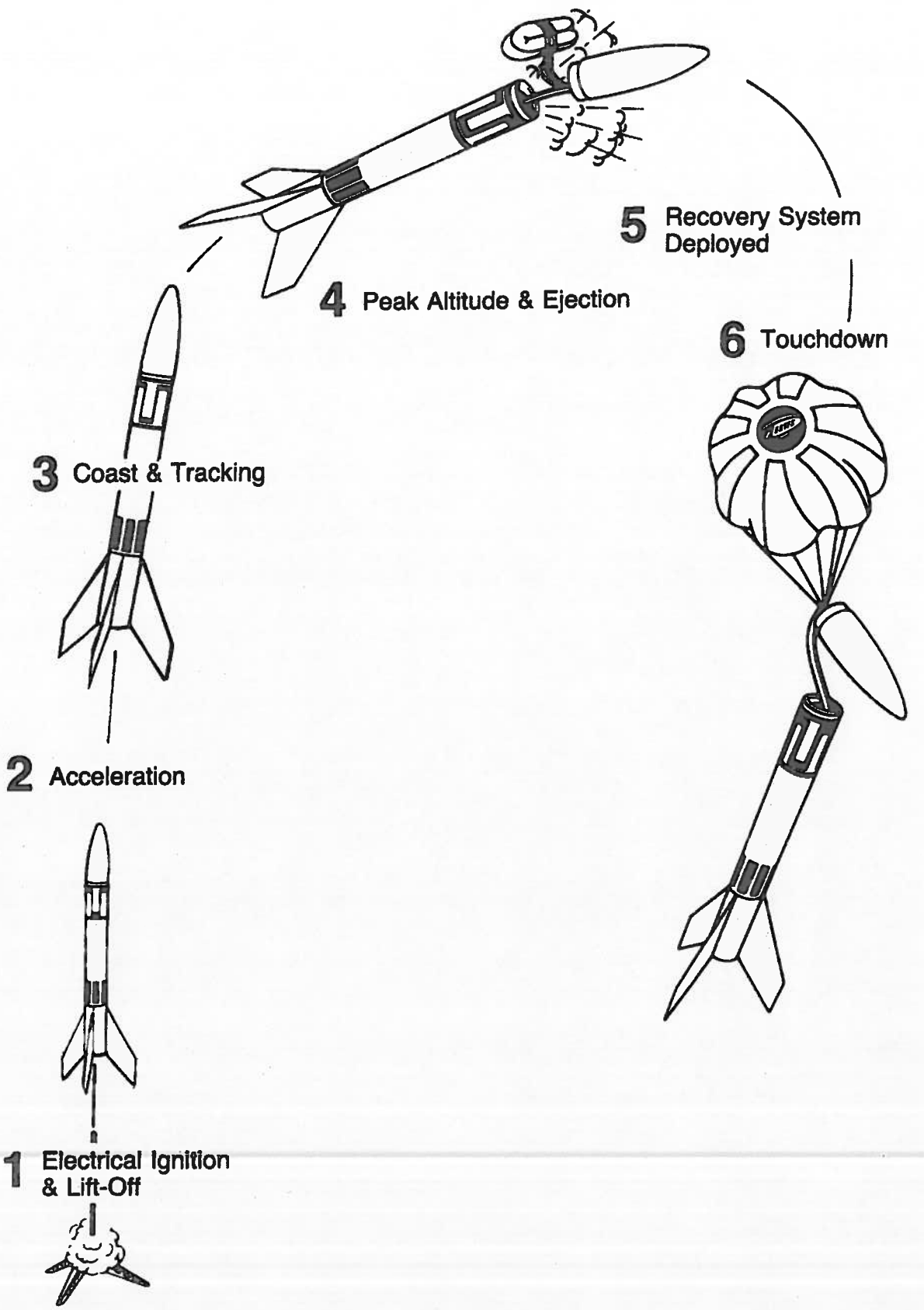
There are three phases to a model rocket flight:

1. During the **thrust phase**, the rocket propellant is ignited and (hopefully) produces enough thrust to overcome the force of gravity on the rocket. This works according to Newton's 3rd Law of Motion.

2. Once the propellant burns out, the rocket enters the **coasting phase**. It still moves upwards, but gravity is slowing it down since there is no longer an upward force from the engine.

3. After three seconds of coasting, the **ejection** charge in our B6-4 rocket engines will be ignited, forcing the nosecone off the body and ejecting the parachute. Ideally, this delay allows the parachute to be ejected at the highest point of the rocket's flight, but this will vary depending on how well the rocket is built.

FLIGHT SEQUENCE OF A MODEL ROCKET



1. Newtons First Law of Motion

• Objects at rest will stay at rest, and objects in motion will stay in motion in a straight line unless acted upon by an unbalanced force.

- **REST**
- **MOTION**
- **UNBALANCED FORCE**

2. Newtons Second Law of Motion

- **Force is equal to mass times acceleration.**

  - **MASS**
  - **ACCELERATION**
  - **FORCE**

3. Newtons Third Law of Motion

- **For every action there is an opposite and equal reaction.**

- **ACTION**

- **REACTION**

Newtons Laws of Motion Putting Them Together with Model Rocketry

Law 1:
An unbalanced force must be exerted for a rocket to lift off from a launch pad.

Law 2:
The amount of thrust (force produced by a rocket engine) will be determined by the mass of rocket fuel that is burned and how fast the gas escapes the rocket.

Law 3:
The reaction, or motion, of the rocket is equal to and in an opposite direction from the action, or thrust, from the engine.