TEALS Program

1 Unit 3: Advanced Data & Control Flow (4 weeks)

The following curriculum map is a day-by-day listing of the AP Computer Science course in chronological order. Each row represents one day of class, based on a medium-paced class. Readings from the textbook and homework assignments are included on the day when they should be assigned. Refer to the Introduction document for information about how to adjust this pacing for your specific classroom.

- Unit 3 Slides
- Unit 3 Word Bank
- Curriculum Assets
- Consumer Review Lab

LP	Title	In Class	Reading	Homework
3.00	Test Review & Reteach	Algorithm for Solving Problems		Test corrections
3.01	Parameters	SC 3.1 – 3.3	3.1 up to “Limitations of Parameters”	SC 3.4-3.7
3.02	Limitations of Parameters & Multiple Parameters	(Art project)	“3.1 “Limitations of Parameters”, “Multiple Parameters”, "“Parameters versus Constants”""	Jazz up art project and program
3.03	Return Values	SC 3.14 – 3.16	“3.1 “Overloading Methods”, 3.2 "“Methods That Return Values”""	SC 3.17, E 3.1
3.04	Programming Project	WS 3.4 Equestria		SC 3.18, 3.19
3.05	Using Objects & String Processing	WS 3.5	3.3 up to “Interactive Programs and Scanner Objects”	SC 3.19-3.21
3.06	Interactive Programs & Scanner Objects	SC 3.24 – 3.26, (5th: 3.23 – 3.25); E 3.12, 3.14, 3.15	3.3 “Interactive programming” and “Sample interactive program”	Outline ch 3 (omit 3.4)
3.07	Pokémon Battle Programming Project	WS 3.7 LP Battle		Summarize notes since last exam
3.08	Finding & Fixing Errors	Fix HW webmaker.org		SC 4.1-4.4
3.09	Relational Operators & if/else	Operator PrecedenceGrudgeball	4.1 up to “nested if else statements”	SC 4.7-4.9; E 4.1-4.2
3.10	Nested if/else Statements	WS 3.10 Teach mini-lessons SC 4.5, 4.6, E 4.3	4.1 “Nested if/else” and “Flow of control”	E 4.4, 4.5

3.11	Reducing Redundancy	(Refactoring com petition)	4.1, “Factoring if/else statements” and “Testing multiple conditions”	Outline ch 4 (omit 4.4, 4.5)
3.12	Cumulative Algorithms	Tally code on board,Collaborative Programming Exercise WS 3.12	Read 4.2	PP 4.2
3.13	while Loops	SC 5.1 – 5.4, E 5.2 WS 3.13	5.1 skip “do/while loops”	E 5.2
3.14	Random Numbers	SC 5.5-5.7; E 5.4, 5.5	5.1 ”Random numbers”	PP 5.1
3.15	Fencepost & Sentinel Loops	WS 3.15 Teach mini-lessons	5.2	E 5.6, 5.8
3.16.1	Boolean Logic	SC 5.27, 5.29 WS 3.16 (RPS, Pig) DeMorgan’s Law Poster 3.16.1 Poster 3.16.2	5.3	Outline ch 5 (through 5.3)
3.16.2	Boolean Logic (Day 2)			
3.17	Finding & Fixing Errors	(Fix HW)		Submit questions for review
3.18.1	Consumer Review Lab (day 1)	Consumer Review Lab Activity 1	Review ch 3-5	
3.18.2	Consumer Review Lab (day 2)	Consumer Review Lab Activity 2		
3.18.3	Consumer Review Lab (day 3)	Consumer Review Lab Activity 3		
3.18.4	Consumer Review Lab (day 4)	Consumer Review Lab Activity 4		

3.18.5	Consumer Review Lab (day 5)	Consumer Review Lab Activity 5		
3.18.6	Consumer Review Lab (day 6)	Consumer Review Lab Activity 5 (day 2)		
[3.18a]	Alternative Project: Calculator	work on project	conduct research	Continue working on project
3.18b	Alternative Project: Frac Calc			
3.19	Review	(Review questions), WS 3.18 practice test		Study
3.99	Unit 3 test	Test 2 Guide Test 2 Section I Test 2 Section II		

Students are expected to work on project in class. | **Reading** | Students are expected to conduct research. | **Homework** | Continue working on project.

1.1 3.00

Lesson 3.00	*Test Review & Reteach*
Objectives	Students will re-learn or strengthen content knowledge and skills from Unit 2.
Assessments	Students will re-submit test answers with updated corrections for partial or full credit, depending on instructor preference.
In Class	Algorithm for Solving Problems
Reading	
Homework	Test corrections

1.2 3.01

Lesson 3.01	*Parameters*
Objectives	Students will correctly construct formal and actual parameters (arguments). Students will predict the output of programs that use parameters.
Assessments	Students will teach a mini-lesson explaining the relationship between parameters and values stored in memory. Students will submit questions.
In Class	SC 3.1–3
Reading	3.1 up to "*Limitations of Parameters*"
Homework	SC 3.4–7

1.3 3.02

Lesson 3.02	*Limitations of Parameters & Multiple Parameters*
Objectives	Students will modify programs using parameters and class constants to create original artworks.
Assessments	Students will complete an art project and "artist statement" justifying their programming choices.
In Class	Art project
Reading	3.1 "*Limitations of Parameters*", "*Multiple Parameters*", "*Parameters versus Constants*"
Homework	Jazz up art project and program

1.4 3.03

Lesson 3.03	*Return Values*
Objectives	Students will write a program that returns values.
Assessments	Students will complete questions and write a program to meet a Pokémon Challenge.
In Class	SC 3.14–16
Reading	3.1 "*Overloading Methods*" 3.2 "*Methods That Return Values*"
Homework	SC 3.17 E 3.1

1.5 3.04

Lesson 3.04	*Programming Project*
Objectives	Students will write a program that uses parameters, the math class, and returns values.
Assessments	Students will submit an Equestria program by the end of class.
In Class	WS 3.4 Equestria
Reading	
Homework	SC 3.18–19

1.6 3.05

Lesson 3.05	*Using Objects & String Processing*
Objectives	Students will be able to differentiate between primitive and object types. Students will apply 0-indexing and string processing techniques to predict the output of a program.
Assessments	Students will complete WS 3.5
In Class	WS 3.5
Reading	3.3 up to "*Interactive Programs and Scanner Objects*"
Homework	SC 3.19–21

1.7 3.06

Lesson 3.06	*Interactive Programs & Scanner Objects*
Objectives	Students will write programs that accept user input using a scanner object.
Assessments	Students will complete problems.
In Class	SC 3.24–26 E 3.12,14,15
Reading	3.3 "*Interactive Programming*" and "*Sample Interactive Program*"
Homework	Outline ch 3 (omit 3.4)

1.8 3.07

Lesson 3.07	*Pokémon Battle Programming Project*
Objectives	Students will write a program that requests user input and returns data.
Assessments	Students will write a program that calculates damage done to Pokémon in a battle.
In Class	WS 3.7 LP Battle
Reading	
Homework	Summarize notes since last exam

1.9 3.08

Lesson 3.08	*Finding & Fixing Errors*
Objectives	Students will find errors and correct their previously submitted homework and classwork assignment.
Assessments	Students will re-submit all homework assignments with corrected answers.
In Class	Fix homework webmaker.org
Reading	
Homework	SC 4.1–4

1.10 3.09

Lesson 3.09	***Relational Operators & if/else***
Objectives	Students will be able to evaluate relational expressions, predict and trace the flow of an if statement.
Assessments	Students will evaluate relational expressions and practice correct if statement syntax during a game of grudgeball.
In Class	Operator Precedence Grudgeball
Reading	4.1 up to "*Nested If/Else Statements*"
Homework	SC 4.7–9 E 4.1–2

1.11 3.10

Lesson 3.10	***Nested if/else Statements***
Objectives	Students will will be able to choose which if statements to use for different problems Students will use correct syntax for the different if statements.
Assessments	Students will teach a mini-lesson on sequential or nested if statements. Students will submit several questions.
In Class	WS 3.10 Teach mini-lessons SC 4.5–6 E 4.3
Reading	4.1 "*Nested If/Else*" and "*Flow of Control*"
Homework	EX 4.4–5

1.12 3.11

Lesson 3.11	*Reducing Redundancy*
Objectives	Students will simplify code and reduce redundancy by factoring if/else statements and testing multiple conditions simultaneously.
Assessments	Students will complete a class competition.
In Class	Refactoring competition
Reading	4.1, "*Factoring If/Else Statements*" and "*Testing Multiple Conditions*"
Homework	Outline ch 4 (omit 4.4, 4.5)

1.13 3.12

Lesson 3.12	*Cumulative Algorithms*
Objectives	Students will find and correct syntax errors in conditional cumulative algorithms.
Assessments	Students will write, modify, and correct programs written by others.
In Class	Tally code on board Collaborative Programming Exercise WS 3.12
Reading	4.2
Homework	PP 4.2

1.14 3.13

Lesson 3.13	*while Loops*
Objectives	Students will trace while loops to predict (1) the number of times the body executes and (2) the output of the code. Students will be able to differentiate between while loops, if statements, and for loops.
Assessments	Students will complete questions.
In Class	SC 5.1–4 E 5.2 WS 3.13
Reading	5.1 (skip "*Do/While Loops*")
Homework	EX 5.2

1.15 3.14

Lesson 3.14	*Random Numbers*
Objectives	Students will be able to write expressions that generate a random integer between any two values.
Assessments	Students will complete questions.
In Class	SC 5.5–7 E 5.4–5
Reading	5.1 "*Random Numbers*"
Homework	PP 5.1

1.16 3.15

Lesson 3.15	*Fencepost & Sentinel Loops*
Objectives	Students will be able to describe when to use fencepost and sentinel loops. Students will use proper syntax to construct these control structures.
Assessments	Students will teach a mini-lesson explaining the relationship between parameters and values stored in memory.
In Class	WS 3.15 Teach mini-lessons
Reading	5.2
Homework	EX 5.6,8

1.17 3.16.1

Lesson 3.16	*Boolean Logic (Day 1)*
Objectives	Students will work in pairs to write a game that plays Rock Paper Scissors.
Assessments	Students will submit a program at the end of 2 or 3 class periods.
In Class	SC 5.27, 5.29 WS 3.16 (RPS, Pig) DeMorgan's Law Poster 3.16.1 Poster 3.16.2
Reading	5.3
Homework	Outline ch 5 (through 5.3)

1.18 3.16.2

| Lesson 3.16 | *Boolean Logic (Day 2)* |:----------------|:-----------------------

1.19 3.17

Lesson 3.17	*Finding & Fixing Errors*
Objectives	Students will find errors in their returned homework assignments, and correct their code.
Assessments	Students will re-submit all homework assignments with corrected answers.
In Class	Fix homework
Reading	
Homework	Submit questions for review

1.20 3.18.1

Lesson 3.18	*Consumer Review Lab (Day 1)*
Objectives	Students will complete a long-form lab, using string literals, static methods, if statements, while loops, algorithms, and the String class.
Assessments	Students will complete the College Board's AP CS A Consumer Review Lab. Students will answer end of activty Check your understanding and complete Open-ended activity.
In Class	Lab: Consumer Review Lab Consumer Review Lab Activity 1
Reading	Review ch 3–5
Homework	

1.21 3.18.2

Lesson 3.18	*Consumer Review Lab (Day 2)*
Objectives	
Assessments	
In Class	Consumer Review Lab Activity 2
Reading	
Homework	

1.22 3.18.3

Lesson 3.18	*Consumer Review Lab (Day 3)*
Objectives	
Assessments	
In Class	Consumer Review Lab Activity 3
Reading	
Homework	

1.23 3.18.4

Lesson 3.18	Consumer Review Lab (Day 4)
Objectives	
Assessments	
In Class	Consumer Review Lab Activity 5
Reading	
Homework	

1.24 3.18.5

Lesson 3.18	Consumer Review Lab (Day 5)
Objectives	
Assessments	
In Class	Consumer Review Lab Activity 5
Reading	
Homework	

1.25 3.18.6

Lesson 3.18	Consumer Review Lab (Day 6)
Objectives	
Assessments	
In Class	Consumer Review Lab Activity 5 (day 2)
Reading	
Homework	

1.26 3.18a

Lesson 3.18a	*Alternative Project - Calculator Project*
Objectives	Students will conduct user-centered research, plan and create, and test, evaluate, and share the end product.
Assessments	Students will submit project for end of Unit 3 assessment.
In Class	Students are expected to work on project in class.
Reading	Students are expected to conduct research
Homework	Continue working on project.

1.27 3.18b

Lesson 3.18b	*Alternative Project - Frac Calc*
In Class	Frac Calc

1.28 3.19

Lesson 3.19	*Review*
Objectives	Students will identify weaknesses in their Unit 3 knowledge.
Assessments	Students will create a personalized list of review topics to guide tonight’s study session.
In Class	Review questions WS 3.18 Practice Test
Reading	
Homework	Study

1.29 3.99

Unit 3 Test	*Advanced Data & Control Flow*
Guide	Test 2 Guide
In Class	Test 2 Section I Test 2 Section II

1.30 Abbreviations

- **WS** — Worksheet
- **SC** — Self-Check problem (in the textbook)
- **EX** — Exercise (in the textbook)
- **PP** — Programming Project (in the textbook)

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