

# Royal Robotics

Lesson Plan - CAD

Bryan Hinze

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## Lesson 1: Inventor Intro

Open an existing part – using a project

Explain what projects are and how they help – group & share files (vault) libraries, etc.

Navigate the screen:

Explain menus, tool panels/tabs, browser panel, etc.

Use cube and zooms and wheels and rotating tools

Make a new simple, single sketch part:

Open new part (project “training”)

Explain selecting ‘templates’ mm/inches and extensions: .ipt (part), .iam (assembly), .idw (drawing), etc.

Open sketch mode

Make various shapes using tools.

Use General dimensions and how to change values of dimensions

Apply various constraints and use show constraints (explain how to delete)

Return to normal mode

Extrusions: extrude in various directions, cut away, etc.

Explain Share sketch and visibility

Explain changing values of extrusions

Explain changing colors/textures, both whole part and pieces.

Save and close

Activity:

set of simple blocks and rulers, make as many as can

NOTE: If time permits go into lesson two concepts

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## Lesson 2: Complex Parts

Explain/demo how to change gridlines (tools, document settings)

Explain/demo how to apply snap to grid (tools, application settings)

Explain fillet, chamfer, face draft, holes, etc. (both sketch and extrude)

Explain trim, extend, move copy, etc. (in sketch)

Explain mirror

Explain patterns - circle/rectangle

### Creating a multi-sketch part (1)

New file – project “training”

Create a keyhole pattern (see sketch 1)

Extrude using revolve and color metallic

use circular pattern to add holes around edge

On side create a hexagon shaft 2” long

Use mirror to make identical shaft on opposite side.

Add a 1” block to one end.

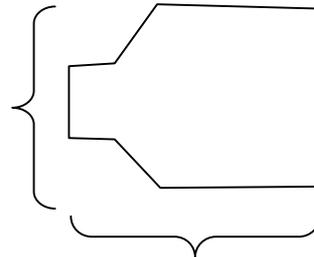
Use Chamfer to angle outside edges 1/8 inch.

Use 1/8 inch Fillet on inside edges (nearest shaft)

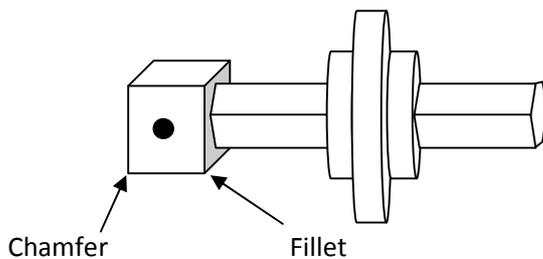
Put a 1/4 inch hole through the side of the block

Save and Close

1.5  
inches  
1/2 inch  
each  
section



2 inches: center  
point 1/2 inch long,  
angle .75 inch long,  
base .75 inch long



review constraints, etc. as needed from lesson 1 to complete

### Activity:

complete sketch above – if extra time, may attempt Lego bricks (have several kinds, rulers)

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## Lesson 3: Assemblies

Explain how to open a new assembly

Explain how to add parts

Explain how to pin/unpin parts

Explain various zooms

Explain visibility on/off

Explain how to turn off/on sketches

Explain constraints: create, delete and modify

Activity:

Using the block part files make a tower assembly

(can do impossible things like sticking blocks to the side as if magnetic)

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## Lesson 4: Drawings

1. Creating a new drawing select ANSI (in).dwg

a) Edit sheet , select size A (8.5 x 11)

b) delete large title block

c) select ANSI A title block (drawing resources, title blocks, double click ANSI A)

d) add info to title block (browser click on ANSI A, field text (pops up editfields box, click on iproperties icon)

(1) title: "training"

(2)part name: tower

(3) revision: 1

(4) author: your name

e) enter base view of tower.iam front view place on left side of page

f) create projected views of tower to show from front angle one rear angle (place on left side pg)

g) add a parts list (position on right) edit to remove description column, adjust to fit page

h) enter base view of each part (use view and size that best shows part for dimensions) place center on page

i) change to annotation panel and retrieve/select dimensions for lengths, widths

j) add balloons to tower assembly (numbers match parts list item numbers)

k) add leader text labels for part name on each part drawing

Save

Activity:

Complete the drawing file