

Benefits for schools engaging with computing

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A school's curriculum

Requirement to be broad and balanced
(Education Act, 2002; Academies Act 2010)

“... helps pupils acquire knowledge, understanding
and skills in all aspects of their education”
(Ofsted Inspection handbook, 2015: 42)

Ultimately, it should be for the pupils



Computing curriculum

“A high-quality computing education equips pupils to use **computational thinking** and **creativity** to understand and change the world.

Computing has deep links with mathematics, science and design and technology, and provides insight into both natural and artificial systems.”
(National Curriculum, 2013)

Transferable skills, not necessarily content

Benefits for pupils

Outstanding leadership and management ensures there is a “broad and balanced curriculum [that] inspires pupils to learn”
(Ofsted Inspection handbook, 2015: 42)

Computing is:

- *a subject that motivates*
- *a subject that is useful*
- *a subject that opens doors*

Thinking about the future

“Up to 15 million jobs could be at risk of automation”
(Bank of England, 2015)

“Economists talk about the ‘hollowing out’ of the labour market. In this scenario, highly-qualified roles are numerous and well-paid. Low-skilled, low-wage jobs (eg in social care) are similarly numerous. Experts point to a gap in the middle where skilled jobs used to be, particularly in manufacturing and in general administration.”

(The Digital Revolution, Kenneth Baker, 2016)

The drivers for change: ICT in schools 2008-11 (Ofsted)

- Just over 1/3 of secondary schools good/outstanding for overall effectiveness of ICT
- Weak use of assessment
- Lack of challenge at KS4
- Pupil achievement inadequate in almost 1/5 of secondary schools
- Weaknesses in the teaching of the more challenging aspects of ICT – such as control and data handling
- Lack of engagement with local business to ‘bring subject alive’
- Leadership and management of ICT no better than satisfactory in half of secondary schools surveyed

Drivers for Change

“One of the problems we’ve had is that the ICT curriculum in the past has been written for a subject that is changing all the time. I think that what we should have is computer science in the future – and how it fits in to the curriculum is something we need to be talking to scientists, to experts in coding and to young people about”

(Michael Gove, December 2011)



Technology does not equate to high quality learning (OECD 2015)

- Education systems which have invested heavily in ICT have seen “no noticeable improvement” in Pisa test results for reading, mathematics or science
- Annual global spending on educational technology in schools - £17.5. In UK, the spend is £900m (Gartner)
- High achieving school system such as S Korea and Shangai have lower levels of computer use
- Socio –economic division between students is not narrowed by technology, perhaps even amplified (Schleicher, OECD Director of Education)
- Report should not be an excuse not to use technology – rather, it is a spur to find a more effective approach
- “[technology] is endemic in society now.... there’s no way we should take technology out of schools, schools should be leading not following” (Mark Chamber, Chief Executive of NAACE)

Reassurance for parents

The Informed Choices University guide for choosing post-16 qualifications lists computer science as useful for studying:

- Aeronautical Engineering
- Biochemistry
- Biology
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Science
- Economics
- Electrical/Electronic Engineering
- Geology/Earth Sciences
- Materials Science
- Mathematics
- Mechanical Engineering
- Medicine
- Optometry
- Orthoptics
- Pharmacy
- Physics
- Psychology
- Sociology
- Teacher Training





Benefits for other subjects

Direct links to future careers in numerous subjects

A context for mathematical mastery by not just doing more of the same

“[Turtle geometry is] a kind of geometry that is easily learnable and an effective carrier of very general mathematical ideas.”

(Mindstorms, Seymour Papert, 1980)

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when  clicked
  pen down
  ask How many sides? and wait
  set Sides to answer
  set Turn to 180 - (Sides - 2) * 180 / Sides
  repeat Sides
    move 50 steps
    turn  Turn degrees
```

Use computing to make sense of mathematical knowledge

Benefits for the school

Outstanding teaching and learning in school is exemplified by “[p]upils [that] love the challenge of learning and are resilient to failure. They are curious, interested learners who seek out and use new information to develop, consolidate and deepen their knowledge, understanding and skills.”

(Ofsted Inspection handbook, 2015: 49)

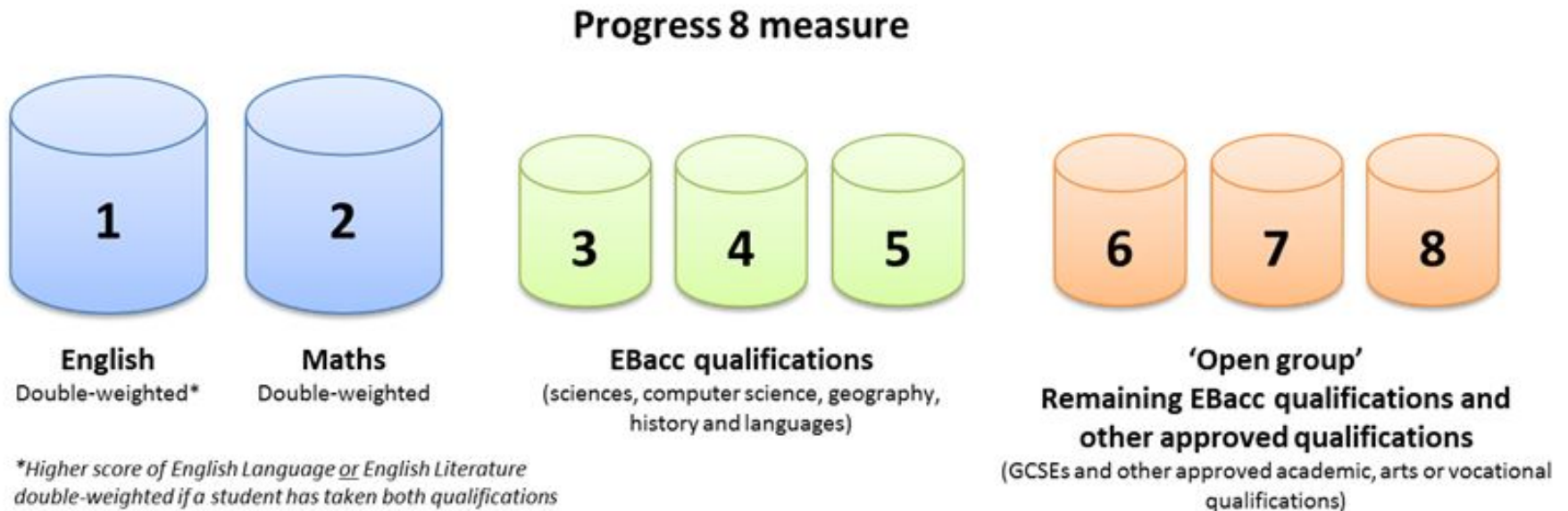




Has computing
made you better
or worse at
problem solving?

1 pupil said no
2 pupils were not sure
26 said yes

Not to mention that it is an EBacc subject counting in buckets 2 and 3 of Progress 8



Barriers to overcome

Lack of curriculum time

Low priority through Primary school

Lack of experienced, specialist teachers

Perception that it is just ICT



Support from BCU

Training specialist teachers at Secondary through the PGCE and Teach First routes

Primary courses provide subject specialism modules

Working with Partnership schools to develop quality teachers with a focus on effective computing pedagogy

Trainee teachers positively influencing department practice

Direct Subject Tutor support for placement schools

Support from CAS

We are looking for schools to work with and can provide free advice from within the CRC

We want to place Master Teachers with schools that need to support their staff (minimal cover and travel costs but not for profit)

Access to free resources through CAS Community

Regular free twilight training events and Hub meetings