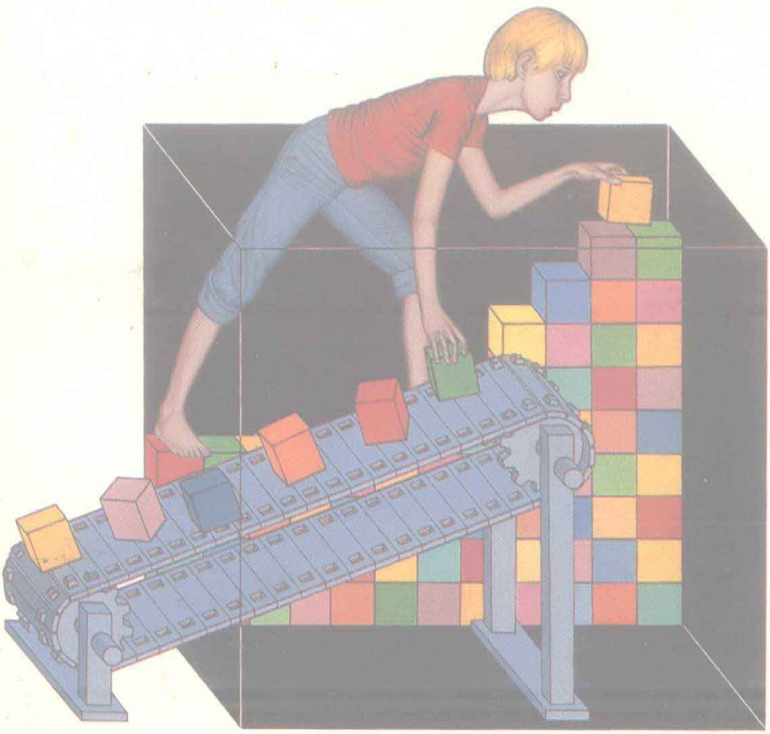
EDWARD DE BONO

Children Solve Problems



PELICAN BOOKS

Children Solve Problems

Edward de Bono was born in Malta and after his initial education at St Edward's College, Malta, and the Royal University of Malta, where he obtained a degree in medicine, he proceeded as a Rhodes Scholar to Christ Church, Oxford, where he gained an honours degree in psychology and physiology and then a D.Phil. in medicine. He also holds a Ph.D. from Cambridge. He has had faculty appointments at the universities of Oxford, London, Cambridge and Harvard.

Dr de Bono is the founder and director of the Cognitive Research Trust in Cambridge (founded 1969) and the Centre for the Study of Thinking. He runs what is now the largest curriculum programme in the world for the direct teaching of thinking in schools. Dr de Bono's instruction in thinking has been sought by many of the leading corporations such as IBM, Shell, Unilever, ICI, Du Pont and many others. He has been invited to lecture extensively throughout the world.

He has written twenty-two books which have been translated into nineteen languages. He has also completed two TV series, 'The Greatest Thinkers' for WDR, Germany, and 'De Bono's Course in Thinking' for the BBC. Dr de Bono is the originator of the term 'lateral thinking' and also the inventor of the classic L-game which is said to be the simplest real game ever invented.

His books include *The Five-Day Course in Thinking* (1968), *The Mechanism of Mind* (1969), *Lateral Thinking* (1970), *The Dog-Exercising Machine* (1970), *Technology Today* (1971), *Practical Thinking* (1971), *Lateral Thinking for Management* (1971), *Eureka!: an illustrated history of inventions from the wheel to the computer* (1974), *Teaching Thinking* (1976), *The Greatest Thinkers* (1976), *Wordpower* (1977), *The Happiness Purpose* (1977), *Opportunities: a handbook of business opportunity search* (1978), *Atlas of Management Thinking* (1978) and *De Bono's Course in Thinking* (1982). Many of these have been published in Penguin. Dr de Bono has also contributed to many journals, including the *Lancet* and *Clinical Science*. He is married and has two sons.

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Penguin Books

Penguin Books Ltd, Harmondsworth, Middlesex, England
Penguin Books, 40 West 23rd Street, New York, New York 10010, U.S.A.
Penguin Books Australia Ltd, Ringwood, Victoria, Australia
Penguin Books Canada Ltd, 2801 John Street, Markham, Ontario, Canada L3R 1B4
Penguin Books (N.Z.) Ltd, 182-190 Wairau Road, Auckland 10, New Zealand

First published by Penguin Books 1972
Published in Pelican Books 1984
Reprinted 1984

Made and Printed in Great Britain by
Butler & Tanner Ltd, Frome and London
Set in Monophoto Century Schoolbook

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Preface

Almost all the drawings in this book were obtained in the course of a design project which I ran in the educational journal *Where*, which is published by the Advisory Centre for Education. I am very grateful to Beryl McAlhone, the editor of *Where*, for her cooperation in running the design project. At that time there was no intention of publishing the drawings in any other way. It was at the suggestion of Martin Lightfoot of Penguin Education that the drawings were put together in a more complete way in this book. I myself agree that the drawings are so good that they deserve this further publication.

The drawings showing improvements in the design of the human body were obtained from Sawston Junior School through the help of David Johns and his staff. I am very grateful to Audrey Davies who transcribed a very hurried tape recording into this book.

I would like to take this new opportunity to thank all those teachers and parents who sent in designs for the original series in *Where*. Since there are thousands of designs, it has never been possible for me to thank them as personally as they deserve. It is always encouraging to be reminded that there really are teachers who are enthusiastic and who do care. Unfortunately, even in this book it is only possible to use a fraction of the drawings sent in. They are not necessarily the best ones, but simply the ones that can be most easily reproduced. For instance, very detailed drawings and coloured drawings were not suitable.

The proceeds from this book go to the Cognitive Research Trust, which is concerned with the study of thinking, and which is working towards the point when it might have enough funds to carry out a research programme in this important but largely neglected area.

Introduction

We can learn a lot from children, and especially from watching children think. Children can be brilliant thinkers. When children were given the 'political' problem of stopping a cat and a dog from fighting their ideas went far beyond the approaches used by politicians. It is not that we judge children with indulgence; they are genuinely more fluent with ideas. It is this fluency that gives children an advantage over adults in creativity and lateral thinking. On several occasions I have asked a lecture hall full of highly-educated and highly-paid thinking men to design a dog-exercising machine. They take the request in good humour but the ideas produced are nothing like as good as those produced by children. From time to time every creative person wishes he had the outlook of a child so that he could find his own perceptions and escape from the ones that have been imposed on him. This book is intended to provide an opportunity to look directly at the thinking of children.

A child enjoys thinking. He enjoys the use of his mind just as he enjoys the use of his body as he slides down a helter skelter or bounces on a trampoline. This enjoyment is reflected in the following comments which came in just some of the covering letters with children's designs:

Too late I suppose! But the children concerned so enjoyed doing them that I didn't have the heart not to send them. (Know College, Jamaica)

The enclosed was completed in a high state of excitement within half an hour of my suggesting to Philip that he 'had a go'.

They obviously enjoyed doing this. The younger one kept happy for quite a while and the elder one finished his design in twenty minutes.

I am now sending you some of the inventions designed by my class of nine year olds. They thoroughly enjoyed this and we are having an inventions corner to display the other designs they thought up.

They enjoyed doing them enormously.

In going through this book I hope you will be as impressed as I always am by the sheer ability of young children to think. At first

sight the drawings may appear to be no more than cute, crazy and amusing, but if you study them more closely and put yourself into the position of the child you will suddenly appreciate the thinking involved in each case. A child's knowledge and experience are limited and so the problem solutions are often impractical. But what matters is the way the child's mind uses the limited material at its disposal.

If children can already think so well at this age, then surely the long years of education must develop this ability to a high level. Not so. At the end of education there has been no improvement in the thinking ability of children - in fact there has actually been a deterioration. This opinion is based on experiments involving several thousand people all of whom had benefited from higher education. It is an opinion which seems to be shared by others who have considered the matter. Why should education have this effect on thinking ability?

Education has always regarded its prime duty to be transfer of knowledge and those who have doubted the wisdom of this approach have usually been brought to their senses by the practical responsibilities of examinations. In transferring knowledge teachers are keenly aware that the only valid criterion of success is for the pupils' output to match the teacher's input. Although the extreme example of this - the example of rote learning - is dying out (more slowly than many imagine) the emphasis is still on doing things 'as they should be done'. This emphasis not only makes it unnecessary to think, but is also dangerous for the unfortunate pupil who comes up with an unacceptable, new point of view. To be fair it should perhaps be added that this method of transferring knowledge is sometimes quite effective if that is what you want to achieve, but the knowledge may not outlast the exams for which it is stored.

The amount of knowledge that has to be transferred is increasing all the time and as a result the student today has much less time to think than ever before. It is true that in some specialized areas, and in passing exams, knowledge is more useful than the ability to think but it may be of little use outside those areas or in helping a person to live with himself and with society. The emphasis on orthodoxy and the amount of knowledge required inhibit the development of thinking ability but may nevertheless

be necessary with the education system as it is at the moment. What is worse is that no time is deliberately set aside for the encouragement of thinking ability. If thinking ability were being actively encouraged in one oasis area then its neglect in other areas would not matter so much. The absence of any such direct attention to thinking is to my mind the main cause of the deterioration of thinking ability during education.

The idea that thinking can be treated as a learnable skill is already taken for granted in two other areas of human activity. These are the business world and the computer world, both of which have to deal with reality, unlike the self-satisfying world of education which measures its own success for itself. In business poor thinking means bankruptcy and in the computer world it means a waste of expensive computer time. In education, alas, it is undetectable. For some time now the business world has been paying direct attention to such aspects of thinking as decision-making, planning, innovation and problem-solving and treating them as learnable skills. From the computer world comes the idea of 'heuristics', which includes all those aspects of thinking which cannot be fitted into mathematical formulations. The paradox is that it required the logical efficiency of the computer to demonstrate that logic is only part of thinking. In the computer world increasing attention is being paid to the thinking that has to take place before a situation is parcelled up into neat concepts that can be worked on with logic. This switch from logical thinking to what might be called perceptual or lateral thinking is a much more important change in thinking about thinking than most people in education realize. Most of them continue to assume that sufficient excellence in logic is all that is required in thinking.

I have often been told that there are four sorts of people in education: fools, knaves, the passive and the impatient. I have met several of the impatient ones but it is clear that they do not run the system and indeed they soon get edged out. As to the other categories I believe that there are not many fools and knaves though they may have an effect out of proportion to their numbers. The majority fall into the passive bracket - not because they are passive in themselves but because the self-preserving character of the education system is so strong as to make them despair of the usefulness of activity. It has been said that education serves two functions supremely well: it preserves its own jobs and it keeps

children out of the home. The reaction of most teachers to the idea of teaching thinking as a specific subject is not a negative one. On the contrary, they are enthusiastic about it but are doubtful about how it can be done.

There would be very little problem in developing and testing a method of teaching thinking directly as a specific subject in its own right. I have already started a project (TAP: Thinking-Ability Project) whereby teachers in different schools try out various formats for the teaching of thinking. It is not a question of creating a body of dogma that has to be learned (like geometry) but of creating special situations which develop thinking ability directly because they are learning situations. The situations do have to be carefully structured so that students can learn from each other, for if the situations are loose the students are working on projects so different that this important aspect of learning is lost. Principles, strategies, guidelines, awareness of error, are all fed in along with the direct-thinking experience. Since the impetus to carry out such a project is unlikely to come from the educational establishment - which is too tied up in the administration of education to be concerned about its content - there is a need for some foundation to take the lead. The importance of the subject and the rewards are great - but so is the boldness required. But when thinking is finally part of the curriculum I believe we shall look back and wonder why it ever seemed a strange idea.

In this book children are shown solving a variety of problems. Problem-solving may seem to be a rather specialized part of thinking. But if we change the name to 'dealing with a situation', 'overcoming an obstacle', 'bringing about a desired effect', 'making something happen', then it can be seen that the thinking involved is very much the thinking that is involved in everyday life even though the actual problems may appear exotic. The convenience of problem-solving as one format for practising thinking is that there is a defined objective. Problem-solving is by no means the whole of thinking but the processes are not essentially different from other thinking processes and it is a convenient way of demonstrating these processes. (In spite of this, not everyone in education has had much to do with thinking. One educational journalist for instance declared himself unable to see what designing a dog-exercising machine had to do with thinking.)

Each of the problems in this book was chosen because it has some special feature. The cat-and-dog problem is a political problem involving psychology and motivation. The elephant problem involves dealing with magnitude and also dealing with matters well outside personal experience. The house-building problem involves making an existing complex process faster and more efficient. The fun machine involves choice and direct experience. The policeman-and-bad-man problem involves moral judgements. And so on.

Finally, a word about drawings. Many people ask me why I seem to prefer drawings to words as a thinking medium for children. There are several reasons. Young children are not always very good at expressing their ideas in words and it would be a pity if their ideas were to be restricted by insisting that they use words. Again, words can sometimes be difficult to understand and interpreting the meaning behind them may become a matter of guesswork. Drawings, however, are clear and relatively unambiguous. To make a drawing you have to commit yourself to a definite idea: you cannot say 'the bricks are put in position more quickly than usual' in a drawing because you have to show exactly how this is done. There are more advantages. With a drawing the whole idea is visible all at once and you can work at it with addition, alteration, modification, change, etc. With words you have either to remember it all in your mind or else read through your description each time you want to see what you have got. It is significant that in a recent survey of inventive people the only uniform characteristic was their use of drawings and sketches in their thinking. Finally, there is the fact that children from disadvantaged backgrounds are often handicapped when it comes to the use of words. But preliminary work suggests that there is no such handicap with visual expression.

To my mind it is a waste of time to flip through this book making 'how cute!' exclamations before moving on to the next drawing. The more you look at a drawing the more you will find in it. Each drawing is a laboratory in which to study. The study of how children think is the best basis for *understanding* how children think. This is obvious. But what is less obvious is that such a study is also a very good basis for understanding how adults think. The differences between the way children think and the way adults do it is much smaller than most adults believe.

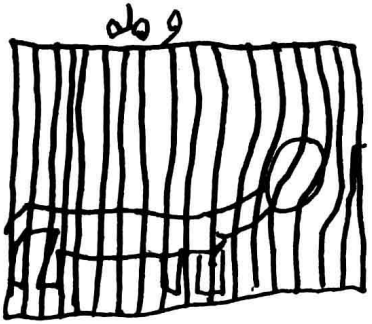
1 Stop a Cat and a Dog Fighting

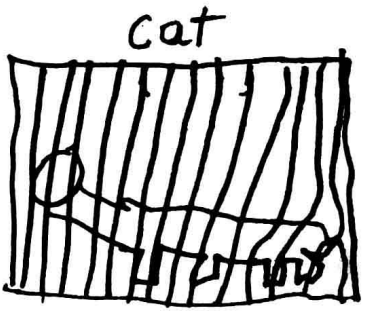
Show how you would stop a cat and a dog from fighting.

This is *the basic* political problem. How to stop people with differences from fighting each other. The differences may be racial, religious, ideological, or based on nationality. Cats and dogs are as racially and culturally different as any two human groups, and traditionally they are supposed to be always fighting each other.

The starting situation is very definite - there are cats and dogs which are distinct and which fight each other. The objective is also very definite - how to stop them fighting. What means would children use to try to achieve this objective? Would they take into account the psychology of a cat and a dog, or would they try and use purely physical means? Even if they used physical means, these could only work in the end if they had psychological effects. As there are no traditional, stereotyped ways of stopping a cat and a dog from fighting, the children would have to solve the problem on their own. They would have to come up with their own ideas of how to stop the fight.

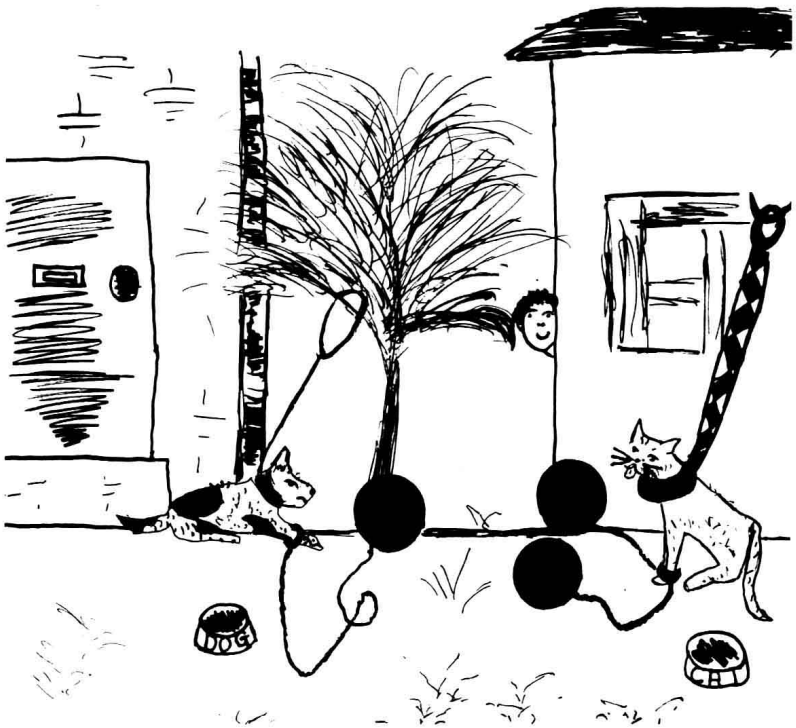
How practical would the children's ideas on fight-stopping be? Would these ideas reflect the political thinking that adults have tried throughout the ages, or would they show different approaches. The language and the ideas used by children might be simple because they have to fit in with the limited experience of a child. And yet the principles involved may themselves be very sophisticated: all one needs to do is to change the names a little to find that they may apply directly in adult political thinking.





Cat and dog - 1

The ghetto concept. The traditional way of stopping two different groups from fighting is to put them in separate cages or within national boundaries and keep them apart. In this way they cannot get at each other to fight. It does not always work, especially when the two groups cannot be separated in this way.



Cat and dog - 2

A variation on the ghetto concept. The cages here are balls and chains which restrict free movement. For instance, the need for visas, special passports and so on, which achieve the same effect as a cage-type or wall-type ghetto.

Put Slippery and magnetic material on their feet so when they start fighting they slide apart. Take more off each time they meet.

Cat and dog - 3

An ingenious idea which constitutes an automatic ghetto. The slippery material on the feet of the dogs and cats presumably would not inconvenience them in general, but as soon as they start to fight then they slip apart and are unable to get at each other's throat. Certainly worth considering in its political implications.