

Pour some water on dry sand hollowed out into a cup-shape; pour some water in like manner upon dry clay, then upon clay that has become saturated with moisture.

Take some garden-soil which has been dried as before. Crush it carefully, and sift it through muslin. Note what is left in the muslin. (Small stones and pieces of vegetable-stems.) Wash the sifted soil with pure water, pouring off the muddy water carefully into a bucket, after allowing the remainder to settle. Wash again and again until clear water only comes off. Examine what is left behind and what has settled in the vessel into which the muddy water has been poured. (Clay.) What is left behind in the other vessels? (Sand.) What does the garden-soil contain?

Repeat the experiments with the subsoil.

Take some garden-soil; weigh it; dry it by placing the vessel containing it in a vessel with water in it, and keeping the latter for some time at the boiling-point; weigh it from time to time until it ceases to lose weight. How much water has been driven off? Take the dry soil; wash it well with pure water, and pour the latter off carefully so that the water poured off is quite clear; dry the soil again. Has it lost weight? Why?

Collect and examine various insects, including the grubs, chrysalides, and the full-grown insects. Rear a few moths in boxes, noting the stages of development. Note the plants on which the grubs or caterpillars are found or feed. Note as far as you can the habits and the life-history of the various insects. Are they noxious or not? Do birds feed upon them; if so, what birds?

Use a thermometer to find the temperature of the air, of warm water, of the surface of the ground. Add half a pint of cold water to half a pint of warm water, observing the temperatures before and after mixing. Find the temperature of the steam over boiling water, and also that of a mixture of ice and water. Take readings of the thermometer twice or three times daily in the shade and in the sun, and, if possible, maximum and minimum readings.

There should be a few simple experiments to show the constitution of air, production of oxygen, burning charcoal in oxygen, testing product with lime-water, &c.; "soda-water"; coal-gas; ammonia, its solubility in water, &c.; composition of water; iron and iron-rust; the distinction between mixtures and chemical compounds; acids and alkalies, effect on litmus, on violet flower; comparative density of liquids; use of hydrometer and lactometer; solutions; emulsions; &c.

The work begun in S4 should be continued in the upper standards in conjunction with the school garden, small plots being cultivated by the individual children for the experimental illustration of the lessons taken within the school, and a somewhat larger plot for more extended experiments—*e.g.*, as to the effects of various modes of cultivation and of various kinds of common manures upon the soils found in the district, one row or ridge being devoted to each experiment.

ELEMENTARY HOME SCIENCE.

Where the circumstances of the school and the staff will permit, there should be a course of home science for girls; this should be founded upon individual observation, experiment, and practice by the girls themselves; it should have reference to the elementary facts and principles underlying the efficient management of a home. The following list of topics will afford material for the construction of a program in home science for girls of the Senior Division; in every school, however small, the girls of S5 and S6 should receive some instruction of this kind. In small schools one course embracing some elementary work in agriculture and some in home science may be drawn up.

LIST OF TOPICS.

Importance of personal and household cleanliness, of wholesome food and sufficient clothing, of fresh air and sunshine, of exercise, sleep, and good habits. Thrift: prudent outlay and judicious saving. Clothing: taste and suitability in dress, hygienic rules as regards clothing, physical properties and cost of materials, cheapness and durability, economic colours, best wearing textures, shoddy; errors in clothing; dangers of flannelette; care of clothes, brushing, removal of mud and grease stains. Treatment of simple injuries and ailments; what to do in case of fire. Methodical habits in home-management. Necessary furniture and its disposition; floor-coverings. Washing, scrubbing, sweeping, dusting, and polishing. Implements and materials used in those operations. Cleaning painted, stained, and varnished surfaces, and windows. Ventilation and warming of rooms; economic and wasteful grates; how to set, regulate, and clean a range;