INTRODUCTION TO MAVEN AND GRADLE
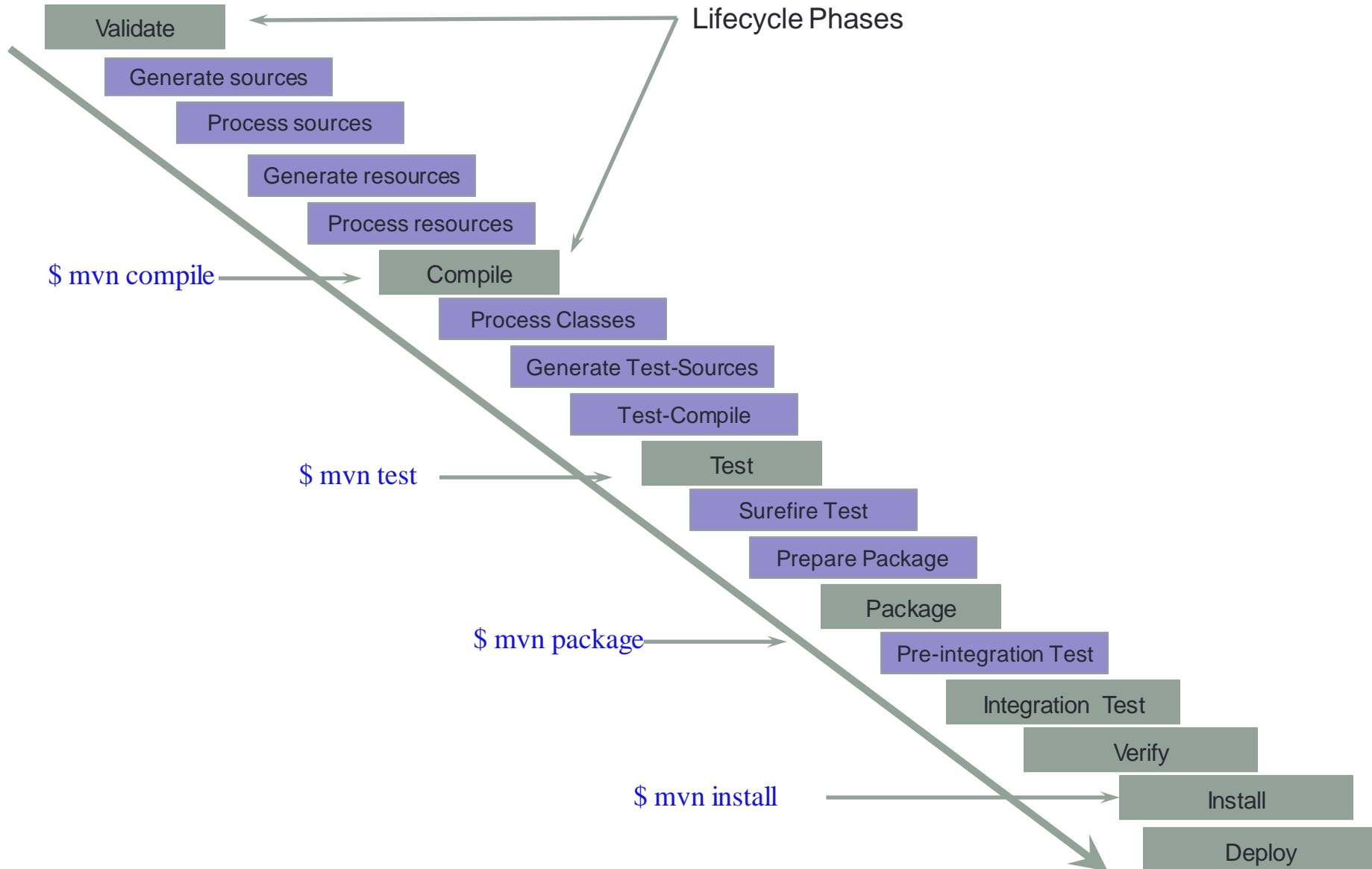
Maven as App Build Automation

- **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

$ mvn compile

Compile

Lifecycle Phases

Process Classes

Generate Test-Sources

Test-Compile

$ mvn test

Test

Surefire Test

Prepare Package

Package

$ mvn package

Pre-integration Test

Integration Test

Verify

$ mvn install

Install

Deploy

Gradle as Build automation

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

- One of the first things we can note about Gradle is that unlike Ant or Maven, Gradle doesn't use XML files.

- Gradle build scripts are written in **DSL based on Groovy.** This leads to smaller configuration files with less clutter since the language is 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'
}
```