

ARROW TRAJECTORY MODELLING - TABLE I STANDARD SHOT RANGES

Arrow trajectories for the standard shot.
Distance to first graze with changing initial velocity.

| v (ft/s) | tgt rge (yd) | bow angle of departure | | rise to apogee | drop from apogee | gd angle of departure | | range on gd | dist to graze |
|-------------|-----------------|---------------------------|---------|-------------------|---------------------|--------------------------|---------|----------------|------------------|
| | | radians | degrees | (ft) | (ft) | radians | degrees | (YDS) | (yd) |
| 300 | 50 | 0.02682 | 1.54 | 1.01 | 6.01 | 0.07 | 3.76 | 122 | 86 |
| 280 | 50 | 0.03080 | 1.76 | 1.16 | 6.16 | 0.07 | 4.08 | 115 | 83 |
| 260 | 50 | 0.03572 | 2.05 | 1.34 | 6.34 | 0.08 | 4.46 | 108 | 79 |
| 240 | 50 | 0.04194 | 2.40 | 1.57 | 6.57 | 0.09 | 4.92 | 102 | 76 |
| 220 | 50 | 0.04994 | 2.86 | 1.87 | 6.87 | 0.10 | 5.49 | 95 | 73 |
| 200 | 50 | 0.06047 | 3.46 | 2.27 | 7.27 | 0.11 | 6.21 | 89 | 70 |
| 180 | 50 | 0.07475 | 4.28 | 2.81 | 7.81 | 0.12 | 7.15 | 83 | 66 |
| 160 | 50 | 0.09482 | 5.43 | 3.57 | 8.57 | 0.15 | 8.44 | 77 | 63 |
| 140 | 50 | 0.12439 | 7.13 | 4.69 | 9.69 | 0.18 | 10.27 | 71 | 61 |

Distance to first graze with changing target range for the standard shot at velocity 300 ft/s.

| | | | | | | | | | |
|-----|----|---------|------|------|------|------|------|-----|----|
| 300 | 50 | 0.02682 | 1.54 | 1.01 | 6.01 | 0.07 | 3.76 | 122 | 86 |
| 300 | 40 | 0.02145 | 1.23 | 0.64 | 5.64 | 0.06 | 3.64 | 118 | 79 |
| 300 | 30 | 0.01609 | 0.92 | 0.36 | 5.36 | 0.06 | 3.55 | 115 | 73 |
| 300 | 20 | 0.01072 | 0.61 | 0.16 | 5.16 | 0.06 | 3.48 | 113 | 67 |

REMARKS:

v - arrow velocity in feet per second
 tgt rge - range of target and, for the standard shot, the range at which the arrow is level with the point of launch (the bow)
 bow angle of departure - the upward angle of the arrow on firing
 rise to apogee - the height above the arrow rest that the arrow reaches, the highest point on the trajectory
 drop from apogee - the rise plus five feet, the standard shot bow height, this is the distance the arrow falls from the highest point to the ground
 gd angle of departure - the upward angle at which the arrow would have been launched from the ground behind the target to follow the same trajectory
 range on gd - the theoretical range that the arrow would travel if launched from the ground behind the archer
 dist to graze - the distance from the archer to the point at which the arrow would strike the ground for the standard shot