DART Characteristics:

Weight – 3g

Length – 11in = 0.28m

Wingspan – 4.39in = 0.11m

Wing Area – 24.15in^2 = 0.016m^2

Center of Mass – 6.09in = 0.15m (from nosetip)

Dihedral – ~-5deg

Aspect Ratio – 0.798

Wing Loading – 3g

No tails

Flight Characteristics:

~1.5m starting height, Slow Throw:

Maximum Range – 2.3m

Time of Flight – 1.1s

~1.5m starting height, Fast Throw:

Maximum Range – 5.8m

Time of Flight – 1.6s

Base Weight, Fast Throw:

Average Gliding Speed – 3.5m/s

Average Glide Path Angle – ~10deg

Approx Roll – 5deg to the right

Approx Yaw – 0deg

Taped on Penny, Fast Throw:

Average Gliding Speed – 2.2m/s

Average Glide Path Angle – ~20deg

Approx Roll – 1deg to the right

Approx Yaw – 0deg

Notes: Unweighted, this plane tends to gradually switch from level flight to nosedive. Additionally, because of the pointed nose, this plane tended to change its flight dynamics as the nose got crunched. This plane also has a tendency to try to roll off of its flight path. Weighted, this plane seems to be more stable, however it also struggled to keep its momentum.

Plane 2: Modified Dart:

This plane is similar to the dart, with a few changes that can improve its longevity and its airtime:

1. Changed start orientation from “Hot Dog” to “Hamburger” (Instead of the first fold making the short side half as long, the first fold made the long side half as long)
2. Folded nose inwards to prevent nose crunching
3. A paper planes on a surface

   Description automatically generatedWing fold keeps fuselage a consistent thickness. Thickness is approx. where nose fold is.

Left: Dart

Right: Modified Dart

MODIFIED DART Characteristics:

Weight – 3g

Length – 9.38in = 0.24m

Wingspan – 5.82in = 0.15m

Wing Area – 27.30in^2 = 0.017m^2

Center of Mass – 4.31in = 0.11m (from nosetip)

Dihedral – ~0deg

Aspect Ratio – 1.241

Wing Loading – 3g

No tails

Flight Characteristics:

~1.5m starting height, Slow Throw:

Maximum Range – 1.5m

Time of Flight – 1.9s

~1.5m starting height, Fast Throw:

Maximum Range – 4.8m

Time of Flight – 3.1s

Base Weight:

Average Gliding Speed – 1.6m/s

Average Glide Path Angle – 5deg

Approx Roll – 180deg

Approx Yaw – 2deg

Taped on Penny:

Average Gliding Speed – 2.1m/s

Average Glide Path Angle – 7deg

Approx Roll – 180deg

Approx Yaw – 0deg

Notes: Unweighted, this plane tends to fly as level as it can until it stalls. Additionally, it has little in the way of roll control, likely due to its decreased fuselage size. Weighted, it drops slightly before it stalls, however there is still two distinct flight paths during its glide.