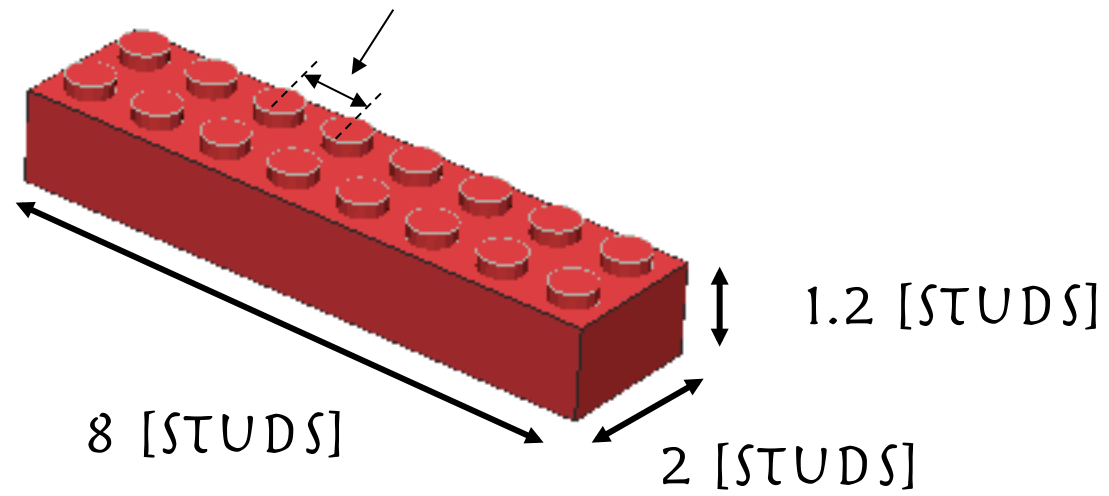


# LEGO Basics

Georgia Tech

## LEGO UNITS

1 STUD LENGTH



## LEGO HEIGHTS

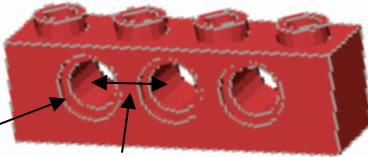
3 PLATES = 1 BRICK HEIGHT = 1.2 [STUDS]



# TYPES OF BRICKS

TECHNIC BRICK

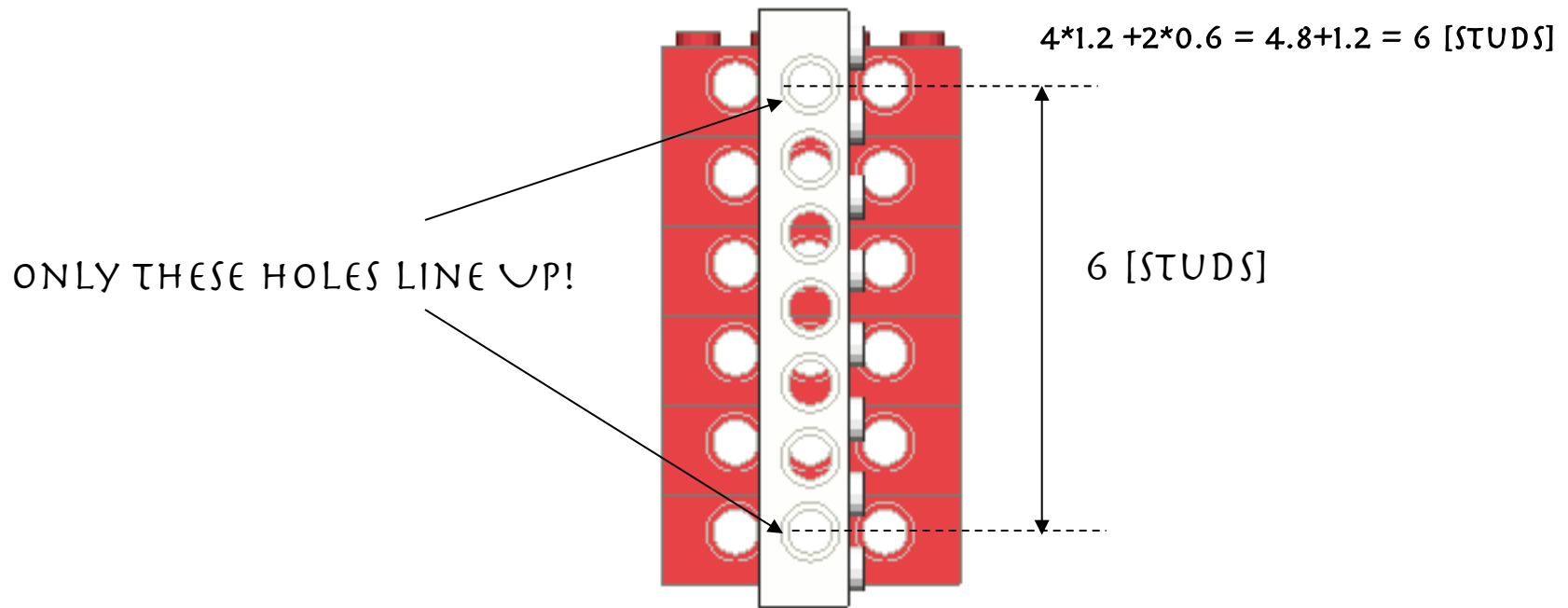
BRICK



HOLES SHIFTED BY 1/2 [STUDS]  
FROM TOP STUDS!

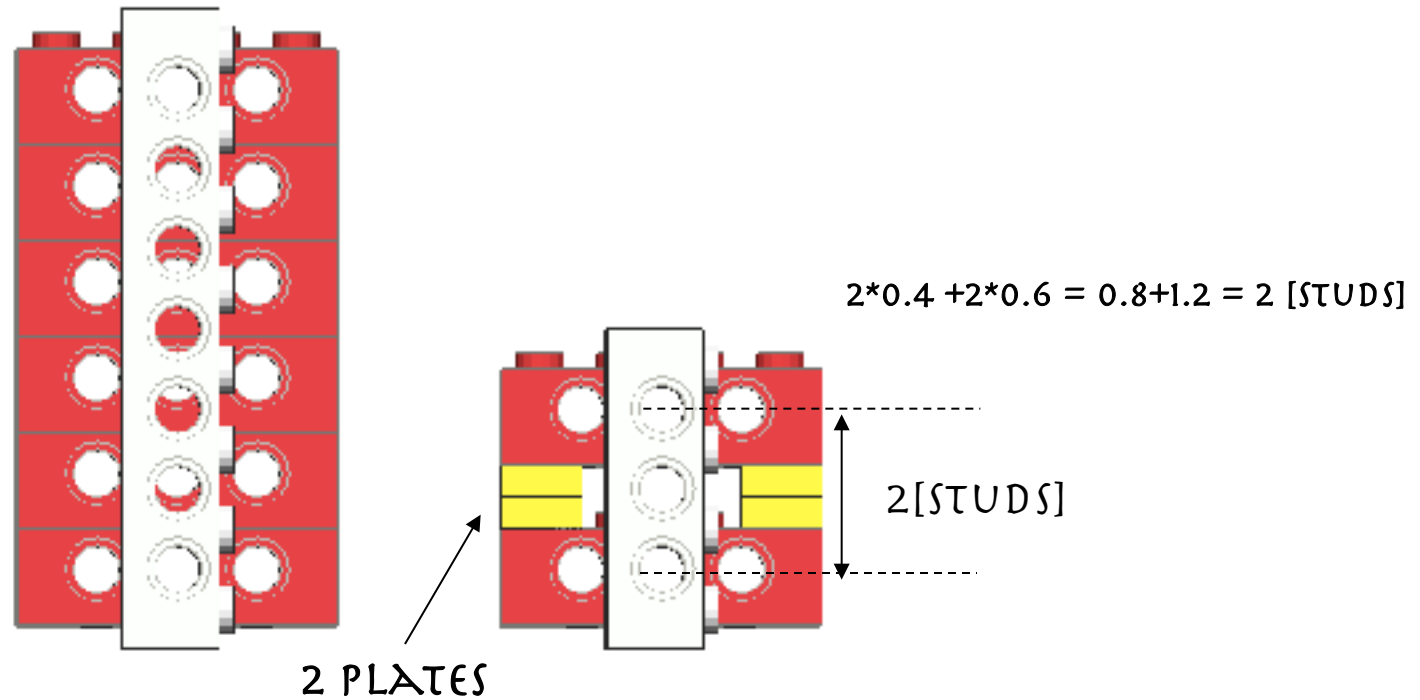
4 STUDS AND 3 HOLES

# ALIGNMENT OF HORIZONTAL/VERTICAL HOLES



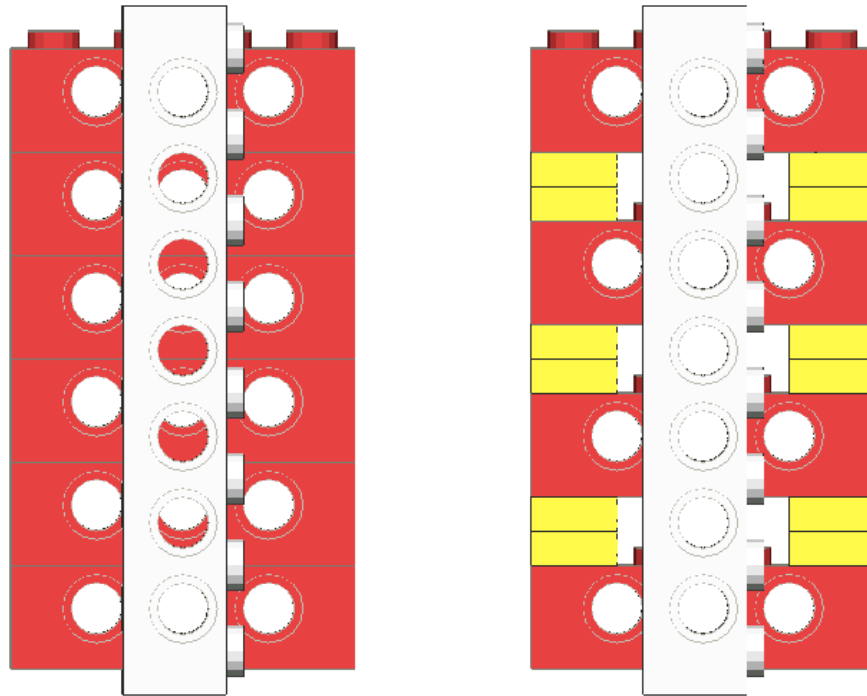
6 BRICKS = EXACTLY 7 HOLES

# ALIGNMENT PATTERNS



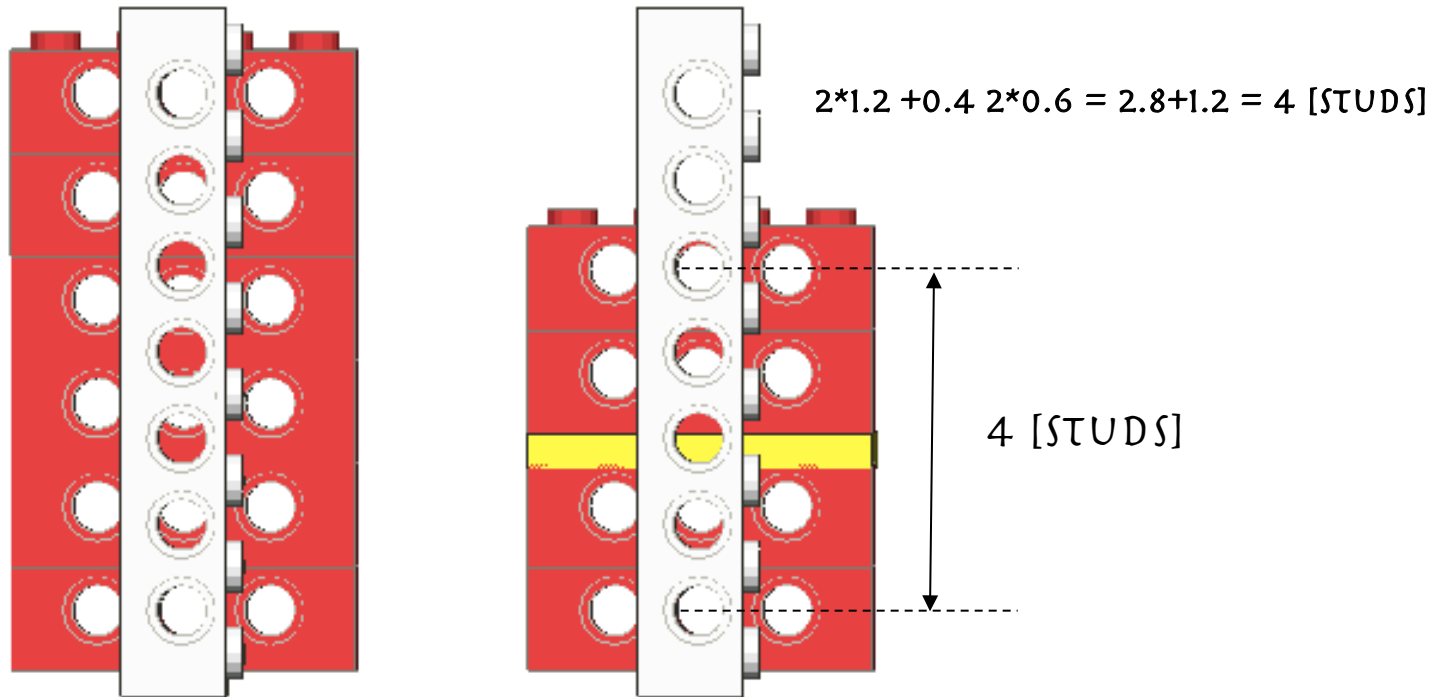
2 BRICKS + 2 PLATES = EXACTLY 3 HOLES

## ALIGNMENT PATTERNS



INSERT TECHNIC PIN EVERY 3 HOLES

## ALIGNMENT PATTERNS



4 BRICKS + 1 PLATES = 5 HOLES



## LEGO CAD AND ONLINE REFERENCE

- DEMO LEGO BRICKSMITH
- PARTS: [GUIDE.LUGNET.COM/PARTSREF](http://GUIDE.LUGNET.COM/PARTSREF)

# LEGO TECHNIC ANGLE CONNECTORS

#1



#2



#3



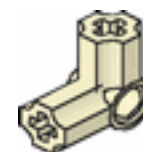
#4



#5



#6



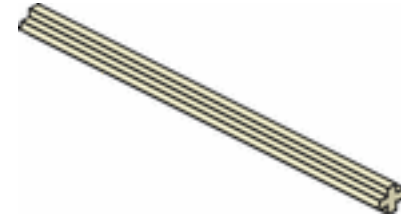
# LEGO TECHNIC AXLE

(NOTCHED)

#2



#8

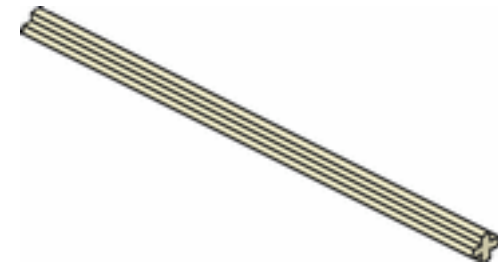


#3

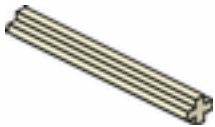


(WITH STUD)

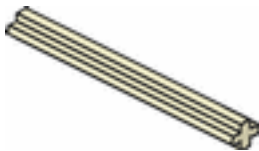
#10



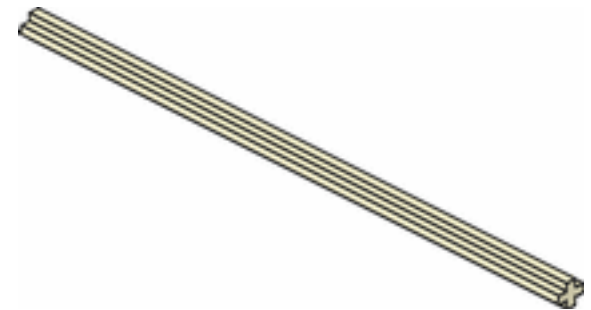
#4



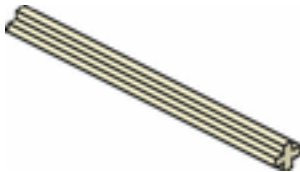
#5



#12



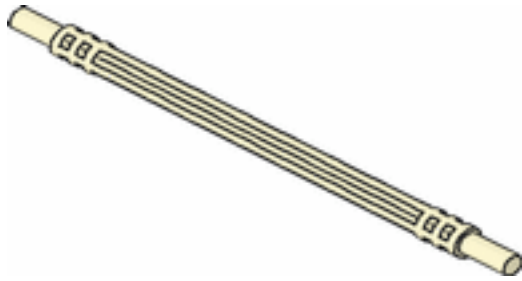
#6



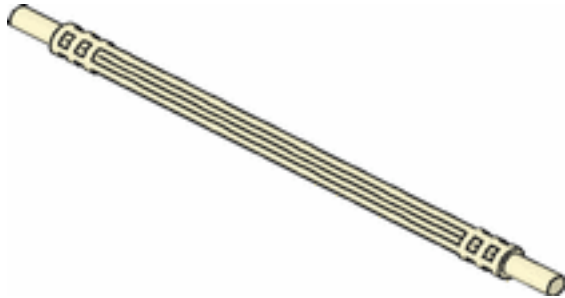
NUMBER = AXLE LENGTH IN LEGO UNITS

# TECHNIC FLEXIBLE AXLE

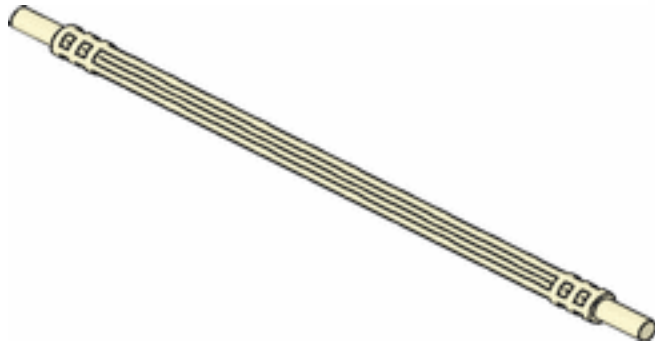
#11



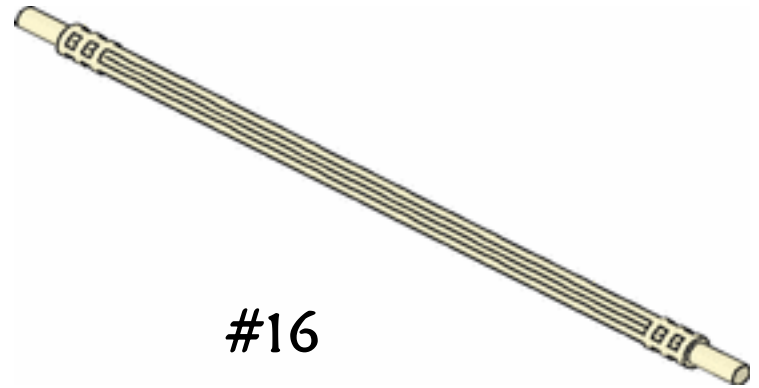
#12



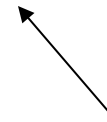
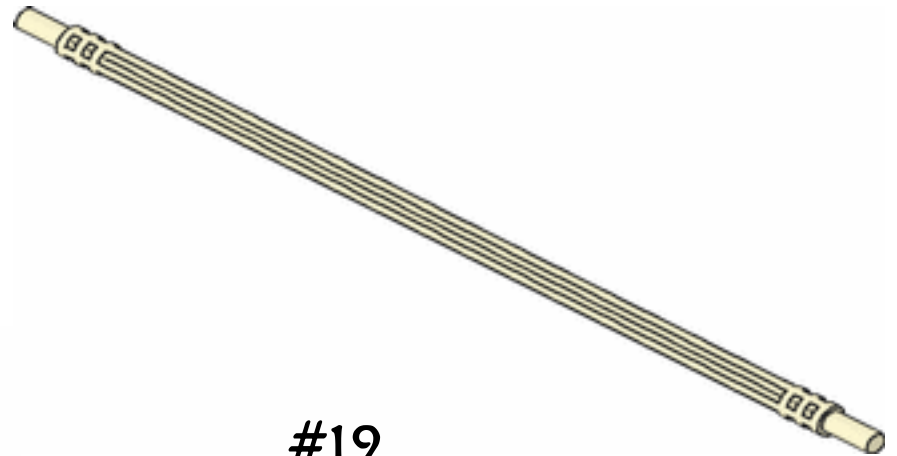
#14



#16



#19



NUMBER = AXLE LENGTH IN LEGO UNITS

## TECHNIC AXLE JOINERS

PLAIN



PERPENDICULAR DOUBLE



PERPENDICULAR



PERPENDICULAR 3L



PERPENDICULAR 3 LONG



## MISCELLANEOUS AXLE PIECES

AXLE PIN



CONNECTOR



AXLE TOWBALL



AXLE NUT



CONNECTOR WITH AXLEHOLE

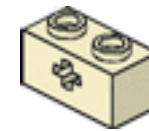


## SMALL TECHNIC BRICKS

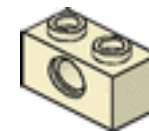
TECHNIC BRICK 1X1 WITH HOLE



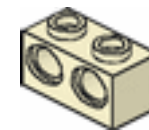
TECHNIC BRICK 1X2 WITH AXLEHOLE



TECHNIC BRICK 1X2 WITH HOLE

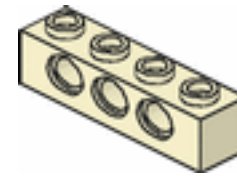


TECHNIC BRICK 1X2 WITH HOLES

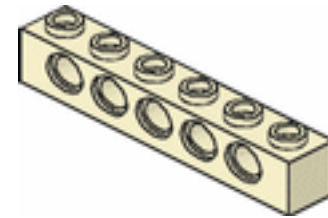


## MEDIUM TECHNIC BRICKS

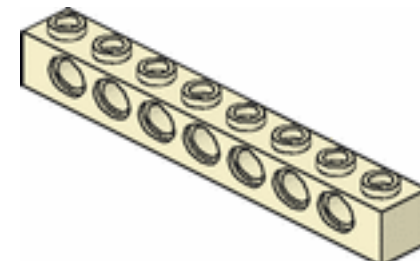
TECHNIC BRICK 1X4 WITH HOLES



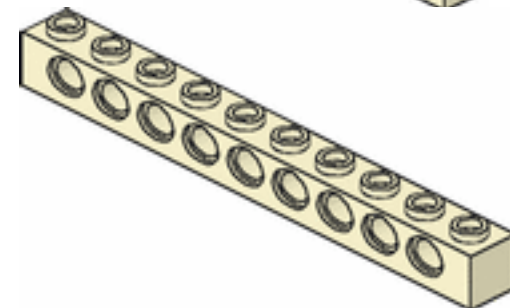
TECHNIC BRICK 1X6 WITH HOLES



TECHNIC BRICK 1X8 WITH HOLES



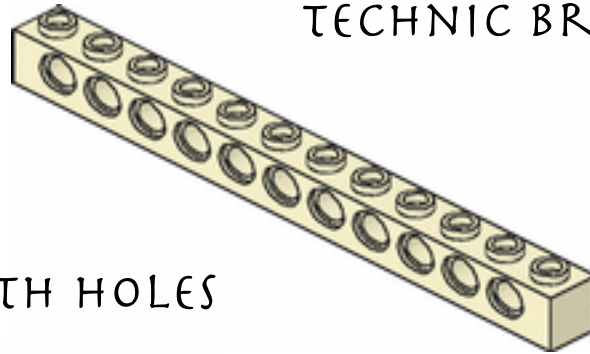
TECHNIC BRICK 1X10 WITH HOLES



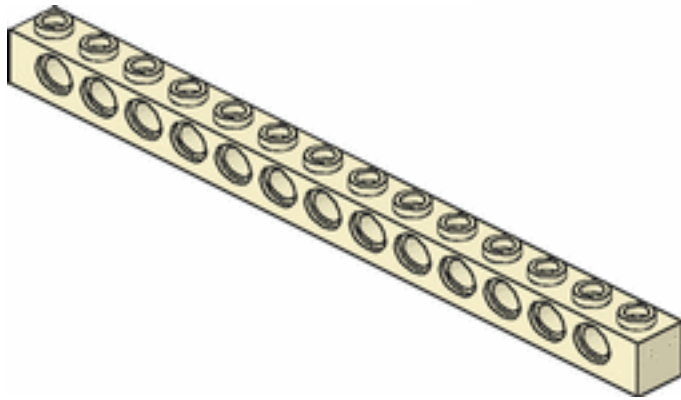


## LARGE TECHNIC BRICKS

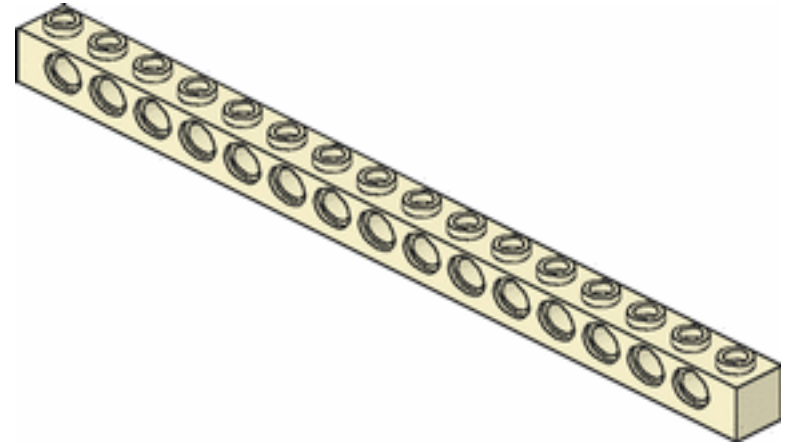
TECHNIC BRICK 1X12 WITH HOLES



TECHNIC BRICK 1X14 WITH HOLES



TECHNIC BRICK 1X16 WITH HOLES



## LARGE TECHNIC BRICKS

“A mechanical **bushing** is a cylindrical lining designed to reduce friction and wear, or constrict and restrain motion of mechanical parts.” (Wikipedia)

TECHNIC BUSH



TECHNIC BUSH 1/2 SMOOTH



## LARGE TECHNIC CAM

“A cam is a projecting part of a rotating **wheel** or shaft that strikes a **lever** at one or more points on its circular path.” (Wikipedia)



TECHNIC CAM



<http://en.wikipedia.org/wiki/Cam>

## SMALL TECHNIC GEAR

GEAR 8 TOOTH



GEAR 12 TOOTH BEVEL



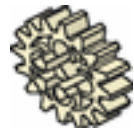
GEAR 14 TOOTH BEVEL



GEAR 12 TOOTH DOUBLE BEVEL



GEAR 16 TOOTH



## TECHNIC GEAR

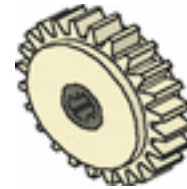
GEAR 16 TOOTH WITH CLUTCH



GEAR 24 TOOTH



GEAR 24 TOOTH WITH CLUTCH

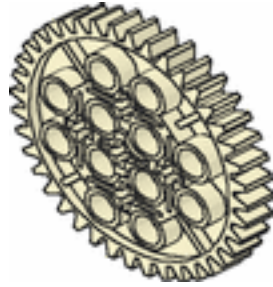


GEAR 24 TOOTH CROWN

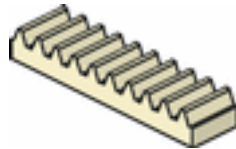


## TECHNIC GEAR

GEAR 40 TOOTH



GEAR RACK 1 X 4

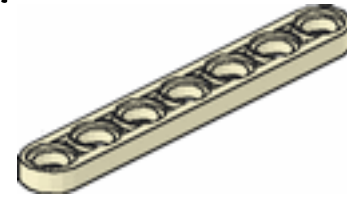


## TECHNIC THIN LIFTARMS

LIFTARM 1 X3



LIFTARM 1 X7



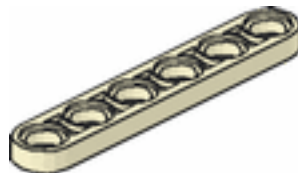
LIFTARM 1 X4



LIFTARM 1 X5



LIFTARM 1 X6



## TECHNIC THICK LIFTARMS STRAIGHT

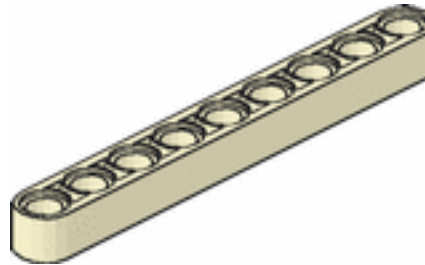
LIFTARM 1 X 3 STRAIGHT



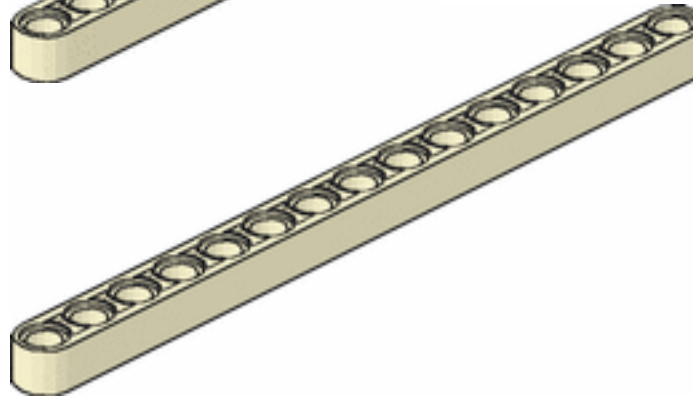
LIFTARM 1 X 5 STRAIGHT



LIFTARM 1 X 9 STRAIGHT



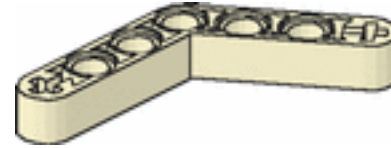
LIFTARM 1 X 15 STRAIGHT



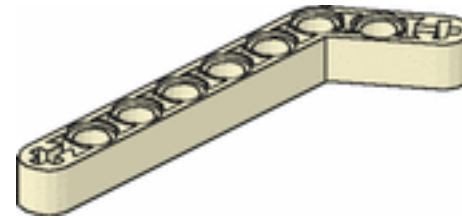


## TECHNIC LIFTARM BENT

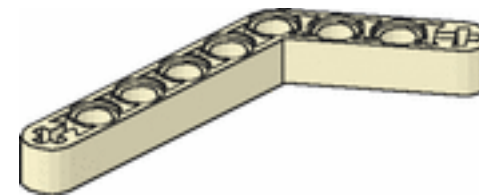
LIFTARM 1 X 7 BENT



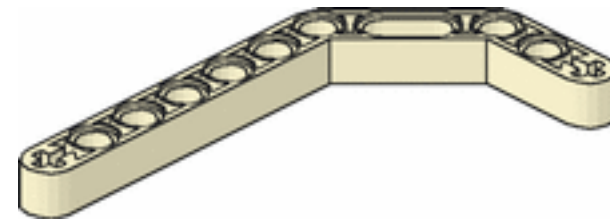
LIFTARM 1 X 9 BENT



LIFTARM 1 X 9 BENT

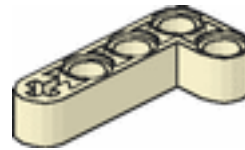


LIFTARM 1 X 11.5 DOUBLE BENT



## TECHNIC LIFTARM L SHAPE

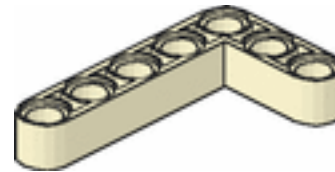
LIFTARM 2 X 4 L SHAPE



LIFTARM 3 X 3 L SHAPE



LIFTARM 3 X 5 L SHAPE

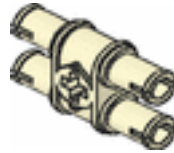


## TECHNIC PINS

TECNHIC PIN



TECHNIC PIN 3L DOUBLE



TECHNIC PIN 1/2



TECHNIC PIN 3/4



TECHNIC PIN LONG WITH FRICTION



TECHNIC PIN WITH FRICTION



TECNHIC PIN LONG WITH STOP BUSH



## TECHNIC PIN JOINERS

TECHNIC PIN JOINER DUAL  
PERPENDICULAR

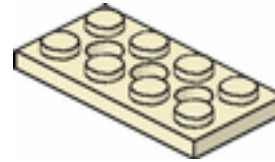


TECHNIC PIN JOINER ROUND

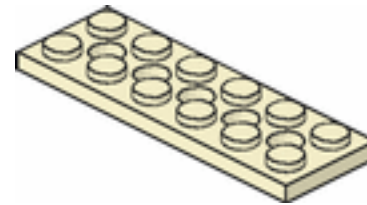


## TECHNIC PLATE

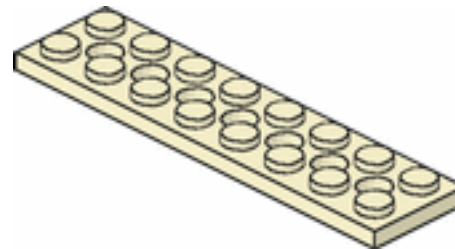
TECHNIC PLATE 2 X 4 WITH HOLES



TECHNIC PLATE 2 X 6 WITH HOLES

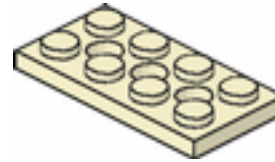


TECHNIC PLATE 2 X 8 WITH HOLES

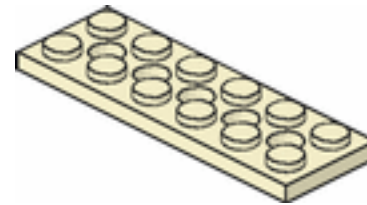


## TECHNIC PLATE

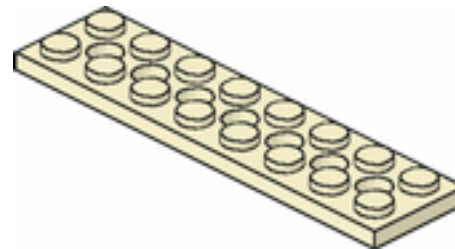
TECHNIC PLATE 2 X 4 WITH HOLES



TECHNIC PLATE 2 X 6 WITH HOLES



TECHNIC PLATE 2 X 8 WITH HOLES



**TECHNIC**  
**MISCELLANEOUS**

TECHNIC PULLEY LARGE



TECHNIC UNIVERSAL JOINT

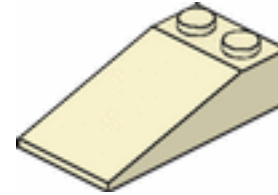


TECHNIC UNIVERSAL SCREW

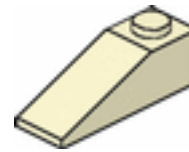


## SLOPE BRICK

TECHNIC SLOPE BRICK 18 4 X 2



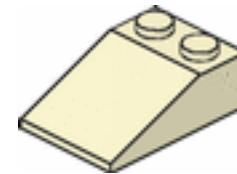
TECHNIC SLOPE BRICK 33 3 X 1



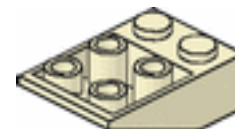
SLOPE BRICK 33 3 X1 INVERTED



SLOPE BRICK 33 3 X 2



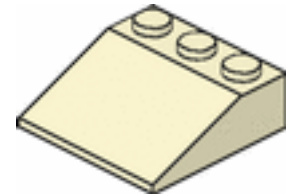
SLOPE BRICK 33 3 X 2 INVERTED



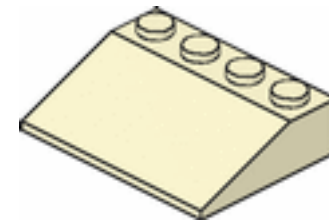


## SLOPE BRICKS

TECHNIC SLOPE BRICK 33 3 X 3



TECHNIC SLOPE BRICK 33 3 X 4



SLOPE BRICK 45 2X1



SLOPE BRICK 45 2 X 1 INVERTED

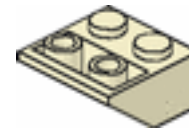


SLOPE BRICK 45 2 X 2

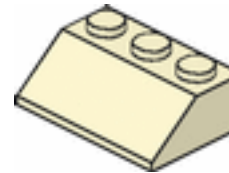


## SLOPE BRICKS

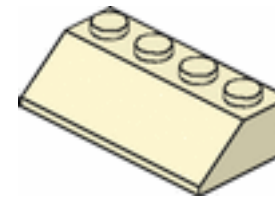
TECHNIC SLOPE BRICK 45 2 X 2 INVERTED



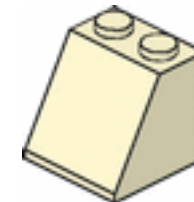
TECHNIC SLOPE BRICK 45 2 X 3



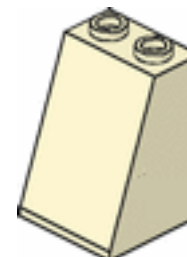
SLOPE BRICK 45 2 X 4



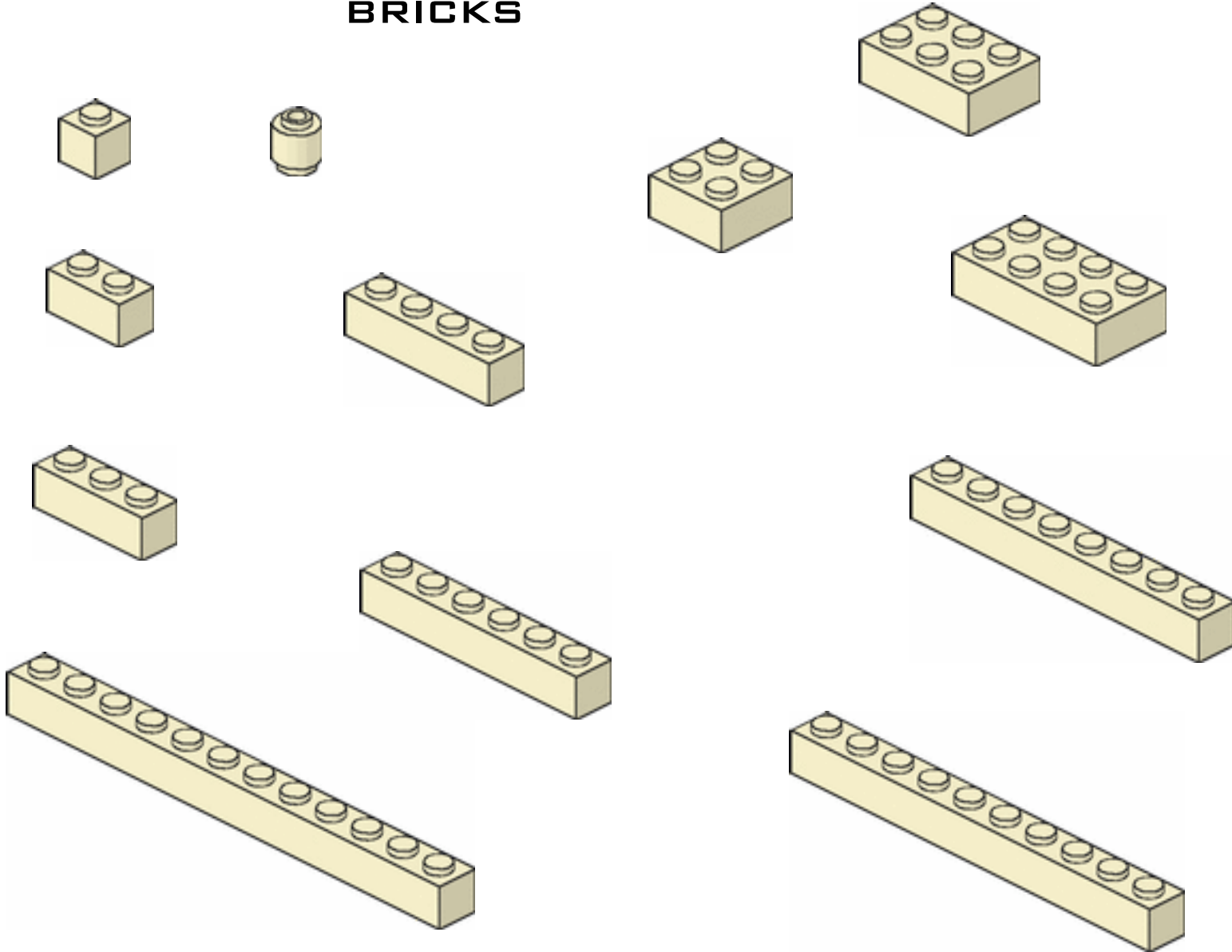
SLOPE BRICK 65 2 X 2 X 2



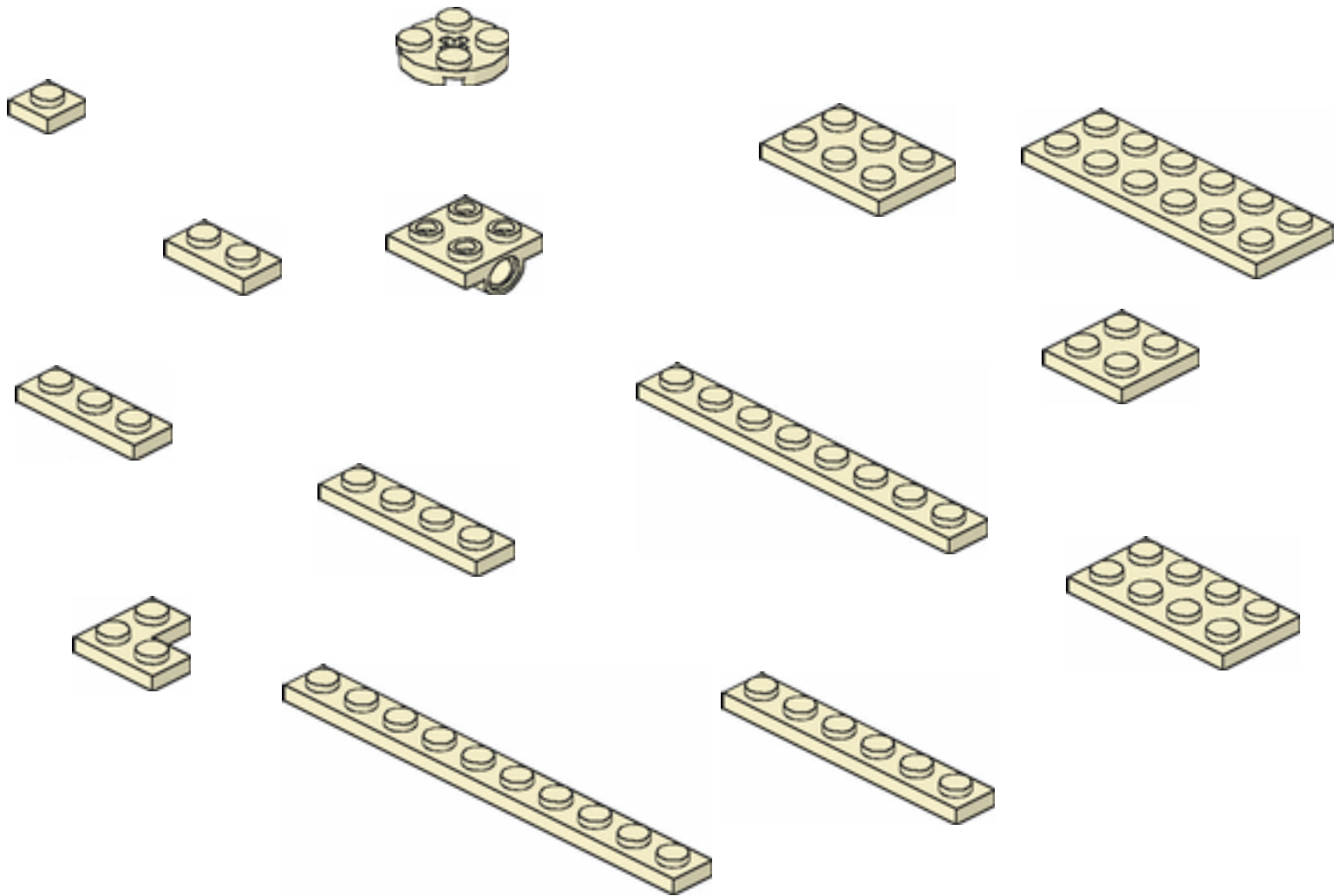
SLOPE BRICK 75 2 X 2 X 3



**BRICKS**



# PLATES

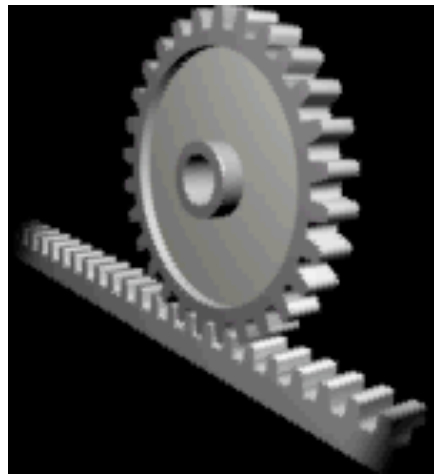


# **SPECIAL GEAR ARRANGEMENTS**

## RACK AND PINION

### ROTATION TO LINEAR MOTION

“A rack and pinion is a pair of **gears** which convert rotational motion into linear motion. The circular **pinion** engages teeth on a flat bar - the **rack**. **Rotational** motion applied to the pinion will cause the rack to move to the side, up to the limit of its travel.” (Wikipedia)



# Worm Gear

(under construction)