

## STANDARDS V AND VI (FORMS I AND II).

1. AIMS.—The work in these classes should result in the pupils' securing a good introduction to scientific method. The pupils should be accustomed to seek the reasons for success or failure in their experiments; they should be encouraged to formulate their own explanations and endeavour to test these in a scientific manner. The instruction should not be of too technical a character, and the teacher should remember that the filling of the pupil's mind with a store of scientific information is of less importance than accustoming him to adopt the right attitude of mind towards his subject.

The teacher should foster in his pupils the spirit of inquiry and encourage independent investigation. Some of the pupil's experiments and investigations might be carried out at home as well as at school.

Agricultural club and project work are to be encouraged. Notebooks should be carefully kept by the pupils. Class diagrams and summaries are also of importance.

2. COURSE OF STUDY.—A two-years programme to be arranged, including in all cases a sufficient number of topics selected from at least two of the following sections. The scheme of work should wherever possible include a selection of topics from either section (b) or section (c), or from both. In schools where in the opinion of the Inspector it is not possible to give practical instruction in elementary agriculture or dairy science, an extended course of general science, including topics closely connected with everyday life of the pupils, is recommended.

(a) *Elementary General Science*.—Study of air: its existence and pressure. The barometer. Common pump, the syphon. Composition of air—oxygen, nitrogen, carbon dioxide, and their properties, to be found by actual experiment. The formation of a chemical compound. The difference between a mixture and a chemical compound. General study of physical properties of water. Filtration. Hard and soft water, and means of softening. Principle of flotation.

Heat: its production by chemical activity. Meaning of combustion. Transmission of heat. Conduction, convection, radiation, expansion, and contraction. Study of fluid thermometers (F. and C. scales). The general dangerous nature of inflammable gases, and of liquids readily convertible into inflammable vapours or gases, should be dealt with. Industrial applications of explosive mixtures—*e.g.*, petrol-engine.

Experimental study of levers (without reference to the three orders).

Methods of measuring the volume of irregular insoluble solids by immersion in water.

Experiments with magnets. Simple cell supplying electrical circuit. Electro-magnet. Lines of magnetic force. The earth as a magnet. Magnetic needle. Electric bell. Electricity as a source of light and heat.

(b) *Elementary Agriculture*.—Study of soil. Mechanical analysis. Humus content. Series of experiments to improve physical condition of soils. Preparation of good seed-bed, on a small scale, on large scale. Trenching. Best methods of sowing and planting. Conditions of plant-growth; thinning. Pruning root and branch. Layering and other forms of propagation.

Influence of light on plant-growth. Elementary forestry: school nursery; planting and care of trees. Elementary orchard work. Common garden pests and blights. Spraying. The experimental and investigational work in the school-garden should be correlated with the indoor work in general science. Elementary study of plant-food. Transpiration and respiration. Water and mineral ash in plant. Conditions of growth of wheat, oats, barley, potatoes, mangolds, turnips. Rotation of crops. Common fodder grasses to be recognized.

Further experiments in pollination of flowers. Testing percentage germination of seeds.

(c) *Elementary Dairy Science*.—Composition of milk to be ascertained as far as possible by actual experiments, sampling. The care of milk. Percentage of butterfat. Scientific principle of the milk-separating machine and of the centrifugal testing machine. Specific gravity of milk, the subject to be treated very simply. Principle and use of the lactometer. Elementary scientific principles in butter and cheese making.

## STANDARD VII (FORM III).

1. AIMS.—This class should do a good deal of independent work in general nature-study as well as in elementary agriculture. Much of the necessary apparatus should be home-made. Lines along which their investigations might proceed may be suggested by the teacher after consultation with the pupils. The pupils should continue experiments started in previous classes, tabulating, and, where suitable, graphing their results. One of the principle aims should be to develop in the pupils a scientific attitude of mind. Scientific hobbies should be encouraged.