Primitives - raw data types

int (32-bits)	short (16)
float (32)	double (64)
char (16)	long (64)
byte (8)	boolean (1)

Wrapper Class - object version of primitive, can convert by un/autoboxing
Literal - represents a primitive value (d, f, ' ', " ", L)

Strings - immutable, final sequence of chars

String Pool	area in Heap that stores String literals to save memory
`String s1 = "hi";` `String s2 = "hi";`	draws from same memory address
`String s3 = new String ("hi");`	stored in heap not pool
StringBuilder	mutable
StringBuffer	+threadsafe

Integer Pool - range -128 to 127

Array - object holding elements of one type

```
int[] numbers = {1, 2, 3};
```
```
int[] numbers = new int[size];
```
```
int[][] 2dArray = new int[rows]-
[columns]
```

Object Class - everything inherits from

`.toStrin-g();`	prints memory address
`.equa-ls();`	checks for same memory address
`.hashCod-e();`	id not guaranteed to be unique

Object - an instance of a class
Class - blueprint for object

Exceptions/Errors

Exceptions/Errors (cont)

`throw`	commands e be thrown useful for testing `throw new Exceptio-nType();`
Create Exception	by extending `Exception` class `public Money Exception{ super("Error Messag-e")};`

```
try{must have try & catch/-
finally not just try}
catch(ExceptionType e){catches+
but only 1 runs}
finally{always executes};
```
Catches go from specific exception to general

Advanced Operators

+ Concat-enation	only operator overloading in Java
% Modulus	returns reminder (7 % 5 = 2)
! Not	returns opposite boolean
++/-- Increment	pre `(println(++5)=6)` post `(println(5++)=5)`
&&/|| And/Or	short-circuit evaluates **one** side
& / | And/Or	evaluates **both** sides
^ Exclusive Or	both cannot be true
? Ternary	(if condition)? return:else return

Access Modifiers

`Public`	all
`Private`	only class
`Protected`	also children
`(Default)`	only package

Scopes - where does reference extend

Class	static
Object	instance
Method	local
Block	local

`Static {block runs at beginning`

File I/O - data access outside JRE

FileInput/OutputSteam	read/write bytes
FileReader/Writer	by characters
BufferedReader/Writer	line by line

```
BufferedWriter bw = new Buffer-
edWriter (new FileWriter(".../-
java/src/main/resources.io.tex-
t"));
```

final Keyword

Class	cannot be extended
Method	cannot be overridden
Variable	cannot change value

Terms

Java	classed-based object-oriented programming (OOP), write once run anywhere (WORA), automatic memory manage-ment, pass by value or copy reference, strong types
IDE	Integrated Development Environment
Linter	auto compiles and catches errors in IDE
Reflection API	allows java to write code at runtime where classes, fields, methods are treated as objects
Recursion	calling a method within itself
Code Coverage	how much reachable tested code

Memory

MetaSpace	unchanging info
HeapSpace	variable content
StackSpace	method calls/variable references

Error	cannot recover from stackoverflow, syntax...	
Checked/C-ompile	cannot compile, compiler sees FiloIO, SQLException...	
Unchecked/Ru-ntime	not required to be handled NullPointer, Arithmetic...	
`throws`	throws e to method caller	

```
when class first accessed,
initialization};
```