

JAVA CURRICULUM

Lesson Number	Activity for the day and student expectation
Lesson 1	<ul style="list-style-type: none"> ● Learn key terms for programming <ul style="list-style-type: none"> ○ Algorithm, compiler, operating system, etc. ● Download and install Java Development Kit (JDK) ● Download and install Eclipse editor ● Write your first program
Lesson 2	<ul style="list-style-type: none"> ● Number systems <ul style="list-style-type: none"> ○ Decimal, binary, hex, octal ○ Learn to convert between these systems
Lesson 3	<ul style="list-style-type: none"> ● Style and syntax ● Objects, classes, and packages ● 3 types of errors <ul style="list-style-type: none"> ○ Compile - time, run - time, and logic errors
Lesson 4	<ul style="list-style-type: none"> ● Data types <ul style="list-style-type: none"> ○ int, double, String ○ Creating and declaring variables <ul style="list-style-type: none"> ■ Understand variable cope ● Arithmetic operations <ul style="list-style-type: none"> ○ Understand order of operations ○ Understand assignment operators ○ Casting ● Converting to/from Strings
Lesson 5	<ul style="list-style-type: none"> ● Introduction to branching <ul style="list-style-type: none"> ○ If statement ○ If - else statement ○ If - else if - else statement ○ Understand logical operators and operands ● Loops <ul style="list-style-type: none"> ○ For loop <ul style="list-style-type: none"> ■ Syntax and structure ○ While loop <ul style="list-style-type: none"> ■ Syntax and structure ○ Understand the situations for each loop
Lesson 6	<ul style="list-style-type: none"> ● Introduction to Strings

	<ul style="list-style-type: none"> ○ What kinds of values to Strings hold? ● String processing ● Converting to and from Strings
Lesson 7	<ul style="list-style-type: none"> ● Introduction to objects <ul style="list-style-type: none"> ○ Learn to write classes ● Understand the fundamentals of data encapsulation and information hiding ● Class basics <ul style="list-style-type: none"> ○ Constructor ○ Mutator and accessor methods ○ The toString method ● Control access: public vs private access ● Understand memory references ● Overloaded methods and static methods/fields
Lesson 8	<ul style="list-style-type: none"> ● Intro. to arrays <ul style="list-style-type: none"> ○ Syntax and structure ○ How they work and how their indexes work ● The for - each loop
Lesson 9	<ul style="list-style-type: none"> ● Intro. to 2D arrays <ul style="list-style-type: none"> ○ Syntax and structure ○ How they work and how their indexes work ● How do we travel rows and columns?
Lesson 10	<ul style="list-style-type: none"> ● Practice exam
Lesson 11	<ul style="list-style-type: none"> ● Intro. to inheritance <ul style="list-style-type: none"> ○ Understand polymorphism ○ Understand the “is a” relationship ● Method overriding ● The “protected” modifier ● Know the rules of inheritance <ul style="list-style-type: none"> ○ What can be inherited and what can't?
Lesson 12	<ul style="list-style-type: none"> ● Abstract classes and Interfaces ● Know the rules of abstraction <ul style="list-style-type: none"> ○ When can a class be abstract? ○ When can methods be abstract? ○ How are interfaces and abstract classes different from normal classes?
Lesson 13	<ul style="list-style-type: none"> ● Introduction to array Lists <ul style="list-style-type: none"> ○ Syntax and structure ○ You must learn how all of the methods work

	<ul style="list-style-type: none"> ○ What is the advantage of using array lists over arrays? What is the disadvantage?
Lesson 14	<ul style="list-style-type: none"> ● Magpie Lab
Lesson 15	<ul style="list-style-type: none"> ● Magpie Lab
Lesson 16	<ul style="list-style-type: none"> ● Elevens Lab
Lesson 17	<ul style="list-style-type: none"> ● Elevens Lab
Lesson 18	<ul style="list-style-type: none"> ● Introduction to recursion <ul style="list-style-type: none"> ○ What is divide and conquer? ○ What situations does recursion work well? ○ What is the recursion stack? ○ Advantages of recursion vs. iteration and vice versa.
Lesson 19	<ul style="list-style-type: none"> ● Intro. to algorithms <ul style="list-style-type: none"> ○ What is time complexity? ○ What is big - Oh ○ How to measure the worst case scenario? ● Searching algorithms <ul style="list-style-type: none"> ○ Linear search - how does it work and what is its run time complexity? ○ Binary search - how does it work and what is its run time complexity?
Lesson 20	<ul style="list-style-type: none"> ● Sorting algorithms <ul style="list-style-type: none"> ○ Selection Sort - how does it work and what is its run time complexity? ○ Insertion Sort - how does it work and what is its run time complexity? ○ Merge Sort - how does it work and what is its run time complexity? ○ Quick Sort - how does it work and what is its run time complexity?
Lesson 21	Take the practice AP Exam