

LEGO

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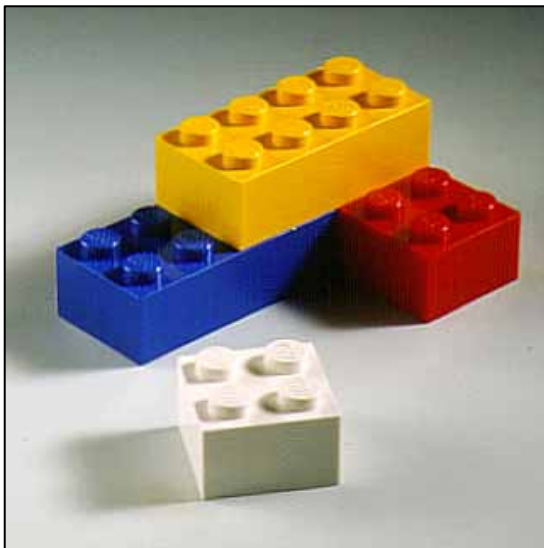
Building Tips

An amateur's technique to building realistic models!

Have you ever looked at a professionally built LEGO model and wondered, "How did they build that?" Well with creativity and practice, building a realistic model out of LEGOs can be a simple task for people of all ages. This article contains 8 steps you can use to help give you an introductory idea for how these life-scale models are imagined, designed on paper first and then built to scale!



Although the LEGO concept was initially designed with young children in mind, the ability to develop complex models fascinates us at all ages. In fact, there are multiple societies, interest groups, competitions, books, even college courses that are focused around LEGO products! Groups like "Serious Play" use LEGOs as a tool to foster creativity and team building skills. Regardless of your background, you are encouraged to become a seasoned LEGO sculptor and use the suggestions in this article as a starting point. We LEGO enthusiasts look forward to hearing from you!



Did you know? With six standard 2 x 4 LEGO bricks, there are 102,981,500 unique assembled combinations.

STEP 1:

Pick an object to model. The best models are items that have basic color patterns and are a solid body. An example of this could be a vehicle, and animal, or a building which are relatively simple to model. A more challenging model would be a bridge or a spherical ball since these models have thin and/or sharply curved surfaces.

STEP 2:

Once a model is chosen, obtain a picture which shows the object in the manner which you plan to model. Note that when building with blocks, orientation does matter! LEGOs are longitudinal with strict aspect ratio options available. Thus, orientate the object in a way where the colors can be displayed longitudinally. Another thing to consider is the structural integrity of the model, if there is a special feature then you will need to orientate the system to allow this. Orientation of the picture to the LEGO grid is one of the most challenging tasks.



We'll use this picture of a parrot (found on the internet). Notice how the object is solid and in the profile direction. The image has a few difficult features such as the beak and color pattern which mandated this orientation.

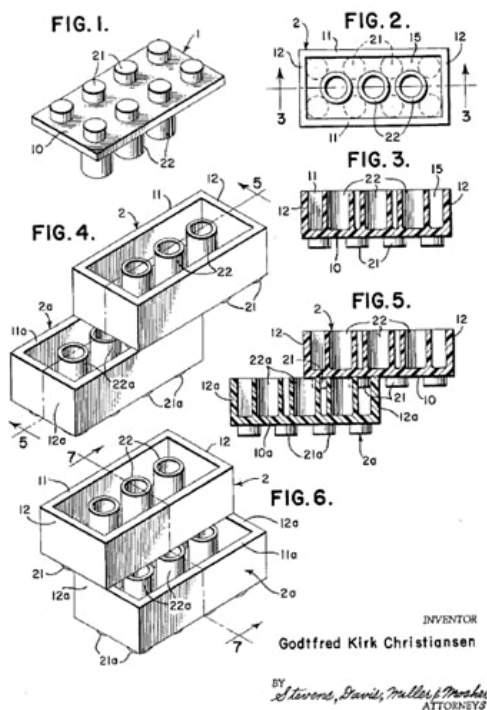
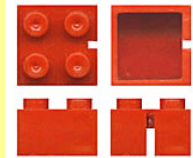


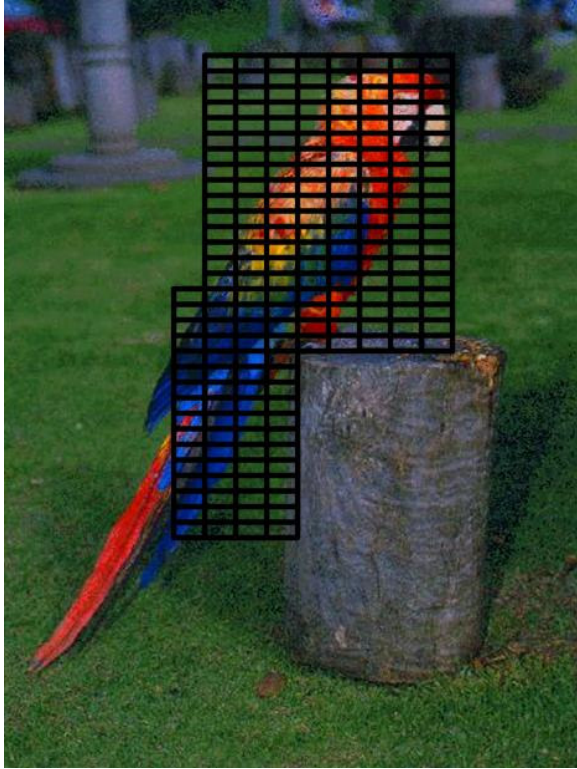
Image from original LEGO patent

A Brief History

The LEGO block first came to life from a small toy Danish company in 1949. The business, known locally as a producer of small wheeled trucks and animals initiated a new type of toy based on a “construction set” concept where the child builds their own toy from a series of standardized pieces.



The LEGO block, built of plastic (instead of wood or metal) enabled simple, colored assembly of identical blocks at a cost effective price. The nature of the toy allows for children to grow with the product and as they mature, so did their models. For this reason, the LEGO product has consistently grown over the last 60 years to become one of the most visible toys on the market and named the *toy of the 20th century*.



Here a transparent grid was placed on top of the object. An aspect ratio of 2:5 was chosen based on having the thin LEGOs available. This grid is set to be fairly coarse for a standard model for simplicity; you may consider making the mesh smaller to improve the model.



Did you know? 'AFOL' is commonly used to refer to: 'Adult Fan Of LEGOs'

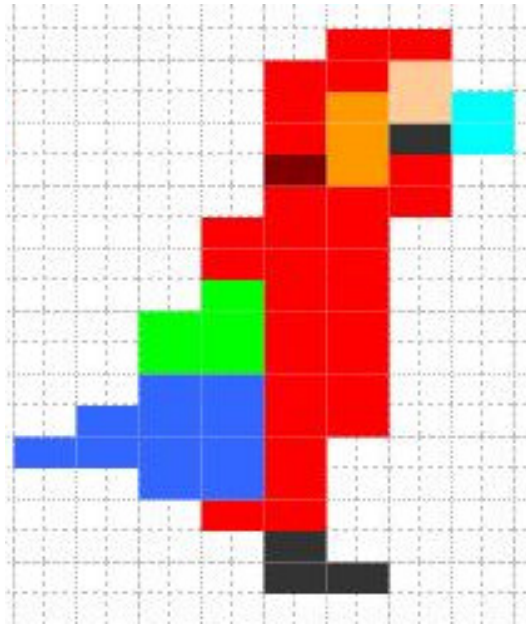
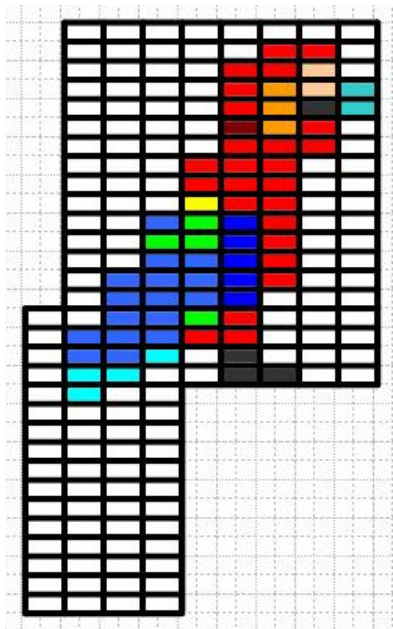
STEP 3:

Place a grid across the picture. The standard LEGO segment has a width to height ratio of 5:6; and with the thin LEGO segment being 2:5. Using these proportions, superimpose a grid on top of the picture and scale it appropriately. The scaling is dependent on the desired size (all LEGO segments are 8mm wide), image detail (edge and color) of the planned model and the quantity of available LEGOs. Make sure that the entire image is covered with the grid as they will be left out.

Did you know? Seven LEGO sets are sold every second around the world.

STEP 4:

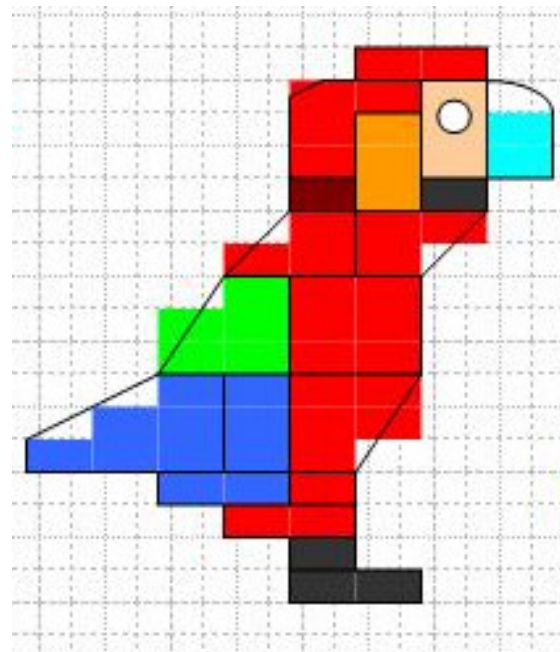
Now that the grid is placed, fill in each rectangle with a color that best represents that segment of the image. Although this step is straight forward, there is a lot of finesse which should be taken to ensure that the colors chosen are available and do not over dominate the image. (See figure on the next page).



The figure on the left shows the color assignments that were selected from the picture. Note how the long tail was not modeled in full due to difficulties in determining color and structure. Based on the preference of the LEGO creator, the model would like to be self supporting on its feet, therefore a few alterations were made to remove part of the tail. The figure on the right shows the final color scheme for the model. You'll notice that the beak is structurally impossible to assemble into the model, however is crucial to the overall look. To resolve this either the model needs to be enlarged (use a finer grid) or there needs to be multiple layers (3D) incorporated; here the latter is used.

STEP 5:

Now it's time to determine how you will physically build the model using LEGO blocks. With the colored image, draw lines to represent the bricks; (it is helpful to first identify which LEGO bricks are available to you). Keep in mind when working on this step to ensure that the model has structural integrity and a strong base to build off of.

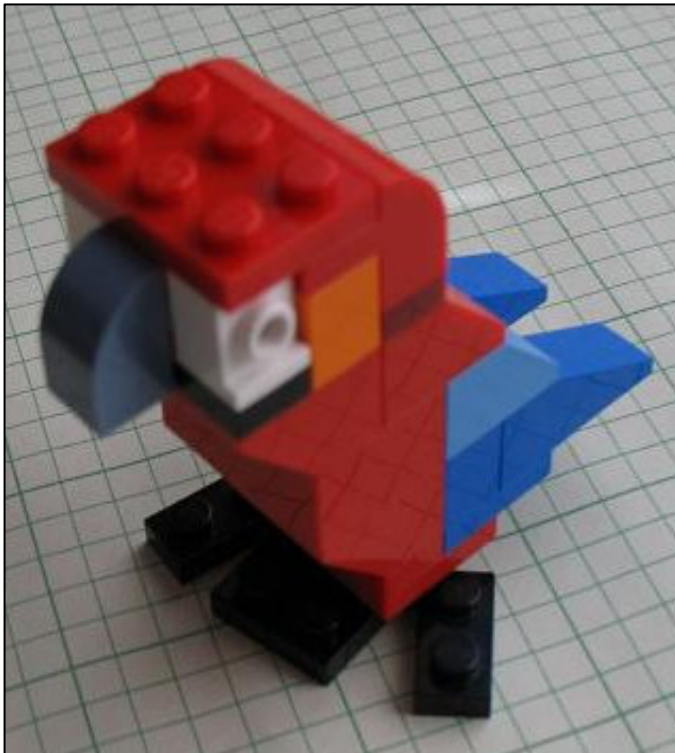


Even at this step, there is still room for small modifications. As an example you'll notice that the custom eye piece pushed the black block down in order to fit.

Did you know? From 1949 to 1996, 180 billion LEGO elements were manufactured.

STEP 6:

Assemble your model! It works well to start from the bottom and work your way up.



The completed model looks great! A few custom pieces were specifically designed into this system including the eye, and beak. There are two unique layers within this where with the central layer having a few subtle modifications from external sides: The feathers were altered and the beak was incorporated which alters the look however was safely hidden between the outer layers. At this point in the design it is never too late to modify the design yet again. As an example, the green block on the tail did not look too great so it was replaced with a light blue color. In addition the thin legs were enhanced to allow the model to stand. Note: LEGOs can now be bought on a per-brick basis on www.LEGO.com.

STEP 8:

Document, disassemble and repeat. Although you have invested significant effort into this model, LEGOs are not meant to stay infinitely fastened.

Did you know? The LEGO word comes from a contraction of the phrase “play well” LEg GOdt in Danish. Incidentally, the Latin meaning of LEGO means “I assemble”

STEP 7:

You’ll notice that this method is 2-dimensional, and that we have created only one layer. From here it now time to make this system three dimensional. For simple models, start with the same color grid and make small changes.

Did you know? The world record for the tallest LEGO structure is 94.5 feet.

References/Notes: The information within this document was written from general knowledge by the author and was supplemented with both published and online content. The parrot model is based on a discontinued model sold by LEGO. This work is not affiliated with LEGO and is intended for general use. The author encourages readers to expand upon this work. Original copies available by request.

Supplement: Here is an example of this method being applied to the NASA emblem. This is one of 5 layers which creates a semi-spherical model in which the lettering is suspended outwards by one segment and the white orbit around the lettering projects outwards in multiple layers to complete the circle. This was created by simply using excel, where the spreadsheet background was set as the image and the cells were adjusted to optimize size, ratio and detail. Finally, a macro was set to label and count the quantity of different LEGO pieces and tallied on a separate spreadsheet..

