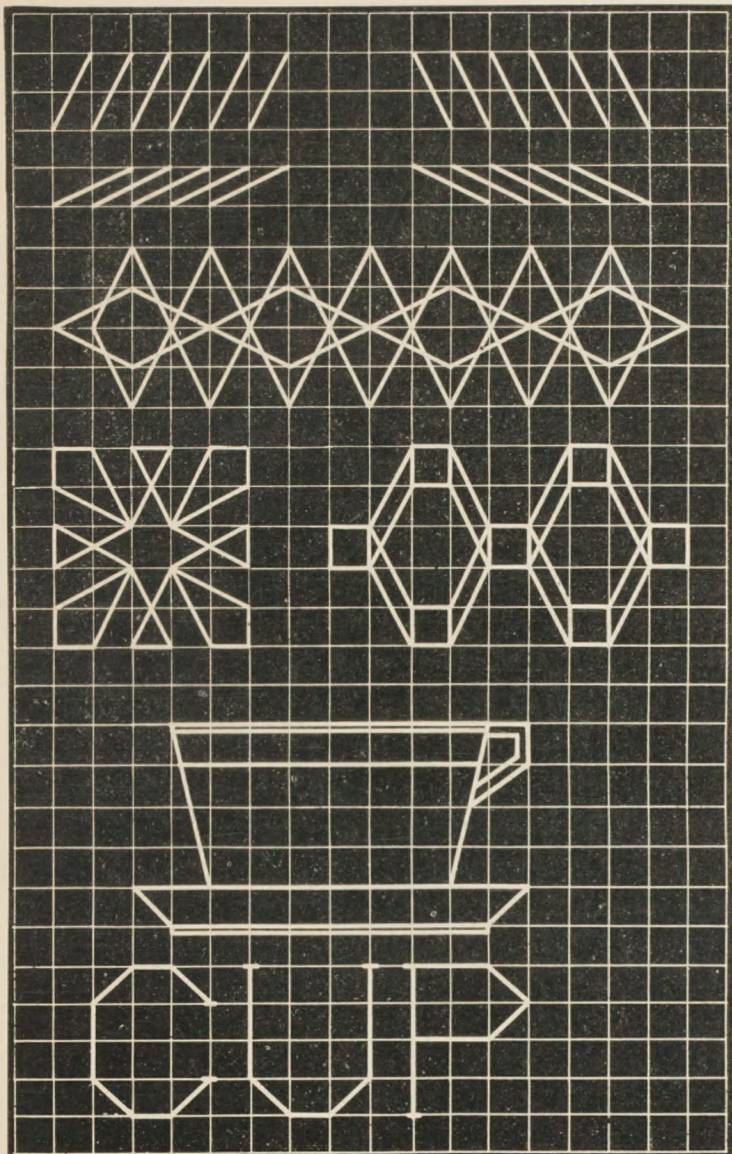


3rd CLASS.

Vertical, horizontal, and advanced oblique lines.

Patterns made by combining these lines.

Elementary objects, more advanced.



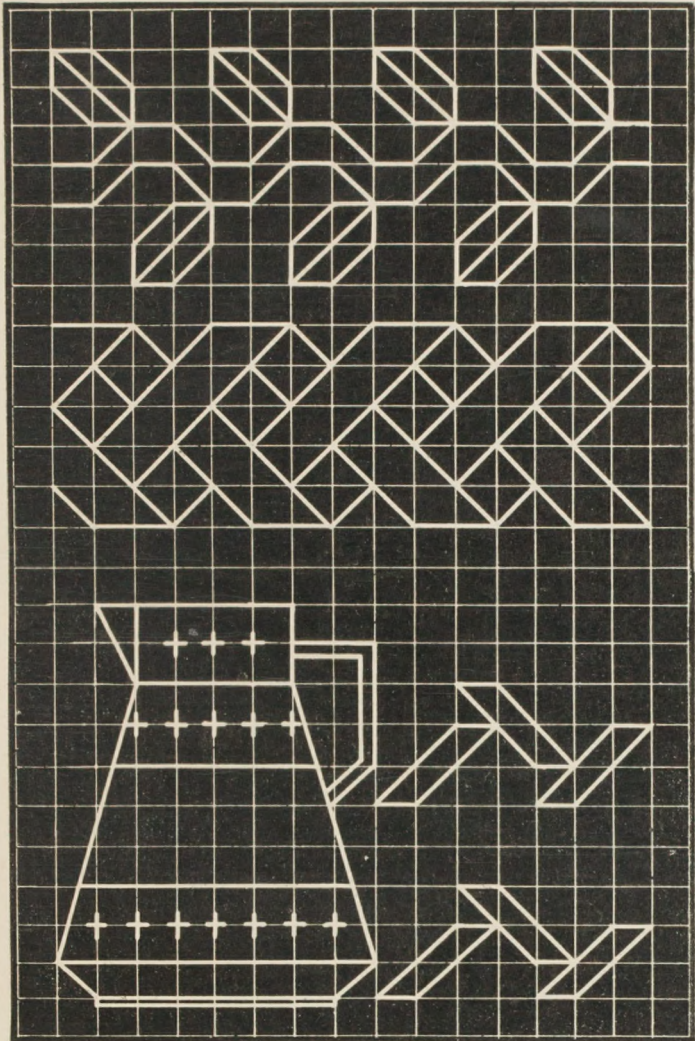
4th CLASS.

Parallel lines—vertical, horizontal, and oblique.

Patterns made by combining these lines.

Advanced objects.

CLASS IV.

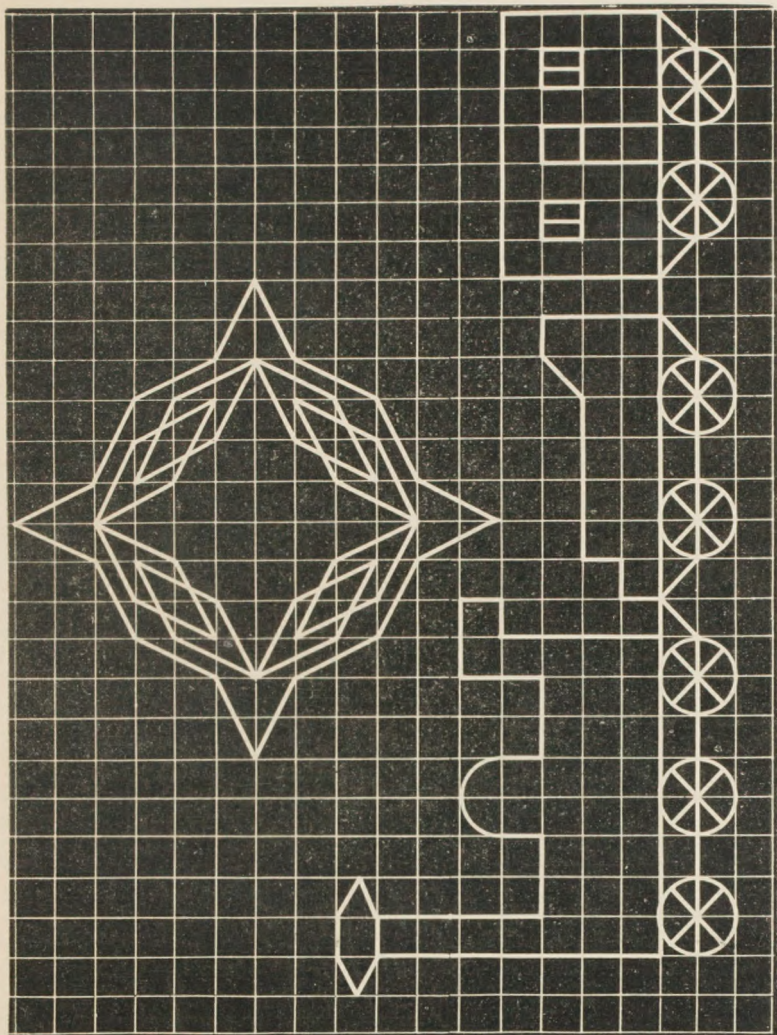


5th CLASS.

Advanced patterns and objects.

Freehand exercises and tests.

CLASS V.



DRILL FOR INFANTS' SCHOOLS

TO ACCORD WITH THE PROVISIONS OF THE
STANDARD OF PROFICIENCY.

Exercise 1.—ARM MOVEMENTS. Standing.

READY. On the word *ready*, place the hands on the knees.

ARMS—Fold. (By numbers.)

ONE. On the word *one*, place the left hand round the waist.

TWO. On the word *two*, raise the right hand as high as the shoulder, palm to the front.

THREE. On the word *three*, place the right hand between the left elbow and waist.

Exercise 2.

READY. ARMS—Fold.

HANDS—Show. On the word *show*, raise the hands as high as the shoulders, palms to the front, thumb close to the forefinger, elbows close to the sides, shoulders pressed back and down.

HANDS—Up. On the word *up*, raise the arms to the full extent above the head, palms to the front.

HANDS—Show. As before.

HANDS—Out. On the word *out*, shoot the arms straight out in front of the body, in line with the shoulders, palms down.

HANDS—Show. As before.

Repeat eight times.

ARMS—fold.

Exercise 3.

READY. HANDS—Show.

HEAD—Touch. On the word *touch*, place the tips of fingers on the crown of the head, fingers pointing downwards, knuckles touching, elbows pressed back, shoulders kept down.

HANDS—Show. As before.

KNEES—Touch. On the word *touch*, place the palms of the hands on the knees, keeping the body upright.

HANDS—Show. As before.

HIPS—Touch. On the word *touch*, place the hands on the hips, fingers to the front, pointing downwards, thumb behind, elbows pressed back, and shoulders down.

HANDS—Show. As before.

SHOULDERS—Touch. On the word *touch*, place the tips of the fingers on the shoulders, elbows in line with the shoulders and pressed well back.

HANDS—Show. As before.

Repeat eight times.

ARMS—Fold.

The teacher may frame a similar exercise by naming other parts of the body.

Exercise 4.—This exercise will be done standing, hands placed by the sides.

READY. HANDS—Show.

FINGER JOINTS—ONE. On the word *one*, close the fingers smartly and tightly on the palms.

TWO. On the word *two*, open the fingers smartly to the fullest extent.

Repeat eight times.

WRIST JOINTS—ONE. On the word *one*, bend the hands forward and down without moving the arm.

TWO. Resume the previous position.

Repeat eight times.

ELBOW JOINTS—ONE. On the word *one*, lower the arms to the full extent.

TWO. Resume the previous position.

Repeat eight times.

SHOULDER JOINTS—ONE. On the word *one*, raise the shoulders as high as possible.

TWO. On the word *two*, lower the shoulders as far as possible.

Repeat eight times.

ATTENTION.

Exercise 5.—This exercise will be done standing.

READY. Hands behind, lower the arms to the full extent behind the back, lock the thumbs, the thumb of the right hand between the thumb and palm of the left hand.

NECK JOINTS—ONE. Lower the head slowly on the chest.

TWO. Raise the head to the previous position.

Repeat eight times.

KNEE JOINTS—ONE. Bend the knees, keeping the body erect.

TWO. Resume the previous position.

Repeat eight times.

ANKLE JOINTS—ONE. Raise the body on the toes as high as possible, heels together.

TWO. Lower the heels.

Repeat eight times.

HIP JOINTS—ONE. Raise the left foot by bending the knee, without moving the body.

TWO. Place the left foot lightly on the ground.

Repeat eight times.

Similar exercise with right foot.
Repeat eight times.

ATTENTION.

Exercise 6. Sitting.

READY. HANDS—Show.

1ST PRACTICE—ONE. On the word *one*, shoot both arms straight out in front, palms facing.

TWO. Clap the hands.

THREE. Hands apart.

FOUR. Clap the hands.

And so on, counting eight.

2ND PRACTICE—ONE. Raise the hands straight over the head, hands apart, palms facing.

TWO. Clap the hands as in 1st Practice.

3RD PRACTICE—ONE. Drop the elbows to the sides, and place the tips of the fingers on the collar-bones, elbows pressed back.

TWO. Raise the elbows in line with the shoulders.

Repeat, counting eight.

4TH PRACTICE—ONE. Bring the elbows as close as possible in front of the body, shoulders down.

TWO. Force the elbows well back by the sides.

Repeat, counting eight.

ARMS—Fold.

Exercise 7.—HEAD MOVEMENTS—In slow time. Standing.

READY. HANDS—Behind.

1ST PRACTICE—HEAD FORWARD—Bend. Lower the head forward until the chin touches the breast, the back of the neck being well stretched.

HEAD—Raise. Raise the head to the former position.

HEAD—Backward—Bend. Carry the head backward as far as possible.

HEAD—Raise. As before.

2ND PRACTICE—HEAD TO RIGHT—Bend. Bend the head sideways until the ear is as close as possible to the shoulder, which must not be raised.

HEAD—Raise. As before.

HEAD TO LEFT—Bend. As in Head to Right—Bend.

HEAD—Raise. As before.

3RD PRACTICE—HEAD TO RIGHT—Turn. Turn the head to the right until the chin is over the shoulder, shoulders square to the front, body steady.

FRONT—Turn. Turn the head to the front.

HEAD TO LEFT—Turn. As in Head to Right—Turn.

FRONT—Turn. Turn the head to the front.

NOTE.—Each practice is to be repeated eight times at first. Afterwards all the movements may be done *once* each way.

Exercise 8.—ARM MOVEMENTS. Sitting or standing.

READY. Hands—Show.

1ST PRACTICE—ONE. Shoot both hands straight out to the front, in line with the head, fingers knit.

TWO. Lower the hands as far as possible.
Repeat, counting eight.

2ND PRACTICE—ONE. Place the hands on top of the head, elbows pressed back.

TWO. Raise the hands, fingers still knit, as high as possible.
Repeat, counting eight.

3RD PRACTICE—ONE. Shoot hands straight out in front, fingers still knit, wrists apart.

TWO. Click wrists.

THREE. Open wrists.

FOUR. Click wrists.

So on, counting eight.

4TH PRACTICE—ONE. Swing the arms, fingers still knit, to the left as far as possible.

TWO. Swing the arms in a similar way to the right.
Repeat, counting eight.

ARMS—Fold.

Exercise 9.—ARM MOVEMENTS. Sitting or standing.

READY. Hands—Show.

1ST PRACTICE—ONE. Shoot both hands straight out to the front, palms down.

TWO. Cross the arms in front, the right arm over the left, both arms as straight as possible.

Repeat, counting eight, arms crossing alternately.

2ND PRACTICE—ONE. Cross the arms on the chest, fingers touching the shoulders.

TWO. Bend the hands from the wrist to the front as much as possible.

Repeat, counting eight.

3RD PRACTICE—ONE. Hold both hands in front of face.

TWO. Lower the hands from the wrist towards the chest.
Repeat, counting eight.

4TH PRACTICE—ONE. Close the fists, lower the left hand in line with the elbow.

TWO. Hammer the left fist with the right.
Repeat, counting eight.

ARMS—Fold.

Exercise 10.—WRIST-TWISTING MOVEMENTS. Sitting or standing.

READY. Hands—Show.

1ST PRACTICE—ONE. Turn the backs of the hands smartly to the front.

TWO. Turn the palms of the hands smartly to the front.
Repeat eight times.

2ND PRACTICE—ONE. Shoot the arms straight out to the front,
palms down.

TWO. Turn the palms up.
Repeat eight times.

3RD PRACTICE—ONE. Shoot the arms straight above the head,
palms to the front.

TWO. Turn the backs of the hands to the front.
Repeat eight times.

ARMS—Fold.

Exercise 11.

READY. Place the fingers on the shoulders, elbows pressed back,
upper arm horizontal.

ONE. Raise the left hand upwards to its fullest extent, palm
inwards.

TWO. Replace the left hand on the shoulder.

THREE. Raise the right hand.

FOUR. Replace the right hand.
Repeat, counting eight.

Continue with both hands raised, and repeat, counting eight.

ARMS—Fold.

NOTE.—This exercise may also be performed with the arms forward
and sideways.

Exercise 12.—FOOT MOVEMENTS. Standing.

READY. Hands on hips.

FEET—Close. Keep the knees perfectly straight, and close the
fore part of the feet, raising the toes, and
turning on the heels.

FEET—Open. Resume the ready position.
Repeat, counting sixteen.

Exercise 13.—BODY MOVEMENTS. Standing.

READY. Hands on hips.

BODY—Forward—Bend. Bend the body slowly forward from the
hips, knees straight, head and neck in line
with the body, chest well arched, eyes to the
front.

BODY—Raise. Resume the ready position.

BODY—Backward—Bend. Bend the body backward from the
hips, directing the face upwards, spine to be
kept as straight as possible.

BODY—Raise. Resume the ready position.

BODY TO RIGHT—Bend. Bend the body on the hips as far as
possible to the right, legs straight, heels close,
eyes to the front.

BODY—Raise. As before.

BODY TO THE LEFT—Bend. Similar movement as the right.

BODY—Raise. As before.

BODY TO RIGHT—Turn. Keep the hips firm ; turn the body steadily to the right, until the shoulders are square to the right.

FRONT—Turn. Resume the ready position.

BODY TO LEFT—Turn. Similar movement as to the right.

FRONT—Turn. As before.

ATTENTION.

Repeat as often as necessary.

Exercise 14.—ARM MOVEMENTS. Standing.

READY. Attention.

ONE. Raise the left arm forward to the full extent above the head.

TWO. Replace it by the side.

THREE. Raise the right arm as at *one*.

FOUR. Replace it by the side.

FIVE. Raise both arms as in *one* and *three*.

SIX. Replace both by the sides.

SEVEN. Raise both arms above the head, and clap the hands.

EIGHT. Lower both arms behind the back, and clap the hands.

ATTENTION.

Exercise 15.

READY. Keeping the elbows close to the side, bring the closed hands to meet in front of the chest, little fingers touching.

ONE. Bring the closed hands smartly back to the shoulders, and force the elbows well back.

TWO. Lift the elbows in line with the shoulders, and lock the fingers behind the neck, head must not be thrown forward.

THREE. Resume position one.

FOUR. Resume the ready position.
Repeat eight times.

ATTENTION.

Exercise 16. Standing.

READY. HANDS—Show (fists closed).

ONE. Arms straight out to the front, finger nails facing.

TWO. Bend the body forward from the hips, and swing the arms by the sides well to the rear.

THREE. Resume the position one.

FOUR. Resume the ready position.
Repeat eight times.

ATTENTION.

Exercise 17.—ARM AND BODY MOVEMENTS. Standing.

READY. Attention.

1ST PRACTICE—ONE. Raise the right arm sideways above the head, keeping it straight, and reach as low down as possible with the left arm, bending well over to the left at the waist, fingers straight, and eyes directed towards the back of the right hand.

TWO. Lower the right arm, and raise the left, both movements to be simultaneous.
Repeat, counting eight.

ATTENTION.

2ND PRACTICE—ONE. Swing both arms up to the right until they are perpendicular over the shoulders, body turned on the hips in the same direction, head and eyes directed to the backs of the hands.

TWO. Swing both arms down close in front of the body and up to the left.
Repeat, counting eight.

ATTENTION.

Exercise 18.—ARM MOVEMENTS. Standing.

READY. Attention.

ONE. Raise the hands in front of the body, to the full extent of the arms, in line with the mouth, palms meeting, but without noise, thumbs close to the forefingers.

TWO. Separate the hands smartly, throwing them well back, slanting downwards, at the same time raise the body on the fore part of the feet.
Repeat eight times.

ATTENTION.

Exercise 19.—ARM MOVEMENTS. Standing.

READY. Attention.

1ST PRACTICE—ONE. Arms raised sideways in line with the shoulders, fists clenched, knuckles down.

TWO. Bring the arms smartly to the front, thumbs up, fingers touching.
Repeat counting eight.

2ND PRACTICE—ONE. Swing both arms from last position round to the rear and back to the front, rising on the toes.

Repeat, counting eight.

ATTENTION.

Exercise 20.—FOOT MOVEMENTS. Standing.

READY. Hands behind.

ONE. Place the left foot nine inches to the left.

- TWO. Replace the left foot.
 THREE. Place the right foot nine inches to the right.
 FOUR. Replace the right foot.
 FIVE. Place the left foot nine inches to the front, toe pointing in the original direction.
 SIX. Replace the left foot.
 SEVEN. Place the right foot nine inches to the front, toe pointing in the original direction.
 EIGHT. Replace the right foot.

Repeat four times.

NOTE.—Both knees to be kept straight, shoulders square to the front, and the body equally balanced between both feet.

Exercise 21.—ARMS BENDING AND STRETCHING.

READY. Attention.

ARMS—Bend. Smartly bend the arms at the elbow, bringing the backs of the hands, which must be firmly clenched, close to and nearly in line with the shoulders.

OUT. Smartly extend the arms to their fullest extent in line and level with the shoulders, backs of the hands up, fingers and thumb fully extended, and close together.

IN. Smartly resume the first position.

UP. Keeping the palms to the front, smartly stretch the thumbs, fingers, and arms directly upwards to their fullest extent.

IN. As before.

OUT. As before.

IN. As before.

ATTENTION.

Exercise 22.—ARMS AND BODY MOVEMENTS.

READY. Lock the thumbs in front, right hand over the left.

ONE. Raise the arms slowly forward and upward to a position as high as possible, eyes directed towards the hands.

TWO. Bend the body slowly forward from the hips until the fingers touch the toes, knees to be kept straight.

THREE. Slowly rise to position one.

FOUR. Bring the arms slowly to attention by forcing them obliquely backward, at the same time rising on the toes.

Repeat four times.

ATTENTION.

Exercise 23.

READY. Hands on hips.

ON THE TOES—Rise. Keeping the body erect, slowly rise on the toes as high as possible, legs perfectly straight, heels together.

SINK. Slowly sink on the heels.

Repeat sixteen times.

ATTENTION.

Exercise 24.

READY. Attention.

ONE. Raise the arms in line with the shoulders, palms upwards.

TWO. Bring both arms straight up beside the ears, palms facing.

THREE. Lower the arms to position one, palms downward.

FOUR. Lower the arms to position of attention.

Repeat four times.

Marching Exercises.—BY NUMBERS. With intervals.

ONE. On the word *one*, place the left foot one pace to the front, the toe pointing in the same direction as at attention; raise the right heel off the ground; both knees straight; the body straight and inclined forward, the weight of the body being on the left foot; shoulders square to the front, head erect, and eyes front.

TWO. On the word *two*, bring the right foot one pace to the front by a slight bend of the knee, and place it lightly on the ground, and raise the left heel. The rear foot may be occasionally raised to see if the body is properly balanced on the front foot.

Repeat as often as necessary.

POSITION OF ATTENTION.—The shoulders and body must be kept square to the front; the heels in line and closed; knees straight; toes turned out at an angle of forty-five degrees; arms hanging easily from the shoulders, elbows to the rear and slightly bent; the hand partly closed; the finger nails touching the dress lightly; thumbs close to the forefingers and to the front; the hips drawn back and the chest forward; the body straight and inclining forward, so that the weight of the body may rest on the fore part of the feet; head erect, chin drawn in, and the eyes looking straight to the front.

POSITION IN MARCHING.—In marching, the position of attention must be maintained; the body must be well balanced on the limbs; the arms and hands must be kept at the sides; the movement of the leg must be free and natural; both knees must be kept straight, except while the leg being carried to the front; the foot must be carried straight to the front, placed firmly on the ground, toes to be turned out at the same angle as when halted.

DRESSING WITH INTERVALS.

EYES—Right. On the word *right*, turn the head and eyes smartly to the right, shoulders square with the front.

DRESS. On the word *dress*, extend the right arm to its full extent, palm upwards, nails touching the shoulder of the pupil on the right. (The pupil on the right does not raise the arm.) At the same time, each pupil will take up the dressing by moving backwards or forwards by short quick steps, till the lower part of the face of the second pupil beyond him can just be seen. The body must be carried backwards or forwards with the feet, and the shoulders kept square to the front.

EYES—Front. On the word *front*, the head and eyes will be turned smartly to the front, and the arms dropped.

TURNINGS. By numbers.

RIGHT TURN. On the word *turn*, place the hollow of the right foot smartly against the left heel, keeping the shoulders square to the front.

TWO. On the word *two*, raise the toes and turn a quarter of a circle to the right on both heels, which must be pressed together.

LEFT TURN. On the word *turn*, place the right heel against the hollow of the left foot, keeping the shoulders square to the front.

TWO. On the word *two*, raise the toes and turn a quarter of a circle to the left on both heels, which must be pressed together.

MARK TIME.—On the word *Time* the foot then advancing will complete its pace, after which the time will be continued, without advancing, by raising each foot alternately about three inches, keeping the feet parallel with the ground, the knees raised to the front, and the body steady. On the word *forward* the pace will be resumed.

From the halt the word of command will be Quick Mark Time, the first motion to be made with the left foot.

FORMATION OF A CLASS FOR INSPECTION AND DRILL.—Each class should form up either in single rank or two ranks, according to number. The pupils of each rank stand side by side, but not touching each other. If in two ranks, the rear rank must be two paces from the front rank. Classes should form in parallel lines behind each other, the heads of classes covering. When the classes turn to the right or left the pupils should be taught to cover correctly, by looking at the back of the head of the one in front.

OPENING TO INTERVALS.—Eyes right. Dress. On the word *dress*, the pupils, except the one on the right, will move out to the left, raising the right arm when sufficient interval is obtained. (Detail given.)

Where the number in a class is very large, so that the lines would be too long to supervise, the class should be formed in four lines.

Division of Exercises.—

First Half-year, Ex. 1 to 6.

Second Half-year, Ex. 1 to 12.

Third Half-year, Ex. 7 to 17, and Marching, Right Turn, Dressing with Intervals.

Fourth Half-year, Ex. 13 to 24.

Marching.

Turnings (Right and Left).

Dressing with Intervals.

Teachers should not confine themselves to the exercises specially quoted for standard purposes, but should endeavour to make their pupils acquainted with the whole of the series.

HINTS TO TEACHERS.

1. Teachers must be clear, firm, and concise in giving their directions. They should teach the drill by illustration rather than by a repetition of explanations. They should not keep the pupils too long at any one exercise.

2. Every command must be distinctly pronounced, and sufficiently loud to be heard by all concerned. Every command should consist of two parts, a cautionary part and an executive part. The cautionary part must be given slowly, and the executive part sharply and quickly, and a pause must always be made between the two parts of the command, *e.g.* :—

DRILL

Hands—up. On the Toes—Rise.

The words of command in the exercises must be given sharply or slowly and smoothly as the nature of the motion may require. All head and body movements are slow movements.

Body forward—Bend.

The word bend should be intoned as a prolonged word.

3. The strictest attention should be paid to minute detail in all movements. Teachers should be careful to secure the correct position of attention.

4. The exercises should be varied, but it is far more beneficial to secure the correct execution of a small number of movements, than to hurry through a large number in a careless and superficial manner.

5. Exercises, when performed in the schoolroom, should be confined to trunk and upper limb movements, and as few foot movements as possible. Stamping the feet on the floor, and slapping the hands on the clothing, should be strictly avoided, as the circulation of the dust thus raised may be injurious to health.

6. Teachers should insist on correct and orderly marching going in and coming out of the schoolroom, and also upon prompt forming up of the class for inspection or drill.

7. Teachers should not always remain in the same place while conducting a class, but should move from one point to another, to see that the several movements are correctly performed. They should be careful that their position when showing the various exercises is as correct as possible. Slovenliness in attitude or word of command should be strictly avoided.

8. When it is necessary to resume the previous position, the command "As you were" must be given. When it is necessary to correct the position of one pupil only, the command "Steady" should be given, when all pupils will remain in whatever position they may be at the time. At the end of each exercise the pupils should be allowed a short rest on the word "Rest."

9. Teachers should teach their pupils "Action Songs," as they are a good preparation for drill. It is well to remember that more strength is required to sing and drill at the same time, so that the movements should not be violent, and not many action songs should be sung consecutively.

10. Breathing exercises should be given at the close of each drill lesson, *e. g.* :—

ARMS—SIDEWAYS RAISE—ONE. Raise the arms slowly sideways until they are in line with shoulders.

Two. Slowly lower the arms to the position of attention.

As the arms are raised inhale through the nostrils.

As the arms are lowered exhale through the nostrils.

See also Exercise 17.

FORM.

There are two kinds of lines—straight and curved.

1. A **STRAIGHT LINE** is the shortest distance between two points.

2. A **CURVED LINE** is one that bends evenly.

3. A **CROOKED OR ZIG-ZAG LINE** is a series of lines connected but running in different directions.

4. **PARALLEL LINES** lie side by side in the same plane, and always keep the same distance apart.

5. A **HORIZONTAL LINE** is one that is always level.

6. A **VERTICAL LINE** is one that always stands upright.

7. An **OBLIQUE OR SLANTING LINE** is one that leans.

8. A **PERPENDICULAR** is a vertical line standing on a level line.

9. An **ANGLE** is a corner.

10. There may be **SHARP** corners, **SQUARE** corners and **BLUNT** corners.

11. A sharp corner is called an **ACUTE** ANGLE.

12. A square corner is called a **RIGHT** ANGLE.

13. A blunt corner is called an **OBTUSE** ANGLE.

14. A **SQUARE** is a figure having four equal sides and four right angles.

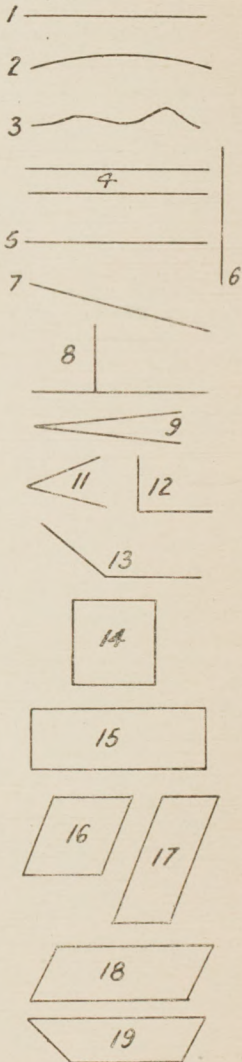
15. An **OBLONG** is a figure having two equal long sides, two equal short sides and four right angles.

16. A **RHOMB** is a figure with four equal sides, two acute angles and two obtuse angles.

17. A **RHOMBOID** has two equal long sides, two equal short sides, two acute angles and two obtuse angles.

18. A **PARALLELOGRAM** is a four-sided figure having its opposite sides parallel.

19. A **TRAPEZOID** is a four-sided figure with only two parallel sides.



20. All four-sided figures may be called QUADRILATERALS.

21. A straight line joining two opposite corners of any four-sided figure is called a DIAGONAL; as, AB.

22. A TRIANGLE is a figure with three angles and three sides.

23. An EQUILATERAL TRIANGLE is one that has all its sides equal.

24. An ISOSCELES TRIANGLE is one that has two sides equal.

25. A SCALENE TRIANGLE is one that has none of its sides equal.

26. A RIGHT-ANGLED TRIANGLE is one that has a right angle in it.

27. An ACUTE-ANGLED TRIANGLE is one that has THREE acute angles.

28. An OBTUSE-ANGLED TRIANGLE is one that has an obtuse angle in it.

29. A figure with more than four sides and angles is called a POLYGON.

30. When all the sides of a polygon are equal it is called a REGULAR POLYGON.

31. A PENTAGON is a figure having five sides and five angles.

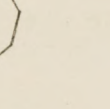
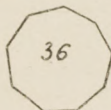
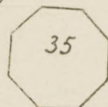
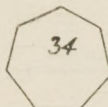
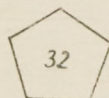
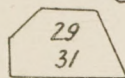
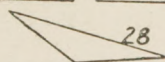
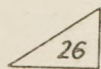
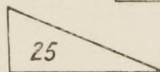
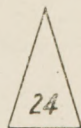
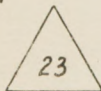
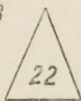
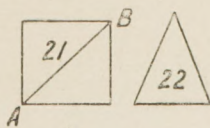
32. A REGULAR PENTAGON is a figure having five equal sides and five equal angles.

33. A HEXAGON is a figure having six sides and six angles.

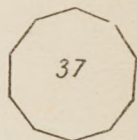
34. A HEPTAGON is a figure having seven sides and seven angles.

35. An OCTAGON is a figure having eight sides and eight angles.

36. A NONAGON is a figure having nine sides and nine angles.



37. A DECAGON is a figure having ten sides and ten angles.



38. A CIRCLE is a figure bounded by an evenly-curved line called its CIRCUMFERENCE; as, EBFDC.

39. The CENTRE of a circle is its middle point; as, A, Fig. 38.

40. A line drawn from the centre of a circle to the circumference is called a RADIUS; two or more such lines are called RADII; as, AC, AD, Fig. 38.

41. All the radii of a circle are of the same length.

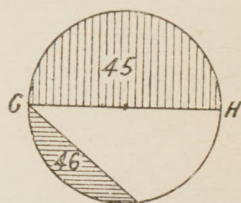
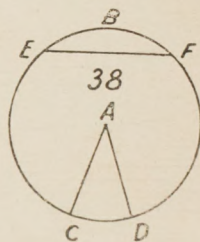
42. Any part of the circumference of a circle is called an ARC; as, EBF, Fig. 38.

43. A straight line joining any two points on the circumference of a circle is called a CHORD; as, EF, Fig. 38.

44. A chord that passes through the centre of a circle is called a DIAMETER; as, GH, Fig. 45. [Every diameter divides a circle into two equal parts called semi-circles.]

45. A SEMICIRCLE is half a circle. (SEMI means HALF).

46. A slice cut out of a circle by a chord is called a SEGMENT.



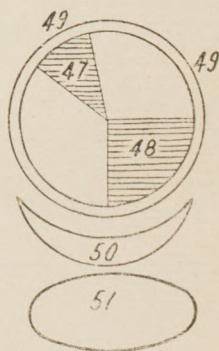
47. A SECTOR is a figure bounded by two radii and an arc.

48. A QUADRANT is a sector, equal in size to a quarter of the whole circle.

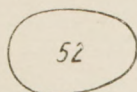
49. A RING is a figure bounded by two circles that have the same centre.

50. A CRESCENT is a figure bounded by two curved edges.

51. An ELLIPSE is a figure with a curved edge and two equal ends.

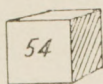


52. An OVAL is a figure with a curved edge, one large end and one small end. (Or an oval is an egg-shaped figure.)

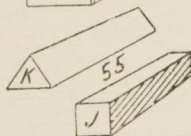


53. A SOLID is a figure that has length, breadth and thickness.

54. A CUBE is a solid, with six square faces all the same size.



55. A PRISM is a solid with oblong sides and equal ends. [If the ends are triangles, it is called a TRIANGULAR PRISM (as K); and if it has a square for each end, it is called a SQUARE PRISM (as J); and so on.]



56. A PYRAMID is a solid having a base and any number of triangular sides meeting at a point on the top. (Pyramids may be TRIANGULAR, SQUARE, &c.)



57. A CONE is a solid tapering regularly to a point at the top, and having a circle for its base. The top of a cone is called its APEX.



58. A CYLINDER is a solid with two circles for its ends and an evenly-curved surface for its size.

59. A SPHERE is a solid shaped like a ball.



COLOUR.

The **Primary Colours** are RED, YELLOW and BLUE.

PRIMARY means FIRST, and from the three primary colours all other colours may be made.

The **Secondary Colours** are ORANGE, GREEN and PURPLE.

RED and YELLOW mixed together produce ORANGE.

YELLOW and BLUE mixed together produce GREEN.

RED and BLUE mixed together produce PURPLE.

“ The primary colours are Red, Yellow, Blue,
The Red and Blue mixed will show Purple to you ;
Mix Yellow and Blue if you wish to make Green,
Mix Yellow and Red, then bright Orange is seen.”

The **Tertiary Colours** are CITRINE, OLIVE and RUSSET.
(TERTIARY means THIRD.)

ORANGE and GREEN mixed together produce CITRINE.

GREEN and PURPLE mixed together produce OLIVE.

PURPLE and ORANGE mixed together produce RUSSET.

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The prismatic colours may all be seen in a rainbow.

White light is made up of the seven prismatic colours.

Shade.—If BLACK be mixed with any colour a SHADE of that colour is produced.

SHADES OF RED : Maroon, Garnet, Magenta.

SHADES OF YELLOW : Citrine, Saffron.

SHADES OF BLUE : Indigo, Prussian Blue, Plum Colour.

Tint.—If WHITE be mixed with any colour a TINT of that colour is produced.

TINTS OF RED : Pink, Rose, Flesh Colour.

TINTS OF YELLOW : Straw, Flaxen.

TINTS OF BLUE : Light Blue, Azure.

By adding a little of one colour to another colour a HUE of the latter is produced.

HUES OF RED : Scarlet, Vermilion.

HUES OF YELLOW : Lemon, Sulphur, Canary.

HUES OF BLUE : Cobalt, Blue, Turquoise.

c. i. R. L.



COLOUR CHART.

PRIMARY COLOURS.



RED

and



YELLOW

and



BLUE

and



Red

SECONDARY COLOURS.



ORANGE

and



GREEN

and



PURPLE

and



Orange.

TERTIARY COLOURS.



CITRINE



OLIVE



RUSSET



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