

# Lecture #11

Assembly modeling and assembling parts

# This week

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You will learn how to assemble the parts . The steps to follow are:

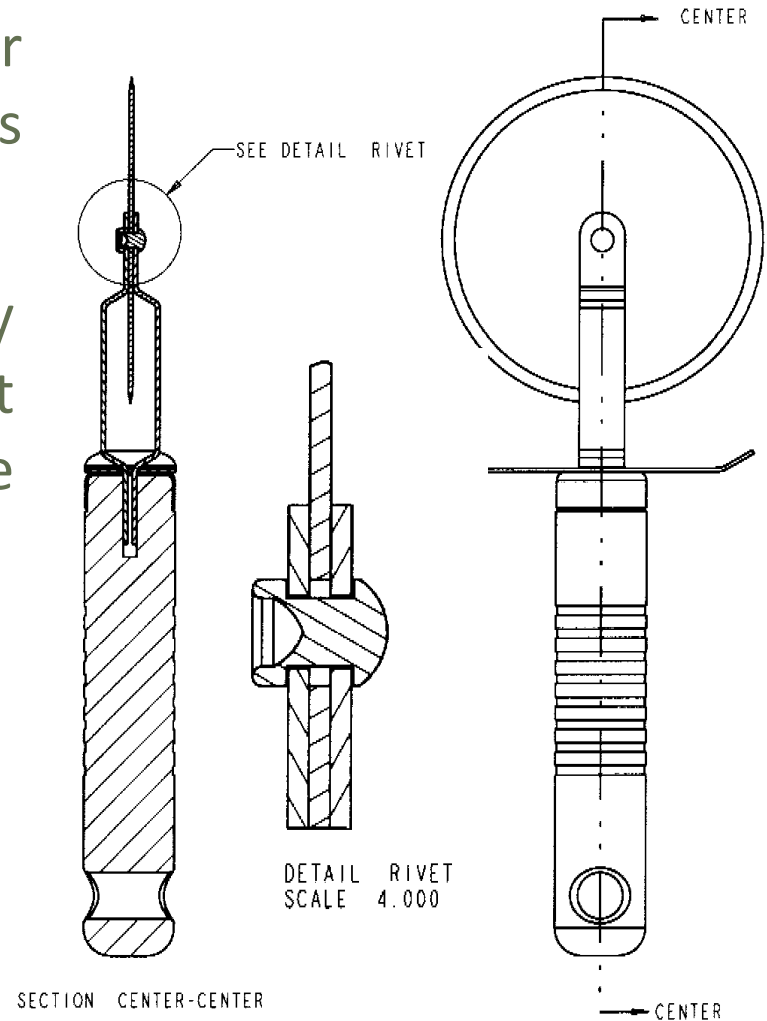
- Assembly drawing
- Assembly section
- Bill of materials
- Exploded assembly
- Animation
- **Assignment # 10**

# Assembly section view

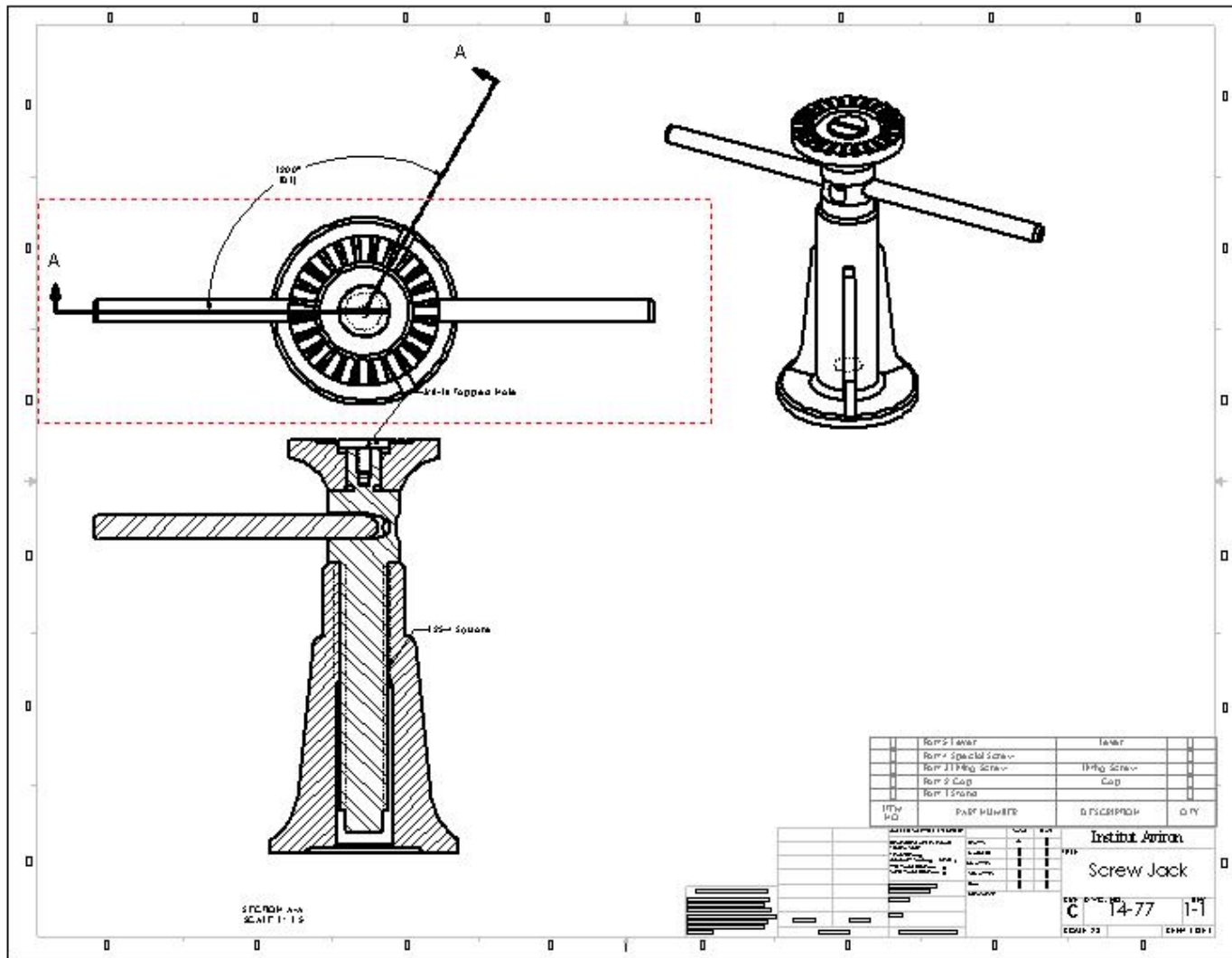
These are typically orthographic or pictorial section views of parts as put together in an assembly.

Adjacent parts in assembly drawings are cross-hatched at different angles to make the separate parts clean.

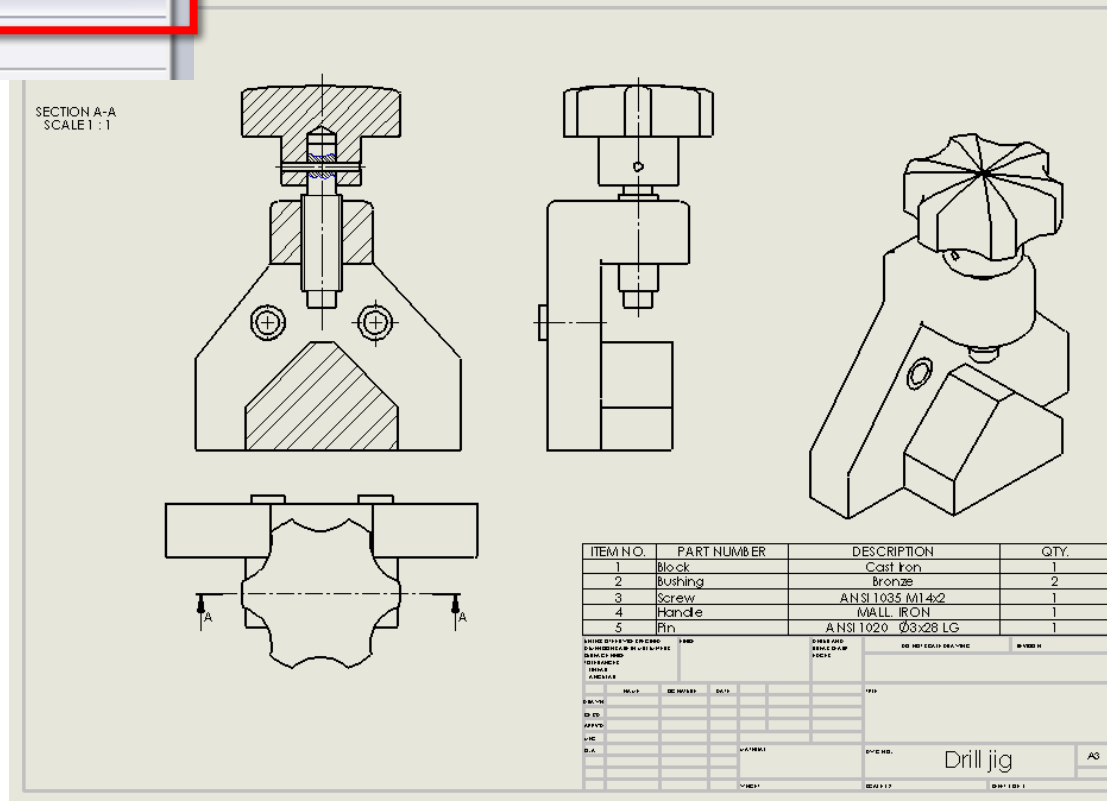
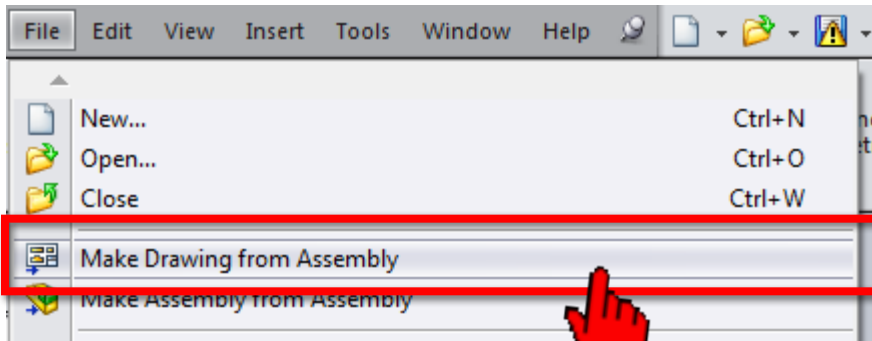
Usually standard parts such as fasteners, washers, springs, bearings, and gears are not cross-hatched.



# Assembly section view



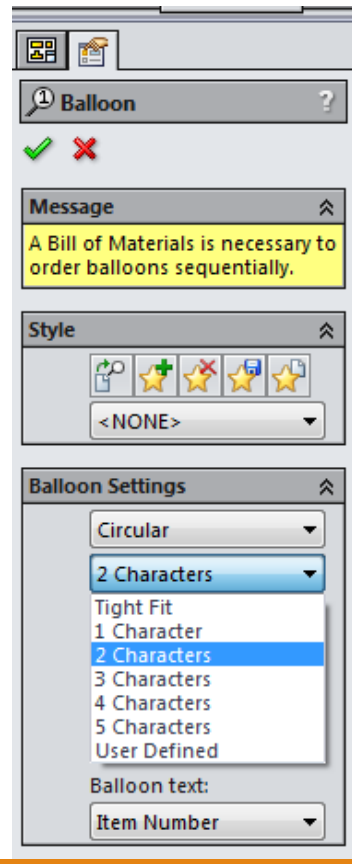
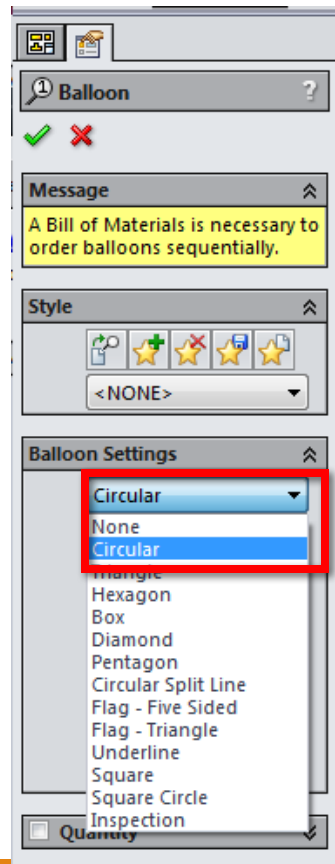
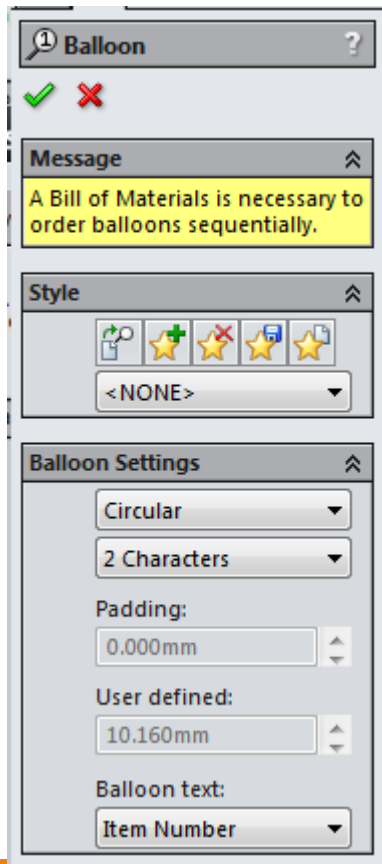
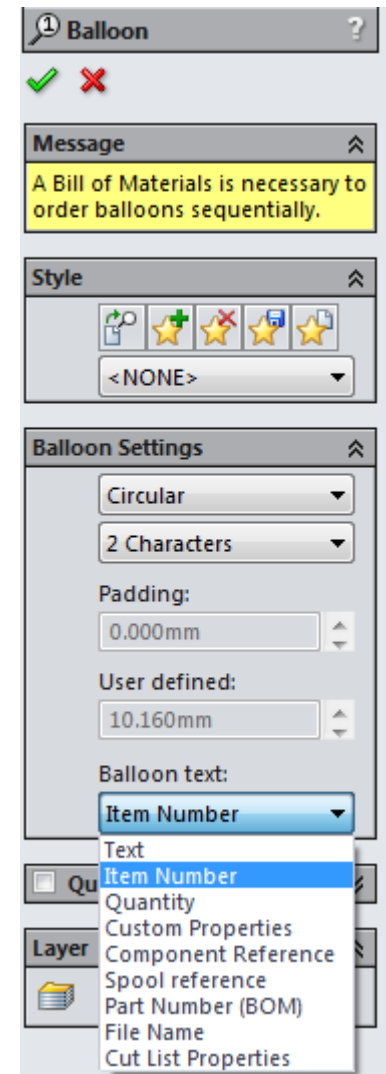
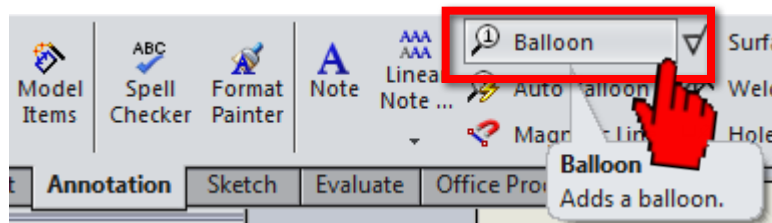
# Make Drawing from Assembly



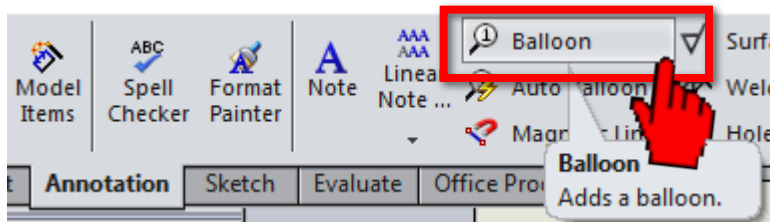
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Block	Cast Iron	1
2	Bushing	Bronze	2
3	Screw	ANSI 1035 M14x2	1
4	Handle	MALL IRON	1
5	Pin	ANSI 1020 @3x28 LG	1

DATE: 01/11/15  
DRAWN BY: [Name]  
CHECKED BY: [Name]  
DATE: [Date]  
SCALE: 1:1  
TITLE: Drill jig  
AS

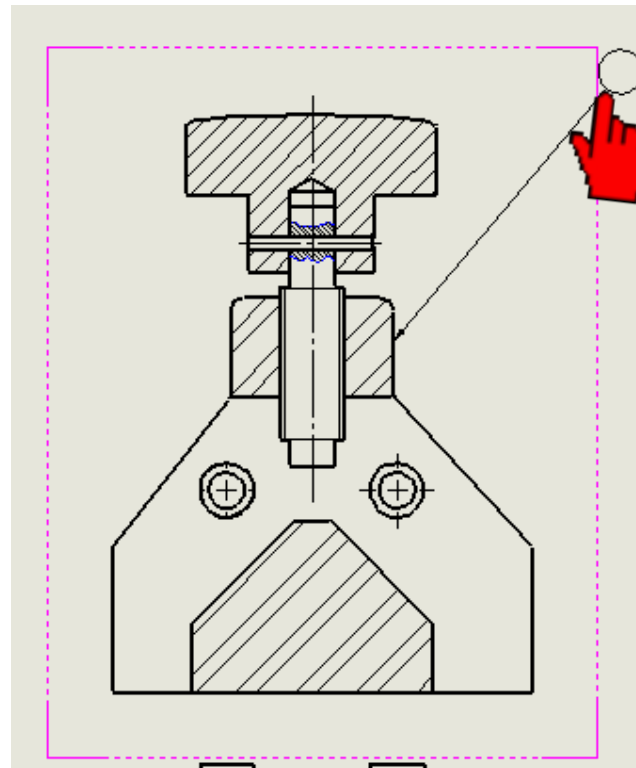
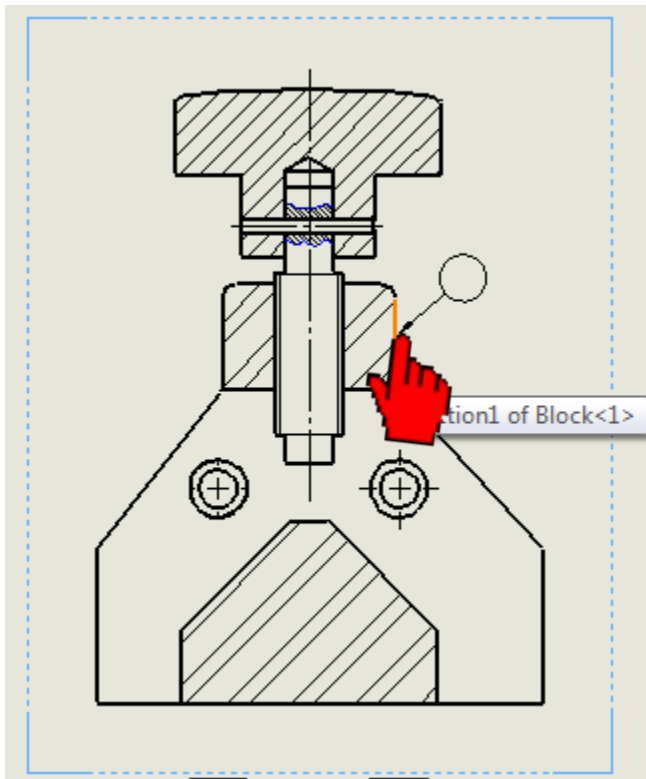
# Make Drawing from Assembly



# Make Drawing from Assembly



The separate parts comprising the assembly are located in the drawing by leaders radiating from the circles and are usually listed in a parts list.



# Bill of materials

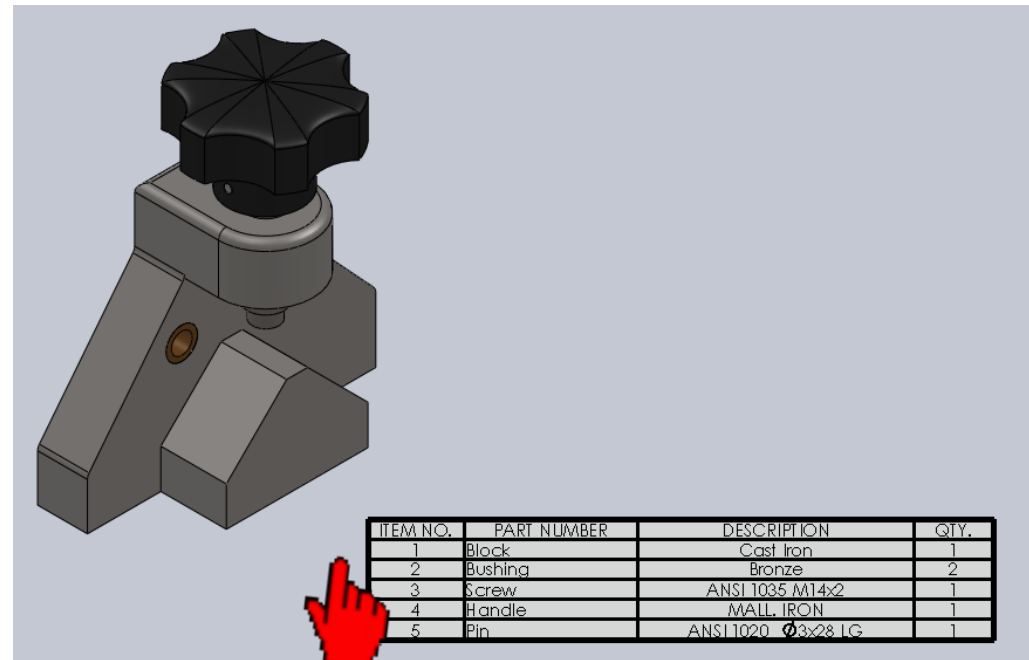
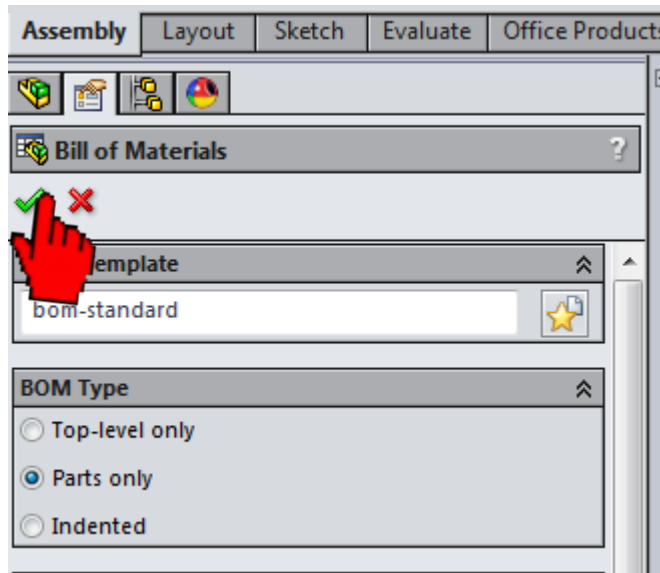
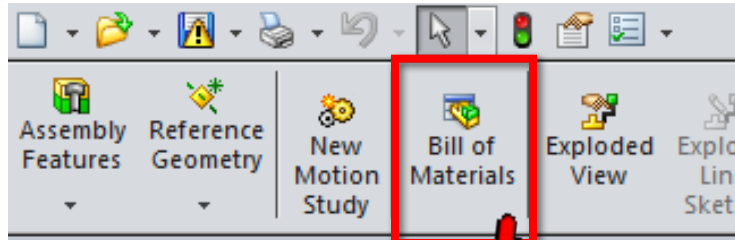
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When all parts in an assembly drawing have to be identified, each single part is usually labelled by means of a reference number.

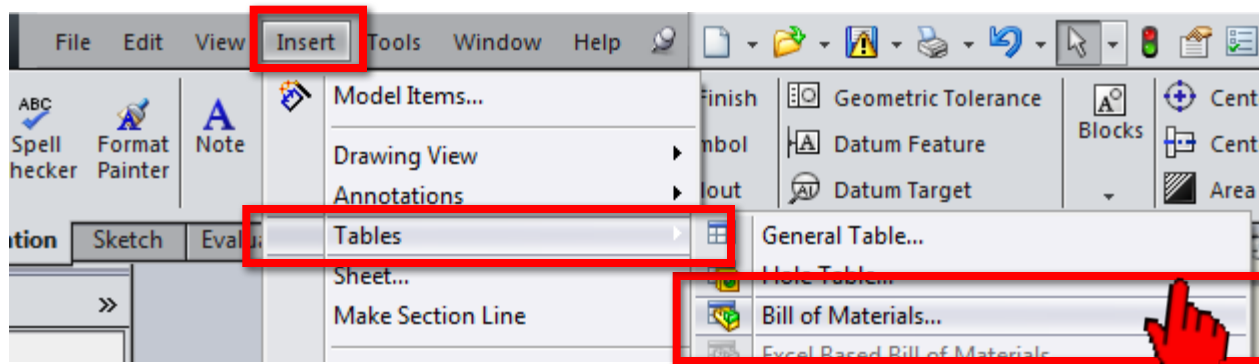
- (a) the part number,
- (b) the name or description of the part,
- (c) the material from which the part is to be made,
- (d) the quantity required.

ITEM NO.	PART NUMBER	QTY.
1	Stepper Mount SA-01	1
2	Standoff SA-03	4
3	Gecko 280 oz in Stepper	1
4	Oldham Coupler	1
5	MC#2938T11 Bronze Bushing	1
6	MC#6157K14 1/2" SHAFT COLLAR	1
7	MC#93070A123 M5X12MM LOW HEAD	4
8	MC#91290A228 M5X12MM SHCS	4

# Bill of materials in Assembly

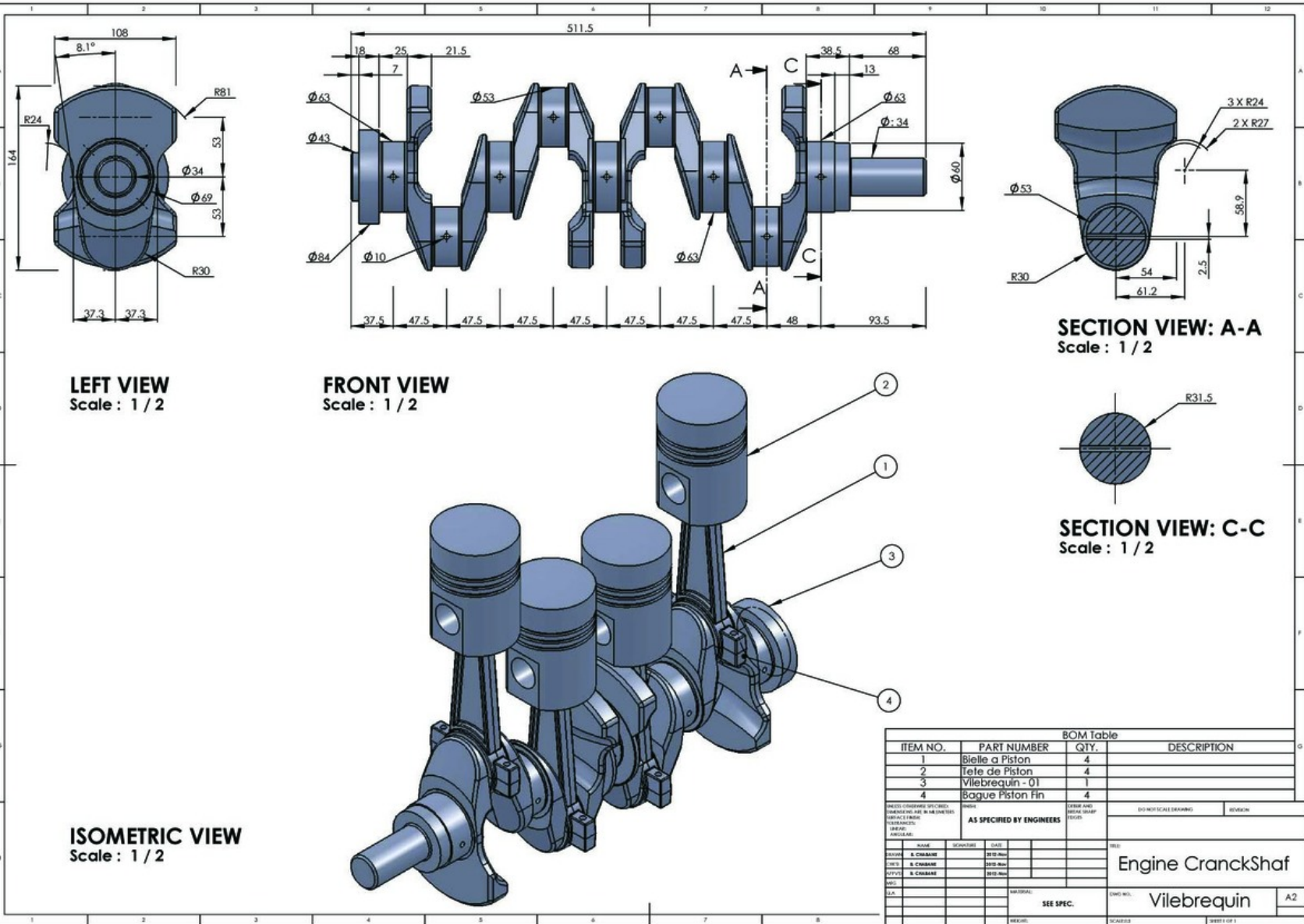


# Bill of materials in Drawing



The image displays a technical drawing of a drill jig. On the left is a Bill of Materials (BOM) table. The drawing includes a section view labeled 'SECTION A-A SCALE:1:1' with a callout 'Boss-Extrude3 of Screw<1>' and a red hand cursor pointing to it. Other views include a top view, a side view, and an isometric view. The title block contains the text 'Drill jig' and 'A3'.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Block	Cast Iron	1
2	Bushing	Bronze	2
3	Screw	ANSI 1035 M14x2	1
4	Handle	MALL. IRON	1
5	Pin	ANSI 1020 Ø3x28 LG	1

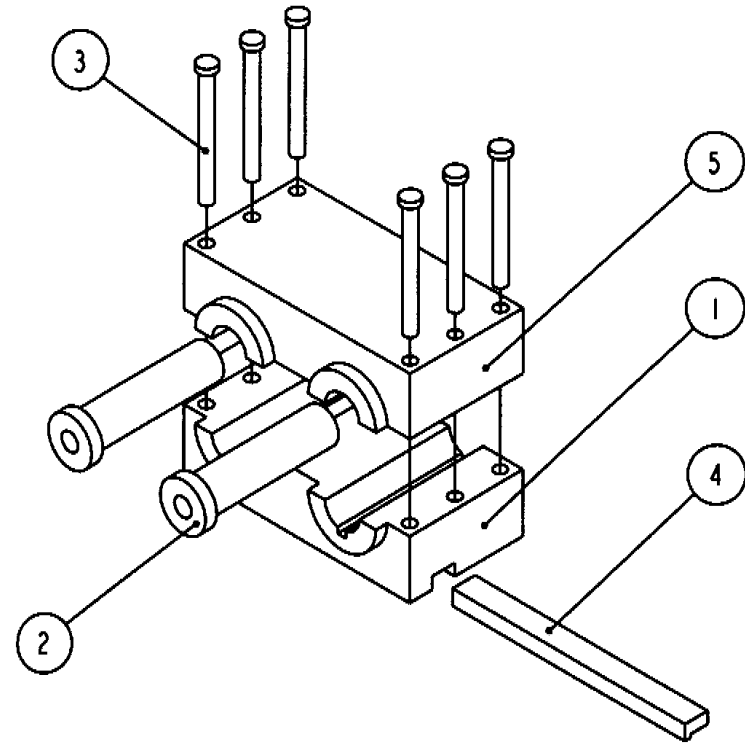


# Exploded Assembly

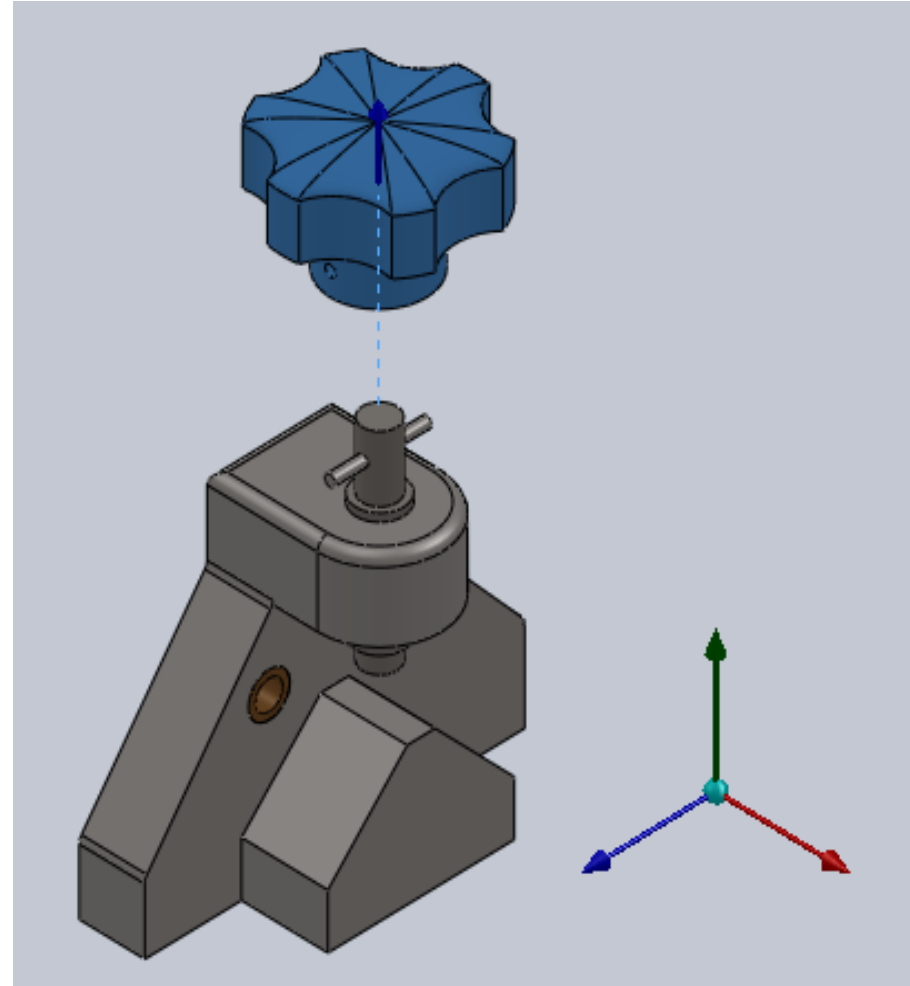
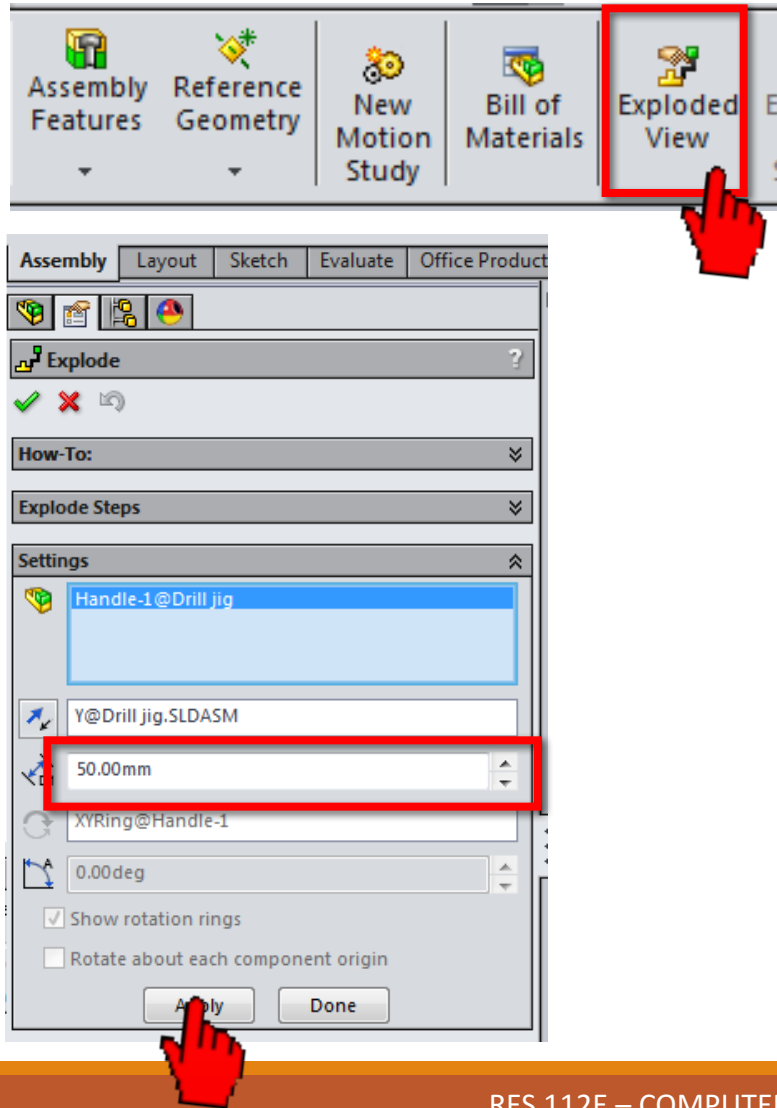
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To make the assembly drawing legible, the assembly can be exploded to separate components.

Once you have assembled your system, you can create an exploded configuration that will essentially be an assembly drawing for the system

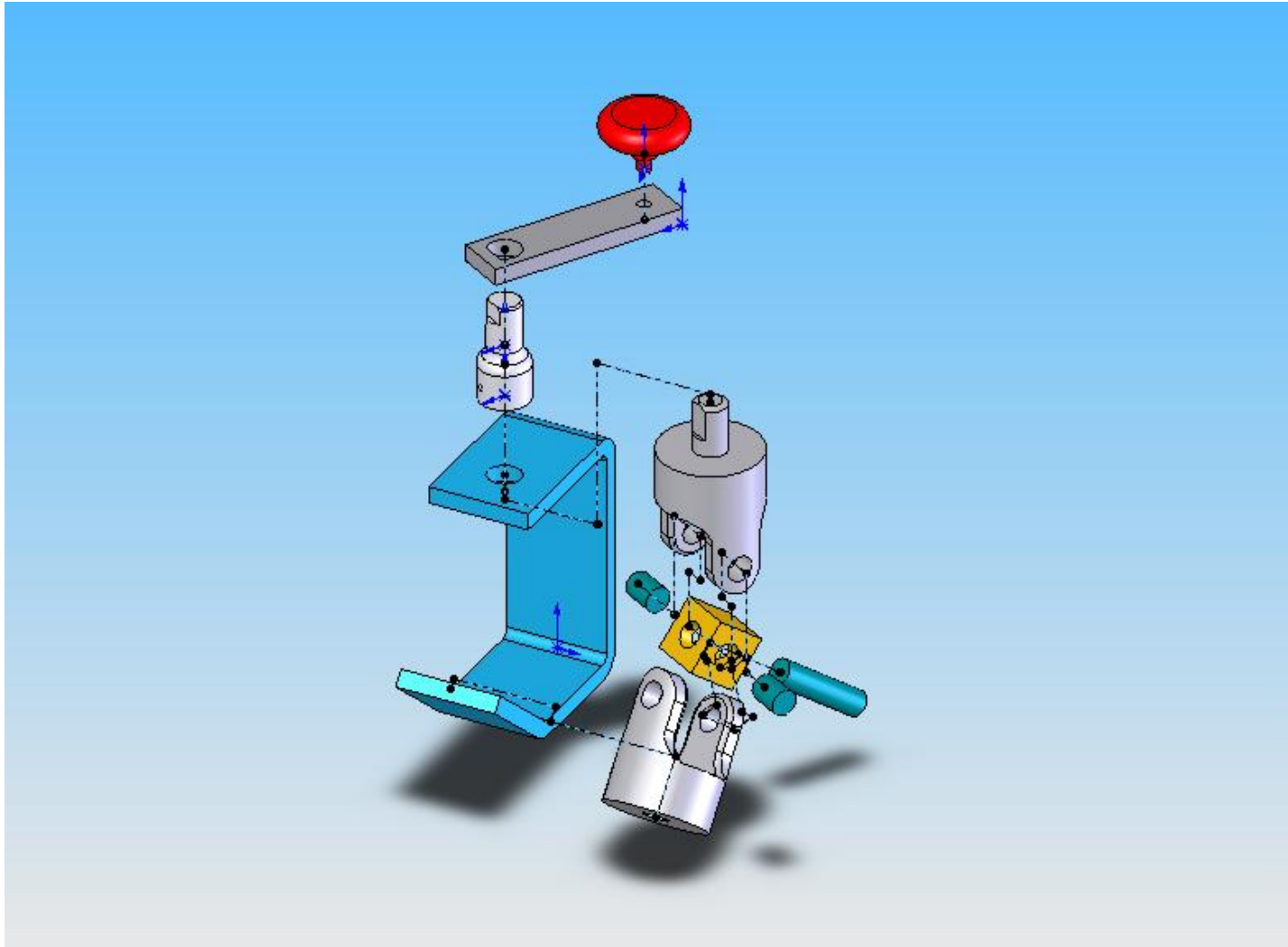


# Exploded Assembly

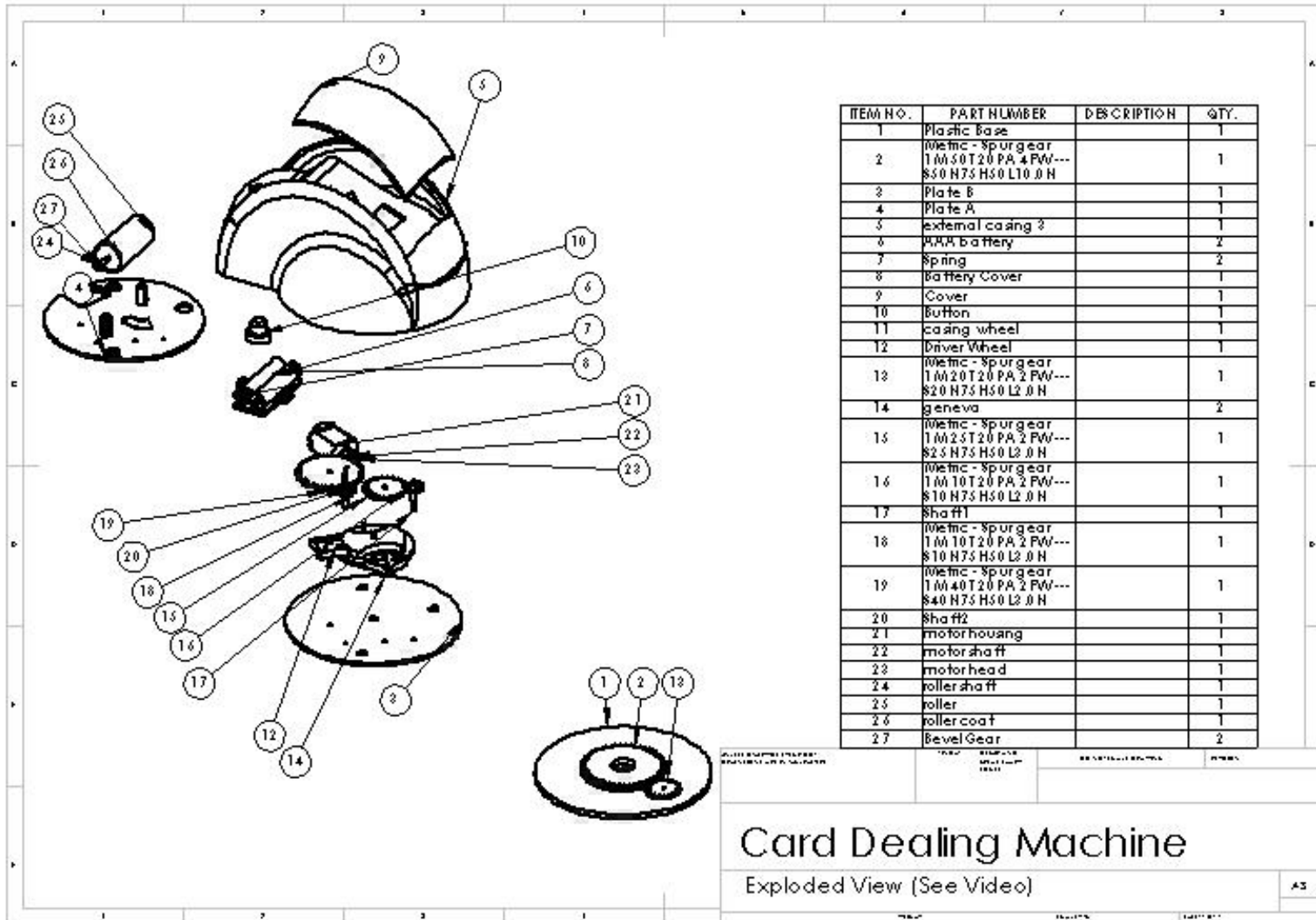


# Exploded Assembly

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# Exploded Assembly

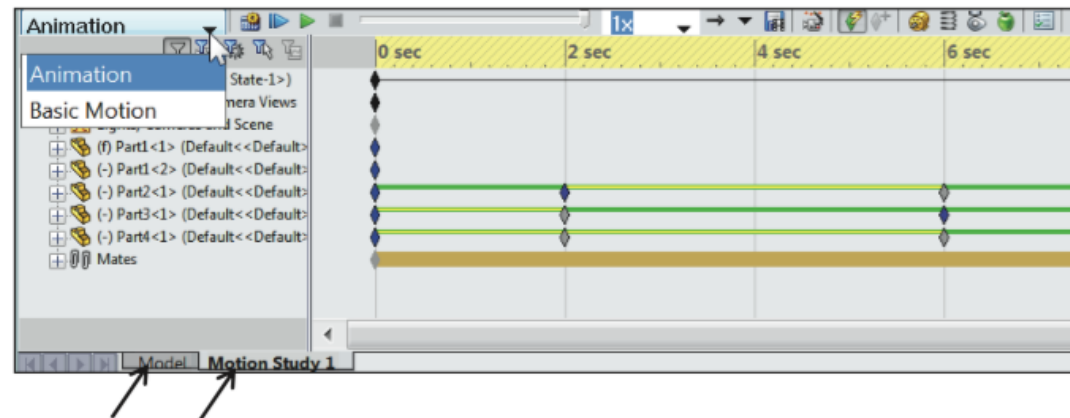


# Animation

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Some software packages allow you to animate your system by displaying slightly different configurations in rapid succession.

Motion Studies are graphical simulation of motion for an assembly. Access Motion Manager from Motion Study tab.

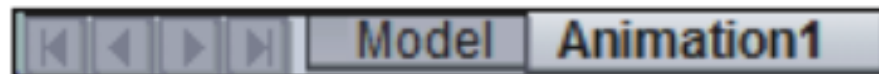


# Motion Manager

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It displays a timeline-based interface and provides the following

**Animation :** Apply animation to animate the motion of an assembly. Add a motor and insert positions of assembly components at various times using set key point.



# Basic Motion

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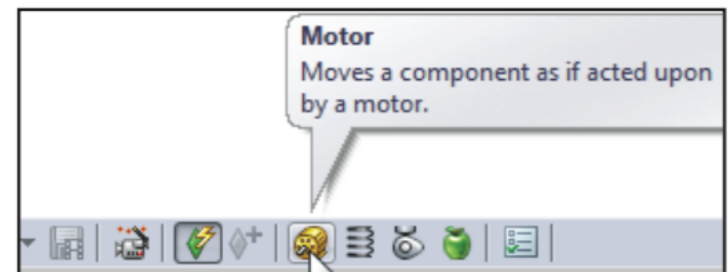
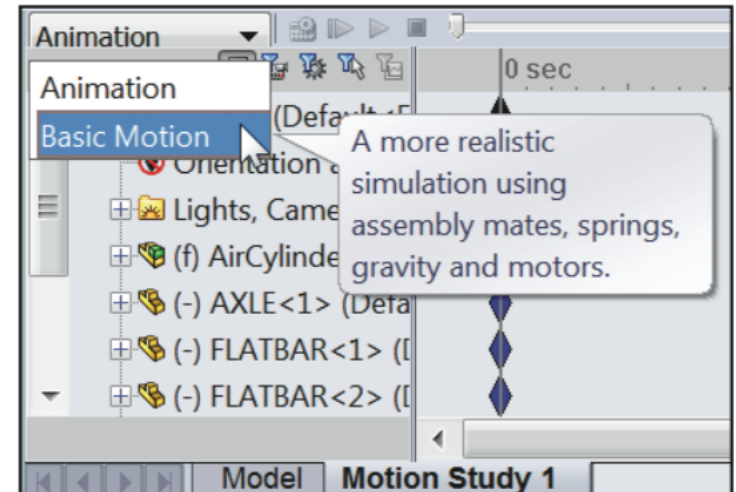
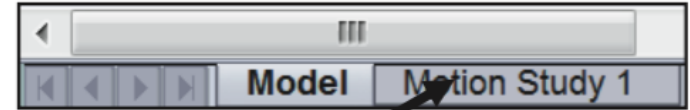
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# Assembly – Basic Motion

Click the **Motion Study 1** tab located in the bottom left corner of the Graphics window. The MotionManager is displayed.

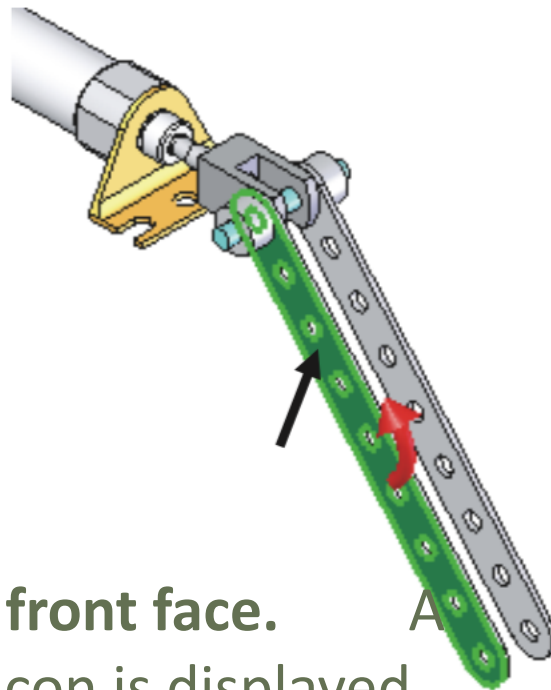
Select **Basic Motion** for Type of study from the MotionManager drop-down menu

Click **Motor** from the MotionManager. The Motor PropertyManager is displayed.

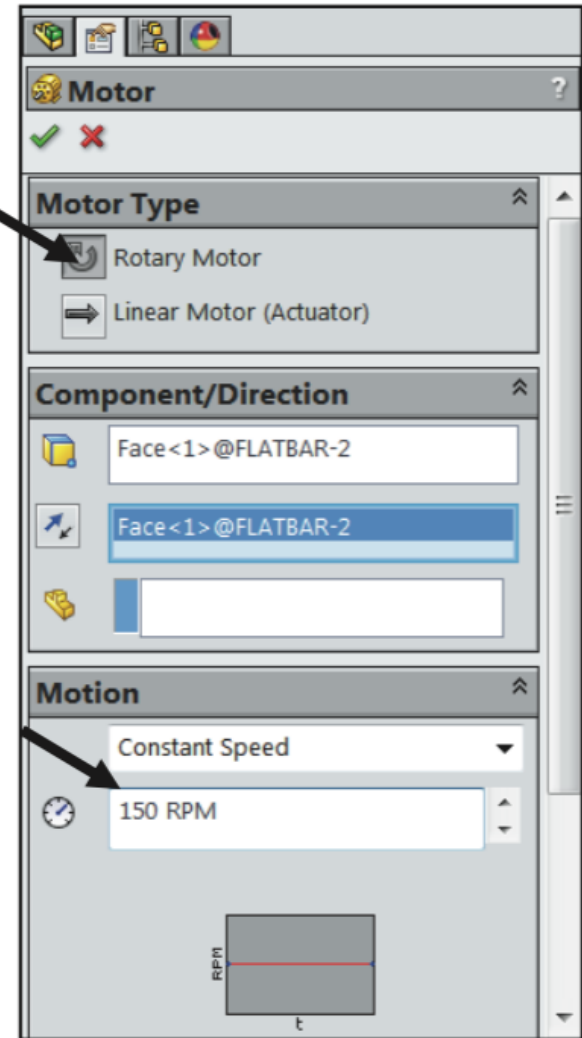


# Assembly – Basic Motion

Click the **Rotary Motor** box.



Click the **FLATBAR** front face.  
red Rotary Motor icon is displayed.  
The red direction arrow points  
counterclockwise.

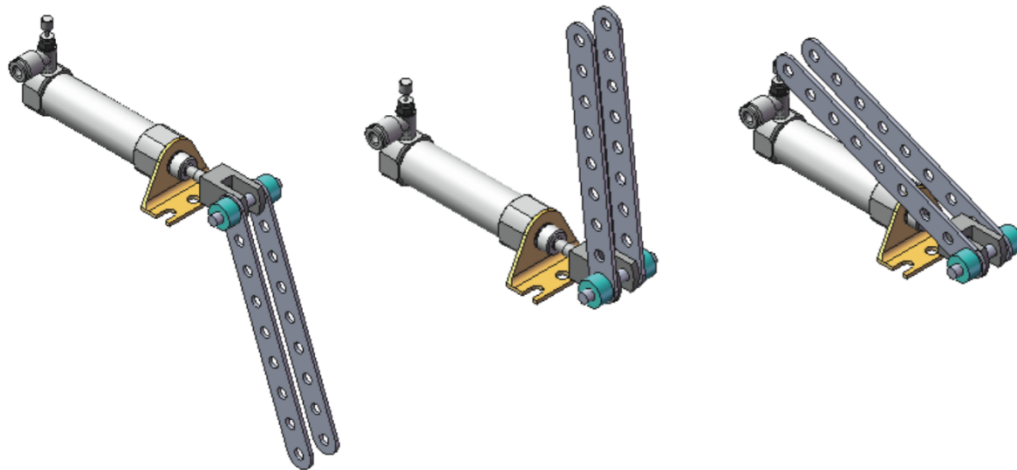


# Assembly – Basic Motion

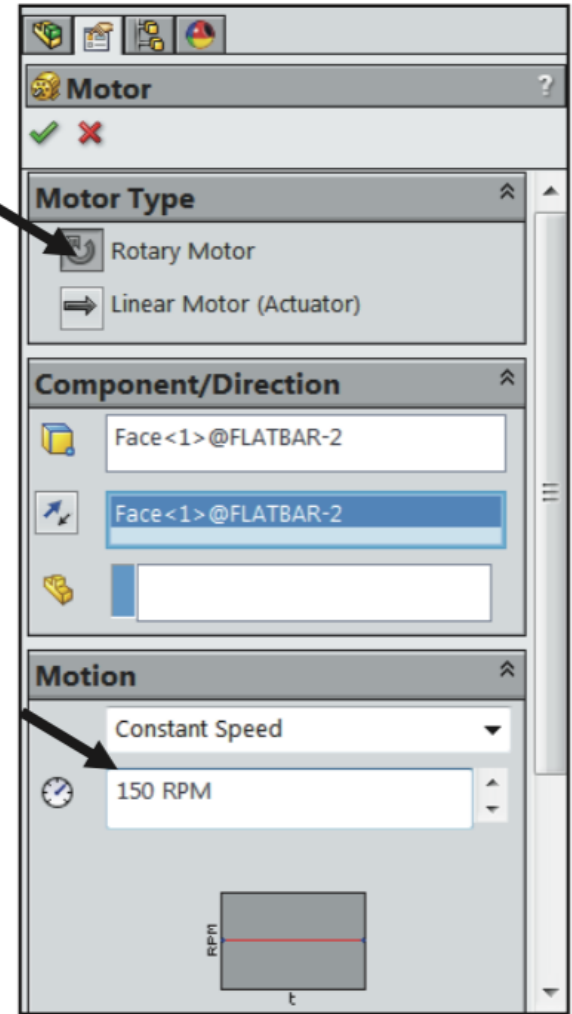
Enter **150 RPM** for speed in the Motion box.

Click **OK** from the Motor PropertyManage

Click **Calculate**. The FLATBAR rotates in a counterclockwise direction for a set period of time.



Click **Play**. View the simulation.



# Assembly – Basic Motion

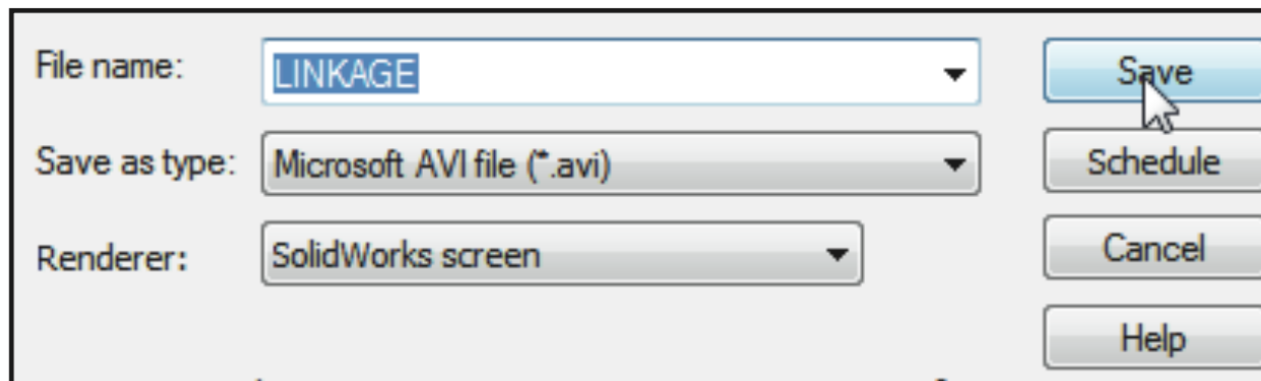
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Save the simulation in an AVI file.

Click Save Animation.









Click **Save** from the Save Animation to File dialog box. View your options.

Click **OK** from the Video Compression box.



For more [details](#) ...

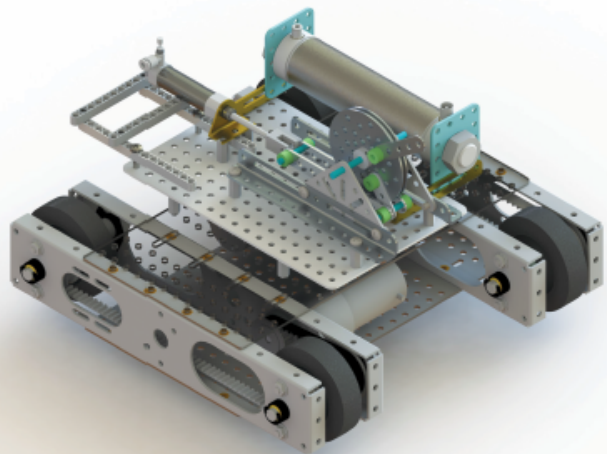
## SolidWorks

-  [SolidWorks 2001 Version Tutorial](#)  
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PDF, 4,40 MB
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-  [Solidworks 2014 Drawing](#)  
PDF, 7,66 MB
-  [Solidworks 2014 Assembly](#)  
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David C. Planchard, CSWP,  
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# Next week ...

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No more class....

## MAKE UP EXAM

For your final exams

Good luck

# Next week ...

---

Design project presentation so ...

There will be take-home assignment

***Do not forget to prepare your  
presentation & poster***

# Before coming ...

## FINAL REPORT SUBMISSION

Title page  
Table of Contents,  
List of Figures  
List of Tables  
Executive summary  
Body  
(text of the report)  
Drawings  
References  
Appendices

## POSTER PREPERATION

Paper size  
(H = 625 mm by  
W = 450 mm)  
Title: 100 point  
Main headings: 36  
to 48 point  
40 % graphics,  
40 % white space,  
20 % text

## ORAL PREPERATION

PowerPoint  
presentation  
No more than 30  
minute  
Max. 30 slides

# Before coming ...

Download this file from web page ...

<http://transport.itu.edu.tr/dersler/lisansdersleri/res112e/desingproject>

Complete this table jointly team and leave the grade column blank for completion by your instructor who will use the chart and the factor F that was computed for each member.

## ORAL REPORT

Team : \_\_\_\_\_ **NAME OF DESIGN**

	Number members: (N = 4 to 6)	% Contribution C	F = N C	GRADE
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
100 %				_____

N : number of members  
 C : the contribution of each member  
 F : factor for each member is the number of members "N" times the contribution of each "C"

EVALUATION BY REVIWER	Max.	Comments :
1. Introduction of team members	2	_____
2. Proper dress of team members	2	_____
3. Statement of purpose of presentation	5	_____
4. Use of visuals- point to important points, do not block screen, do not fumble, etc.	10	_____
5. Adequate number of visual aids	9	_____
6. Quality of visual aids	15	_____
7. Clear presentation of recommended design	10	_____
8. Coverage of alternative solutions considered	2	_____
9. Consideration of human factors	5	_____
10. Coverage of economics (manufacturing, shipping, packing, overhead, mark-up, etc.)	10	_____
11. Presentation of an effective conclusion	5	_____
12. Continuity of presentation	3	_____
13. Poise and professionalism	2	_____
14. Team participation (perfect score if all participate)	10	_____
15. Use of allotted time	10	_____
<b>TOTAL</b>	<b>100</b>	_____

### Oral Presentations

Final oral presentations generally follow this order

1. Introduction
2. Agenda
3. Explanation of problem
4. Overview of solution
5. Features
6. Summary
7. Recommendations
8. Conclusion
9. Q & A

Sometimes the problem is explained in the introduction and thus precedes the agenda. If the content of your presentation does not lend itself to this outline, talk to your instructors about alternative ways of organizing it. This same advice applies to all the examples in this chapter. **Do not use the sample slides and other examples as templates.**

Instead, adapt them to your content, audience, and purpose. Time yourselves to ensure that the presentation is no more than 30 minutes, with the last 10 devoted to questions and answers. Rehearse at least twice, once in front of your class and instructors, and, if possible, video your practice presentation so that you can review it later.

from "Engineering Design Graphics: AutoCAD 2007" by **J.H. Earle, 2008**  
 and "Engineering Design and Communication: Principles and Practice" (2010 edition)

For more details please see [Oral Presentations](#)  
 For Oral Presentations Outline please see [Oral Presentations Outline](#)  
 Evaluation Form (\*.doc) file for Grading Oral Reports [Oral Report](#)

# Before coming ...

Complete this table jointly team and leave the grade column blank for completion by your instructor who will use the chart and the factor F that was computed for each member.

## ORAL REPORT

Team : \_\_\_\_\_ **NAME OF DESIGN**

	Number members: (N = 4 to 6)	% Contribution C	F = N C	GRADE
1.	_____			
2.	_____			
3.	_____			
4.	_____			
5.	_____			
6.	_____			
100 %				

N : number of members  
 C : the contribution of each member  
 F : factor for each member is the number of members "N" times the contribution of each "C"

EVALUATION BY REVIWER	Max.	
1. Introduction of team members	2	_____
2. Proper dress of team members	2	_____
3. Statement of purpose of presentation	5	_____
4. Use of visuals- point to important points, do not block screen, do not fumble, etc.	10	_____
5. Adequate number of visual aids	9	_____
6. Quality of visual aids	15	_____
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11. Presentation of an effective conclusion	5	_____
12. Continuity of presentation	3	_____
13. Poise and professionalism	2	_____
14. Team participation (perfect score if all participate)	10	_____
15. Use of allotted time	10	_____
<b>TOTAL</b>	<b>100</b>	_____

Comments :

Team : \_\_\_\_\_ **N**

Type your team name

# Before coming ...

Complete this table jointly team and leave the grade column blank for completion by your instructor who will use the chart and the factor F that was computed for each member.

## ORAL REPORT

Team : \_\_\_\_\_ **NAME OF DESIGN**

	Number members: (N = 4 to 6)	% Contribution C	F = N C	GRADE
1.	_____			
2.	_____			
3.	_____			
4.	_____			
5.	_____			
6.	_____			
100 %				

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12. Continuity of presentation	3	_____
13. Poise and professionalism	2	_____
14. Team participation (perfect score if all participate)	10	_____
15. Use of allotted time	10	_____
<b>TOTAL</b>	<b>100</b>	_____

Comments :

\_\_\_\_\_ **NAME OF DESIGN**

Change with your design problem

# Before coming ...

Complete this table jointly team and leave the grade column blank for completion by your instructor who will use the chart and the factor F that was computed for each member.

## ORAL REPORT

Team : \_\_\_\_\_ **NAME OF DESIGN**

Number members: (N = 4 to 6)    % Contribution C    F = N C    GRADE

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

100 %

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9. Consideration of human factors	5	_____
10. Coverage of economics (manufacturing, shipping, packing, overhead, mark-up, etc.)	10	_____
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12. Continuity of presentation	3	_____
13. Poise and professionalism	2	_____
14. Team participation (perfect score if all participate)	10	_____
15. Use of allotted time	10	_____
<b>TOTAL</b>	<b>100</b>	_____

Number members: (N = 4 to 6)

1. Ahmet
2. Mehmet
3. Hale
4. Lale
5. \_\_\_\_\_
6. \_\_\_\_\_

Type team members' names

# Before coming ...

Complete this table jointly team and leave the grade column blank for completion by your instructor who will use the chart and the factor F that was computed for each member.

## ORAL REPORT

Team : \_\_\_\_\_ **NAME OF DESIGN**

	Number members: (N = 4 to 6)	% Contribution C	F = N C	GRADE
1.	_____			
2.	_____			
3.	_____			
4.	_____			
5.	_____			
6.	_____			
_____ 100 %				

N : number of members  
 C : the contribution of each member  
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9. Consideration of human factors	5	_____
10. Coverage of economics (manufacturing, shipping, packing, overhead, mark-up, etc.)	10	_____
11. Presentation of an effective conclusion	5	_____
12. Continuity of presentation	3	_____
13. Poise and professionalism	2	_____
14. Team participation (perfect score if all participate)	10	_____
15. Use of allotted time	10	_____
<b>TOTAL</b>	<b>100</b>	_____

	% Contribution C	F
	20	_____
	15	_____
	25	_____
	40	_____
	_____	_____
	_____	_____
	100 %	_____

Give contribution



# Before coming ...

Complete this table jointly team and leave the grade column blank for completion by your instructor who will use the chart and the factor F that was computed for each member

## ORAL REPORT

Team : \_\_\_\_\_ **NAME OF DESIGN**

Number members: (N = 4 to 6)    % Contribution C    F = N C    GRADE

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

100

N : number of members  
C : the contribution of each member  
F : factor for each member is the number of members "N" times the contribution of each "C"

EVALUATION BY REVIWER	Max.		Comments :
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12. Continuity of presentation	3	_____	
13. Poise and professionalism	2	_____	
14. Team participation (perfect score if all participate)	10	_____	
15. Use of allotted time	10	_____	
<b>TOTAL</b>	<b>100</b>	_____	

EACH TEAM (Team Leader)

Before coming project presentation

- Fill in the blanks
- Make 7 copies for each team leader



# During presentation

EVALUATION BY REVIWER		Max.	
1.	Introduction of team members	2	_____
2.	Proper dress of team members	2	_____
3.	Statement of purpose of presentation	5	_____
4.	Use of visuals- point to important points, do not block screen, do not fumble, etc.	10	_____
5.	Adequate number of visual aids	9	_____
6.	Quality of visual aids	15	_____
7.	Clear presentation of recommended design	10	_____
8.	Coverage of alternative solutions considered	2	_____
9.	Consideration of human factors	5	_____
10.	Coverage of economics (manufacturing, shipping, packing, overhead, mark-up, etc.)	10	_____
11.	Presentation of an effective conclusion	5	_____
12.	Continuity of presentation	3	_____
13.	Poise and professionalism	2	_____
14.	Team participation (perfect score if all participate)	10	_____
15.	Use of allotted time	10	_____
<b>TOTAL</b>		<b>100</b>	_____

# Next week ...

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Design project presentation so ...

There will be take-home assignment

***Do not forget to prepare your  
presentation & poster***

# Assignment #10

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Page

Figure

You will build the assembly model

Submit the assignment on time

Upload file into NINOVA

