

Plumb and Level

Aim: What are the similarities and differences between plumb and level?

Directions: Read the following article and annotate as you read.

Introduction

As carpenters frame doors and windows, or set beams and posts or even install trim, carpenters must be mindful of accuracy in both the horizontal and vertical directions. A vertical framing piece, such as a post or stud, is "plumb" when it's perfectly straight, and when a horizontal member has no tilt, it is "level." The tools that carpenters and homeowners use to determine plumb and level all rely in some way on gravity.



Example of a **water level**. This tool can be used for finding both **plumb** and **level**.

What tools are used for figuring out plumb and level?

The Plumb Bob

The word "plumb" comes from the Latin word "plumbum," which means lead. It came to acquire the meaning "exactly vertical" because one of the original tools for making this determination consisted of a string and a lead weight. This tool, called a plumb bob, is in common use even today, and some carpenters consider it the most

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reliable method for truing objects in the vertical direction. Modern plumb bobs are usually made of brass -- not lead -- and they have a conical shape that tapers to a sharp point at the lower end. Water levels, as seen and used in class, are a modern version of the original plumb bob. Water levels are used to establish whether a piece of material is perfectly vertical. When using a level, always make sure the bubble is perfectly centered between the two lines.

Leveling Tools

The water level is the traditional tool for ensuring that objects have to tilt in the horizontal direction, but it isn't the only one, and it has limitations. It must sit flush on a flat surface for the measurement to be meaningful, so you can't use it to level an object with a curved surface, such as a bathtub or an appliance with a curved top. For this reason, many carpenters pack a laser level; its dead-straight laser establishes a level line from which to take measurements. You can use a laser level that has a vertical beam as well as a horizontal to determine both level and plumb.

Laser Levels

Due to the construction boom in major cities across the country, there's a lot of quality construction work to be done in a short timeline and on a tight budget. With little room in the budget for rework, saving time and labor is crucial to the project meeting deadlines and forecasts. To that end, laser levels are used daily as the go-to tool for contractors when referencing plumb, level, and square.



Contractors used to rely on the bubble vial level also known as a "water level." Most laser levels are self-leveling so the contractor will rest the laser on a flat platform, magnetic bracket, Self leveling laser levels floor stand, or tripod and aim the laser towards the area of the layout.

Example of a **laser level**.

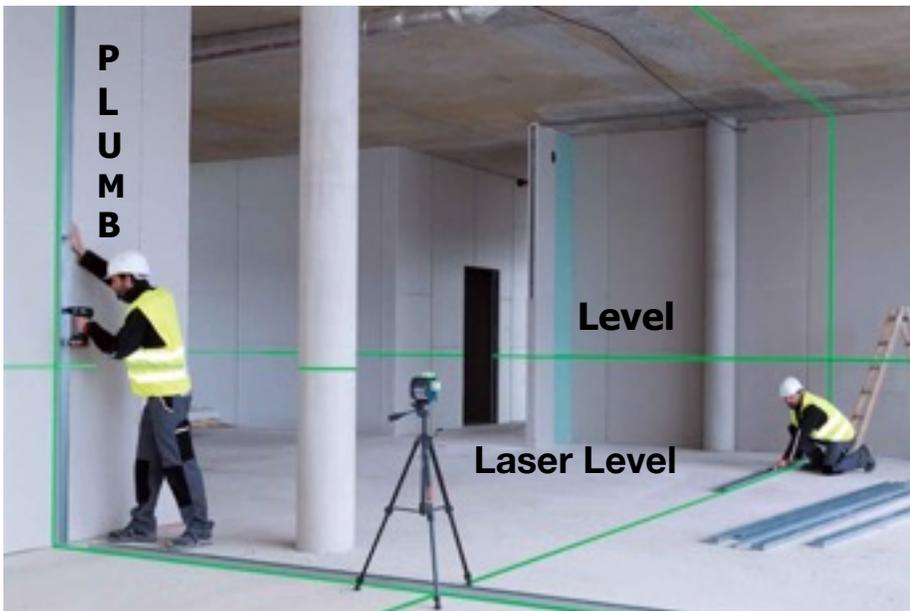
The green line represents the laser line.

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The laser point or line will be visible for most interior applications and the contractor will then mark the point or line to indicate where the material is to be installed. In areas of reduced visibility or longer range, green laser levels or laser detectors can be used to help complete the task. Laser levels drastically improve accuracy and time on the job site by providing a controlled point or line. Consistent checking, measuring, and calculating is replaced with establishing a reference point and setting your laser level to that point.



Example of a **laser level** in use. The **green laser line** can be used to show level and plumb and the same time.

This saves time, and also money, by allowing carpenters to work faster.

Guiding Questions: In your own words, answer each question in five complete sentences. Please use examples from the reading to prove your answers.

1. What are the benefits of a laser level? Why have they become so important in the construction industry?

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2. If you had to choose, would you rather work with a water level or laser level? Explain your answer with examples from the reading.

3. What are the similarities and differences between plumb and level? How are they found? What tools can be used for determining them?