

CSpashshala Syllabus & Implementation plan for grades 1-8

CSpashshala national curriculum committee comprising computer scientists from top academic institutes as well as IT industry experts have explored various curricula framework and recommendations and have developed a computing curriculum suitable for K-12. The guidelines as well as the curriculum details are presented in the CSpashshala Curriculum document.

The principles of computational thinking viz. decomposition, pattern recognition and generalization, algorithms and programming are explained in CSpashshala curriculum through the following themes:

- Systematic listing, counting and reasoning
- Iterative patterns and processes
- Information processing (Data)
- Discrete Mathematical Modelling
- Following and Devising Algorithms
- Programming
- Digital Literacy

CSpashshala presents a well thought out syllabus for grades 1-8. CSpashshala has created 25 lesson for each grade. Each lesson has teaching aids in the form of a slide deck for the teacher to be used in the classroom, a lesson plan for the teacher that serves as a script for the slide deck and a worksheet for the students. These are provided at no cost to the teachers under the CC BY 4.0 license.

CSpashshala has also created a structured three-year implementation plan with the recommended order of lessons to be taught grade-wise. A lesson may be taught over one or more periods. Programming and Digital Literacy lessons can be interspersed with the other lessons.

To enable simultaneous implementation across multiple grades, certain concepts need to be taught as prerequisites to the higher grades before topics from the appropriate grade can be taught. This would mean that some topics in a grade could be introduced in the following years. The prerequisite topics will reduce every year and from the beginning of 4th year the complete syllabus can be implemented. The list of prerequisite topics might also be useful to teachers for training students joining the school midway.

Key:

❖ - If you are teaching a subset of the curriculum, we recommend that you teach this lesson

P - Prerequisite lesson from earlier grade. The prerequisite lesson is to be taught only if the students have not learnt it in the previous grades. From the 4th year of implementation, there will be no more prerequisite or P lessons.

✓ - Lesson to be taught in a given year

* - If standard 7 and standard 8 students have no prior exposure to programming, we suggest teaching Scratch for the first 2 years and introduce Python from third year in standard 7 and standard 8. The prescribed 8th standard Python syllabus will be applicable from year 4.

Standard I

Download: [Standard I Lessons.zip](#)

Part I	Computational Thinking	Lesson Code	Y1	Y2	Y3
1.1	Systematic Counting				
	❖ Counting: Reason, Order. Count shapes, Colors, Students	01-LCR-01	✓	✓	✓
	❖ Counting: Different ways to count	01-LCR-02	✓	✓	✓
	❖ Puzzle: Counting squares	01-PS-33	✓	✓	✓
1.2	Iterative patterns & processes				
	Patterns: Days of week, Seasons, Months in year, TV serial timing	01-IPP-01	✓	✓	✓
	Patterns: Guess the next shape	01-IPP-02	✓	✓	✓
1.3	Data				
	Understanding objects and their attributes: Shape, Size, Colour,...	01-IP-01	✓	✓	✓
1.4	Algorithms & Programming				
	❖ Simple instructions	01-DA-01	✓	✓	✓
	Performing simple instructions	01-DA-02	✓	✓	✓
	❖ Puzzle: Searching small words	01-PS-29	✓	✓	✓
	❖ Help Flurb reach destination using directions	01-PS-11	✓	✓	✓
	Instructions to move from one point to another in classroom	01-PS-12	✓	✓	✓
	Spelling Bee: Word search	01-PS-13	✓	✓	✓
	❖ Getting Loopy: Introduction to loops	01-PS-14	✓	✓	✓
1.5	Discrete Modeling				
	Maps: Navigation	01-DM-02	✓	✓	✓
	Introduction to Maps	01-DM-01	✓	✓	✓
Part II	Digital Literacy				
	Parts of a computer: Input output devices	01-DL-01	✓	✓	✓
	Parts of a computer: Keyboard	01-DL-03	✓	✓	✓
	Familiarity with Computers: Paint	01-DL-05	✓	✓	✓
	Familiarity with Computers: Gcompris - Maze activities	01-DL-07	✓	✓	✓
	Familiarity with Computers: Gcompris - Memory activities	01-DL-08	✓	✓	✓
	Familiarity with Computers: Gcompris - Color activities	01-DL-09	✓	✓	✓
	Familiarity with Computers: Gcompris - Misc activities	01-DL-10	✓	✓	✓
	Introduction to Devices	01-DL-16	✓	✓	✓
	Introduction to Networks - I	01-DL-17	✓	✓	✓
	Introduction to Networks - II	01-DL-18	✓	✓	✓

Standard II

Download: [Standard II Lessons.zip](https://goo.gl/io4kYW) (<https://goo.gl/io4kYW>)

Part I	Computational Thinking	Lesson Code	Y1	Y2	Y3
1.1	Systematic Counting				
	Counting: Groups of objects	02-LCR-01	✓	✓	✓
	❖ Puzzle: Joining dots - Thinking ahead	01-PS-24		✓	✓
1.2	Iterative patterns & processes				
	❖ Making Rangoli: Basic shapes	02-IPP-01	✓	✓	✓
	❖ Making Rangoli: Joining shapes	02-IPP-02	✓	✓	✓
1.3	Data				
	Classifying objects: Shape, Size, Colour,...	02-IP-01	✓	✓	✓
	Representing information: Defining a code	02-PS-17	✓	✓	✓
1.4	Discrete Modeling				
P	Maps: Navigation	01-DM-02	✓		
	Draw school map	02-DM-02	✓	✓	✓
1.5	Algorithms & Programming				
P	Help Flurb reach destination using directions	01-PS-11	✓		
	Stepwise Thinking	02-PS-07		✓	✓
	❖ Introduction to Algorithms	01-ALG-01	✓	✓	✓
	Algorithms & Loops	01-ALG-02	✓	✓	✓
	Programs: What are programs?	02-PS-11	✓	✓	✓
	Program: Examples of programs	02-PS-12	✓	✓	✓
	❖ Program: Sequence of steps	02-PS-14	✓	✓	✓
	❖ Program: Loops: Repeating a sequence of steps	02-PS-16	✓	✓	✓
	❖ Puzzle: Tic-Tac-Toe	01-PS-06	✓	✓	✓
Part II	Computational Thinking - Advanced				
2.1	Systematic Counting				
	Missing Numbers	02-LCR-02	✓	✓	✓
	❖ Puzzle: Fit numbers in grid, Missing numbers pyramid	02-PS-30	✓	✓	✓
	❖ Puzzle: More examples on missing numbers	02-PS-31	✓	✓	✓
Part III	Digital Literacy				
	Parts of a computer: Input output devices	02-DL-01	✓	✓	✓
	Parts of a computer: Keyboard	02-DL-03	✓	✓	✓
	File System Usage	02-DL-05	✓	✓	✓
	Using Paint	02-DL-06	✓	✓	✓
	Communication & Reliability	02-DL-18	✓	✓	✓
	Introduction to Networking-I	02-DL-19	✓	✓	✓
	Introduction to Networking-II	02-DL-20	✓	✓	✓

Standard III

Download: [Standard III Lessons.zip](https://goo.gl/ZbrG2B) (<https://goo.gl/ZbrG2B>)

Part I	Computational Thinking	Lesson Code	Y1	Y2	Y3
1.1	Iterative patterns & processes				
	Patterns in words	03-IPP-02	✓	✓	✓
1.2	Data				
	❖ Arranging & Analysing information	03-IP-01	✓	✓	✓
	Storing Information	03-IP-02	✓	✓	✓
	Arranging Information: Tables	02-IP-02	✓	✓	✓
1.3	Discrete Modeling				
P	Draw school map	02-DM-02	✓		
	Maps: Understanding scale	03-DM-01	✓	✓	✓
	Puzzle: 3 Cups	03-DM-02		✓	✓
1.4	Algorithms & Programming				
	❖ Finding Patterns: Word Grid	02-PS-15	✓	✓	✓
	Solving simple problems: Better ways of doing tasks	02-DA-02	✓	✓	✓
	❖ Decomposition: Splitting into smaller task	03-DA-01	✓	✓	✓
	❖ Decomposition: Tower of Hanoi	03-DA-02	✓	✓	✓
	Basic Algorithms	03-ALG-09	✓	✓	✓
P	Program: Loops: Repeating a sequence of steps	02-PS-16	✓		
	Loops: Drawing patterns in a loop	03-ALG-10	✓	✓	✓
P	Representing information: Defining a code	02-PS-17		✓	
	Program: Representing Info as Code	03-ALG-12		✓	✓
	Program: Representing Info as Code - Alphabets	03-ALG-13		✓	✓
Part II	Computational Thinking - Advanced				
2.1	Systematic Counting				
P	Puzzle: Fit numbers in grid, Missing numbers pyramid	02-PS-30	✓		
P	Puzzle: More examples on missing numbers	02-PS-31	✓		
	❖ Counting: Combinations	03-LCR-01		✓	✓
2.2	Algorithms				
	❖ Basic Conditionals: Using AND	03-ALG-08	✓	✓	✓
	❖ Basic Conditionals: Using OR	03-ALG-08-b	✓	✓	✓
2.2	Programming: Using Scratch				
	Familiarity with software	03-P-19 , 03-P-20 , 03-P-21	✓	✓	✓
	Demonstration of programs with simple instructions	03-PRG-01-05	✓	✓	✓
	Explore preloaded projects				

Standard IV

Download: [Standard IV Lessons.zip](https://goo.gl/SX7f2j) (<https://goo.gl/SX7f2j>)

Part I	Computational Thinking	Lesson Code	Y1	Y2	Y3
1.1	Systematic Counting				
P	Counting: Combinations	03-LCR-01	✓		
	❖ Counting: Combinations with conditions	03-LCR-02	✓	✓	✓
	❖ Solving Sudoku - 4 x 4	04-LCR-01	✓	✓	✓
	❖ Solving Sudoku - 4 x 4 - More Examples	04-LCR-02	✓	✓	✓
	❖ Puzzle: Arithmagon	02-PS-32		✓	✓
1.2	Iterative patterns & processes				
P	Patterns in words	03-IPP-02	✓		
	❖ Patterns in numbers	03-IPP-01	✓	✓	✓
	❖ Patterns in shapes	04-IPP-01		✓	✓
1.3	Data				
P	Arranging Information: Tables	02-IP-02	✓		
	❖ Data Compression	04-IP-01		✓	✓
	❖ Representing Information & Introduction to Codes	04-IP-02	✓	✓	✓
1.4	Algorithms				
P	Decomposition: Tower of Hanoi	03-DA-02	✓		
	Following instructions: Robot game	04-DA-01	✓	✓	✓
	Devising & Following instructions: Robot game	04-DA-02	✓	✓	✓
	❖ Algorithms: Help Aambot pick mangoes	04-ALG-01	✓	✓	✓
	Introduction to Sorting: Playing cards	04-ALG-02	✓	✓	✓
	❖ Debugging programs	03-ALG-16	✓	✓	✓
1.5	Programming: Using Scratch				
	Recap				
	Animate stationary farm animals using costume and loop: Dog, Sheep, Butterfly, ...	04-PRG-01-06	✓	✓	✓
	Bring together the above farm animals into a single program with background				
Part II	Computational Thinking - Advanced				
2.1	Iterative patterns & processes				
	Complex patterns: Symmetry	04-PS-08		✓	✓
2.2	Algorithms				
	Basic Conditionals: Using AND/OR	03-ALG-18	✓	✓	✓
2.3	Programming: Using Scratch				
	Stories: Using simple animation learnt earlier	04-PRG-07-10	✓	✓	✓
	Introduce movement				

Standard V

Download: [Standard V Lessons.zip](https://goo.gl/yKEZQy) (<https://goo.gl/yKEZQy>)

Part I	Computational Thinking	Lesson Code	Y1	Y2	Y3
1.1	Systematic Counting				
P	Counting: Combinations with conditions	03-LCR-02	✓		
	❖ Counting combinations: Making brick towers with conditions	05-LCR-01	✓	✓	✓
P	Solving Sudoku - 4 x 4	04-LCR-01	✓		
	❖ Solving Sudoku -6x6	02-PS-33	✓	✓	✓
	Solving Sudoku -6x6	02-PS-34	✓	✓	✓
1.2	Data				
	Rearranging Information: arranging data in some order	05-IP-01	✓	✓	✓
	Binary Numbers	04-P-10	✓	✓	✓
	Binary Numbers: Decimal to Binary	05-P-02		✓	✓
	Binary Numbers: Binary to Decimal	05-P-03		✓	✓
1.3	Discrete Modeling				
	Relations: How are things related	04-DM-01		✓	✓
	❖ Paths: Find shortest path for Dhuma in his village	04-DM-02	✓	✓	✓
	Graphs & Trees	05-DM-01		✓	✓
	Puzzle: 4 Friends with lamp crossing bridge	05-DM-02		✓	✓
1.4	Algorithms				
P	Devising & Following instructions: Robot game	04-DA-02	✓		
P	Basic Conditionals: Using AND/OR	03-ALG-18	✓		
P	Algorithms: Help Aambot pick mangoes	04-ALG-01	✓		
	Introduction to Searching: Numbers	04-ALG-04	✓	✓	✓
1.5	Programming: Using Scratch				
P	Simple Animation using single object	04-PRG-01-10	✓		
	Animation with motion (Fish tank)	05-PRG-01-03	✓	✓	✓
Part II	Computational Thinking - Advanced				
2.1	Systematic Counting				
	❖ Counting combinations	05-LCR-02	✓	✓	✓
2.2	Iterative patterns & processes				
	❖ Patterns: Symmetry	05-IPP-01	✓	✓	✓
2.3	Data				
	Summarizing information	05-IP-02	✓	✓	✓
2.4	Programming: Using Scratch				
	Stories: Using simple animation learnt earlier	05-PRG-04-10		✓	✓
	Simple games: Maze games (if touching sides, start again); catching egg/ single fruit falling in a bowl; paddle				

and ball

Standard VI

Download: [Standard VI Lessons.zip](https://goo.gl/Puon9w) (<https://goo.gl/Puon9w>)

Part I	Computational Thinking	Lesson Code	Y1	Y2	Y3
1.1	Systematic Counting				
P	Solving Sudoku - 4 x 4, 6x6	04-LCR-01 , 02-PS-33 , 02-PS-34	✓		
P	Counting combinations	05-LCR-01	✓		
P	Counting combinations	05-LCR-02	✓		
1.2	Data				
	Morse code	06-IPP-01			✓
	Morse code: Examples	06-IPP-02			✓
	❖ Parity bits: Magic game	06-IP-03	✓	✓	✓
P	Binary Numbers: Decimal to Binary	05-P-02	✓	✓	
P	Binary Numbers: Binary to Decimal	05-P-03	✓	✓	
	Binary Numbers	04-P-11			✓
	Binary Numbers: secret messages	04-P-12			✓
1.3	Discrete Modeling				
P	Relations: How are things related	04-DM-01	✓	✓	
P	Paths: Find shortest path for Dhuma in his village	04-DM-02	✓		
P	Graphs & Trees	05-DM-01		✓	
P	Puzzle: 4 Friends with lamp crossing bridge	05-DM-02		✓	
1.3	Algorithms				
P	Introduction to Searching: Numbers	04-ALG-04	✓		
	❖ Flowcharts: Introduction	06-DA-01	✓	✓	✓
	Flowcharts: More examples	06-DA-02	✓	✓	✓
	Algorithm to Convert Hour, Minute, Seconds	06-ALG-02	✓	✓	✓
	Flowchart & Simulation of above algorithm	06-ALG-03	✓	✓	✓
	❖ Search: find smallest number	06-ALG-04		✓	✓
	Flowchart & Simulation of above algorithm	06-ALG-05		✓	✓
	Computational Thinking: Principles	04-PS-06	✓	✓	✓
1.4	Programming: Projects (Scratch)				
P	Animate stationary farm animals using costume and loop: Dog, Sheep, Butterfly, Multiple animals on a farm, simple animation/stories, Animation with motion (Fish tank)	04-PRG-01-10 , 05-PRG-01-03	✓		
P	Simple games: Maze games (if touching sides, start again); catching egg/ single fruit falling in a bowl;	05-PRG-04-10	✓	✓	

	paddle and ball				
	Simple games: To the above games add moving objects/dragons in fixed path (left-right / up-down), Paddle ball => bricks game. Points for different bricks, multiple eggs / fruits falling in bowl. count # eggs/fruit, Add background music, change speed, add lives, levels	06-PRG-01-10		✓	✓
Part II	Computational Thinking - Advanced				
2.1	Iterative patterns & processes				
	❖ Simple patterns in Mathematics	05-IPP-02	✓	✓	✓
2.2	Data				
	Information processing: Sorting	06-IP-01		✓	✓
	Digital Representation: Encoding & Decoding	04-PS-14			✓
	Digital Representation: Audio, Video	04-PS-15			✓

Standard VII

Download: [Standard VII Lessons.zip](#)

Part I	Computational Thinking	Lesson Code	Y1	Y2	Y3
1.1	Systematic Counting				
P	Solving Sudoku - 4 x 4, 6x6	04-LCR-01 , 02-PS-33 , 02-PS-34	✓		
	❖ Solving Sudoku - 9 x 9	06-LCR-02		✓	✓
	❖ Solving Sudoku - 9 x 9	06-LCR-03			✓
P	Counting combinations	05-LCR-01	✓		
P	Counting combinations	05-LCR-02	✓		
	Permutations and Combinations	06-LCR-01		✓	✓
1.2	Iterative patterns & processes				
P	Simple patterns in Mathematics	05-IPP-02	✓		
	❖ Iterative processes: Examples	07-IPP-01		✓	✓
1.3	Data				
	Compression	07-IP-01	✓	✓	✓
P	Information processing: Sorting	06-IP-01	✓	✓	
	Sorting & Derangement	07-IP-02	✓	✓	✓
1.4	Discrete Modeling				
P	Relations: How are things related	04-DM-01	✓		
P	Paths: Find shortest path for Dhuma in his village	04-DM-02	✓		
P	Graphs & Trees	05-DM-01	✓	✓	
P	Puzzle: 4 Friends with lamp crossing bridge	05-DM-02	✓	✓	
	❖ Spanning trees	07-DM-01			✓
	❖ Spanning trees: Road networks	07-DM-02			✓
1.5	Algorithms				
P	Computational Thinking: Principles	04-PS-06	✓		
P	Flowcharts: Introduction	06-DA-01	✓		
P	Search: find smallest number	06-ALG-04	✓	✓	
P	Flowchart & Simulation of above algorithm	06-ALG-05	✓	✓	
	❖ Introduction to selection sort	06-ALG-06		✓	✓
	❖ Flowchart & Simulation for selection sort	06-ALG-07		✓	✓
	❖ Binary Search	07-ALG-05		✓	✓
	❖ Flowchart for above lesson & Simulation	07-ALG-06		✓	✓
Part II	Computational Thinking - Advanced				
2.1	Algorithms				
	Optimization strategies - I	07-DA-01		✓	✓
	Optimization strategies - II	07-DA-01-b		✓	✓
	Optimization strategies - III	07-DA-02			✓
2.2	Programming: Using Scratch*				

P	Animate stationary farm animals using costume and loop: Dog, Sheep, Butterfly, Multiple animals on a farm, simple animation/stories, Animation with motion (Fish tank) Simple games: Maze games (if touching sides, start again); catching egg/ single fruit falling in a bowl; paddle and ball	04-PRG-01-10 , 05-PRG-01-10	✓		
P	Simple games: To the above games add moving objects/dragons in fixed path (left-right / up-down), Paddle ball => bricks game. Points for different bricks, multiple eggs / fruits falling in bowl. count # eggs/fruit, Add background music, change speed, add lives, levels	06-PRG-01-10		✓	
2.2	Programming: Using Python*				
	Introduce Python				✓
	Simple to medium complexity algorithms. Examples: print first 100 natural numbers, multiply n numbers, finding max, second largest, palindrome,	07-PRG-01-10			✓

Standard VIII

Download: [Standard VIII Lessons.zip](#)

Part I	Computational Thinking	Lesson Code	Y1	Y2	Y3
1.1	Systematic Counting				
P	Solving Sudoku - 4x4, 6x6	04-LCR-01 , 02-PS-33 , 02-PS-34	✓		
P	Solving Sudoku -9x9	06-LCR-02		✓	
	Solving Sudoku -9x9	06-LCR-03			✓
1.2	Data				
P	Compression	07-IP-01	✓		
	❖ Modulo arithmetic	08-IP-01-A		✓	✓
	❖ Cryptography: Caesar cipher	08-IP-01-B		✓	✓
1.3	Discrete Modeling				
P	Relations: How are things related	04-DM-01	✓		
P	Paths: Find shortest path for Dhuma in his village	04-DM-02	✓		
P	Graphs & Trees	05-DM-01	✓		
	❖ Graph coloring	08-DM-01		✓	✓
1.4	Algorithms				
P	Computational Thinking: Principles	04-PS-06	✓		
P	Flowcharts: Introduction	06-DA-01	✓		
P	Search: find smallest number	06-ALG-04	✓		
P	Flowchart & Simulation of above algorithm	06-ALG-05	✓		
P	Introduction to selection sort	06-ALG-06	✓	✓	✓
P	Flowchart & Simulation for selection sort	06-ALG-07	✓	✓	✓
P	Binary Search	07-ALG-05		✓	✓
P	Flowchart for above lesson & Simulation	07-ALG-06		✓	✓
	Algorithm to compute LCM & GCD	07-ALG-07			
	Flowchart for above lesson & Simulation	07-ALG-08			
	Bubble sort	08-ALG-01			
	Number is a perfect Square and square root of perfect square algo	08-ALG-05			
	Flowchart for above lesson & Simulation	08-ALG-06			
	BestFit Algorithm	08-ALG-07			
Part II	Computational Thinking - Advanced				
2.1	Systematic Counting				
P	Counting combinations	05-LCR-02	✓		
P	Permutations and Combinations*	06-LCR-01	✓	✓	
	Permutations and Combinations	07-LCR-01			✓
2.2	Iterative patterns & processes				
P	Simple patterns in Mathematics	05-IPP-02	✓		

	Modeling system and improving iterations	08-IPP-01	✓	✓
	Using models of systems for tasks like prediction	08-IPP-02	✓	✓
	Regular Expressions	07-IPP-02		✓
2.3	Discrete Modeling			
P	Spanning trees	07-DM-01	✓	✓
P	Spanning trees: Road networks	07-DM-02	✓	✓
P	Puzzle: 4 Friends with lamp crossing bridge	05-DM-02	✓	
	5 Room problem	08-DM-02	✓	✓
2.4	Algorithms			
P	Optimization strategies - I	07-DA-01	✓	✓
P	Optimization strategies - II	07-DA-01-b	✓	✓
P	Optimization strategies - III	07-DA-02		✓
	Optimization Strategies	08-DA-01		
2.5	Programming: Using Scratch*			
P	Animate stationary farm animals using costume and loop: Dog, Sheep, Butterfly, Multiple animals on a farm, simple animation/stories, Animation with motion (Fish tank) Simple games: Maze games (if touching sides, start again); catching egg/ single fruit falling in a bowl; paddle and ball	04-PRG-01-10 , 05-PRG-01-10	✓	
P	Simple games: To the above games add moving objects/dragons in fixed path (left-right / up-down), Paddle ball => bricks game. Points for different bricks, multiple eggs / fruits falling in bowl. count # eggs/fruit, Add background music, change speed, add lives, levels	06-PRG-01-10	✓	
1.5	Programming: Using Python*			
P	Introduce Python			✓
P	Simple to medium complexity algorithms. Examples: print first 100 natural numbers, multiply n numbers, finding max, second largest, palindrome,	07-PRG-01-10		✓
	Examples:print pattern, lcd & gcm, reverse number.Compute GST, compute min number of notes from multiple denominations for given amount, sum of squares of first n natural numbers ...	08-PRG-01-10		