

LEGO Nomenclature

LEGO uses both categories, item names, part numbers, descriptors, and colors to talk about the different parts that they manufacture.

Basic Terms: (https://nostarch.com/download/resources/Supp_LegoBoost_PartList.pdf)

1. Bricks
2. Baseplates
3. Plates
4. Gears
5. Axles
6. Knobs (the universal measurement of most things LEGO)
7. Connectors
 - a. Pinned connectors
 - b. Axle connectors
 - c. Combination connectors
8. Tiles
9. Wheels
 - a. Wheel (hard center part)
 - b. Tire (soft outer part)
10. Specialty pieces
11. Minifig (mini figure)
12. Liftarms
 - a. Straight
 - b. Bent
13. Treads
 - a. Sprockets, drive wheel in a treaded drive system
 - b. Return rollers (on top to help get the tread back to the front)
 - c. Road wheels (support the weight)
 - d. Treads (either individual continuous piece or a set of connected pieces)

Measuring:

1. If it has knobs, it's measured in knobs

This diagram shows the precise measurements of a LEGO plate and brick in millimetres.

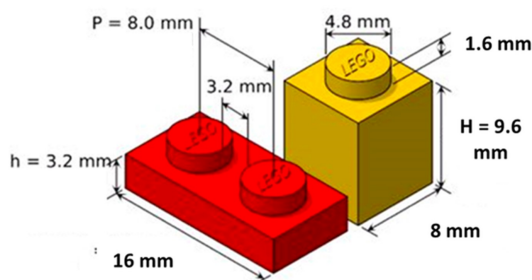


Figure: tipsandbricks.co.uk/post/1418-tips-lego-dimensions-and-units

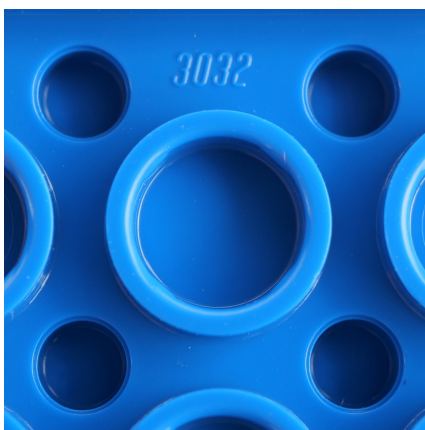
2. If it doesn't have knobs it's measured as a number
 - a. If it has holes (like a liftarm) then it is measured in # of holes
 - b. If it lacks holes (like an axle) then it is measured in length when compared to a set of knobs
3. If it is a gear, it is the number of teeth
4. If it is a tire, it is generally the diameter of the tire and the width of the tread
5. If it is a connector, it is generally the length of the connector (Usually 1, 1.5, 2, 3) but sometimes referred to as "short" (2) or "long" (3)
6. Thickness refers to either the height or thickness of a part.
 - a. Plates are $\frac{1}{3}$ the thickness of bricks
 - b. Bricks are 1 thick and serve as the defacto standard thickness
 - c. Liftarms are 1 thick and thin or 0.5 thick and are equivalent to the width of one knob of lego (so as wide as a 1 knob brick) but not as tall
7. Examples
 - a. So a Brick 2 x 4, is simply a LEGO brick that is 2 knobs x 4 knobs
 - b. A Plate 2 x 8, is a LEGO plate that is 2 knobs x 8 knobs
 - c. A #6 axle is a LEGO Axle that is 6 knob units long
 - d. A #10 technic liftarm is 10 knobs long
8. Note, most people would say 2 x 4 brick, but you'll find it under Brick, 2 x 4 if you are looking for it online.

Finding a part name and where to get them?

LEGO(r) has over 7,000 different bricks and a total of 70,000 different parts to pick from. A lot of these are specialty pieces or pieces that have a particular color scheme or detailed painting or decal attached. So 50 years ago there were just 7 pieces that made up the LEGO minifigs and now there are 14,000 of them to pick and choose from. Which is why we have something like 300 hats to choose from.

So how do you find a part number?

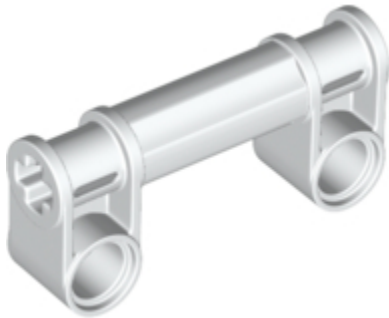
1. You can look on the part. Some parts are large enough to find the part number. Note, the numbers are small and may require additional lighting or a magnifying glass (I use a jeweler's headset myself).



- a. Part number 3032 is in fact a Plate 4 x 6 (note the number is on the back surface in this case). You can also see some cool statistics about the part, like it was first introduced in 1970, weighs 3.3 grams, and has appeared in 2284 different LEGO sets. It also is available in about 30 different colors.
 - b. The day we checked on Bricklink (5/17/2022) there were 59,597 of these for sale, starting at about \$0.01 each.
2. If you know the kit it came from, then go to BrickLink.com and find the kit and look for the inventory for that kit. **Pictures are included** and then you'll be able to see both what the part name is but also the part number.
 - a. Let's look for the Tire and Wheel that comes with the EV3 kit.
 - b. On Bricklink we search for EV3 and find that it came in two basic kits
 - i. The EV3 Core Set (education kit) #45544-1 and
 1. There were 3 additional submodels but all had the 45544 kit as the base of the total package.
 - a. 5003462-1 (Core Set with Software)
 - b. 5003400-1 (Curriculum set)
 - c. 5003464-1 (Homeschool set)
 - ii. Mindstorms EV3 (consumer kit) #31313-1

- c. Click on the “Item Consists of” section under “Parts” to see the full set of parts in the kit.
- d. 45544-1 came with 542 Parts
 - i. Scrolling down we found:
 - 1. Black Tire 56 x 28 ZR Street #41897
 - 2. Light Bluish Gray Wheel 43.2mm D. x 26mm Technic Racing Small, 6 Pin Holes #56908
- e. 31313-1 came with 601 parts
 - i. Scrolling down we found:
 - 1. Black Tire 43.2 x 22 ZR #44309
 - 2. Black Wheel 30.4mm D. x 20mm with No Pin Holes and Reinforced Rim #56145

Here is a horrible example of names that you may have to deal with and why you sometimes need to know what kit it comes from so you can reverse lookup what it is:



Is a ***Technic, Axle and Pin Connector Perpendicular Double with Axle Connector 2L*** (#80910)

Or maybe: this ***Technic, Liftarm, Modified Bent Thick 1 x 11.5 Double*** (#32009)



Some References:

1. <https://usm.maine.edu/stem>
2. https://nostarch.com/download/resources/Supp_LegoBoost_PartList.pdf
3. <https://www.bricklink.com/v2/main.page>
4. <https://education.lego.com/en-us/downloads/retiredproducts/mindstorms-ev3/curriculum>
5. <https://education.lego.com/en-us/lessons>
6. <https://www.cmu.edu/roboticsacademy/roboticscurriculum/Lego%20Curriculum/>
7. <https://www.robot-academy.com/schools/>
8. <https://ev3lessons.com/en/>
9. <https://www.damienkee.com/teacher-resources/>