INTRODUCTION TO MAVEN AND GRADLE
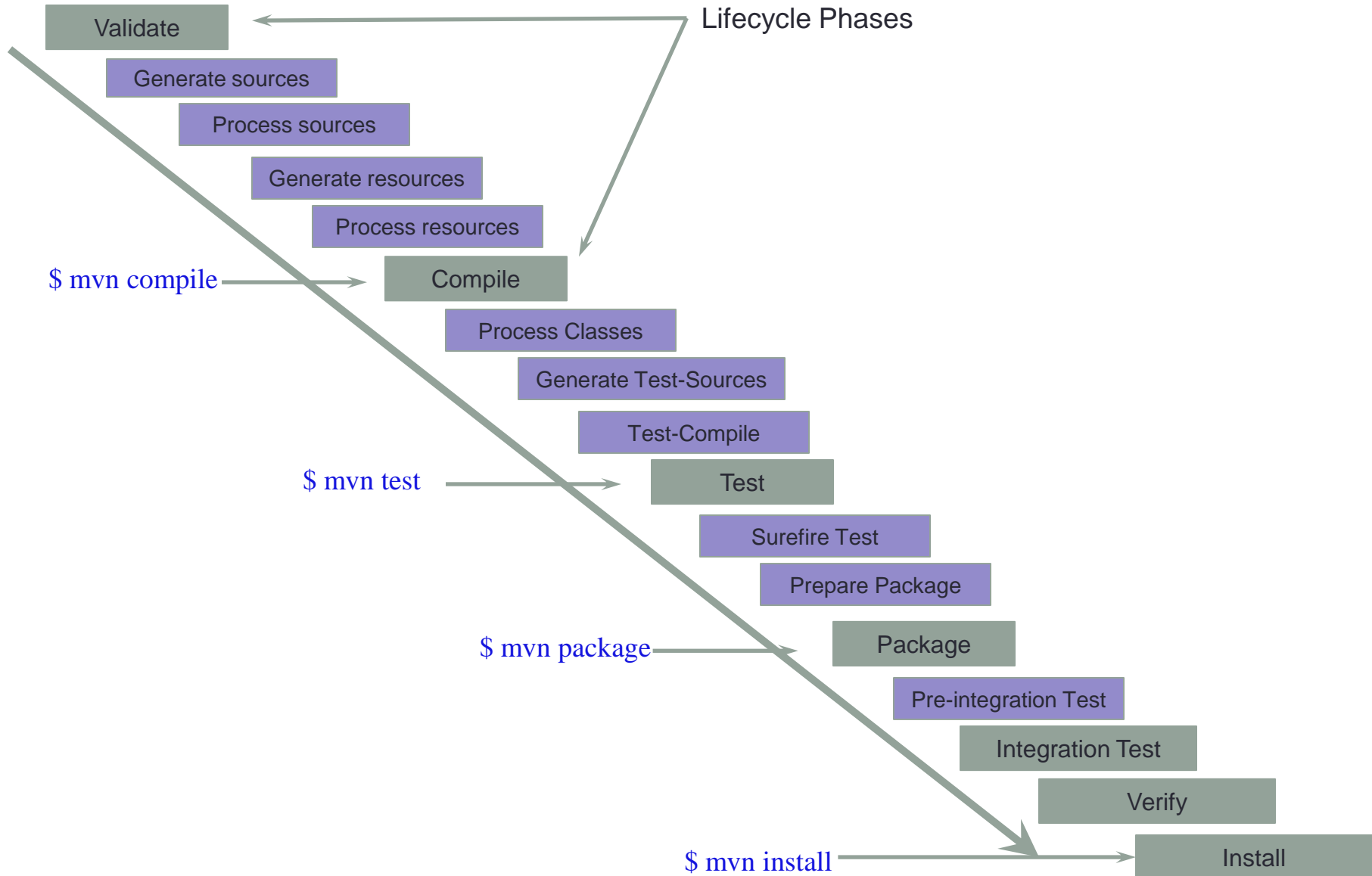
Maven as App Build Automation

- **Apache Maven** is a dependency management and a build automation tool, primarily used for Java applications. **Maven continues to use XML files just like Ant but in a much more manageable way.**

- Maven follows the rule of convention over configuration.

- Simply put, Maven allows us to focus on what our build should do, and gives us the framework to do it. Another positive aspect of Maven is that it provides built-in support for dependency management.

- Maven's configuration file, containing build and dependency management instructions, is by convention called *pom.xml*. Additionally, Maven also prescribes strict project structure, while Ant provides flexibility there as well.

Sample POM.xml file

Here's an example of a *pom.xml* file for the same simple Java project with the *HelloWorld* main class from before:

```xml
<project xmlns="http://maven.apache.org/POM/4.0.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
      http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>
    <groupId>baeldung</groupId>
    <artifactId>mavenExample</artifactId>
    <version>0.0.1-SNAPSHOT</version>
    <description>Maven example</description>

    <dependencies>
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>4.12</version>
            <scope>test</scope>
        </dependency>
    </dependencies>
</project>
```

Build Lifecycle

Validate

Generate sources

Process sources

Generate resources

Process resources

Lifecycle Phases

$ mvn compile

Compile

Process Classes

Generate Test-Sources

Test-Compile

$ mvn test

Test

Surefire Test

Prepare Package

$ mvn package

Package

Pre-integration Test

Integration Test

Verify

$ mvn install

Install

Gradle as Build automation

- **Gradle** is a dependency management and a build automation tool which was built upon the concepts of Ant and Maven.

- One of the first things we can note about Gradle is that it's not using XML files, unlike Ant or Maven.

- This was adopted by Gradle, which is using a **DSL based on Groovy.** This led to smaller configuration files with less clutter since the language was specifically designed to solve specific domain problems. Gradle's configuration file is by convention called *build.gradle.*

- Gradle gave its build steps name **"tasks".**

Sample build.gradle file

- Here is an example of a build.gradle file for the same simple Java project with the HelloWorld main class from before:

```
apply plugin: 'java'
 repositories {
    mavenCentral()
}
 jar {
    baseName = 'gradleExample'
    version = '0.0.1-SNAPSHOT'
}
 dependencies {
    compile 'junit:junit:4.12'
}
```