

KINDERGARTEN AND PRIMARY COURSE.

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The children of a certain schoolroom were greatly interested recently in watching the star-shaped snow-flakes as they fell on the outside of the broad window-sill. Wondrously beautiful they were, and very varied, some of the flakes exceedingly small, others large and feathery, but all showing the characteristic six-sided form. And as one after another quickly melted away, what a marvel to see them turn into such tiny round specks of water!

The rapidity with which they come and the sudden destruction of the form, make it difficult for children at first to get more than a hazy idea of the general appearance of the snow-crystals. They recognize the whole form as star-shaped, but not being able to detect outlines easily, their ideas of the particular design must be very vague. Outline pictures of magnified snowflakes, or simple drawings of them made by the teacher on the blackboard, will not only help to give the children more correct knowledge of the form, but, what is of far more importance, will arouse their interest and make them eager to examine again and again for themselves the real snowflakes as they may have opportunity.

The very simplest outline forms may be laid with kindergarten sticks by the children, either as copies of blackboard drawings, or from the dictation of the teacher. In laying such forms the children should be trained to work by opposites, making the side farthest from them correspond with that nearest, and using the right hand in arranging the sticks on the right side, and the left hand for those on the left. In the children's blackboard drawings of these forms laid with sticks the same course should be followed. The left hand may do poor work at first, but its power will increase with use, and there will follow an added sense of ability to the child. After using the sticks, which are from one to five inches in length, affording a standard of measurement, the children may be interested in estimating the depth of a fall of snow, and in testing the correctness of their opinions in the matter.

Such an occasion as that of a silver thaw should be specially noticed, the children's attention being called not only to the beauty of the landscape, but to the causes which led to it. One morning recently, when the air had been heavily charged with moisture, the trees were found to be loaded with a thick coating of hoar-frost. Every little twig was distinct with its dainty white covering, and the whole effect was charming. But the marvellous beauty of it all was only disclosed on a closer look, when it was seen to be made up

entirely of the most tiny and delicate star-shaped particles, which, at a touch, disappeared as if by magic. The air was still, and in the absence of wind that beauty lay there, sparkling in the sunshine, for a whole forenoon; but how few saw it, or thought it worthy of more than a passing glance!

To little children, the story of the formation of this frost-work, or of a snow-flake, is intensely interesting. They like to hear of the tiny specks of water (*moisture* or *vapor* may not be known words to them as yet) which the frost, or "*Jack Frost*" if you choose, changes so wonderfully by a freezing breath. They may get some notion of the minuteness of these water-drops by reference to the specks of dust often seen dancing in a bar of sunshine. It would, however, be misleading to small children, to apply to the moisture the term of *water-dust*. They seem to understand readily what is meant by water-specks, and greatly enjoy experiments made to discover their presence in the atmosphere, such as breathing on a cold slate, bringing a pitcher of cold water into a warm room to observe the gathering of water-drops on the outside, watching their breath as it appears in the cold hall or out-doors in the frosty air.

In connection with this, it is interesting to question them with regard to the damp clothes hung on the line, or even the towel they used in the morning. Where did the water-specks go that had been in the clothes? How did the towel get dry? What has become of the wetness on the floor that was scrubbed? Water likes to run, but water also likes to fly; and we may find the inside of our window covered with these water-specks, ready to fly out at the first chance, perhaps to find a home in the air far above the earth. When the frost touches these water-specks floating high up in the air, they begin to stretch themselves out, and join themselves one to another until there are six, symmetrically arranged in a group, forming one pattern or another of the beautiful snowflakes which come softly down to the earth.

Bring a cupful of snow into the room—how much water will there be in the cup when the snow is melted? Have guesses made; then show the result, and as the children observe the quantity, call attention to the quality also—is it fit to drink? Children frequently eat snow, which, in many instances, if melted, they would find full of impurities and would turn from with disgust. It might be wise to set them thinking about this and to help them discover some of the causes.

An interesting and simple experiment to show that water expands under the action of frost is made by setting a small bottle full of water just outside the window on a very cold day. If the bursting of the