

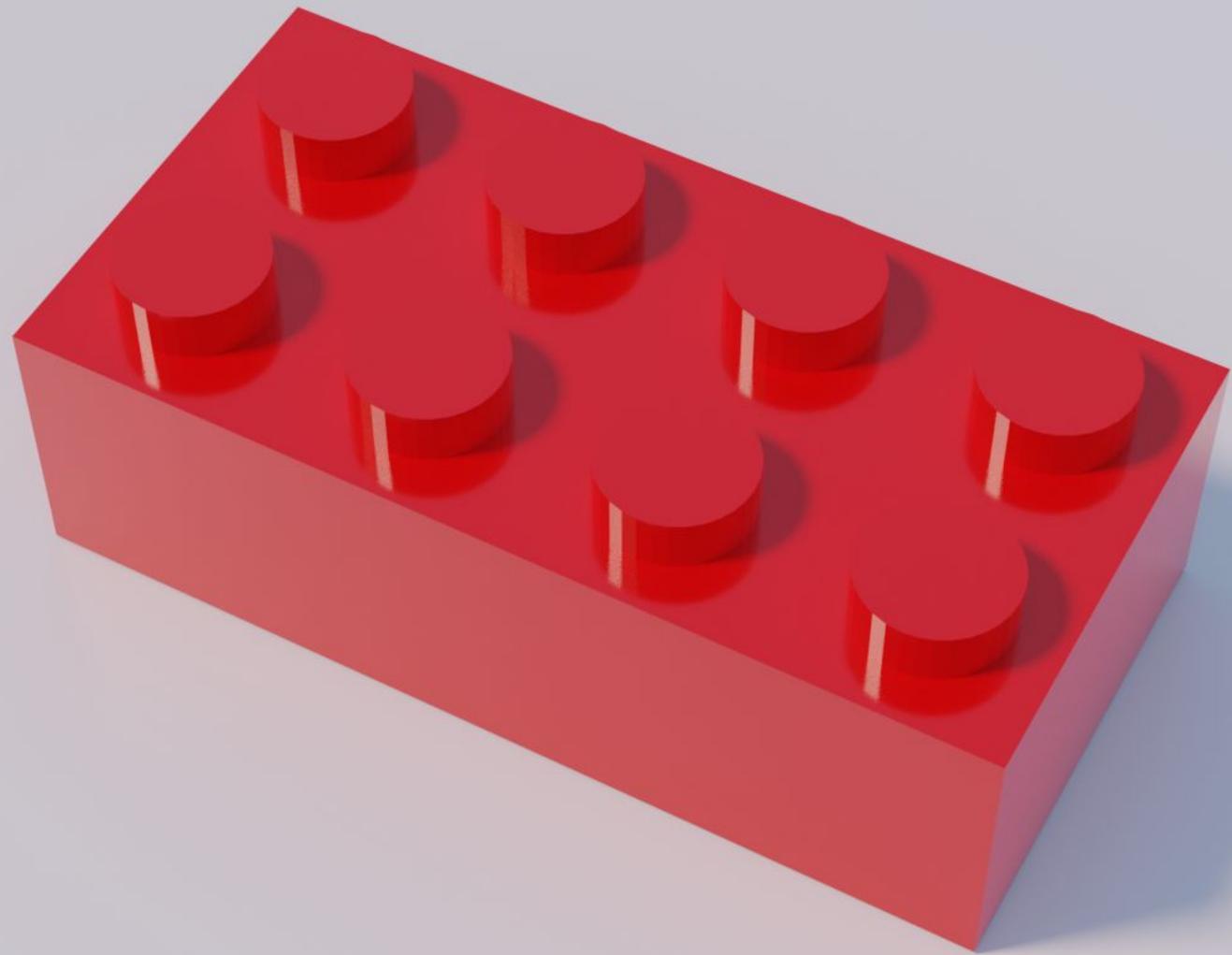
# Basic Design

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Творческая студия

# Точные построения в Blender

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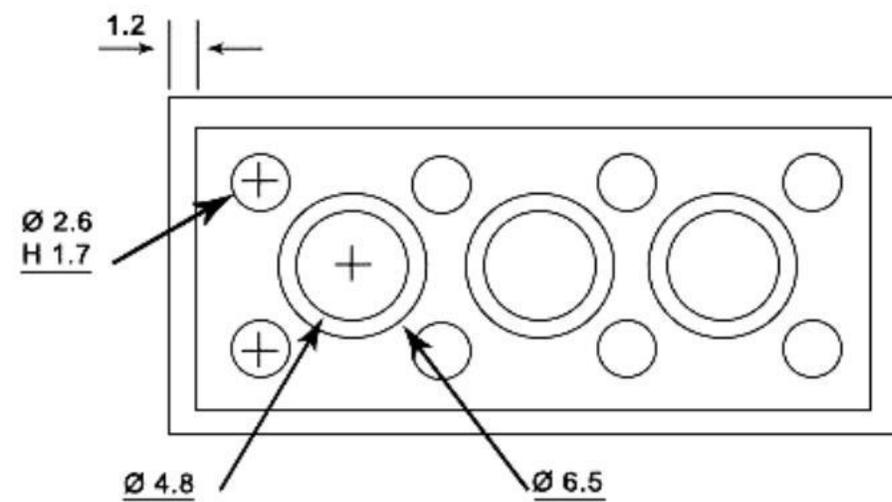
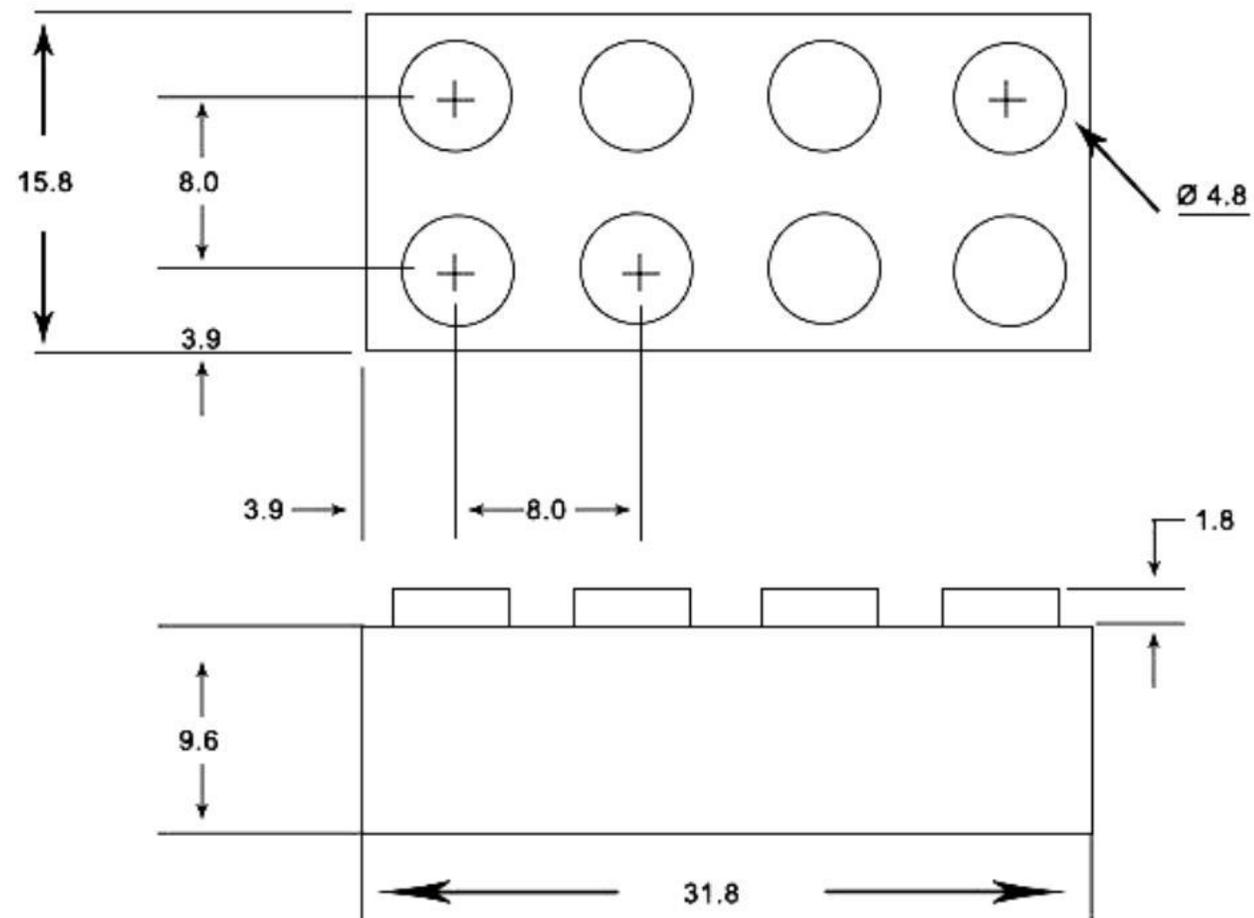
Для точных построений используются **чертежи, схемы, планы.**

**Чертёж** — это графический конструкторский документ, содержащий изображение инженерного объекта (например, детали, сборочной единицы, изделия, здания, сооружения и т. п.), а также данные, необходимые для его изготовления, сборки, монтажа, упаковывания, строительства, контроля и др.

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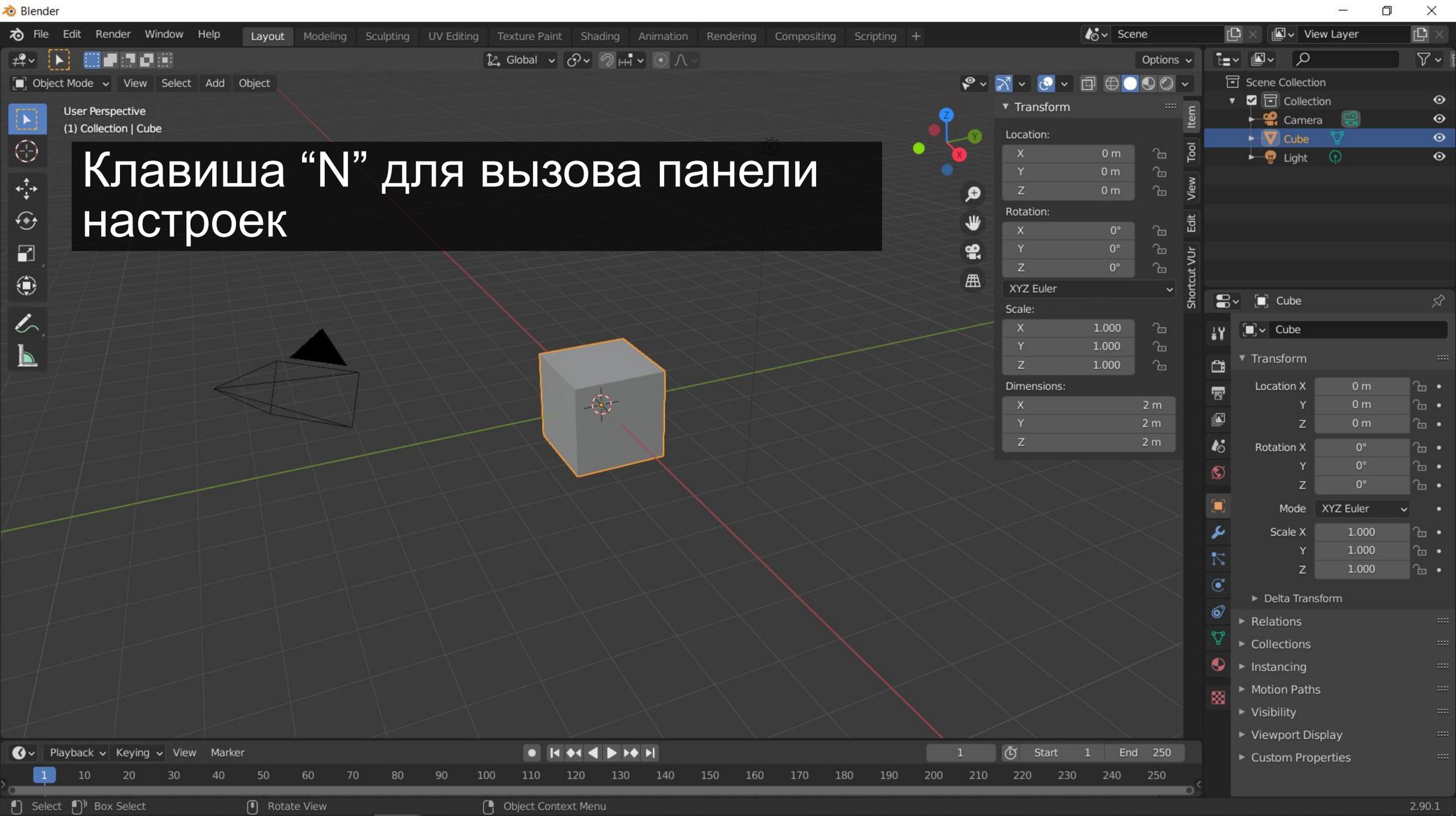
# Работа с чертежом

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# 1. Настроим размеры основной детали

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Клавиша "N" для вызова панели настроек

Transform	
Location:	
X	0 m
Y	0 m
Z	0 m
Rotation:	
X	0°
Y	0°
Z	0°
XYZ Euler	
Scale:	
X	1.000
Y	1.000
Z	1.000
Dimensions:	
X	2 m
Y	2 m
Z	2 m

Cube	
Transform	
Location X	0 m
Y	0 m
Z	0 m
Rotation X	0°
Y	0°
Z	0°
Mode	XYZ Euler
Scale X	1.000
Y	1.000
Z	1.000
Delta Transform	
Relations	
Collections	
Instancing	
Motion Paths	
Visibility	
Viewport Display	
Custom Properties	

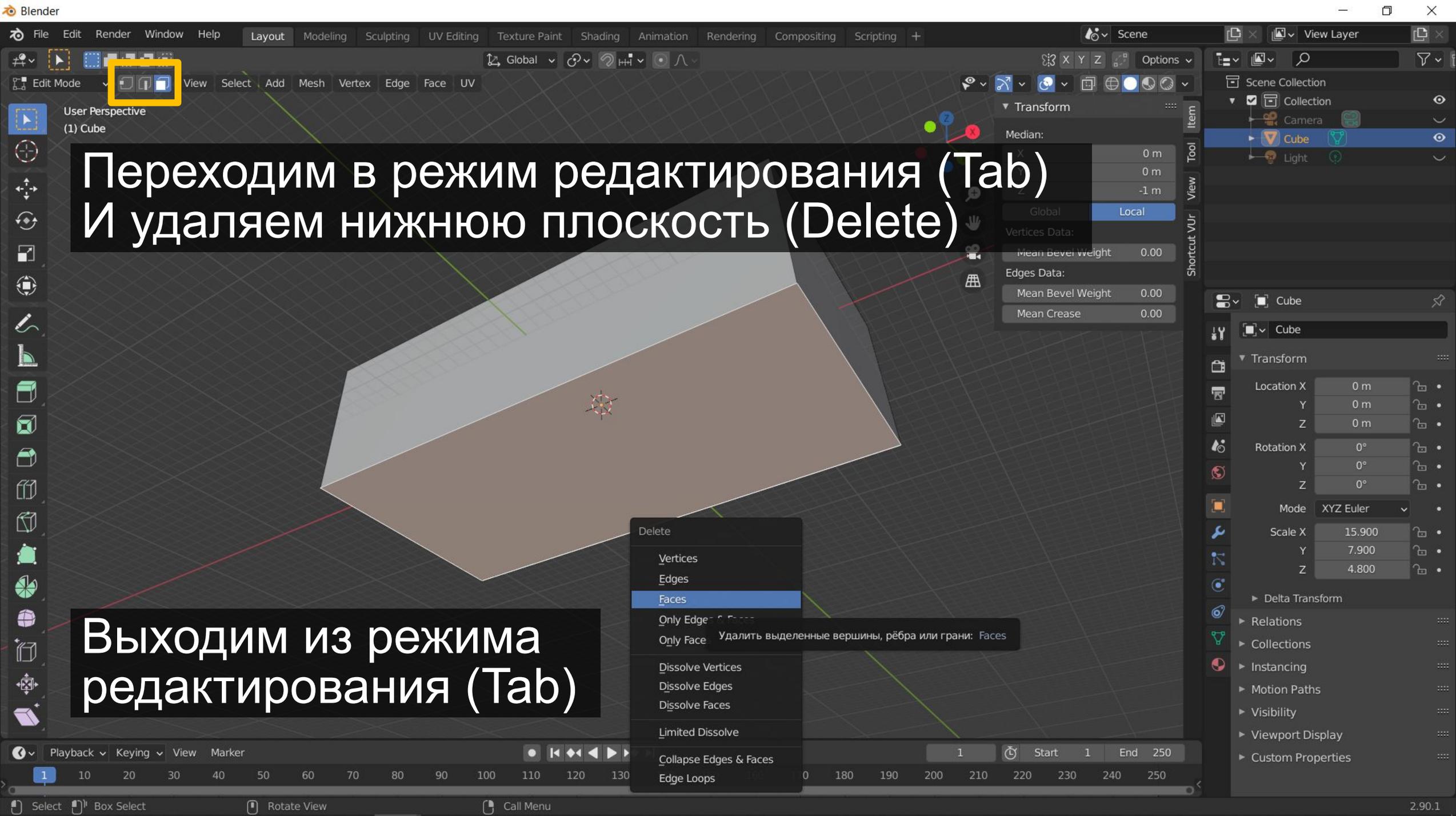
Вносим необходимые размеры

Затем: Ctrl+A – Scale

Dimensions:	
X	31.8 m
Y	15.8 m
Z	9.6 m

## **2. Убираем нижнюю плоскость и настроим толщину стенок**

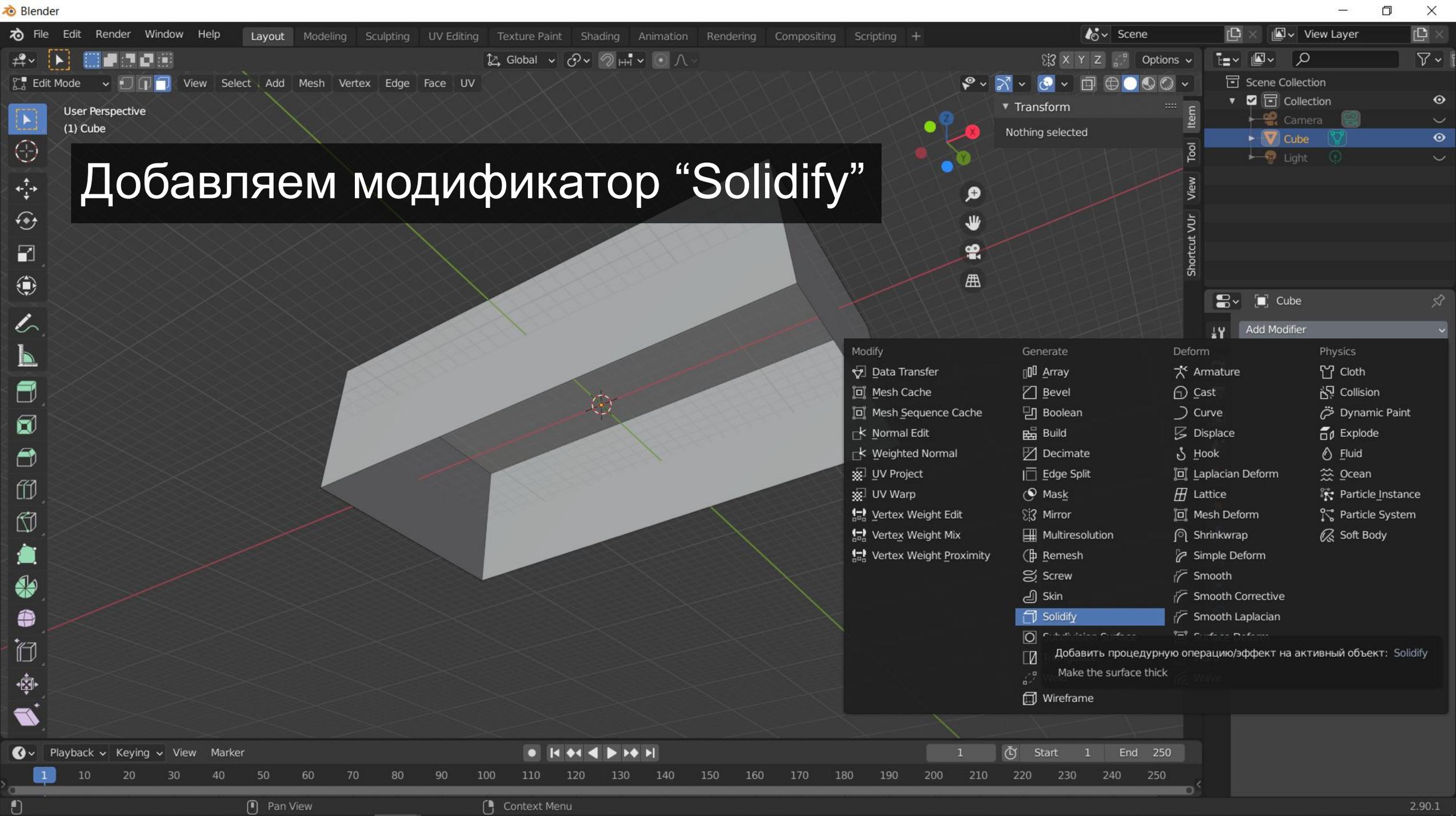
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Переходим в режим редактирования (Tab)  
И удаляем нижнюю плоскость (Delete)

Выходим из режима редактирования (Tab)

- Delete
- Vertices
- Edges
- Faces
- Only Edge
- Only Face Удалить выделенные вершины, рёбра или грани: Faces
- Dissolve Vertices
- Dissolve Edges
- Dissolve Faces
- Limited Dissolve
- Collapse Edges & Faces
- Edge Loops



# Добавляем модификатор "Solidify"

- Modify
  - Data Transfer
  - Mesh Cache
  - Mesh Sequence Cache
  - Normal Edit
  - Weighted Normal
  - UV Project
  - UV Warp
  - Vertex Weight Edit
  - Vertex Weight Mix
  - Vertex Weight Proximity
- Generate
  - Array
  - Bevel
  - Boolean
  - Build
  - Decimate
  - Edge Split
  - Mask
  - Mirror
  - Multiresolution
  - Remesh
  - Screw
  - Skin
  - Solidify
  - Subdivision Surface
  - Wave
  - Wireframe
- Deform
  - Armature
  - Cast
  - Curve
  - Displace
  - Hook
  - Laplacian Deform
  - Lattice
  - Mesh Deform
  - Shrinkwrap
  - Simple Deform
  - Smooth
  - Smooth Corrective
  - Smooth Laplacian
  - Surface Deform
- Physics
  - Cloth
  - Collision
  - Dynamic Paint
  - Explode
  - Fluid
  - Ocean
  - Particle Instance
  - Particle System
  - Soft Body

Настраиваем модификатор

Ctrl+A для применения модификатора

Properties panel for a Cube object:

X	0 m
Y	0 m
Z	0 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	1.000
Y	1.000
Z	1.000

Dimensions:

X	31.8 m
Y	15.8 m
Z	9.6 m

Properties panel for a Cube object, showing the Add Modifier panel:

Mode: Simple

Thickness: 1.2 m

Offset: -1.0000

Even Thickness:

Rim:  Fill

Only Rim:

Vertex Group:

Factor: 0.000

- Normals
- Materials
- Edge Data
- Thickness Clamp
- Output Vertex Groups

# 3. Добавляем шипы (цилиндр)

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# Shift+A – Mesh – Cylinder

▼ Add Cylinder

Vertices	32
Radius	2.4 m
Depth	1.8 m
Cap Fill Type	Ngon
<input checked="" type="checkbox"/> Generate UVs	
Align	World
Location X	-12 m
Y	-4 m
Z	5.7 m
Rotation X	0°
Y	0°
Z	0°

X	-12 m
Y	-4 m
Z	5.7 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	1.000
Y	1.000
Z	1.000

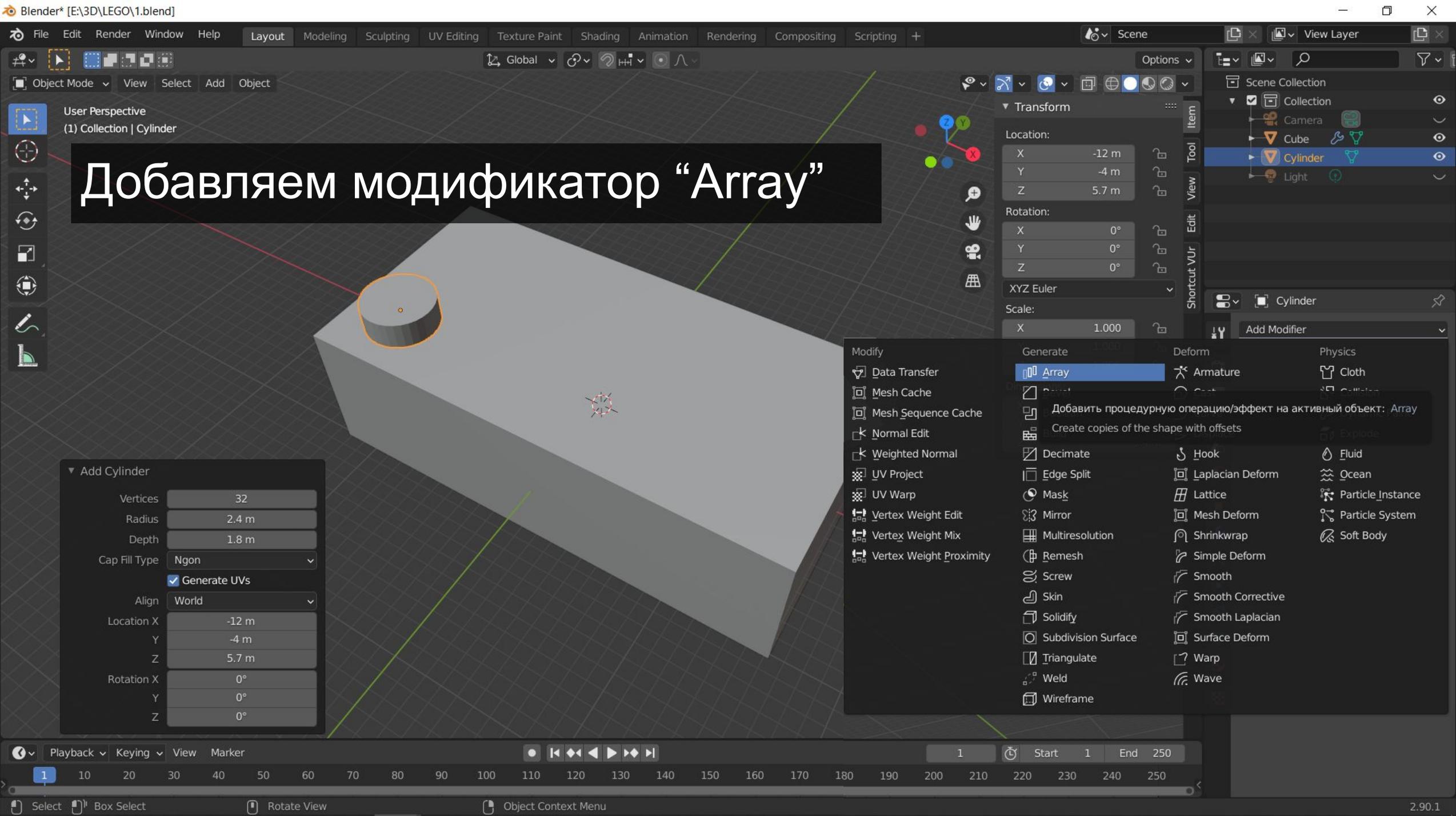
Dimensions:

X	4.8 m
Y	4.8 m
Z	1.8 m

Playback Keying View Marker

1 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

Select Box Select Rotate View Object Context Menu



# Добавляем модификатор "Array"

**Add Cylinder**

Vertices	32
Radius	2.4 m
Depth	1.8 m
Cap Fill Type	Ngon
<input checked="" type="checkbox"/> Generate UVs	
Align	World
Location X	-12 m
Y	-4 m
Z	5.7 m
Rotation X	0°
Y	0°
Z	0°

**Transform**

Location:

X	-12 m
Y	-4 m
Z	5.7 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	1.000
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**Modify**

- Data Transfer
- Mesh Cache
- Mesh Sequence Cache
- Normal Edit
- Weighted Normal
- UV Project
- UV Warp
- Vertex Weight Edit
- Vertex Weight Mix
- Vertex Weight Proximity

**Generate**

- Array**
- Bevel
- Boolean
- Decimate
- Edge Split
- Mask
- Mirror
- Multiresolution
- Remesh
- Screw
- Skin
- Solidify
- Subdivision Surface
- Triangulate
- Weld
- Wireframe

**Deform**

- Armature
- Cast
- Hook
- Laplacian Deform
- Lattice
- Mesh Deform
- Shrinkwrap
- Simple Deform
- Smooth
- Smooth Corrective
- Smooth Laplacian
- Surface Deform
- Warp
- Wave

**Physics**

- Cloth
- Collision
- Explosion
- Fluid
- Ocean
- Particle Instance
- Particle System
- Soft Body

Добавить процедурную операцию/эффект на активный объект: Array

Create copies of the shape with offsets

Add Modifier

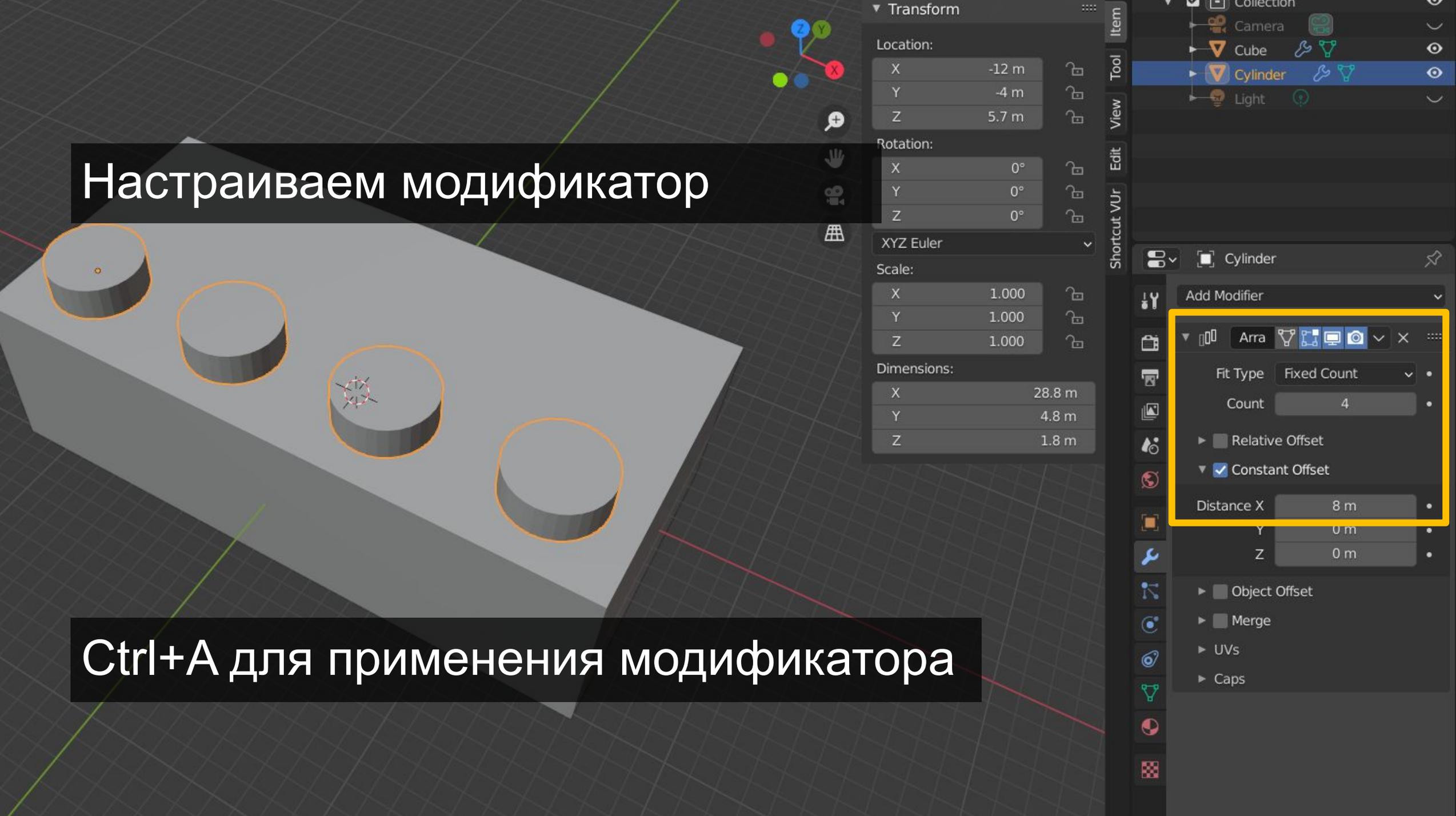
Playback Keying View Marker

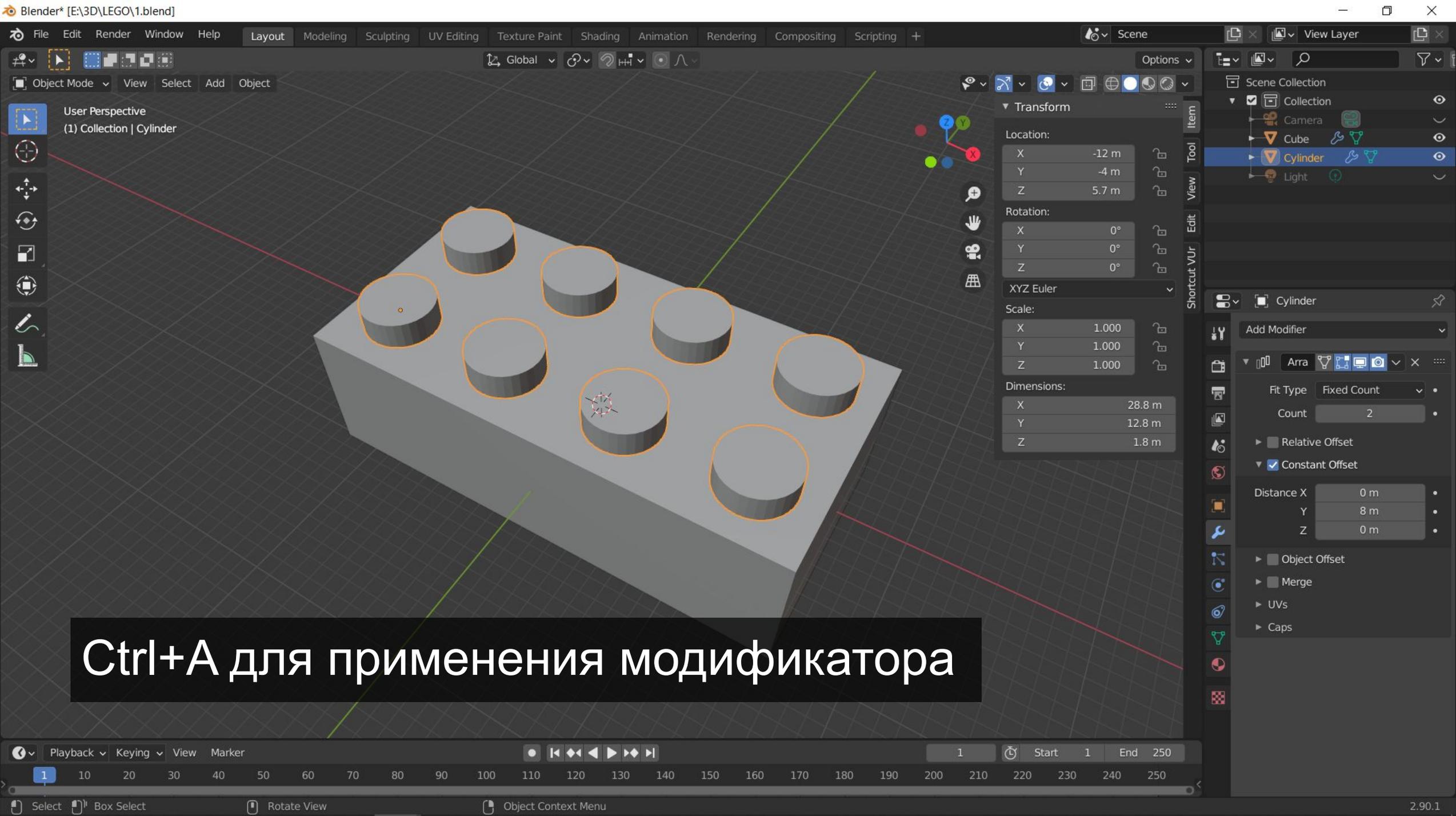
1 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

1 Start 1 End 250

Настраиваем модификатор

Ctrl+A для применения модификатора





Ctrl+A для применения модификатора

Options

▼ Transform

Location:

X	-12 m	🔒
Y	-4 m	🔒
Z	5.7 m	🔒

Rotation:

X	0°	🔒
Y	0°	🔒
Z	0°	🔒

XYZ Euler

Scale:

X	1.000	🔒
Y	1.000	🔒
Z	1.000	🔒

Dimensions:

X	28.8 m	🔒
Y	12.8 m	🔒
Z	1.8 m	🔒

Scene Collection

- Collection
  - Camera
  - Cube
  - Cylinder**
  - Light

Cylinder

Add Modifier

▼ Arra

Fit Type Fixed Count

Count 2

Relative Offset

Constant Offset

Distance X 0 m

Y 8 m

Z 0 m

Object Offset

Merge

UVs

Caps

Playback Keying View Marker

1 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

1 Start 1 End 250

Select Box Select Rotate View Object Context Menu

# 3. Добавляем трубки (цилиндр)

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# Shift+A – Mesh – Cylinder

▼ Add Cylinder

Vertices	32
Radius	3.25 m
Depth	9.4 m
Cap Fill Type	Nothing
	<input checked="" type="checkbox"/> Generate UVs
Align	World
Location X	-8 m
Y	0 m
Z	0 m
Rotation X	0°
Y	0°
Z	0°

X	-8 m
Y	0 m
Z	0 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	1.000
Y	1.000
Z	1.000

Dimensions:

X	6.5 m
Y	6.5 m
Z	9.4 m

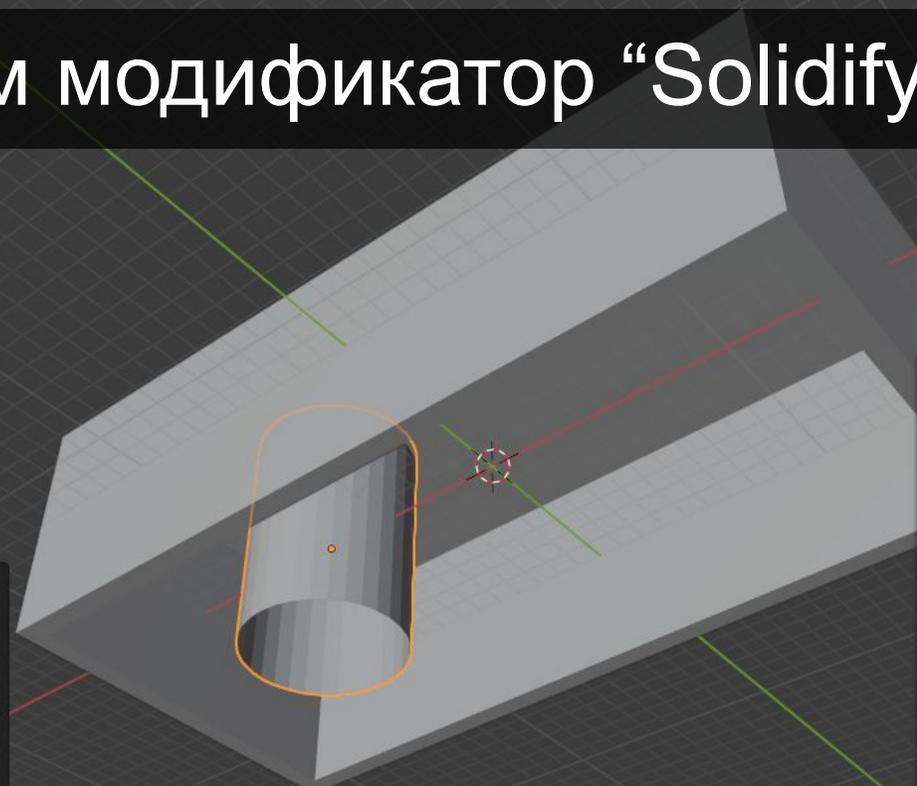
Playback Keying View Marker

1 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

Select Box Select Rotate View Object Context Menu

User Perspective  
(1) Collection | Cylinder.001

# Добавляем модификатор "Solidify"



▼ Add Cylinder

Vertices	32
Radius	3.25 m
Depth	9.4 m
Cap Fill Type	Nothing
<input checked="" type="checkbox"/> Generate UVs	
Align	World
Location X	-8 m
Y	0 m
Z	0 m
Rotation X	0°
Y	0°
Z	0°

▼ Transform

Location:

X	-8 m
Y	0 m
Z	0 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	1.000
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Scene Collection

- Collection
  - Camera
  - Cube
  - Cylinder
  - Cylinder.001**
  - Light

Cylinder.001

Add Modifier

Modify	Generate	Deform	Physics
▼ Data Transfer	▼ Array	▼ Armature	▼ Cloth
▼ Mesh Cache	▼ Bevel	▼ Cast	▼ Collision
▼ Mesh Sequence Cache	▼ Boolean	▼ Curve	▼ Dynamic Paint
▼ Normal Edit	▼ Build	▼ Displace	▼ Explode
▼ Weighted Normal	▼ Decimate	▼ Hook	▼ Fluid
▼ UV Project	▼ Edge Split	▼ Laplacian Deform	▼ Ocean
▼ UV Warp	▼ Mask	▼ Lattice	▼ Particle Instance
▼ Vertex Weight Edit	▼ Mirror	▼ Mesh Deform	▼ Particle System
▼ Vertex Weight Mix	▼ Multiresolution	▼ Shrinkwrap	▼ Soft Body
▼ Vertex Weight Proximity	▼ Remesh	▼ Simple Deform	
	▼ Screw	▼ Smooth	
	▼ Skin	▼ Smooth Corrective	
	▼ Solidify	▼ Smooth Laplacian	
	▼ Subdivision Surface	▼ Surface Deform	
	▼ Добавить процедурную операцию/эффект на активный объект: Solidify		
	▼ Make the surface thick		
	▼ Wireframe		

Настраиваем модификатор

Ctrl+A для применения модификатора

X	-8 m
Y	0 m
Z	0 m

Rotation:

X	0°
Y	0°
Z	0°

XYZ Euler

Scale:

X	1.000
Y	1.000
Z	1.000

Dimensions:

X	6.5 m
Y	6.5 m
Z	9.4 m

Cylinder.001

Add Modifier

Solid

Mode Simple

Thickness 0.85 m

Offset -1.0000

Even Thickness

Rim  Fill

Only Rim

Vertex Group

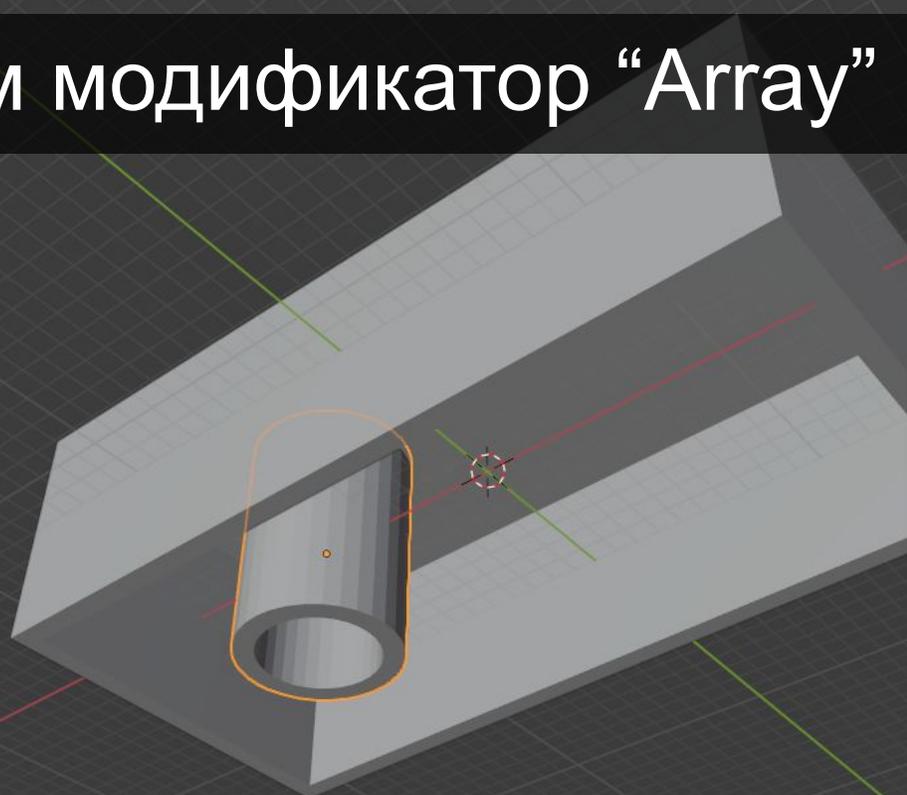
Factor 0.000

- Normals
- Materials
- Edge Data
- Thickness Clamp
- Output Vertex Groups

User Perspective

(1) Collection | Cylinder.001

# Добавляем модификатор "Array"



Modify

- Data Transfer
- Mesh Cache
- Mesh Sequence Cache
- Normal Edit
- Weighted Normal
- UV Project
- UV Warp
- Vertex Weight Edit
- Vertex Weight Mix
- Vertex Weight Proximity

Generate

- Array
- Bevel
- Boolean
- Добавить процедурную операцию/эффект на активный объект: Array
- Create copies of the shape with offsets
- Decimate
- Edge Split
- Mask
- Mirror
- Multiresolution
- Remesh
- Screw
- Skin
- Solidify
- Subdivision Surface
- Triangulate
- Weld
- Wireframe

Deform

- Armature
- Cast
- Hook
- Laplacian Deform
- Lattice
- Mesh Deform
- Shrinkwrap
- Simple Deform
- Smooth
- Smooth Corrective
- Smooth Laplacian
- Surface Deform
- Warp
- Wave

Physics

- Cloth
- Collision
- Explosion
- Fluid
- Ocean
- Particle Instance
- Particle System
- Soft Body

Настраиваем модификатор

Ctrl+A для применения модификатора

X	-8 m
Y	0 m
Z	0 m
Rotation:	
X	0°
Y	0°
Z	0°
XYZ Euler	
Scale:	
X	1.000
Y	1.000
Z	1.000
Dimensions:	
X	22.5 m
Y	6.5 m
Z	9.4 m

Cylinder.001

Add Modifier

Arra

Fit Type Fixed Count

Count 3

Relative Offset

Constant Offset

Distance X 8 m

Y 0 m

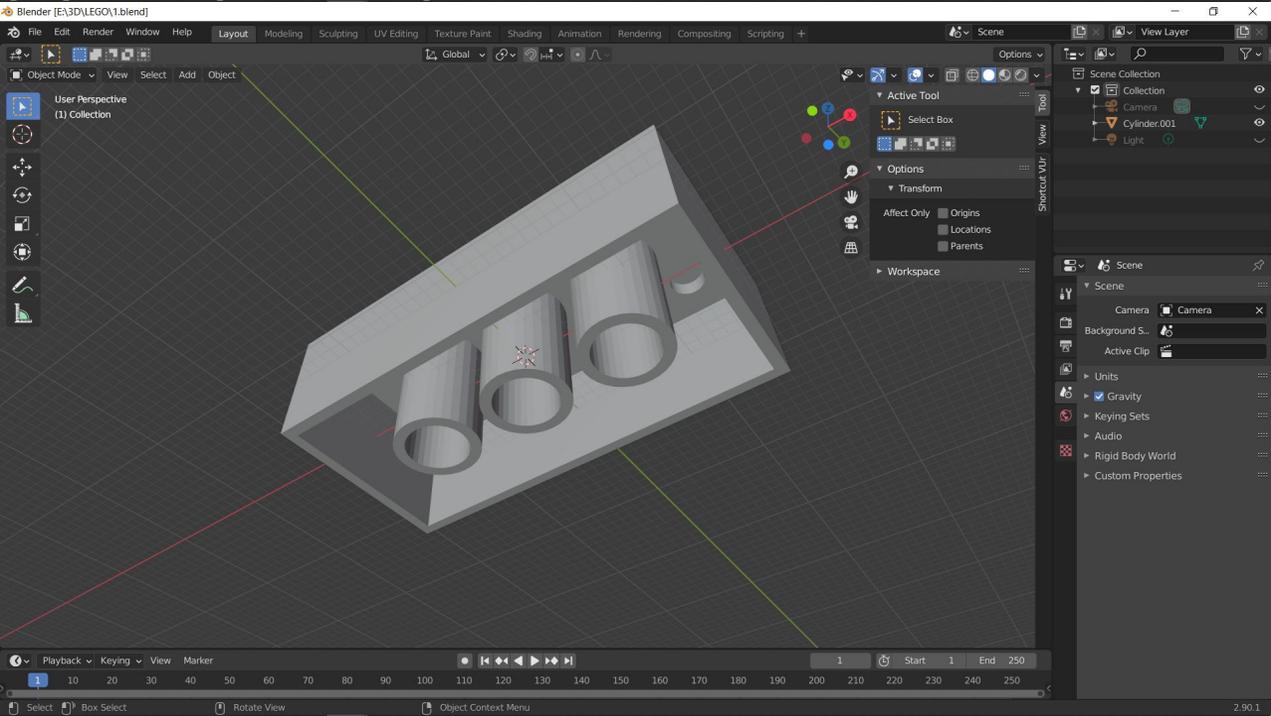
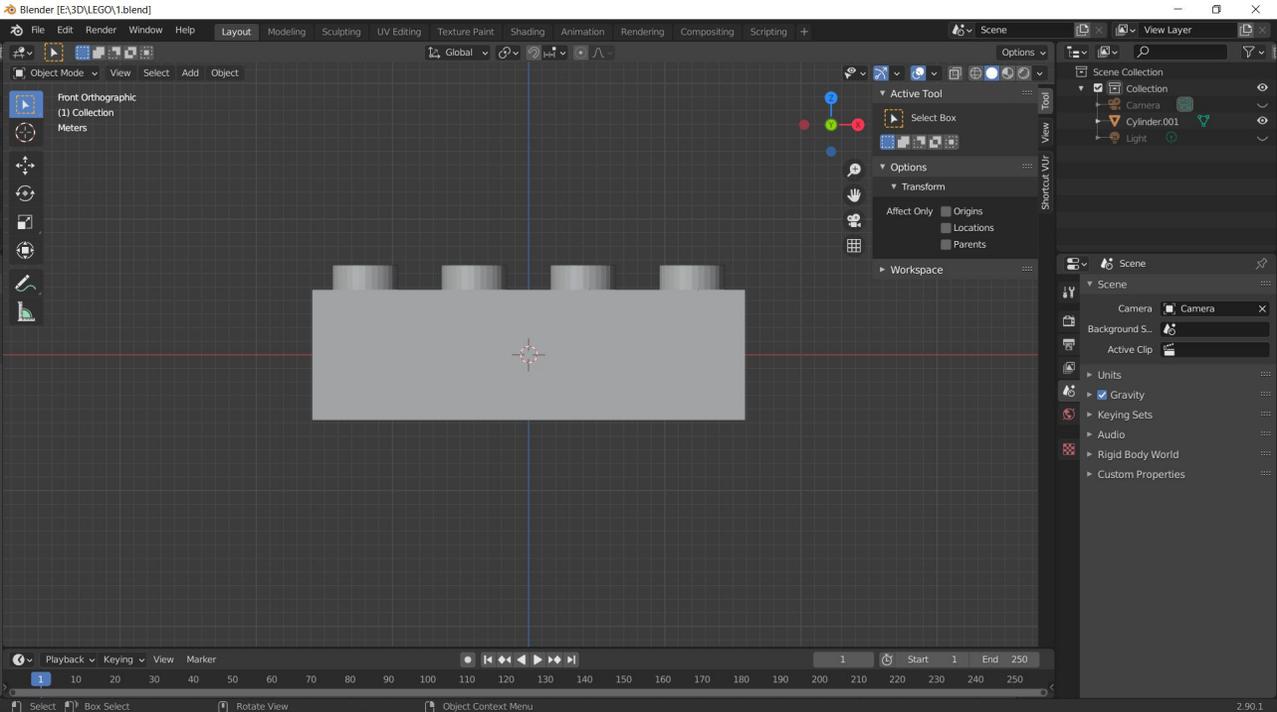
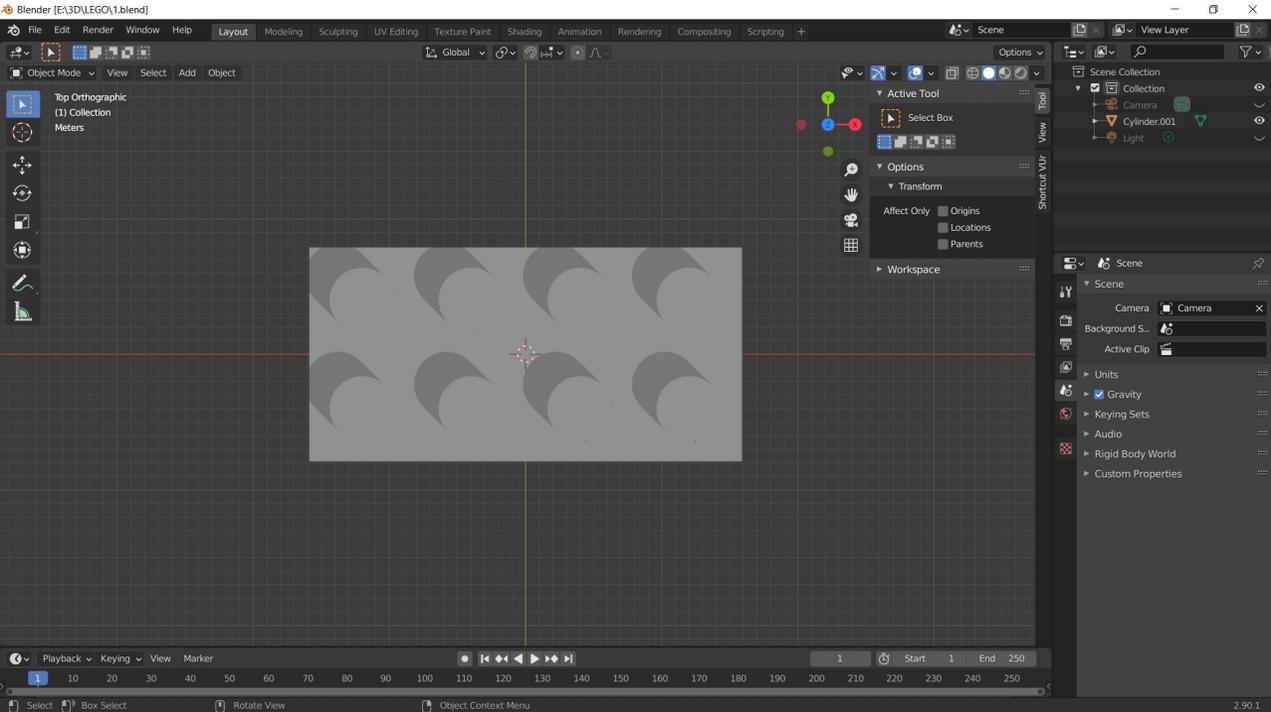
Z 0 m

Object Offset

Merge

UVs

Caps



Готово!

## **Дополнительное задание:**

- настроить материалы и освещение
  - вывести результат в качестве рендера
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