

# Cognitive Acceleration /Let's Think

## Programmes for developing high-level thinking

### **What's in a name?**

“Cognitive Acceleration” is a good description of the programmes which accelerate the development of students’ thinking so that they become more intelligent, faster. But “Cognitive Acceleration” is a bit of a technical mouthful, so we often refer to the programmes by the friendlier term, “Let’s Think”. Let us think about what the programmes are and what they do.

### **What are the Let's Think programmes?**

They are sets of problem-solving classroom activities geared to different ages which provide learners with interesting and puzzling challenges. Carefully orchestrated by trained teachers, students tackle the problems collectively, reach their own conclusions, and reflect on the thinking processes they used. As they progress through the graded problems they become more confident, both at solving the puzzles and at knowing when they are “stuck” and seeking help from peers or from the teacher. The programmes start from youngsters’ current levels of thinking and extend them through lively scenes of interactions which accelerate the development of their thinking (based on the premise that the mind of the youngster develops through experiences and challenges rather than just maturing with age).

### **What do they look like?**

Each Let’s Think programme consists of from 15 to 30 activities intended to be used over one or two years. The activities are grouped into particular types of thinking called “Reasoning Patterns” which underlie all high-level thinking and can be applied to many different contexts. Each activity has detailed instructions for the teacher and many have sample materials that can be copied for learners.

### **What ages? What preparation is needed?**

There are Let’s Think programmes available for all ages from 4 to 14 years, but some of the later ones have also been adapted for older students, up to college level. No previous knowledge is required for any of the programmes. They are set in subject contexts such as science, mathematics or English, but they do not rely on knowledge of those subjects as the activities focus on the process of thinking.

### **Does Let's Think work?**

Yes it does. Research carried out over 25 years at King’s College London and published in many peer reviewed papers in internationally recognised academic journals has repeatedly shown that students who experience a Let’s Think programme score higher than matched control groups:

- on measures of cognitive development immediately at the end of the programme and subsequently;
- in the subject matter of the programme (e.g. science, maths) up to three years after the end of the programme;
- also in subjects remote from the subject context up to three years after the end of the programme. For example, students who followed Let’s Think over two years in a science

context when they were 12-13 years old, went on to score significantly higher grades in an English examination taken when they were 16.

This last result, in particular, provides evidence that Let's Think raises students' general intelligence. Their experience of solving challenging problems, of doing so cooperatively with peers, and of reflecting explicitly on their successes and difficulties with the tasks provides them with both the intellectual machinery and the attitudes to their own abilities which positively impact on all subsequent learning.

More details of samples of this evidence, and references, are given in an appendix.

### **How were the Let's Think programmes developed?**

From the early 1980s, Professors Michael Shayer and Philip Adey started developing Cognitive Acceleration activities, based on the psychological insights provided by Jean Piaget and Lev Vygotsky. The programmes were extensively trialled and evaluated and the subject contexts and age ranges have continually been expanded. Currently a new programme for Cognitive Acceleration in English is being developed at King's College London.

### **Why doesn't everyone use Let's Think?**

Teaching the Let's Think way is not easy. Teachers need special training to learn how to conduct Let's Think classes which are very different in nature from traditional classrooms: they are more cooperative, speculative, philosophical and enquiring. Even getting something wrong in a Let's Think class can be cause for celebration since we often learn from our mistakes. The teacher is not the fount of all knowledge but a fellow-enquirer with the students, albeit a more experienced one who has a good idea how to encourage others to find solutions, without spoon-feeding them.

### **Where do I find out more?**

See [www.letsthink.org.uk](http://www.letsthink.org.uk) for an up-to-the-minute account of Let's Think activities and people.

The Wikipedia entry for cognitive acceleration is also useful:  
[en.wikipedia.org/wiki/Cognitive\\_acceleration](http://en.wikipedia.org/wiki/Cognitive_acceleration)

## Appendix

A small sample evidence for the effect of Let's Think! (Cognitive Acceleration)

### Gains in % $\geq$ grade C GCSE 3 years after CASE Let's Think intervention in Y7&8 (age 12-13 Yrs) science in 5 schools

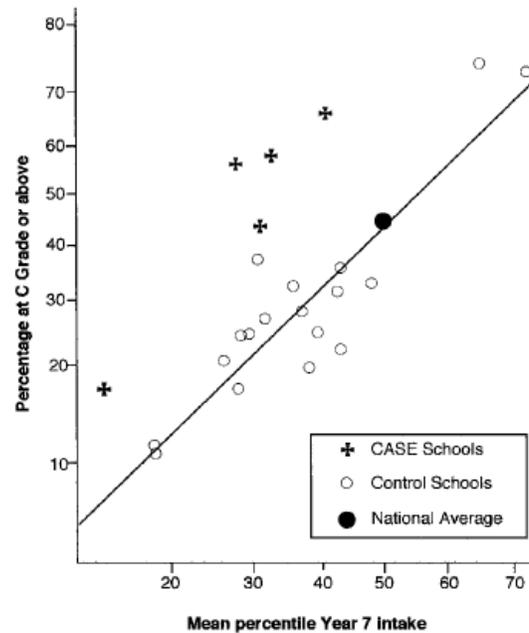


Figure 8. GCSE science 1997.

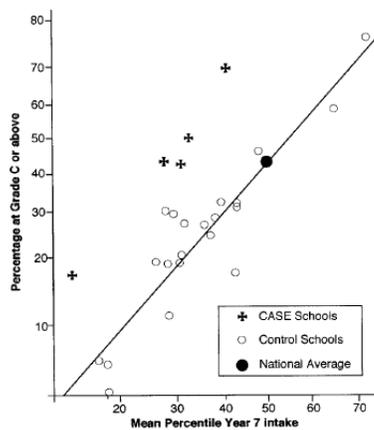


Figure 9. GCSE mathematics 1997.

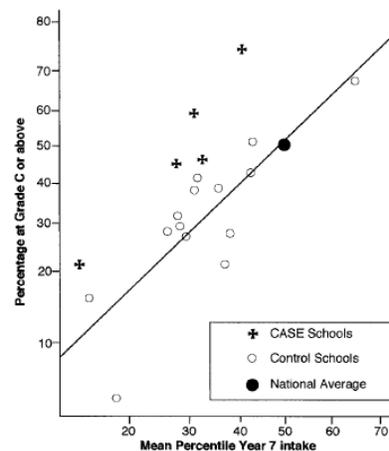
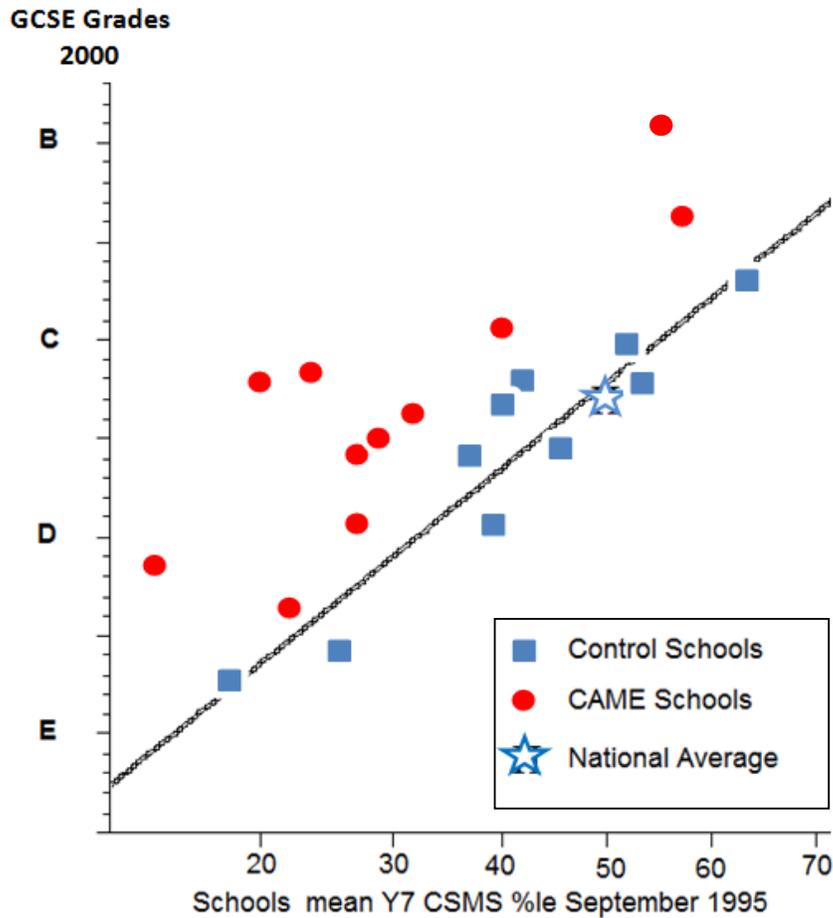


Figure 10. GCSE English 1997.

From : INT. J. SCI. EDUC., 1999, VOL. 21, NO. 8, 883- 902  
Cognitive acceleration through science education II: its effects and scope  
Michael Shayer, King's College, University of London, UK

## Gains in GCSE mean grades 3 years after CAME Let's Think intervention in Y 7&8 in 11 schools



- The gain above national average in mathematics in the 11 experimental schools is 0.8 grade. The highest gain was 1.35 grades, and the lowest 0.23 grade.
- Teachers reported an average of 18 Thinking Maths lessons in Y7&8
- Total number of students is about 1600 in 77 classes
- The 10 control schools are averaged by the straight line.
- All the schools are arranged by the mean cognitive test at age 11, but the gains will be the same with any arrangement.

**CAME schools' average Maths grades above national average: 0.80 grade**

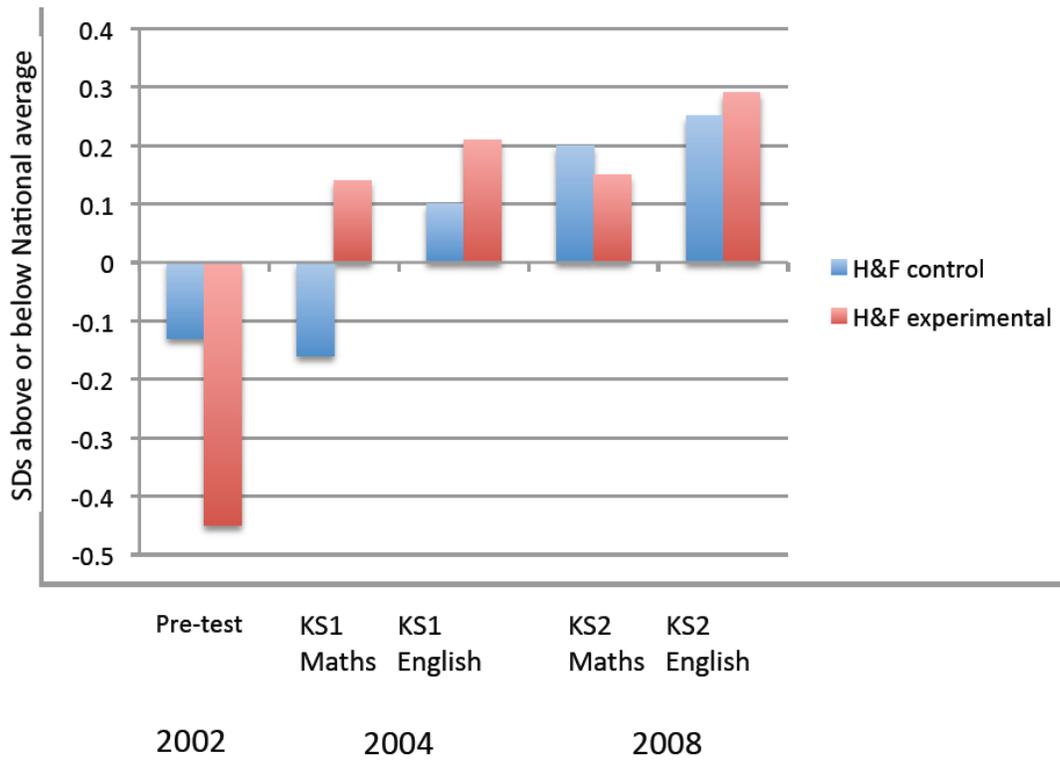
**CAME schools' average Science grades above national average: 0.51 grade**

**CAME schools' average English grades above national average: 0.52 grade**

From: Michael Shayer and Mundher Adhami (2007) Fostering Cognitive Development through the context of Mathematics: Results of the CAME Project Educational Studies in Mathematics 2007 pp 256-291

*All of the above graphs show that classes which experience Let's Think score significantly higher than matched classes without Let's Think, whatever their starting level.*

## Long term effects of Let's Think intervention with 5-6 year olds in one London borough (H&F)



*This shows how a Let's Think group starting way below the national average ended up 5 years later well above, and made far greater gains than a matched control group.*

### References to papers providing evidence for the effect of cognitive acceleration.

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- Venville, G., Adey, P., Larkin, S., & Robertson, A. (2003). Fostering thinking through science in the early years of schooling. *International Journal of Science Education*, 25(11), 1313-1332.