The ability to think clearly and sensibly, which involves being able to follow a line of reasoning, to grasp concepts and to initiate lines of enquiry oneself, is obviously central to a child's educational progress. No matter what subject he is studying, failure to understand what is required of him, and to identify and tackle the problems it involves, are obvious barriers to any real progress. Although they are fully aware of this, some teachers are unclear of the level of thinking they can reasonably expect of a child at a given age. Much educational failure, indeed, stems from the fact that forms of thinking are demanded of children that they are incapable of supplying.

The most sustained and ambitious attempt at studying children's thinking is that of the Swiss biologist-turned-psychologist, Jean Piaget. Piaget's findings led him to propose an essentially developmental theory of how children form the concepts involved in thinking. That is, a theory which proposes that children develop more sophisticated patterns of thinking as a consequence primarily of maturation, and according both to a set pattern and a more or less stable timetable. His theory is necessarily somewhat complex and elaborate in detail, but its basic ingredients can be understood readily enough.

Before we look at these ingredients, however, we must first define what we mean by a 'concept'. A concept is the idea an individual has about a particular class of objects (including animate objects) or events, grouped together on the basis of the things they have in common. It is through concepts that we make sense of the world. Thus a small child will have a concept of 'big things', a concept of 'small things', a concept of 'wetness' and of 'dryness', a concept of 'things I like' and of 'things I don't like', and so on. When he encounters novel objects or experiences, or is faced with problems of any kind, he attempts to make sense of them by fitting them into the range of concepts that he already has. If these concepts prove inadequate, he may have to modify them in some way, or perhaps try to develop a new concept altogether (as, for example, when he encounters a live dog or a snowstorm for the first time). Usually even
new concepts can be related back in some way to concepts he already holds (e.g. the dog moves of its own accord like people do, the snow is wet like cold water), but if the relationships he thinks he sees are not the right ones, and he thus cannot interpret anything important about the new experience correctly, then he may be unable to develop a concept for dealing with it appropriately (e.g. the child may tear up a £10 note or Daddy's contract for his new book because he classifies them along with chocolate wrappers and newspapers which he knows to be expendable).

Piaget's theory has it that the way in which we are able to form and handle concepts changes as we go through childhood into adolescence. Thus the child's thinking is not simply an immature version of the adult's, but differs from it in a number of radical and important ways. These ways can be classified in terms of several different stages which the child apparently passes through on his way from the thought patterns of the infant to those of the fully developed adult. Piaget has it that the child goes through each of these stages in turn, at approximately the ages shown below, and that the speed at which he moves through each stage, though influenced by environment and by the richness or otherwise of the experiences it offers, is essentially governed by biologically determined maturational processes. Each of the stages is characterized by a particular cognitive 'structure' (or structures); that is, by the particular strategy (or strategies) manifested by the child in his attempt to organize and make sense of experience. The stages are discussed in their chronological order below.

Stage 1. Sensori-motor. Approximately birth to two years

In the early weeks of life, the child's activity appears to be purely reflex in character. He sucks, he grasps objects, he cries, he throws out his arms and legs when startled and so on. Such actions are apparently entirely involuntary. The child is presented with a stimulus (e.g. something to suck, something to grasp) and the reflex response is evoked. There is no thinking on his part, just as there is no thinking on our part if we snatch our hands away from something hot or blink if something threatens our eyes.

At first these reflex activities are directed towards the child's own body, but somewhere between four and eight months of age he comes increasingly to direct them towards objects external to himself as well. This is an important development in that it indicates that an element of purpose is now being introduced into the child's behaviour, that is, he is now apparently using sequences of movement directed towards the attainment of definite goals. Piaget calls such sequences schemata, and claims they are evidence of cognitive structures which allow the child to link actions together into stable and repeatable units. Between the ages of 12 and 18 months these schemata become increasingly elaborate as the child experiments with them to attain desired ends.