

# School Curriculum for all Grades



# **GRADE 1 CURRICULUM**

#### **BUILDING SKILLS**

Introduction to Block based coding using Solve structured puzzle using Blocks Customize a maze for block commands

Intro to Sprite Lab for creation of animation stories Create object sprites for animation Simple story animation - Object creation

Understand and implement simple events in coding Trigger actions as result of event

Simple story animation - Animate using events

Creating and appying sequences of blocks Solving structured puzzle exercises: Critical Thinking

Using Sequences create art forms, Simple 2D drawings using line sequences

Pattern recognition and Replace repeating code with Loops to write efficient code

Manipulate x,y co-ordinates in apps to Fun programs to move animal sprites on grid, change their look and behaviours on the fly

Code animation stories where object sprites respond to user key events Story animations with key press functionality

Independant implementation of concepts from C1 to C8 to create animation game

Indepenent implementation : SpaceTech themed story game app

Structured activities in artist and sprite lab

Build game app in Sprite Lab

Analyze and decompose puzzle structures Build animation stories thru' logical decomposition

Create custom behaviors to animate and

Create Custom behaviors specific to

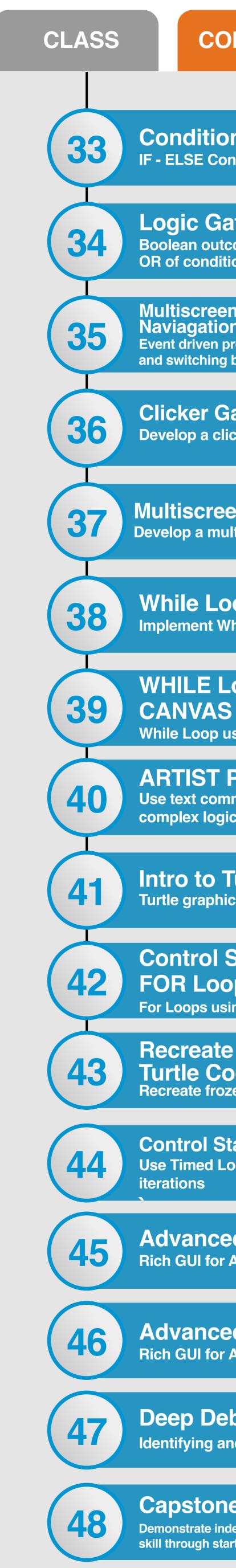
Generic Custom behaviors to apply Code custom behaviors for custom sprites in app

Practice excercises: for fundamental coding concepts of sprite & artist lab. Program with goal directed actions:Logical Thinking

Introduction to IPO How computers

CONCEPT & LEARNING
Variables Variables
<b>Extended Variables</b> Variables
<b>The Flappy Bird Challenge</b> User interactions and Keypress events
Module checkpoint - 2/ Capstone Class Checkpoint Class 2
<b>Conditionals</b> If - then Conditions and decision making
Making Decisions in Code Conditional Programming
Making Decisions in Code Conditional Programming
Programming App To Make Decisions IF-ELSE Conditional Statement
Programming App To Make Decisions Conditional Statements with Boolean values
<b>Nested Loops</b> Nested Loop : recognize patterns to create optimized code
While Loop Programming construct of "WHILE" Loop
<b>Binary Strings</b> Convert simple code of 0s and 1s into machine-level binary
<b>Binary Math</b> Binary Math and Number system
Module Checkpoint class - 3/Capstone Class Checkpoint Class 3
Build your own mobile app Intro to App Lab using standard UI elements Buttons & Texts.
Mobile App - Greeting Card

IG	<b>BUILDING SKILLS</b>
	Intro to Sprite Lab for creation of animation stories Create object sprites for animation and impart them behaviour Solving structured puzzle exercises: Critical Thinking
	Manipulating variables in code Game app using variable values
	Use keypress events to develop the popular flappy bird game Single player : Tap game with score
9	Build story app in Sprite Lab using variables Independant implementation : Build Story app
	Use of Conditional Statements to evaluate and predict outcomes. Structured Puzzles :Logical Thinking
	Conditional constructs in Apps using directions Build decision making logic in apps Structured Puzzles :Logical Thinking
	Conditional constructs in Apps to evaluate outcomes Decision making capability in game apps Never Ending Game
	STEM: States of Water app
es	STEM: States of Water app <b>Game rules using conditionals</b> to determine win/lose Car Racing game : NFS (Need for Speed)
	Game rules using conditionals to determine win/lose
	Game rules using conditionals to determine win/lose   Car Racing game : NFS (Need for Speed)   Advanced programming: Write optimized Structured Activities : Logical Thinking for
	Game rules using conditionals conditionals determine win/lose   Car Racing game : NFS (Need for Speed)   Advanced programming: Write optimized   Structured Activities : Logical Thinking for efficient coding   Understand and Implement While Loops
	Game rules using conditionals conditionals determine win/lose   Car Racing game : NFS (Need for Speed)   Advanced programming: Write optimized   Structured Activities : Logical Thinking for efficient coding   Understand and Implement While Loops   Structured Activities : Logical Thinking for efficient coding   Write short computer programs in Binary
	Game rules using conditionals to determine win/loseCar Racing game : NFS (Need for Speed)Advanced programming: Write optimized Structured Activities : Logical Thinking for efficient codingUnderstand and Implement While Loops Structured Activities : Logical Thinking for efficient codingWrite short computer programs in Binary Sx8 bitmap images from binary stringsConvert 4 bit binary into Decimal value system
es	Game rules using conditionals to determine win/lose   Car Racing game : NFS (Need for Speed)   Advanced programming: Write optimized Structured Activities : Logical Thinking for efficient coding   Understand and Implement While Loops   Structured Activities : Logical Thinking   Virte short computer programs in Binary 8x8 bitmap images from binary strings   Convert 4 bit binary into Decimal 2010 strimes   Sx8 bitmap images from binary strings   Independent app development : from Algorithm to final code. Revision of concepts





CONCEPT & LEARNING	<b>BUILDING SKILLS</b>
tionals in Mobile App Conditional statement	Conditional statements & its evaluation based on different input values. Learn condition evaluation using comparison operations. Season App, Password Checker app that performs conditional analysis on user feedback
Gates outcomes from logical AND and nditional statements	Conditional evaluation using logical operations Use logical operators (&& , II) to implement decision logic Logic Gates app for Boolean And, Or Operations
reen App - Multiscreen ation en programming with multiple screens ning between them	Navigation in an app by switching context between multiple screens STEM: Scientific Animal Classification app
r Game : Keeping Score a clicker game	Build a clicker game app using detailed UI properties in design. Learn the concepts of random number & variable maniupulation for score Clicker game with score card
reen clicker chaser game multi screen chaser catch game	Game design concepts of lives used, number of tries, total score & implement in clicker catcher game Structured Activities : Logical Thinking with game design rules
Loop - Mobile App Int While Loop in App Lab	While loops with an evaluating condition and a correct terminating condition Fun creative activity exercises: Apps using while loops to perform repetitive tasks defining boundary conditions for exit
E Loops with AS UI elements op using Canvas elements	While Loop for Creative art Concept of RBG color manipulation Fun creative exercises : Drawing with code using loops
<b>T PATTERNS</b> commands, angles, loops and logic for creative outcomes	Use the Artist environment to explore loops and text commands that draw complex patterns Structured Activities : Logical Thinking
o Turtle programming phics to create visual output	Program the turtle pointer to move on the screen using coordinate location system and complex designs. Fun creative exercises : Develop programs for creative expression using Turtle Code
ol Statements - OOP s using Turtle Programming	Use loops with embedded counters having predetermined start and stop values Structured Puzzles : Logical Thinking exercises
ate Frozen Patterns in Code frozen patterns in Turtle Code	Revision practice for While and For Loops Structured Puzzles : Logical Thinking exercises for creative outcomes
Statements - Timed Loops d Loops to create deterministic	Learn to use timed loops to implement delays and run loops at precise time intervals Apps with Countdowns and delays
<b>ced UI Controls - Part 1</b> for Apps using multiple controls	Extended UI : Slider, checkbox radiobutton and dropdown controls in app Rich GUI and well designed apps
<b>iced UI Controls - Part 2</b> for Apps using multiple controls	String functions with Extended UI components in apps Rich GUI and well designed apps
Debugging g and Fixing bugs in programs	Debug sequential & event-driven programs using debug console, speed slider,& breakpoints Learn best practices for debugging programs Debugging:Persistence and Best Practices
one Checkpoint Project te independent implementation th start to end self written programs	Independent implementation of concepts taught in 48 classes Options to exhibit skill in various types of programs Capstone Assessment Project (Any 1): Quiz / Treasure Hunt, Pop the Bubble OR Get a 10, Turtle Scenary, Clicker Catcher Chaser App: Catch the Burglar



#### GRADE 2 & 3 CURRICULUM

#### **BUILDING SKILLS**

Space Game: Fly me to

Spot the Boy + Create the

Ping-pong/ Bouncing Ball Game

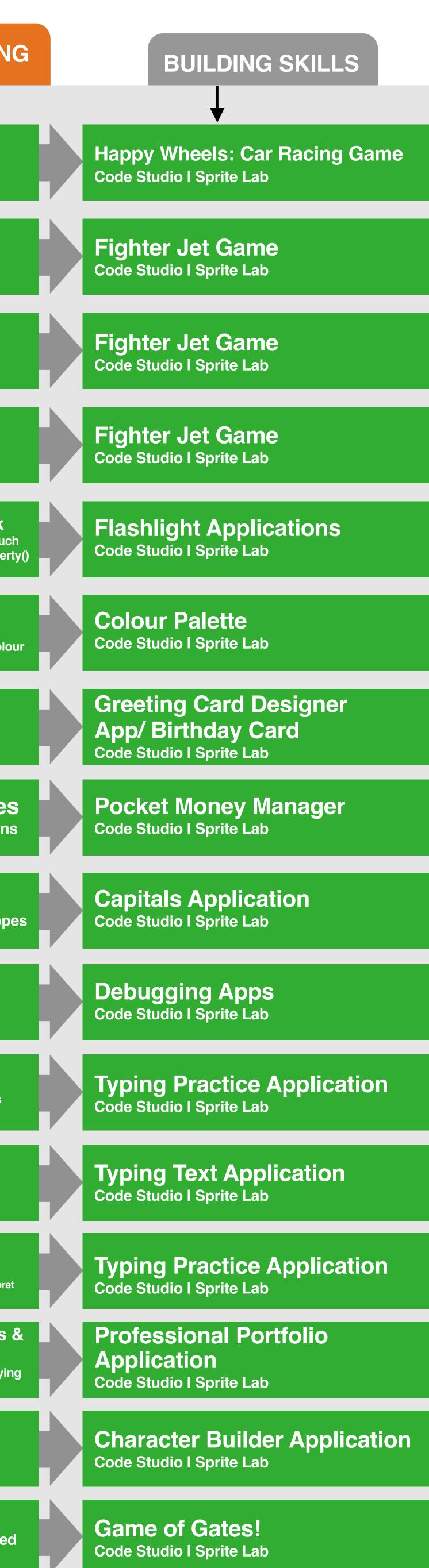
**Ping-pong/ Bouncing Ball Game** 

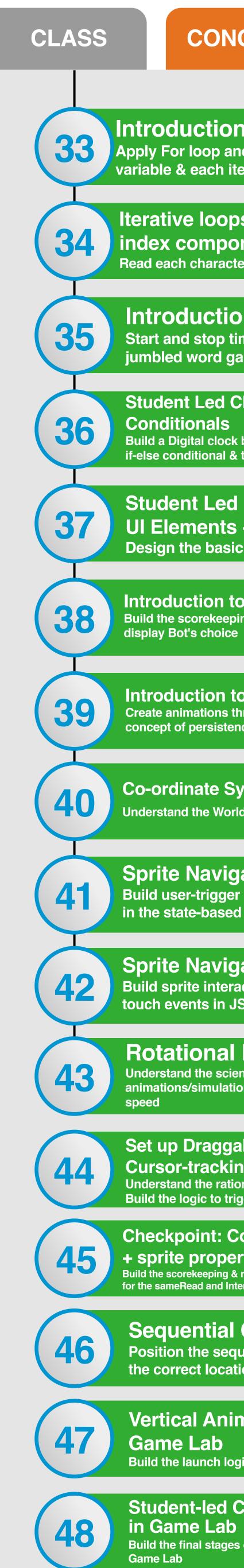
Ping-pong/ Bouncing Ball Game

Drive to the Gas Station

Happy Wheels: Car Racing Game

CLASS	CONCEPT & LEARNING
17	Sprite Animation Events, Variable and Loops
(18	<b>Conditionals</b> While – Do conditions, Nested Loops
	Functions
19	Create function Repeat Loop
	Extended Functions
20	Loops, Nested Functions
21	4-Step App Development Framework Introduction to Design Elements & their Properties such
	as Color, Element Id, Text & other properties setProperty
00	Design Discipline: Introduction to Colour Themes
22	Understand Colour themes in an application Read colou palettes
	Introduction to I/O UI Elements &
23	Design Balance Input UI Elements: text_input Output UI Element: label getText()
	Math Operations on Variables
24	Math Operations on Variables Initialisation, Assignment & Math Operations
	Scope of Variables
25	Understand Global and Local Variable Scope
	Introduction to Dobugging
(26)	Introduction to Debugging Debug at various steps of app development Read and interpret error to debug the code at
	different steps of app development
27	String Manipulation I
	Declaring, Assigning & Manipulating String Variables UI Element: Checkbox
20	String Manipulation II
28	Concatenation
	Student-led CheckPoint:
29	Variables & Debugging Perform String Comparison using if-conditionals Read and interpret error to debug the code at different steps of app development
	Student-led CheckPoint: UI Elements 8
30	Navigation Showcase the applications developed so far by applying the UI knowledge thus far
	Introduction to Boolean Variables
31	& Logic Gates Apply If-Else conditional UI Element: Radio Buttons Enforce algorithmic thinking thro
20	Branched Conditionals
32	If-Else conditional to build logic - gate based apps







CONCEPT & LEARNING	BUILDING SKILLS
ction to Iterative Loops oop and understand counter each iteration	UnStructured - Bullet unstructure sentences! Code Studio I Sprite Lab
loops to scan through omponents character of a string using a For Loop	Word & Character Counter Application Code Studio I Sprite Lab
uction to timed loop stop timedloop to build a timed vord game	<b>Timed Jumbled Tester</b> Code Studio I Sprite Lab
Led Checkpoint: Loops & nals al clock by applying string concatenation, tional & time-based loop	<b>Digital Clock Application</b> Code Studio I Sprite Lab
t Led Checkpoint: ents + Conditionals e basic UI of Rock-Paper-Scissors	<b>Rock-Paper-Scissors I</b> Code Studio I Sprite Lab
tion to Functions + Delay Block prekeeping functionality using functions to s choice	<b>Rock-Paper-Scissors II</b> Code Studio I Sprite Lab
tion to Persistence of Vision ations through an understanding of the persistence of vision, framerate & framecount	Virtual Flipbook Animation Code Studio I Sprite Lab
ate System in Game Lab (p5.js) the World & Screen of the Game Lab (p5.js)	<b>Drone Delivery to the Pin!</b> Code Studio I Sprite Lab
<b>avigation in p5.js</b> trigger event & resulting change based simulations	State-based Simulation Game I Code Studio I Sprite Lab
<b>Javigation in p5.js</b> e interactions using collide and its in JS	State-based Simulation Game II Code Studio I Sprite Lab
<b>Chal Motion in p5.js</b> the science of rotation & build rotational simulations using change in direction and	State-based Simulation Game III Code Studio I Sprite Lab
raggability in p5.js + racking the rationale behind waste segregation gic to trigger event to open the trash-cans	Trash Sorter Game I Code Studio I Sprite Lab
<b>int: Coordinate + Conditionals</b> <b>properties</b> keeping & result logic by setting up conditions ad and Interpret errrors in Game Lab to debug the code	Trash Sorter Game II Code Studio I Sprite Lab
ntial Conditional Logic he sequence of rocket assembly in at location	Lunar Launch Mission - Rocket Assembly Code Studio I Sprite Lab
Animation/ Navigation in _ab unch logic using timedloop and counter	Lunar Launch Mission - Countdown to Launch Code Studio I Sprite Lab

Student-led Checkpoint: Kinematics Build the final stages of the mission using kinematics in

Lunar Launch Mission -Landing the Rover Code Studio I Sprite Lab



### GRADE 4, 5 & 6 CURRICULUM

DING	SKILLS

**Double Player Game** 

**Double Player Game** 

Create Arcade Game

Create Complex Mobile App Design and Code

Create Complex Arcade Game

CLASS	CONCEPT & LEARNIN
17	<b>Times Loop</b> Iterative Conditional Loop
18	Count Loop Iterative Conditional Loop
19	Nested Loops Recursive Looping
20	Game Design GUI Design and Code
21	App Design GUI Design and Code
22	App Design GUI Design and Code
23	App Design GUI Design and Code
24	Publishing App
25	<b>Touch Event</b> Trigger code on Touch
26	While-do Conditional Programming
27	<b>If-do</b> Conditional Programming
28	App Design GUI Design and Code
29	<b>If-else</b> Conditional Programming
30	Costume Property Control Object Appearance
31	<b>Color Property</b> Control Object Appearance
32	Game Design GUI Design and Code







ONCEPT & LEARNING	BUILDING SKILLS
t do o Conditionals	Solve Puzzle Logical Thinking Skill
ent Function e Design Components	<b>Mobile App</b> Critical Thinking Skill
el Functions e Design Components	<b>Mobile App</b> Parallel Thinking Skill
esign on and Code	App Entrepreneur
ot Development « Services	Al Chatbot Critical Thinking Skills
ot Development ntents	Al Chatbot Abstract Thinking Skills
ot Development Knowledgebase	Al Chatbot Critical Thinking Skills
ot App atbot App	Al Chatbot Abstract Thinking Skill
ced Chat App Design	Communication Apps Algorithmic Thinking Skill
ced Chat App Prototype	Communication Apps Critical Thinking Skill
ced Chat App egration	Communication Apps Algorithmic Thinking Skill
ced Chat App Integration	Communication Apps Analytical Thinking Skill
ced Logic les	Cloud Based Game Critical Thinking Skill
ced Logic les	Cloud Based Game Critical Thinking Skill
ced Logic Integration	Cloud Based Game Analytical Thinking Skill
ced Logic Integration	Cloud Based Game Analytical Thinking Skill



# GRADE 7, 8 & 9 CURRICULUM

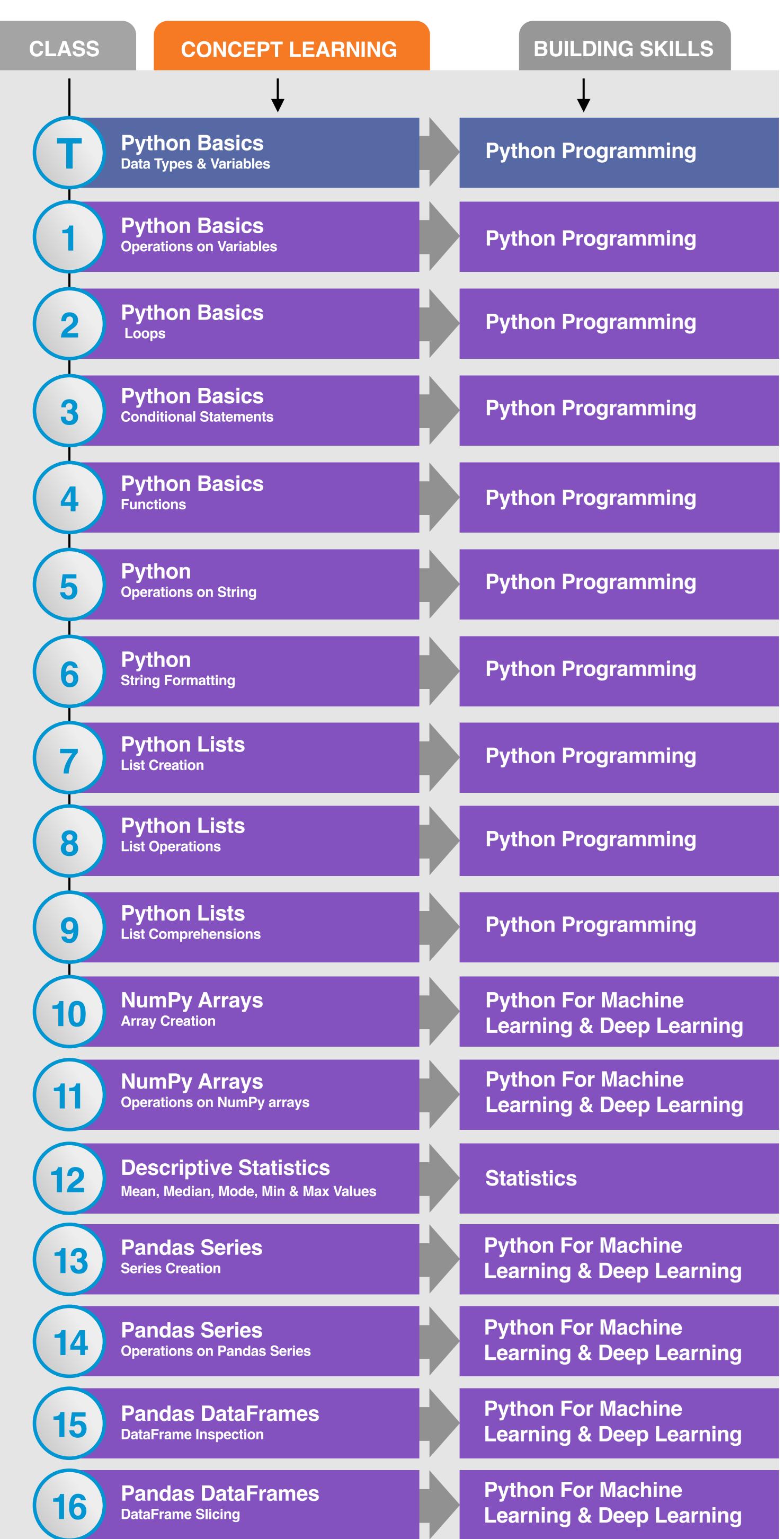
DING SKILLS	
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ne Objects	
etection <sup>n</sup>	
vstem	
g code	

CLASS	CONCEPT & LEARNIN
(17)	Iterator Iterating over data
18	<b>Return Values</b> Returning values from functions
19	Flags Storing levels as flags
20	Game Design Game Design and Code
21	OOPS Using object oriented style
22	<b>Recursion</b> Function calling itself
23	<b>Graphics</b> Creating graphic effects
24	Game Design Game Design and Code
25	<b>Object types</b> Different data types
26	<b>Events</b> Detecting events
27	<b>Booleans</b> True/False data type
28	Game Design Game Design and Code
29	Classes Designing classes
30	Asynchronus calls Parallel instructions
31	OOPS Using object oriented style
32	Game Design Game Design and Code





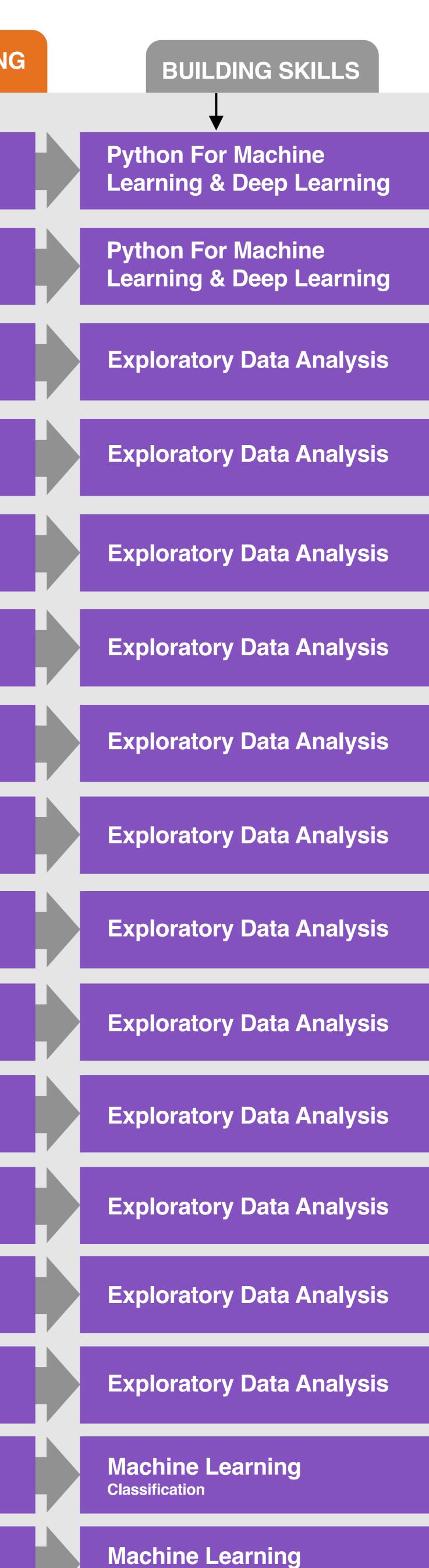




#### GRADE 10, 11 & 12 CURRICULUM

or	Machi	ne
&	Deep	Learning

CLASS	CONCEPT & LEARNIN
(17)	Pandas DataFrames Operations on DataFrame
18	Pandas DataFrames Merging & Joins
19	<b>Univariate Analysis</b> Continuous Data (Matplotlib Plots)
20	<b>Univariate Analysis</b> Continuous Data (Seaborn Plots)
21	<b>Univariate Analysis</b> Categorical Data (Matplotlib Plots)
22	<b>Univariate Analysis</b> Categorical Data (Seaborn Plots)
23	<b>Bivariate Analysis</b> Continuous Data (Matplotlib Plots)
24	<b>Bivariate Analysis</b> Continuous Data (Seaborn Plots)
25	<b>Bivariate Analysis</b> Categorical Data (Matplotlib Plots)
26	<b>Bivariate Analysis</b> Categorical Data (Seaborn Plots)
27	<b>Bivariate Analysis</b> Time-Series Data Introduction
28	<b>Bivariate Analysis</b> Time-Series Data (Date Formatting)
29	<b>Bivariate Analysis</b> Pivot Tables
30	<b>Cartograms</b> Cartograms - Folium Maps
31	<b>Binary Classification</b>
32	Decision Tree & Random Forest Introduction



Classification





CONCEPT & LEARNING	BUILDING SKILLS
m Forest Classifier	Machine Learning Classification
om Forest Classifier n Matrix	Machine Learning Classification
om Forest Classifier ation Report	Machine Learning Classification
om Forest Classifier	Machine Learning Classification
om Forest Classifier	Machine Learning Classification
m Forest Classifier	Machine Learning Classification
om Forest Classifier	Machine Learning Classification
Mechanics Ile Play	Machine Learning Classification
ampling	Machine Learning Classification
ost Classifier ployment	Machine Learning Classification
ost Classifier idation	Machine Learning Classification
<b>Testing</b> n Matrix	Machine Learning Classification
hing a game ation Report	Machine Learning Classification