Play LEGO® MINDSTORMS® with CATIA V6R2011

Creating Learning Experience in your Classroom

About this Course

Course objectives

This courseware is a secondary education's project-based approach to learning CATIA V6.

The goal of the project is to build a LEGO® MINDSTORMS® Assembly using existing virtual LEGO® MINDSTORMS® parts. The following pages describes how to set-up the CATIA catalog and gives some tips & tricks to facilitate the design process. More tutorials are available on the DS Academic website: *http://campus.3ds.com/news/play-lego-with-catia-v6/*

The CATIA LEGO® MINDSTORMS® catalog brings the construction and creativity inherent to LEGO® MINDSTORMS® into a new and fun virtual experience. It is composed of LEGO® MINDSTORMS® building blocks.

Targeted audience

Educator and Student interested in 3D

Prerequisites

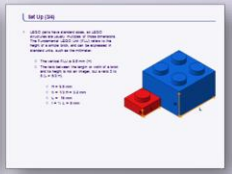
CATIA V6 Fundamentals

30 minutes

How to use this guide/course

This manual uses the following typographical conventions:

Entry page



Theory

Main tools

Hands-on

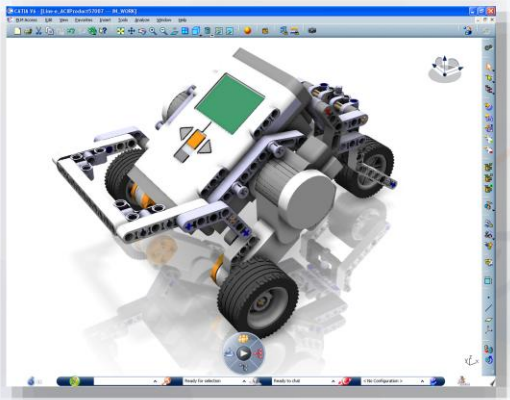
Single click

Double click

Hold button

More information on a specific topic.

Play LEGO® MINDSTORMS® with CATIA V6R2011



Here are the steps to be followed:

1. Before You Begin
2. Catalog Description
3. Import CATALOG
4. Create a New Assembly
5. Open the CATALOG
6. Insert a Part
7. Specification Tree
8. Save Your Assembly
9. More to Explore
10. Academic Certification Program

Before You Begin

- Courseware materials
  - During the course, you will be asked to use some specific files.
  - Before starting this project:
    - Download the LEGO® MINDSTORMS® catalog from the DS Academic website (http://campus.3ds.com/news/play-lego-with-catia-v6/) onto your system.
    - Extract all the zip content in one time in order to keep the original file tree directory structure.
  - You should have a folder named LegoMindstormNXT2catalog on your disk.

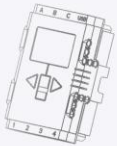
LegoMindstormNXT2catalog
|LEGO_MINDSTORM_Catalog.3dxml

Catalog Description (1/6)

- The catalog is composed of 9 categories

Beam

Gear

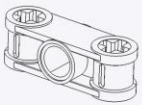


Controller

Sensor and actuator

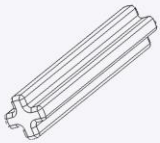
Ball

Connector



Junction

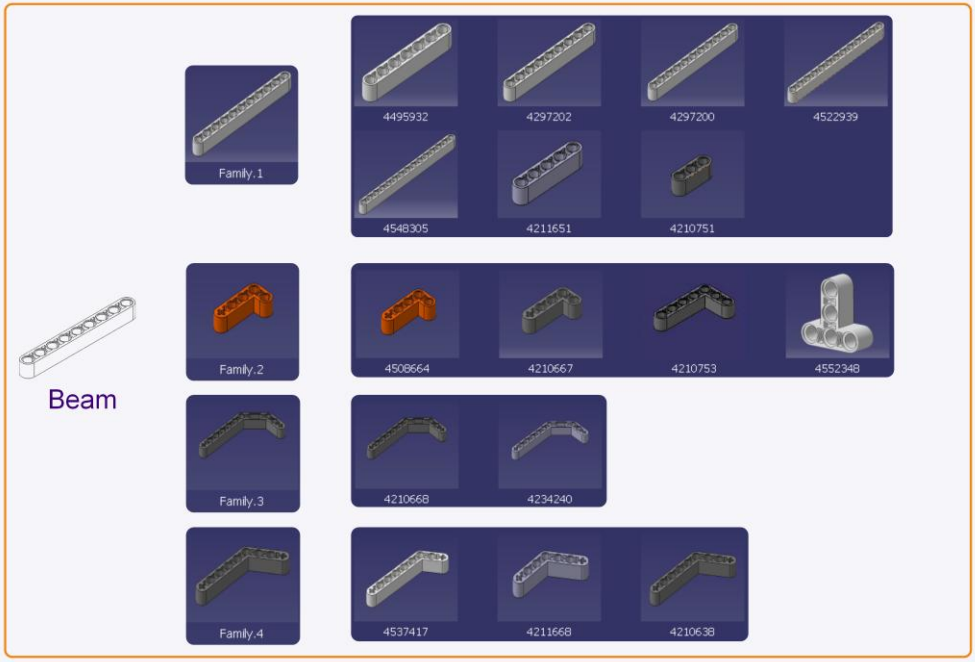
Wheel



Axle

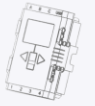
Each category is described in the next slides

Catalog Description (2/6)

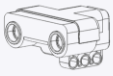


Catalog Description (3/6)

Gear

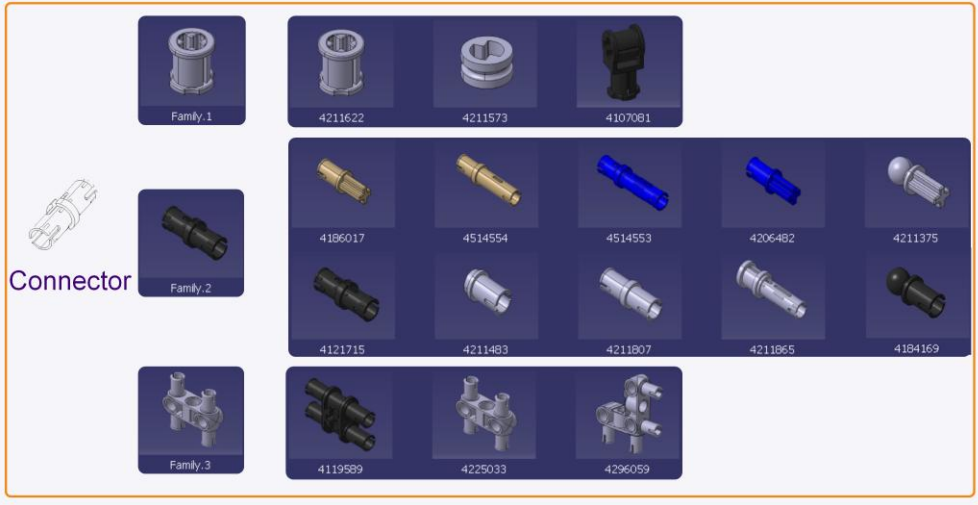


Controller

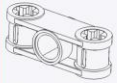


Sensor and actuator

Catalog Description (4/6)



Catalog Description (5/6)



Junction

Wheel

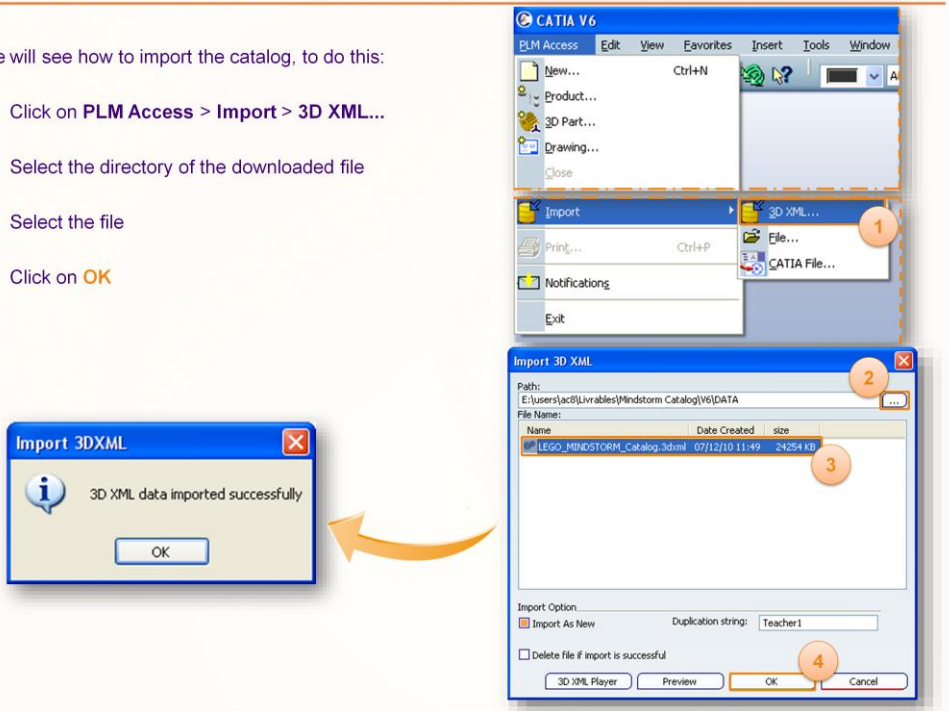
Catalog Description (6/6)

Axle

Import the CATALOG

We will see how to import the catalog, to do this:

1. Click on **PLM Access** > **Import** > **3D XML...**
2. Select the directory of the downloaded file
3. Select the file
4. Click on **OK**



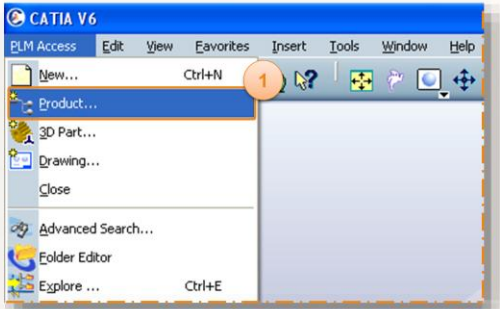
Create a New Assembly

You will start by creating a new Assembly. To do this:

1. Click on **PLM Access > Product...**

2. Name the file My Assembly

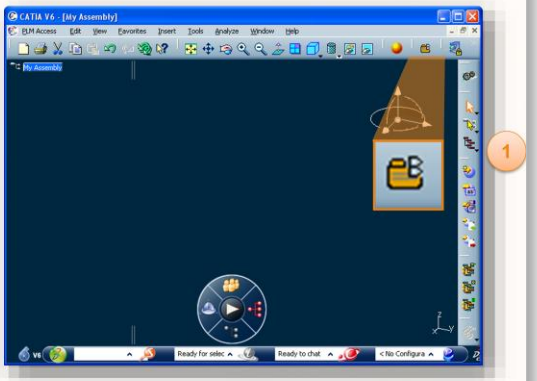
3. Click on **Finish**



Open the CATALOG (1/3)

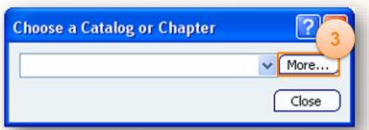
You will open the LEGO® MINDSTORMS® catalog. To do this:

1. Click on **Catalog Browser** icon



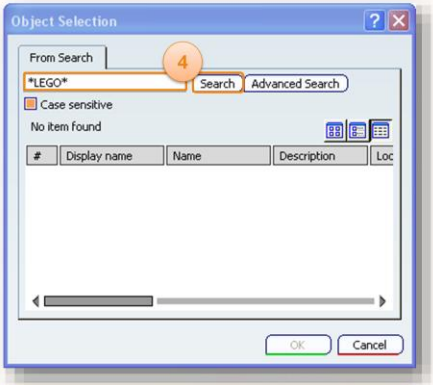
2. Click on **Open a catalog**

3. Click on **More...**



Open the CATALOG (2/3)

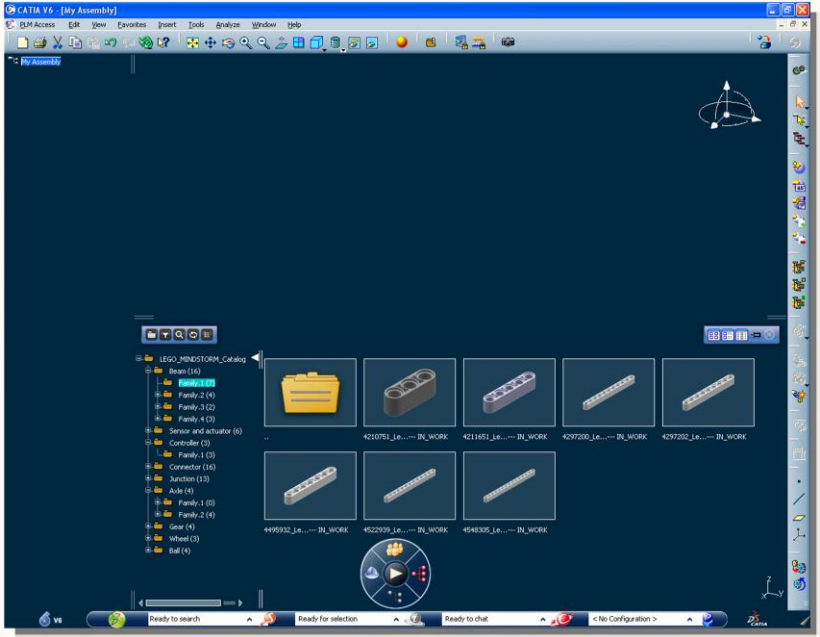
4. Type *LEGO* in the search field and click on **Search**



5. Select **LEGO_MINDSTORM_Catalog** and click on **OK**

Open the CATALOG (3/3)

6. Your catalog is open



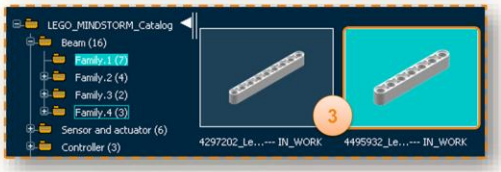
Insert a Part

We will see how to insert a LEGO® part in your assembly, to do this:

1. Double Click to select the **Category**: Beam

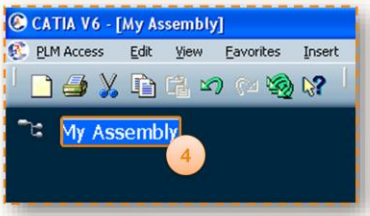
2. Double Click to select the **Family**: Family.1

3. Double Click to select the **Part**: 4495932

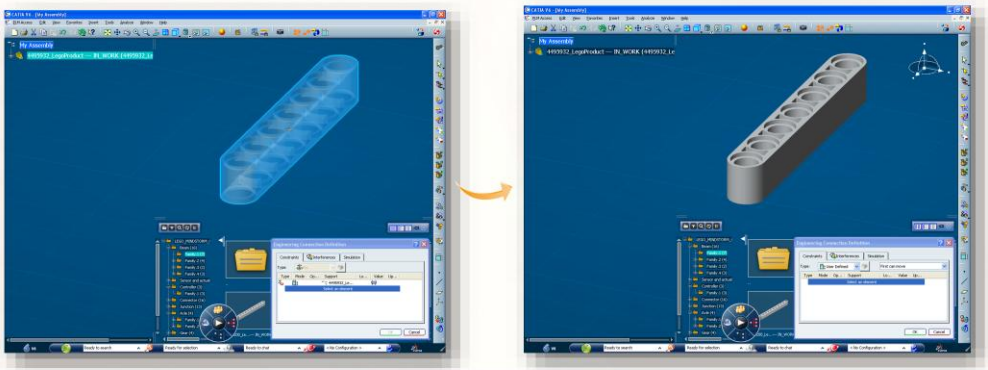


Insert a Part

4. Click on **My Assembly**



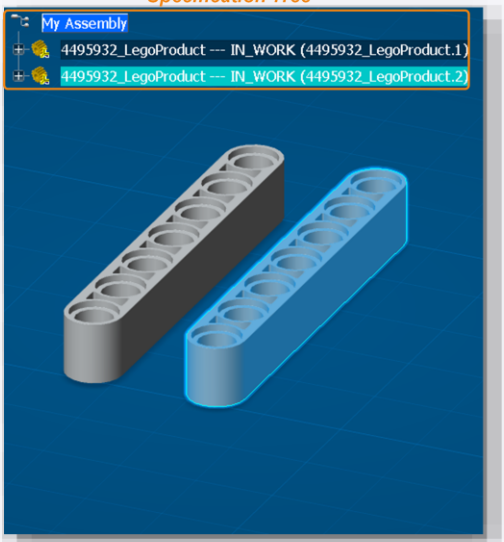
5. Click on the window to position your part



Specification Tree

- The inserted part is linked to the Specification Tree.
- To select a part, you can either select it in the 3D model or through the specification tree.
- An inserted part is an instantiation of the reference part.
- In order to differentiate each part instance, an integer is automatically added at the end of the name of each Part (1, 2, ...)

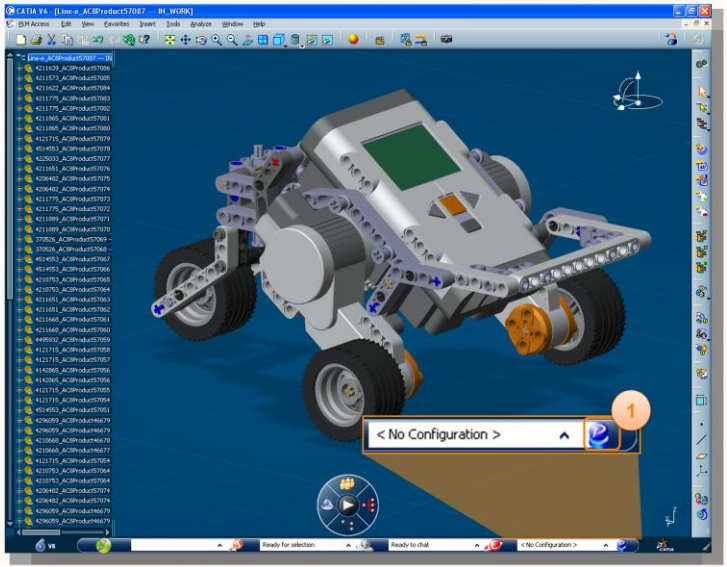
Specification Tree



Save your Assembly

To save your assembly,

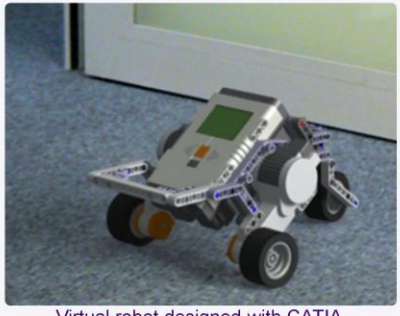
1. Click on **Propagate** icon



More to Explore

- LEGO® MINDSTORM® catalog allows you to design an infinite number of combinations. The only limit is your imagination.
- CATIA is going to help you not only to design but also to:
  - Create realistic rendering images with « Photo Studio Easy tool »
  - Manage kinematics simulation in CATIA Kinematics workbench.
  - Insert 3D in your presentations with the 3D XML based format. 3D XML file can be easily incorporated into documentation, websites...
  - …
- Now, it's your turn to play!

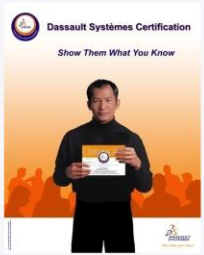
Real robot with LEGO® MINDSTORMS®



Virtual robot designed with CATIA

Academic Certification Program

- Dassault Systèmes proposes to academia an Academic Certification partnership program which allows students to take standard CATIA certification exams at a discounted price.
- This represents a unique opportunity to manage student curricula and boost their technical recognition of the industrial market.
  - Being a CATIA Certified Professional is a great way for students to valorize their competencies on DS products and gain professional recognition in order to obtain better job opportunities in today's competitive industrial world.
  - Dassault Systèmes Academic Certification Partners may also become test centers in order to facilitate registration and delivery of CATIA exams to their students. This is also a great way to expand their influence and reinforce their educational recognition among the academic and the industrial worlds.



http://www.3ds.com/education/certification/academic-certification/