Computer Science Scope and Sequence

Six Weeks	Organizing Topic	Classroom Activities/ Assessment	Resources
1	Introduction to the three fundamental variable types… *String, int, double, boolean* Mixed data types, casting Input from the keyboard	Written exercises, daily quizzes online, create programs, participation in web based forums. Teacher observations: Written tests: Online tests: Rubric assessed programming projects:	Textbook: Blue Pelican Java Web site: bluepelicanjava.com
	Decision structures (*if* and *switch* statements)		
	Loops (*for* , *while*, and *do-while*)		
	ASCII codes *char* type manipulation		
2	Decimal, binary, hex, and octal number systems Conversion between the systems		
	Fundamentals of classes and objects		
	Advanced *String* methods		
	Fundamentals of arrays Use of the *Arrays* class		
	Static methods and variables Static imports		
	Wrapper classes Conversion between primitives and wrapper classes Auto-boxing and unboxing		
3	Using *StringTokenizer* (optional)		
	Input from a disk file Formatting (rounding off) Writing to a disk file		
	Bitwise operators		
	Random numbers		
	StringBuffer Class		

	Boolean Algebra DeMorgan's theorem	Written exercises, daily quizzes online, create programs, participation in web based forums. Teacher observations: Written tests: Online tests: Rubric assessed programming projects:	Textbook: Blue Pelican Java Web site: bluepelicanjava.com
4	Using the selection operator		
	Passing by value and by reference		
	Two-dimensional arrays Using the *Arrays* class		
	Inheritance The cosmic superclass		
	Exceptions		
	Interfaces		
	Complexity analysis Big O		
	Recursion Application to classical problems such as the Fibonacci series and factorial		
	Sorting routines Bubble, selection, insertion, quick, merge		
5	*List* interface *ArrayList* *Iterator*/*ListIterator* *Comparable*/*Comparator*		
	HashSet *TreeSet* Flow charts Optimizing for speed (optional)		
6	Singly Linked List The *LinkedList* class		
	Binary Search Binary Search Tree		
	Queues Inner classes (optional)		

	Heaps Priority Queues Lookup tables Hashing	Written exercises, daily quizzes online, create programs, participation in web based forums. Teacher observations: Written tests: Online tests: Rubric assessed programming projects:	Textbook: Blue Pelican Java Web site: bluepelicanjava.com