



An Institute of



Computational Thinking

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Computational Thinking

- Computational Thinking: as a subject taught in school or to be incorporated in an existing subject?
- What is the essence of Computational Thinking?

School Subject

- Current stage in Singapore: Not a “new” subject.
- Computational Thinking is linked to “coding”, and coding is now an “enrichment” for most primary and secondary students.
- To do CT, is coding essential?

Computational Thinking

- Understood as a problem solving paradigm of mathematizing a problem in such a way that the computer can execute it.
- In a way, “coding” is a good (but not essential) way to develop Computational Thinking (CT).

Impact on Mathematics Curriculum

- Sin x is the ratio of the length of the side of a right-angle triangle of the opposite side to the hypotenuse where x is an angle of the right-angle triangle.
- Sin x also defined in terms of a unit circle.
- $$\sin x = x - \frac{x^3}{3} + \frac{x^5}{5} - \dots$$

Impact on Mathematics Curriculum

- Microsoft Excel spreadsheet in the teaching of mathematics (e.g. Algebra, Statistics etc.)

Impact on Mathematics Curriculum

- Number sequences

1, 3, 5, 7, 9, 11, _____, _____, _____

1, 4, 9, 16, 25, _____, _____, _____

Should not be limited to only one that the formulae involved either linear or quadratic polynomials.

Impact on Mathematics Curriculum

- Basic idea of “coding” for mathematics is NOT to learn as many languages as possible, but more to understand the underlying logic.

Mathematics Teacher Education

- Mathematics – a compulsory subject on Computational Thinking.
- All student teachers must be aware of the pedagogical principles in teaching coding and computational mathematics.
- All mathematics teachers are able to use LaTeX to type their final year project.