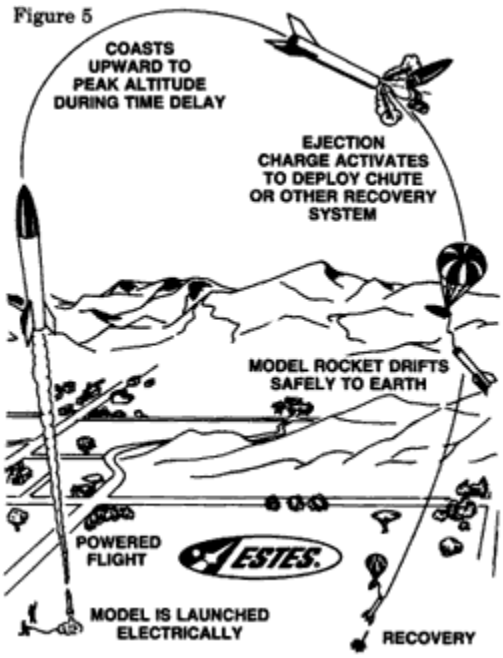
IMPORTANT FACTS ABOUT ESTES MODEL ROCKET ENGINES



Due to their design as precisely manufactured packages of power with strictly engineered tolerances, Estes engines are the standard in the industry. Some important features are:

** A totally safe product throughout its 40+ year history, owing this outstanding record to experienced craftsmanship and engineering.
** Pre-manufactured propellants that are placed in their casings at the factory. The modeler does not have to handle or mix propellants, just insert the igniter in the engine and install the engine in the rocket.
** Expendable engines that are used once, then discarded. Attempting to reload these engines can be dangerous and is forbidden by regulations. Manufacturing of or tampering with propellants can be extremely dangerous and is against the model rocket safety code. Expendable model rocket engines have provided the foundation for model rocketry as an educational tool and hobby activity.
** Three percent of all Estes engines are tested for reliability and adherence to performance standards. If standards are not met, the engines do not make it to market.

The following illustrations help you picture the details of our engine. Figure 6 illustrates the Estes color coding for use identification and the alphanumeric code for performance ratings. Recommended launch field sizes are shown in Figure 7
based on engine power usage.

ESTES ENGINE CODING

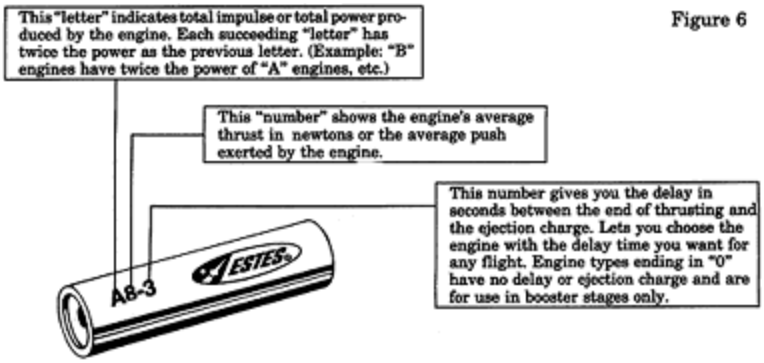


Figure 6

Estes engines are color-coded for recommended use. GREEN engines are for use in single stage models; PURPLE engines for the top stages of multi-stage rockets and very light single stage rockets; RED engines for all booster and intermediate states of multi-stage models. YELLOW are 'plugged' and recommended for special uses only.

LAUNCH SITE DIMENSIONS

Installed Total Impulse Equivalent Engine (Newton-Seconds)	Type	Minimum Site Dimension (feet) (meters)
0.00-- 1.25	1/4A & 1/2A	50 / 15
1.26-- 2.50	A	100 / 30
2.51-- 5.00	B	200 / 60
5.01-- 10.00	C	400 / 120
10.01-- 20.00	D	500 / 150
20.01-- 40.00	E	1000 / 300
40.01-- 80.00	F	1000 / 300
80.01-- 160.00	G	1000 / 300
160.01-- 320.00	2Gs	1500 / 450

TYPICAL TIME/THRUST CURVES ESTES B6-4 MODEL ROCKET ENGINE

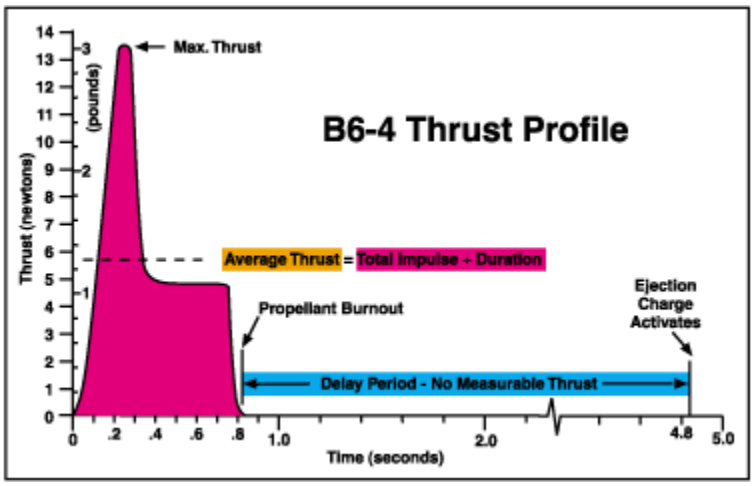
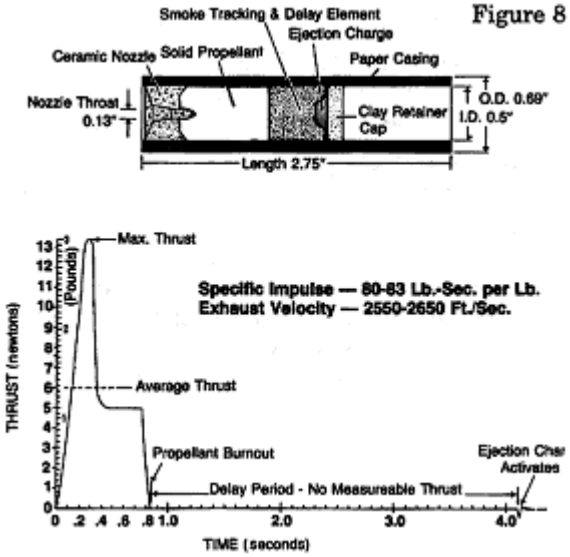


Figure 8 shows a cross section of a standard Estes rocket engine and a time thrust curve used to plot the engine's performance. Comparing the force it exerts (vertical axis) versus the time over

which it burns (horizontal axis) provided information about the engine's total impulse, average thrust and time delay.



HOW HIGH WILL YOUR ROCKET GO?

The chart below shows the approximate altitudes that can be achieved with single stage rockets.

Engine Size	Altitude Range (depending on rocket size and weight)	Approximate Altitude in a typical 1 oz. model
1/2A6-2	100 to 400	190
A8-3	200 to 650	450
B6-4	300 to 1000	750
C6-5	350 to 1500	1000
(Some high performance rockets will reach higher altitudes than shown above.)		

MODEL ROCKET ENGINE FUNCTIONS

Graphic explanation of a rocket engine's fundamental construction and functions. Figure 9 shows the internal structure of a typical model rocket engine and the function of each component during a typical flight.

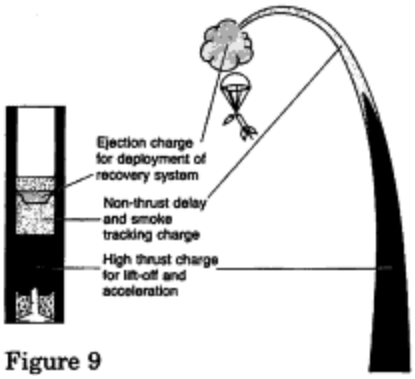


Figure 9

https://www.youtube.com/watch?feature=player_embedded&v=T15CaYzchv8