National Qualifications **2011/ 2012**	**Graphic Communication** **Advanced Higher** **Computer-Aided 3D Modelling Presentation**

Fill in these particulars.

Full name of Centre   **Centre Number**

Galashiels Academy	5619734

Forename(s)   **Surname**

Michael	Inglis

Date of Birth   **Scottish Candidate Number**

04.11.93	062657774

Title of Computer-Aided 3D Modelling Presentation

LEGO General Grievous

NOTE: The Student Record has been designed to record the work of your Computer-Aided 3D Modelling Presentation. It should also help to ensure that your Computer-Aided 3D Modelling Presentation meets the assessment requirements. Teacher/ lecturers **must** refer to "Guidance on Assessment - Computer-Aided 3D Modelling Presentation" (Diet 2011/ 2012) **before** attempting to complete this form.

Assessment Requirements

1   The Computer-Aided 3D Modelling Presentation, which is worth 30% of the total marks for the Advanced Higher Graphic Communication Course assessment, must be your own work.
2   The Computer-Aided 3D Modelling Presentation should consist of **six to ten pages of work.**   A3, A4, or a mixture of A3 and A4 page formats may be used**.**
3   In completing the Student Record, **all** photocopied, scanned, captured, or clip art images used **must** be acknowledged. A description of any work carried out to enhanced, photocopied, scanned, captured, or clip art images must also be declared; as well as acknowledging the source of all other images.
4   All CAD, Illustration or computer graphic work produced by following a directed approach, such as by step-by-step guide or wizard is **not valid** for assessment purposes.
5   The candidate declaration must be completed for a submission to be valid.

I have read and understood the assessment requirements of the Computer-Aided 3D Modelling Presentation and acknowledge that this, depersonalised, work may be used as exemplification for learning and teaching purposes.

Signature of Candidate _____   Date_____

Graphic Communication Advanced Higher - Computer-Aided 3D Modelling Presentation

The Student Record should be used by candidates to provide a description of their 3D modelling techniques and how they were used in the model.

Development of Modelling Technique 1

Please provide a description of how technique was used to create the model or items within the environment.

Name of modelling technique:	Solids created through extrusion

Situation of technique – Model

Screenshot	Description	Model Tree
	The shape was drawn out in a sketch.	
	A solid was extruded from the sketch.	
	A new sketch was drawn on the center plane. It overlaps the top and bottom of the solid.	
	A cut extrusion is then applied to the new sketch. This causes the top and bottom of the solid to be at an angle to the original sketch.	
	More extrusions of different lengths are applied to give the basic shape.	
	Edges are filleted to make object appear more realistic.	
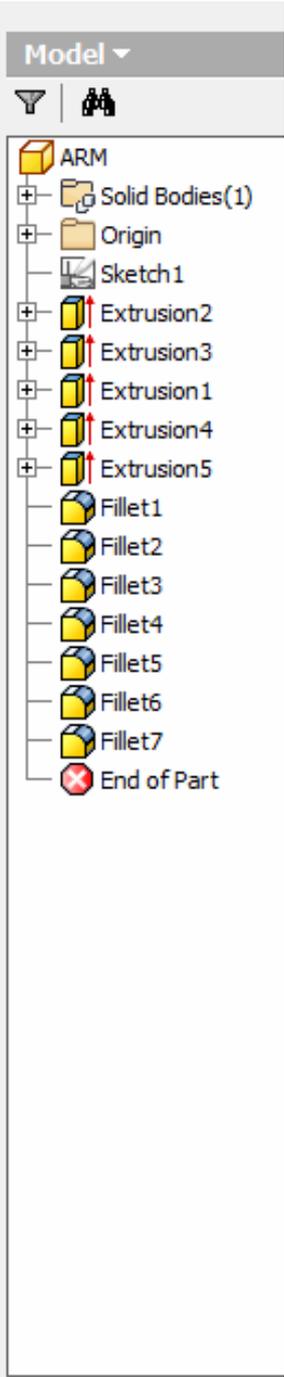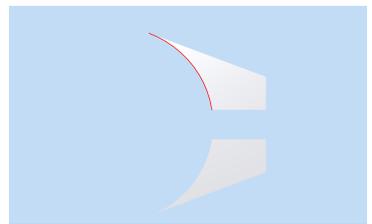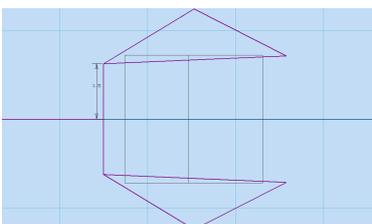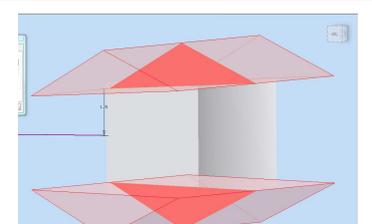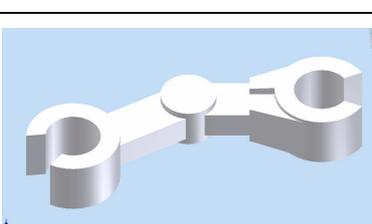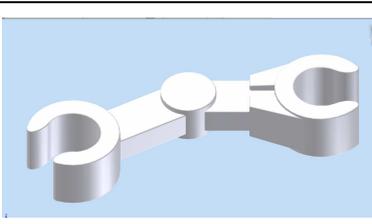
Graphic Communication Advanced Higher - Computer-Aided 3D Modelling Presentation
The Student Record should be used by candidates to provide a description of their 3D modelling techniques and how they were used in the model.

Development of Modelling Technique 2

Please provide a description of how technique was used to create the model or items within the environment.

Name of modelling technique:	Solids created between two or more entities

Situation of technique – Environment

Screenshot	Description	Model Tree
	Two extrusions were made using two different sketches.	Model ▾ 4x4 Curved End - 4250256 Solid Bodies(1) Origin Extrusion1 Sketch2 Extrusion2 Loft1 Mirror1 Shell1 Sketch4 Extrusion8 Extrusion4 Extrusion5 Extrusion6 Extrusion7 Extrusion9 Extrusion10 Extrusion11 Extrusion12 Extrusion13 Mirror2 Fillet13 Fillet15 Fillet14 End of Part
	A third sketch was drawn on the end of the first extrusion.	
	The sketch was then projected using a loft. This loft used 3 rails and finished on a point.	
	The whole object was mirrored.	
	Shell was then applied to the base.	
	More detail was extruded into the base using several extrusions at different lengths.	
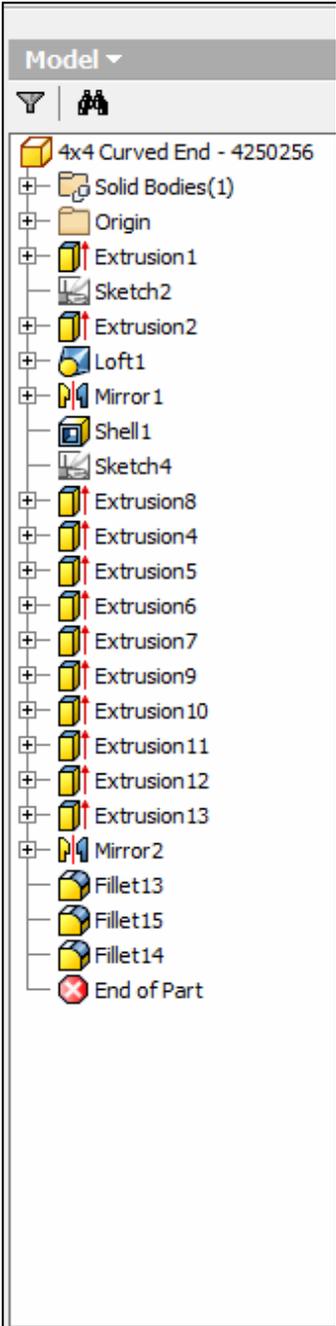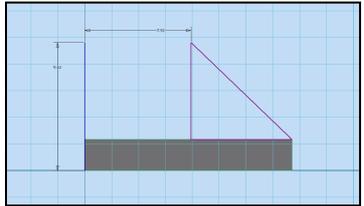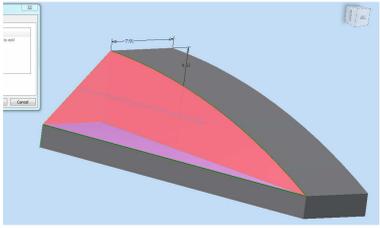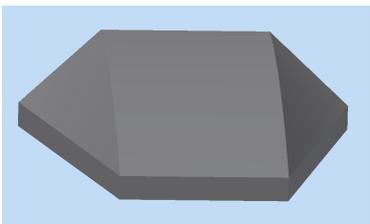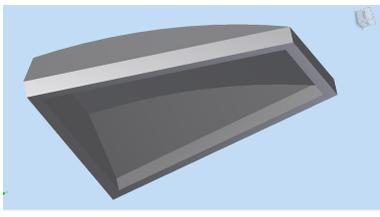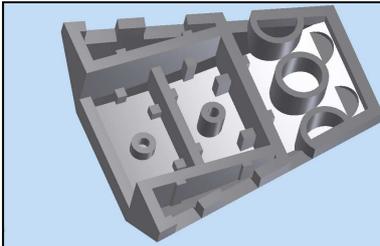
*Delete as appropriate

Graphic Communication Advanced Higher - Computer-Aided 3D Modelling Presentation
The Student Record should be used by candidates to provide a description of their 3D modelling techniques and how they were used in the model.

Development of Modelling Technique 3

Please provide a description of how technique was used to create the model or items within the environment.

Name of modelling technique: Solids created through revolution

Situation of technique – Model

Screenshot	Description	Model Tree
	A tapered extrusion is added to a loft cut through revolution and extrusion to create a pointed solid. This will serve the basis for a hip.	Model ▾ Sketch1 Work Plane1 Sketch3 Loft1 Extrusion1 Sketch4 Loft2 Extrusion2 Sketch7 Work Plane2 Work Plane7 Work Plane8 Extrusion11 Revolution2 Sketch19 Extrusion9 Extrusion12 Extrusion14 Fillet4 Extrusion10 Sketch21 Fillet3 Mirror1 Extrusion13 Extrusion15 Extrusion16 Mirror2 Work Plane9 Loft5 Mirror3 Revolution3 Sketch28 Work Plane10 Sketch29 3D Sketch7 Loft6 Mirror4 Mirror5 Extrusion18 Sketch31 Extrusion19 Extrusion20 Extrusion21
	The pointed solid is then brought further in by a loft which creates a solid in which the revolution can penetrate.	
	The 'hip' which has now been created is mirrored. The solid is now ready for acting as an attachment for the revolution.	
	A shape is drawn in a sketch overlapping the hips.	
	The profile is then revolved around an axis to create the attachment for the legs.	
	The shape is then filleted to get rid of all the sharp edges.	
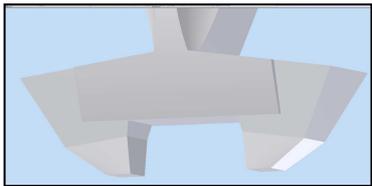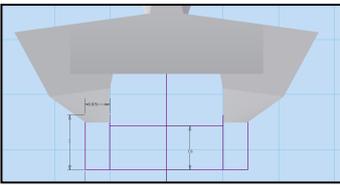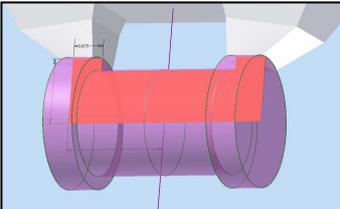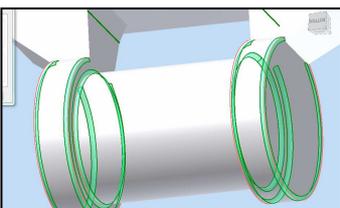
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Graphic Communication Advanced Higher - Computer-Aided 3D Modelling Presentation

The Student Record should be used by candidates to provide a description of their 3D modelling techniques and how they were used in the model.

Development of Modelling Technique 4

Please provide a description of how technique was used to create the model or items within the environment.

Name of modelling technique:	Surfaces created through revolution

Situation of technique – Environment

Screenshot	Description	Model Tree
	A sketch is drawn of a shape to be revolved. The profile is not completed.	Model ▾ ▽ 🔍 📂 Lightsaber SURFACE - 4212074 ⊞ 📂 Solid Bodies(2) ⊞ 📂 Surface Bodies(7) ⊞ 📁 Origin — 📐 Sketch1 ⊞ 🔄 RevolutionSrf1 ⊞ 🔄 RevolutionSrf2 ⊞ 🔄 RevolutionSrf3 — 🔧 Thicken1 — 🔧 Thicken2 — 🔧 Thicken3 — 🔧 Thicken4 — 🔧 Thicken5 — 🔧 Thicken6 ⊞ 🔄 RevolutionSrf5 — 🔧 Thicken7 ⊞ 🔷 Circular Pattern 1 — 🔶 Fillet1 — ❌ End of Part
	The sketch is revolved as a surface model.	
	Thicken is used on each of the surfaces.	
	Another profile is revolved as a surface. It however is not a full revolution and is set to an angle.	
	Thicken is applied to this new revolution.	
	Circular pattern is applied to the newly thickened revolution. A fillet is also added.	
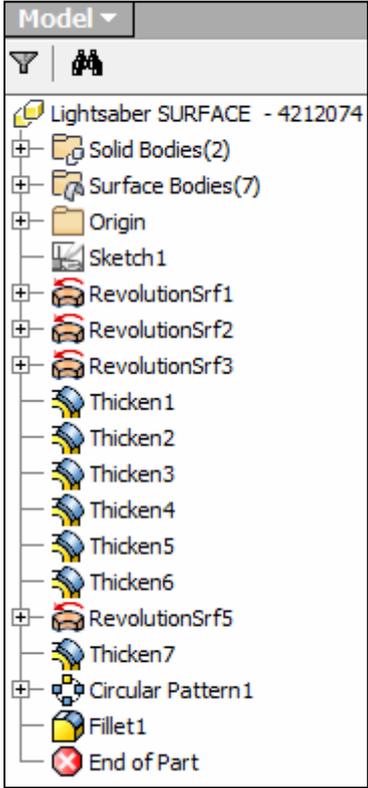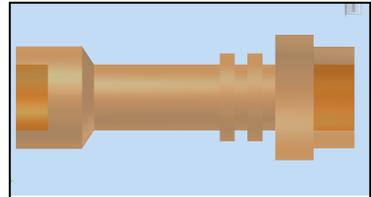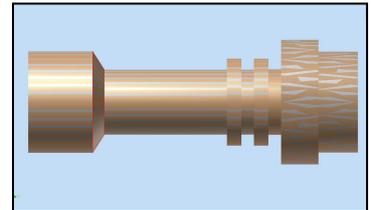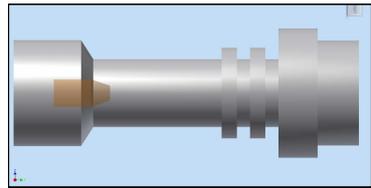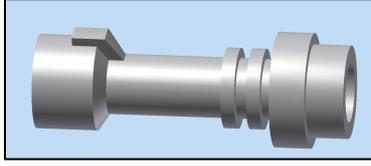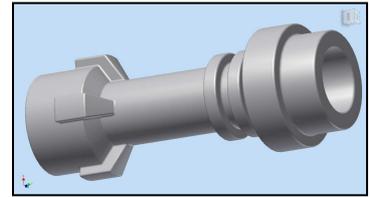
5

The Student Record should be used by candidates to provide a description of their 3D modelling techniques and how they were used in the model.

Development of Modelling Technique 5

Please provide a description of how technique was used to create the model or items within the environment.

Name of modelling technique:	Surfaces created through extrusion/ thickness

Situation of technique – Environment

Screenshot	Description	Model Tree
	Lines are drawn on a sketch. The profile loop was not completed.	Model ▾ ▽ 🔍 Ship Glass ⊞ Solid Bodies(1) ⊞ Surface Bodies(3) ⊞ Origin Sketch1 ⊞ RevolutionSrf1 Work Plane3 ⊞ Boundary Patch4 Trim2 ⊞ Trim3 Work Plane6 ⊞ Boundary Patch5 Trim4 Trim5 Thicken5 Thicken6 Thicken7 ⊞ Revolution2 Sketch7 ⊞ Extrusion1 ⊞ Extrusion2 ⊞ Mirror1 End of Part
	Lines are revolved as a surface.	
	A boundary patch is added on a new plane and trimmed.	
	Another plane is created and a second boundary patch is added and trimmed.	
	Thicken is then applied to the surfaces.	
	A cutting revolution is applied to the top of the solid to give a smooth surface.	
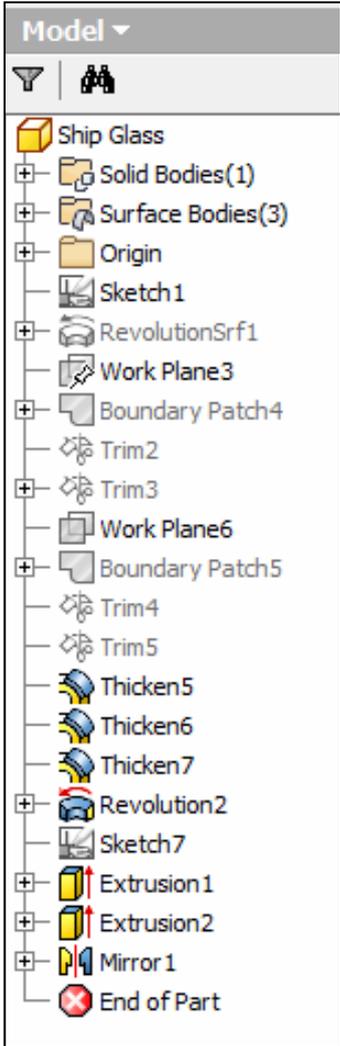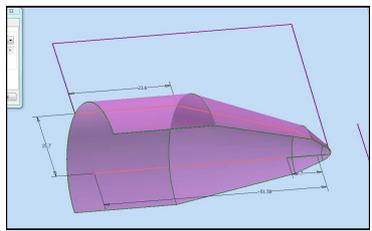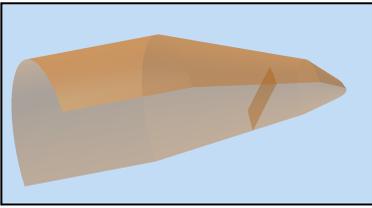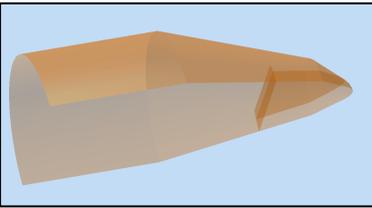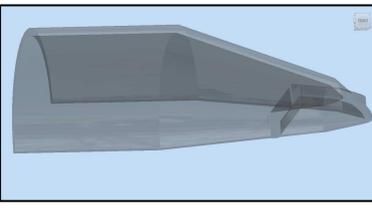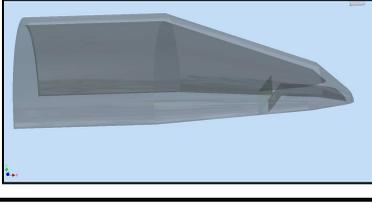
Graphic Communication Advanced Higher - Computer-Aided 3D Modelling Presentation

Candidates are advised to label each item/ page number for each technique and a description of the graphic should be given for each technique. A description of any clip art, library items, images and modelling elements not created by the student should be given here.

Computer Platform used:	Microsoft Windows
Software used:	Autodesk Inventor
Software used:	Adobe Photoshop (for environment decals)

Please provide a brief description of how the 2D drawings were created.

Orthographic

A base view of the 3D model was added and projected views were taken from it. A sectional view was also taken from the base view in Drawing 2. A copy of the original model with several constrains offset was added as an exploded view. Lines representing fillets were removed from the drawing to comply with British Standards. Dimensions, hidden detail and centerlines were then added.

Pictorial

A range of rendered views were taken highlighting different parts of the model and the environment. These were rendered at a high resolution and compiled in a Microsoft Publisher document.

Materials & Lights

The material ABS plastic was applied to most objects. Glass was applied to the surface model. Lighting was then created to match the harsh sun of Utapau. Unlike Tatooine, Utapau only has one sun and has managed to retain most of it's water. The intensity of one sun was taken into consideration when applying the strongest lights. Terrain lights were also added to give the impression of reflection off the rocks that would appear below.
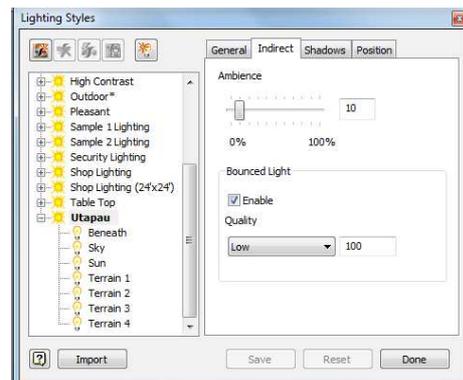
Graphic Communication Advanced Higher
Teacher/ Lecturer Assessment of Computer-Aided 3D Modelling Presentation

Teacher/ lecturers must refer to "Guidance on Assessment – Computer-Aided 3D Modelling Presentation" (Diet 2011/ 2012) before attempting to complete this form.

Candidate ___M INGLIS___

Item No.(s)	Assessment Criteria	Max. Marks	Mark Awarded	Official Use
	Section 1. 3D Modelling			
	(a) Modelling Technique 1	6	6	
	(b) Modelling Technique 2	6	6	
	(c) Modelling Technique 3	6	6	
	(d) Modelling Technique 4	6	6	
	(e) Modelling Technique 5	6	6	
	Section 2. Presentation			
	(a) Creation of three Related Orthographic Views	6	6	
	(b) Creation of Additional Views (i) Orthographic	4	4	
	(ii) Line Pictorial	6	6	
	(c) Annotation	2	2	
	Section 3. Visualisation			
	(a) Adding Materials and Lights	6	6	
	(b) Producing a Suitable Environment	6	6	
	Total Marks	60	60	

18.42

Plan

42.23

48.17
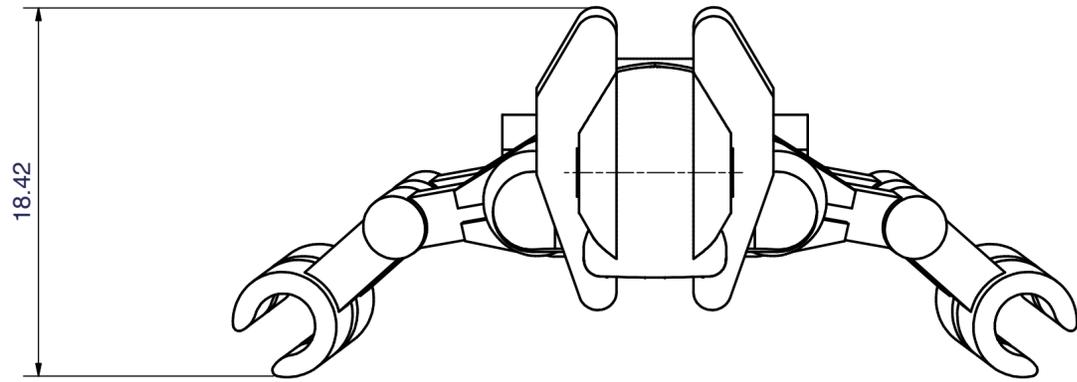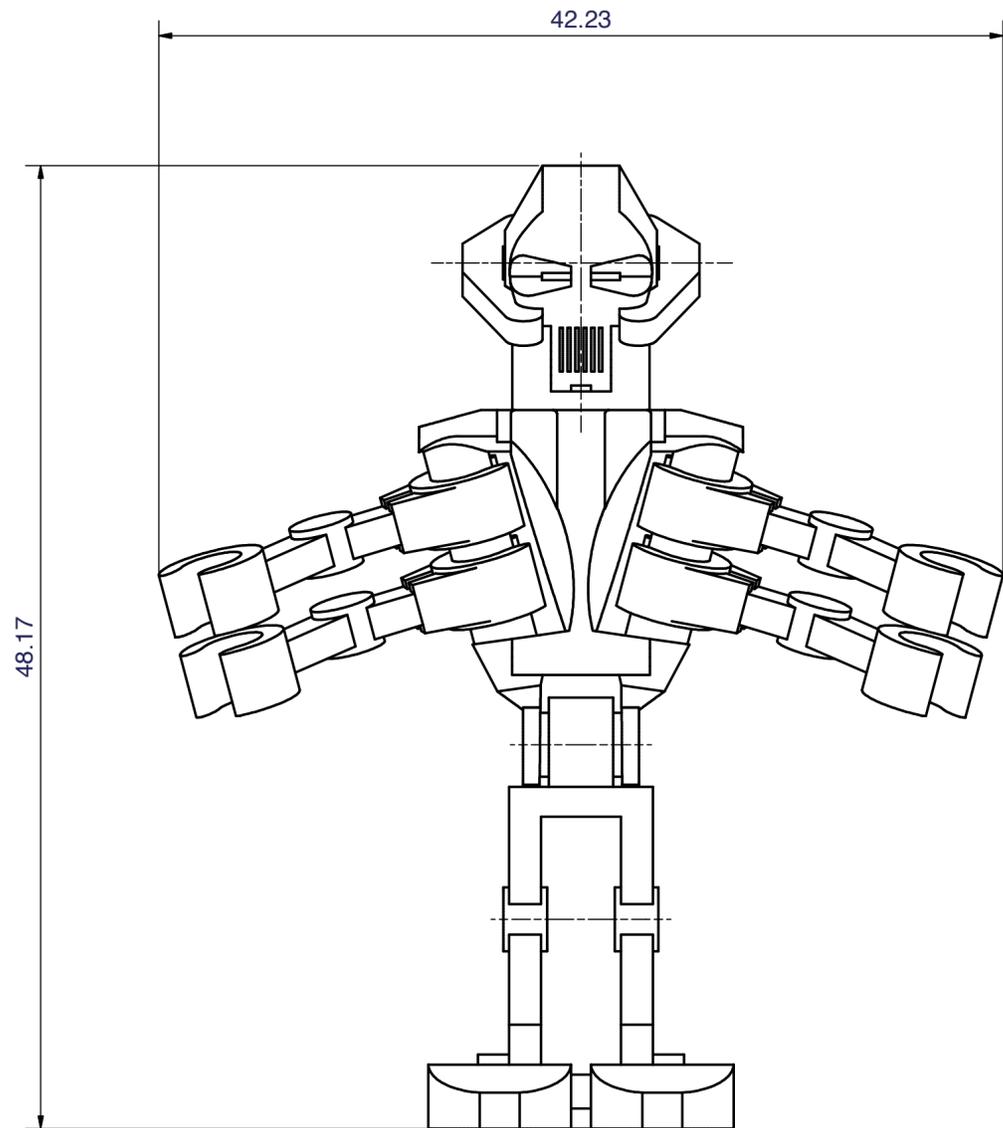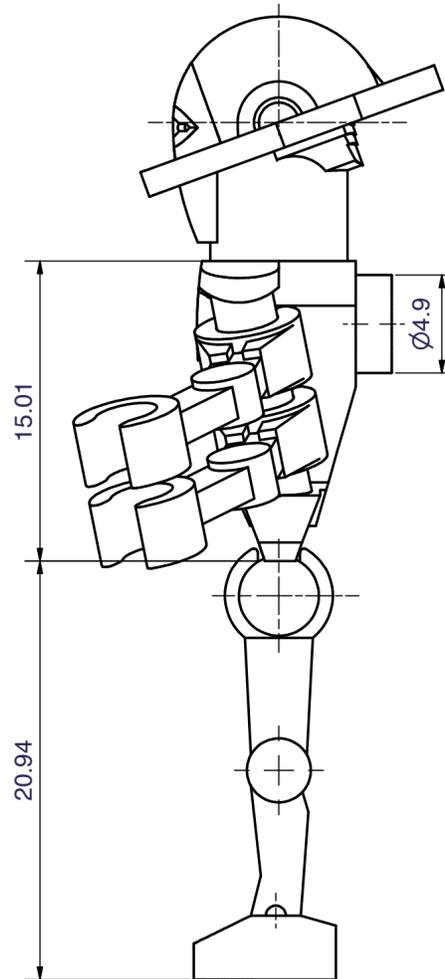
Elevation

ASSEMBLED ISOMETRIC

Ø4.9

15.01

20.94

End Elevation

Title: Grievous Assembled	
Date: 15/11/2011	MINGLES
Tolerance: ±0.10	
Scale: 4:1	Drawing Number: 1
All Dimensions in mm	
Drawn By: Michael Inglis	

A

A

ELEVATION
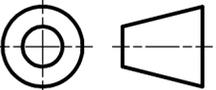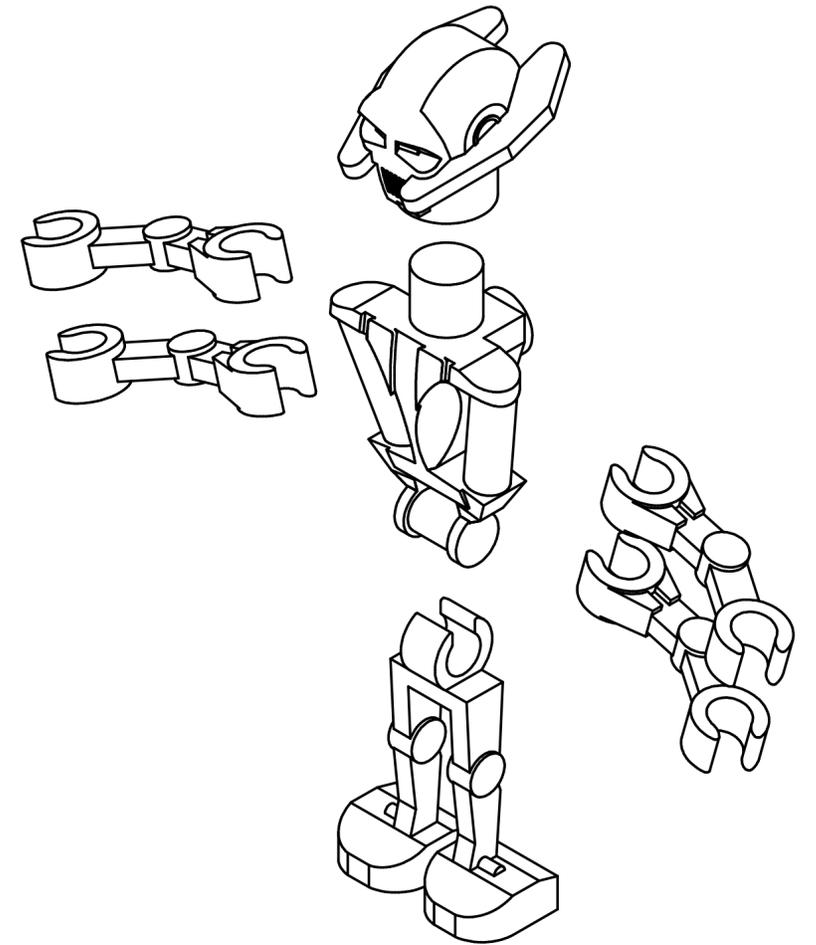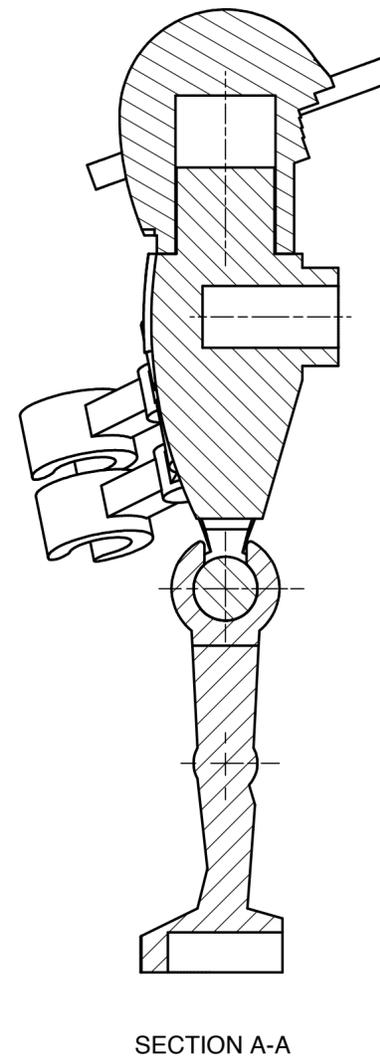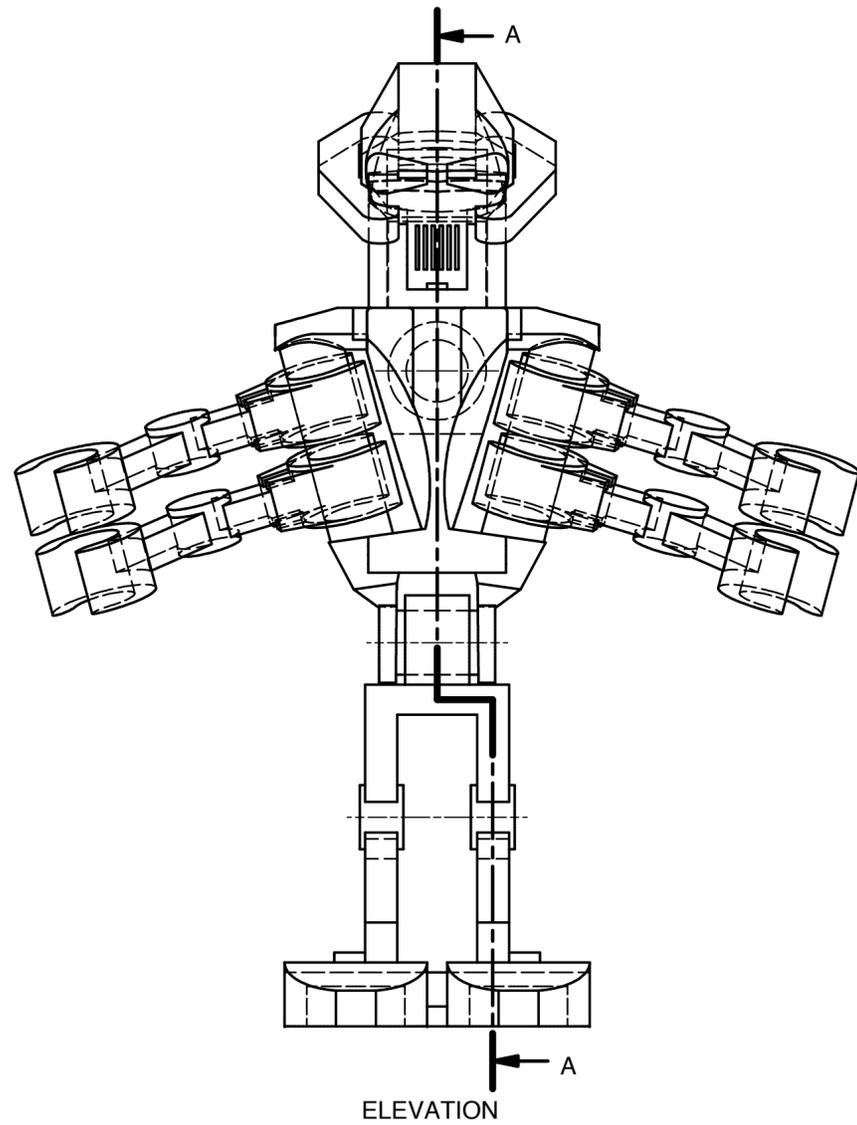
SECTION A-A

EXPLODED ISOMETRIC

Title: Grievous Section	
Date: 15/11/2011	MINGLES
Tolerance: ±0.10	
Scale: 4:1	Drawing Number: 2
All Dimensions in mm	
Drawn By: Michael Inglis	

HEAD

11.86

7.6

3.86

12.22

5.48

Ø6.86

ELEVATION

R5.3
R2.06
R1.25
R1

1.3

0.97

5

END ELEVATION

LEGS

7.2

4

3.22

5.86

6.5

3.2

7.14

1

ELEVATION

R2.7
R1.6

Ø3.2

21.53

7.1

END ELEVATION

BODY

PLAN

Ø4.9

4.32

13.25

3.2

3.86

5.5

ELEVATION

3.85

3.85

1.8

3.1

6.3

4.77

Ø3.2

R2

END ELEVATION

ARM

4.75

Ø3.2

1.5

PLAN

R2.68
R1.58

150°

4.31

R2.68

2.55

ELEVATION
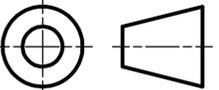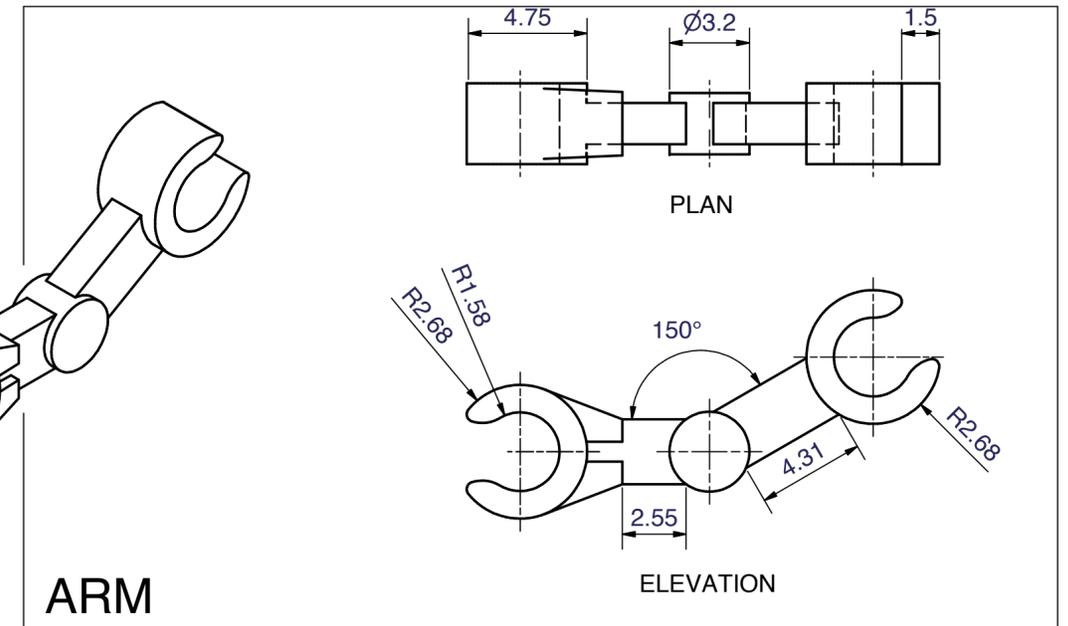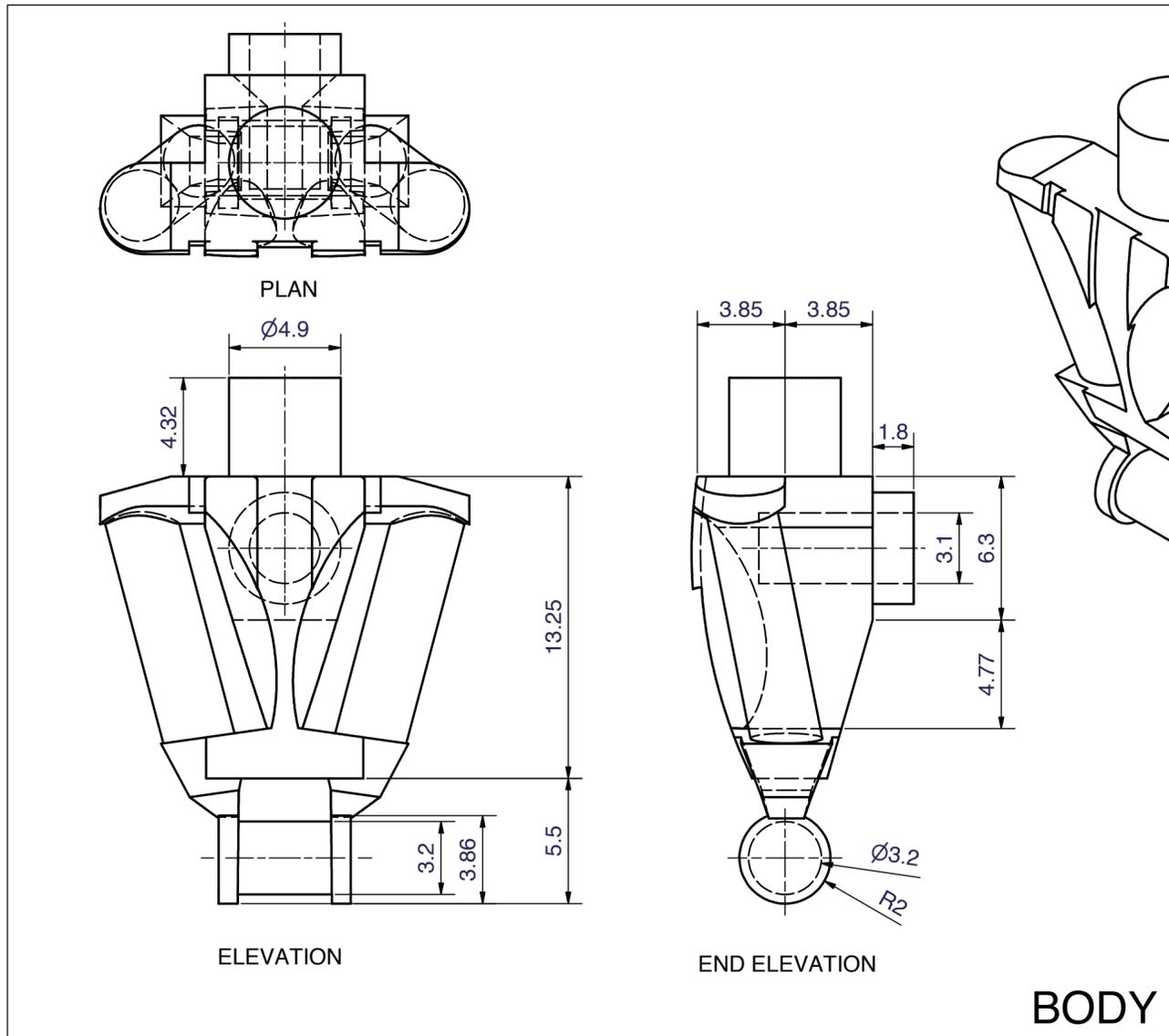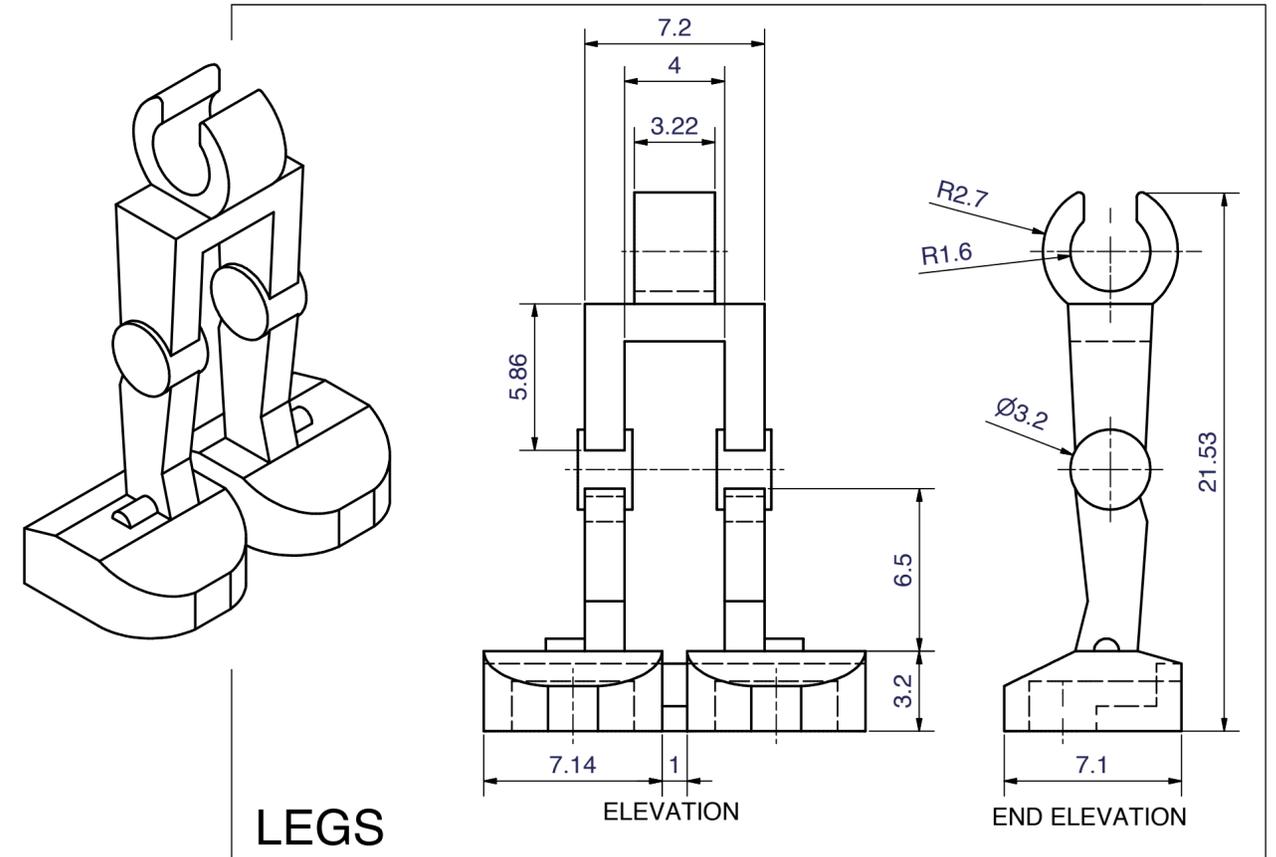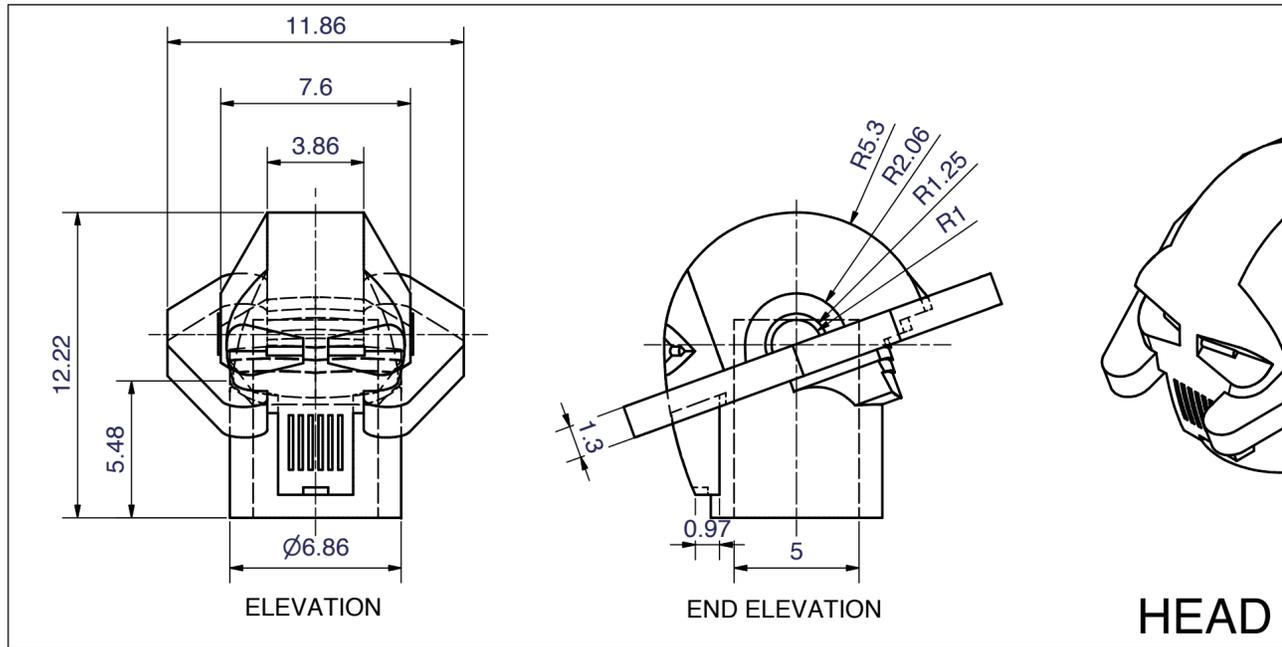
Title:	Grievous Components	
Date: 17/11/2011		MINGLES
Tolerance: ±0.10		
Scale: 5:1		Drawing Number: 3
All Dimensions in mm		
Drawn By: Michael Inglis		
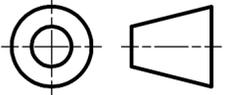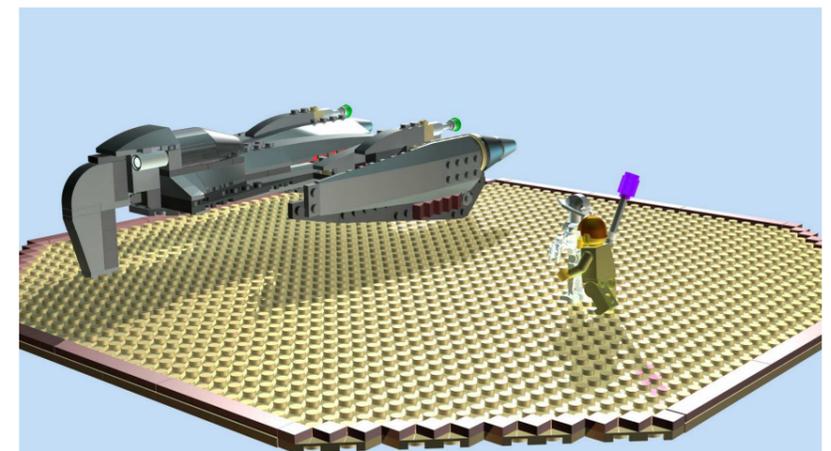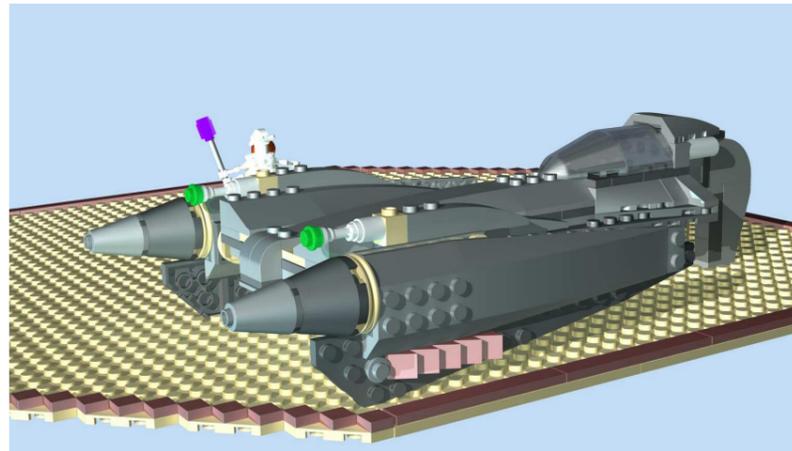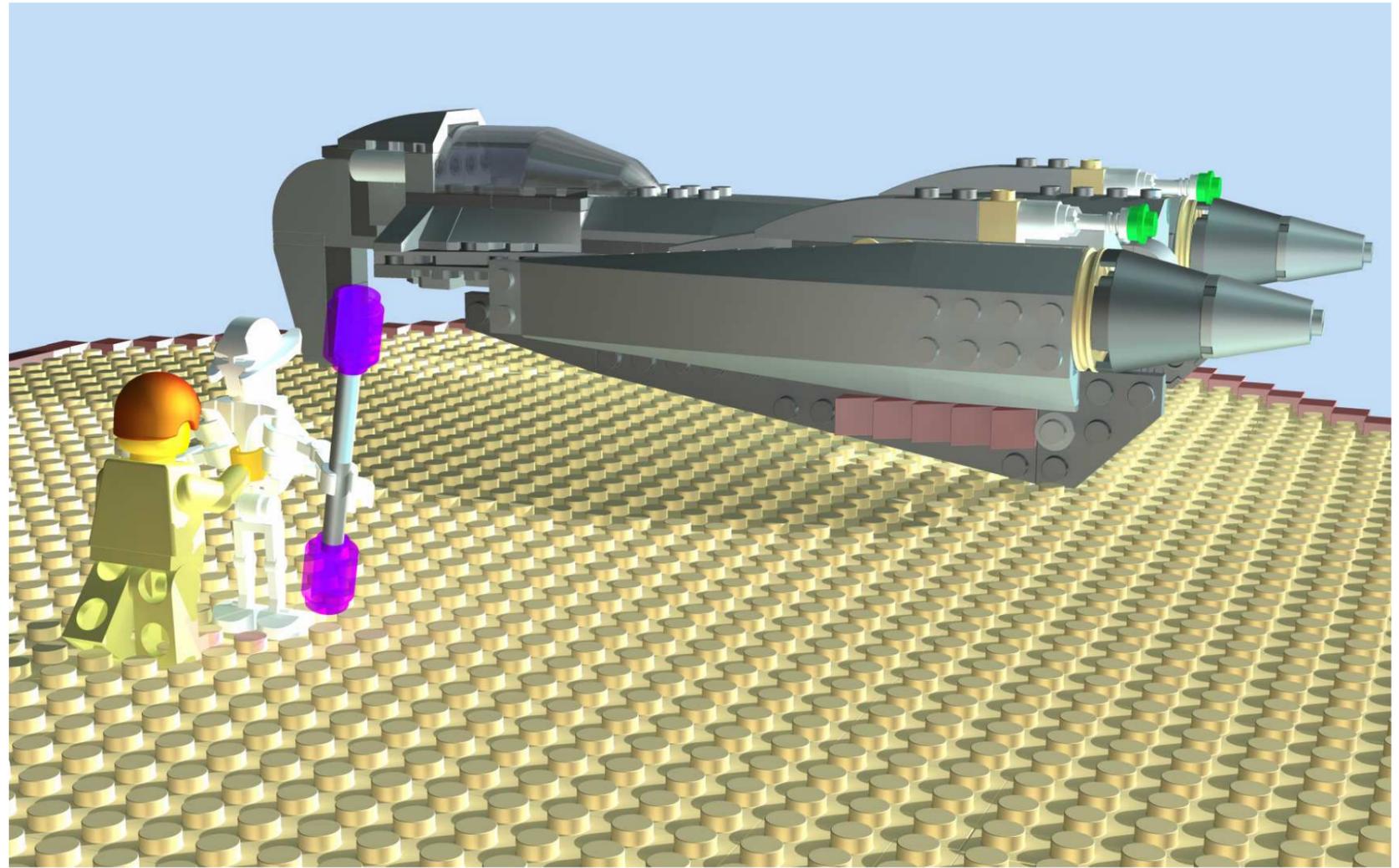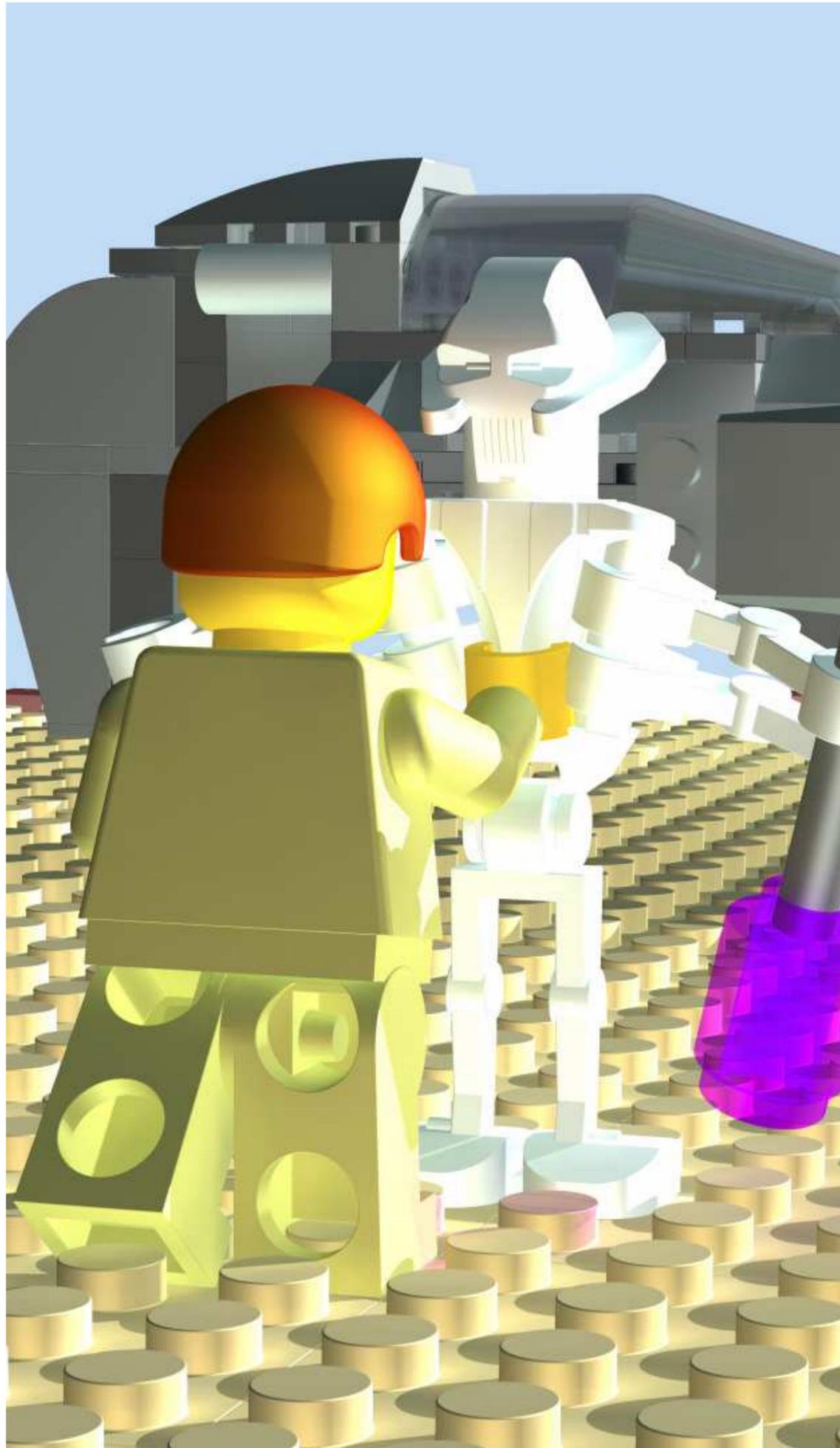
LEGO General Grievous
Rendered 3D Assembly