# When is a Constructor Called in C++?

* Creation of an object: When an object of a class is created, the appropriate constructor for that class is called. Example: MyClass obj; calls the default constructor.
* Initialization with values: If an object is initialized at the point of declaration, the constructor matching the given arguments is called. Example: MyClass obj(10, "hello"); might call a constructor that takes an int and a std::string.
* Creating a temporary object: Constructors are called when a temporary object is created, often during the evaluation of expressions. Example: functionCall(MyClass(5)); where MyClass(5) creates a temporary object.
* Copying an object: When an object is copied, the copy constructor of the class is called. Example: MyClass obj1 = obj2; uses the copy constructor to initialize obj1 with obj2.
* Assignment of an object: While not a constructor call per se, the assignment operator might create temporary objects which involve constructor calls. Example: obj1 = MyClass(10); might involve the creation of a temporary object.
* Returning an object from a function: If a function returns an object by value, the copy or move constructor is called for the object being returned. Example: return MyClass(); from within a function.
* Inserting into a container: When objects are inserted into standard containers like vectors, maps, etc., constructors are called to handle the objects being stored. Example: std::vector<MyClass> v; v.push\_back(MyClass());
* List initialization: Using brace initialization invokes constructors. Example: MyClass obj{5, "test"}; calls the appropriate constructor.
* Derived class object creation: When an object of a derived class is created, the base class constructor(s) are also called. Example: Creating an object of a class derived from Base triggers Base's constructor.
* Exception throwing and handling: Throwing an exception creates an object that involves calling its constructor. Example: throw MyClass("error");
* Global or static objects: Constructors for global or static objects are called before main() begins. Example: static MyClass obj; at global scope.
* Using new keyword: Constructors are called when objects are dynamically allocated using new. Example: MyClass\* obj = new MyClass();
* Initialization with aggregate type: For aggregate types, constructors are called when using aggregate initialization. Example: struct MyStruct { int x; double y; }; MyStruct s = {1, 3.14};