A superquick getting started with Openrocket.

Openrocket is a great opensource package that enables users to design and simulate rocket designs using a variety of materials and commercially available rocket motors. This getting started guide is based on a script I've used in rocketry workshops I've delivered and seems to do the job getting people started.

Before we dive in download openrocket from the website http://openrocket.info/

You will need the Java runtime environment installed it can be downloaded from here https://java.com/en/download/

Open Openrocket and lets begin!

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Click the Nosecone icon,

In the dialogue box that appears;

- Select shape from dropdown "ellipsoid"
- set nose length to 8cm
- base diameter 3cm
- Wall thickness 0.2cm
- Click material set to PVC
- Click "shoulder" Tab
- Diameter 2.6
- Length 2cm

- Click Apply

Click Bodytube,

In the dialogue box;

- Length 45 cm
- Outer diameter 3cm

(Double check but the inner diameter should automatically set to to 2.6cm and therefore wall thickness 0.2)

- Material should be cardboard

- Click Apply

Click Fin set Trapezoidal icon. (you will need to have the bodytube highlighted in the plan view for the finsets to be available to highlight a component either click on it in the plan view or click its name in the component tree)

In the dialogue box;

- No of fins = 3
- Root chord = 4cm

- tip chord = 4cm
- Height = 2cm
- Sweep= 1.5cm
- Sweep angle = 36.9
- Fin cross section =rounded
- thickness =0.3cm
- material = birch
- Click Apply

*****You should note now that the centre of pressure (CP) symbol (red dot inside red circle) is behind (toward the fin end) of the centre of gravity (CG) symbol (blue quartered circle). In the top right hand corner of the plan box is some text about their positions. The “Cal” number is to do with stability. It is the number of calibres (diameter of the body tube) behind the CG the CP is.. we ideally are aiming for the CP to be between 1 and 2 calibres behind the CG . Over 2 calibres is OK but overstable and may turn more into a prevailing wind resulting in a ballistic flight!***

Again with bodytube highlighted
Click Inner Tube icon

In the dialogue box;

- Outer dia = 1.9cm
- Inner dia= 1.8cm
- wall thickness =0.05cm
- length = 7cm
- material (cardboard)
- In the “Motor” tab check “this is a motor mount” dialogue box

- Click Apply

With the Inner tube (motor mount tube) highlighted
Click Centring ring icon

In the dialogue box;

- Outer dia= 2.6cm
- (next should auto to)
- inner dia= 1.9cm
- Set thickness to 0.5mm

- Set “position to parent” to -7cm

- Material Balsa

Repeat and add another centring ring but leave the “position to parent” at 0 to add one at base of motor mount

Highlight body tube

Click Parachute icon

In the dialogue box;

- Diameter 30cm
- Position “top plus” 3cm

Save your work!

Click to highlight inner tube/motor tube and then click the “motors and configuration tab in the main window (top left next to current rocket design tab)

- Click “new configuration”
- Click “select motor”

There are all kinds of ways you can constrain the lists of commercially available motors but essentially find an “Estes B6-4” motor and select it and make sure to add a 4 second delay in the motor selection dialogue box.

- Click “Add the motor” (should dump you back onto the rocket design page)

Click the Flight simulations tab from the main 3 tabs

You should see that there is a single simulation listed that hasn't been run with your motor details in it.. highlight it and then click run simulation button.. the slots will fill with data.. then click the plot button and ok the next dialogue and you should get a flight simulation graph.

:)

Congratualtions! If you made it this far you have designed and simulated a small and not terribly efficient rocket! Time for you to experiment and play and design something amazing!

Feel free to find me on twitter to ask questions @concreted0g