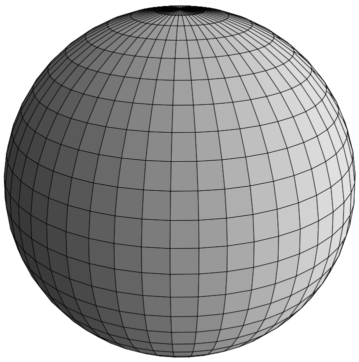
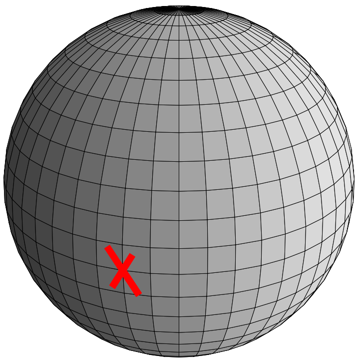
Projectile Motion with Respect to the Earth's Rotation: An Explanation of the Coriolis Effect

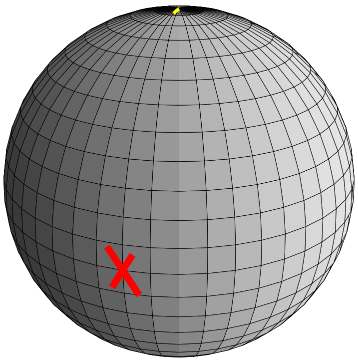
Greg Kennedy 44929008

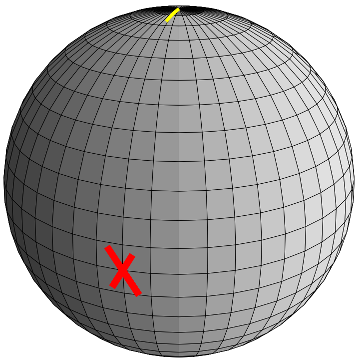
A launched projectile deviates from its targeted path because the Earth is rotating on its axis.

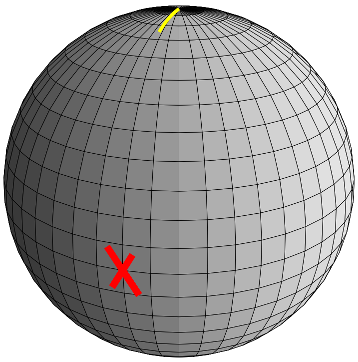


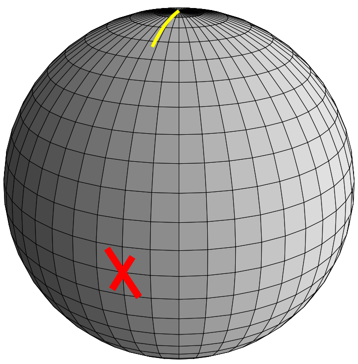
A projectile is launched from the north pole at a given target.

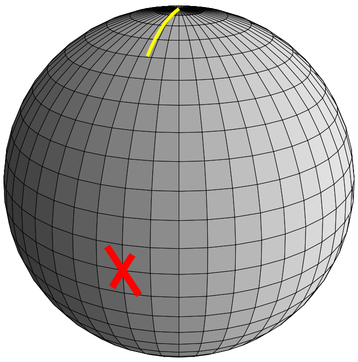


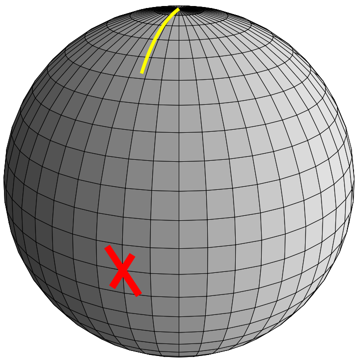


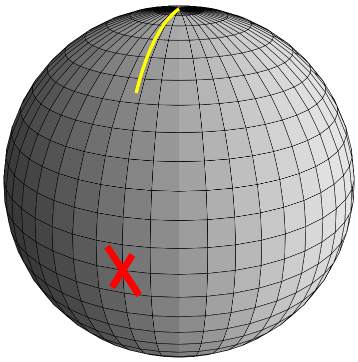


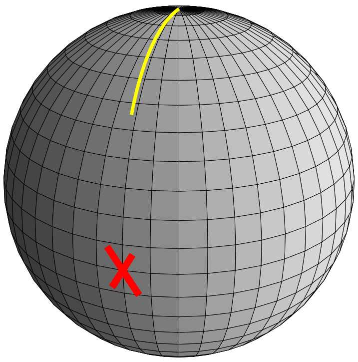


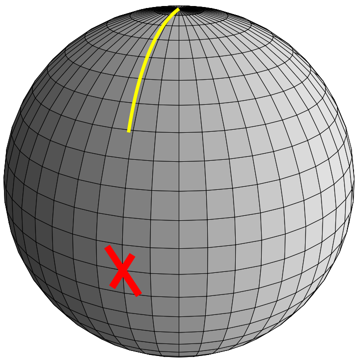


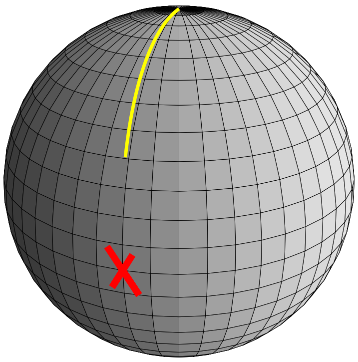


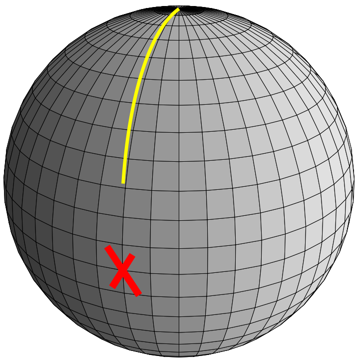


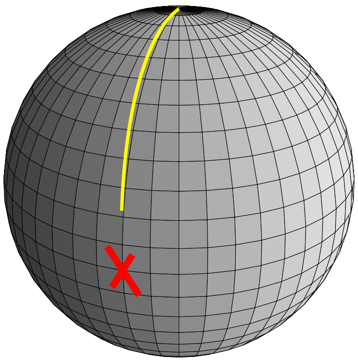


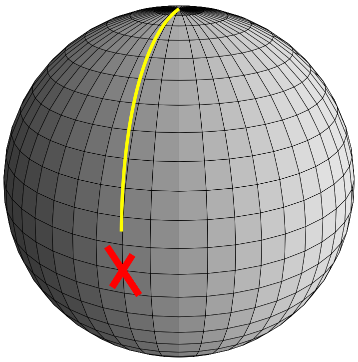


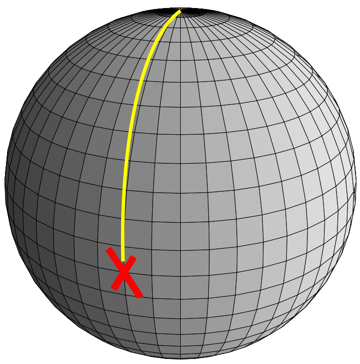


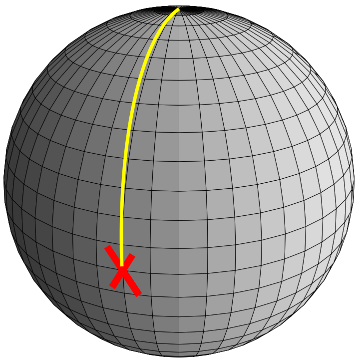


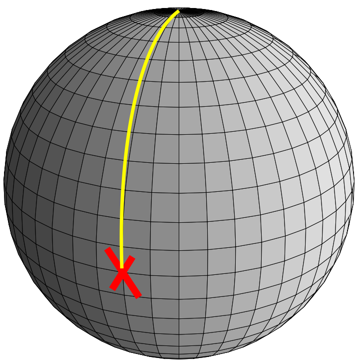




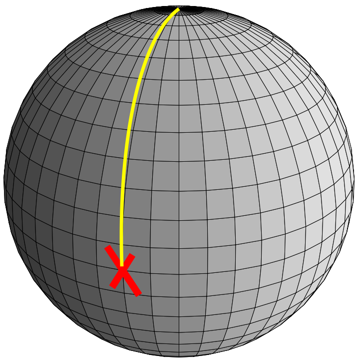




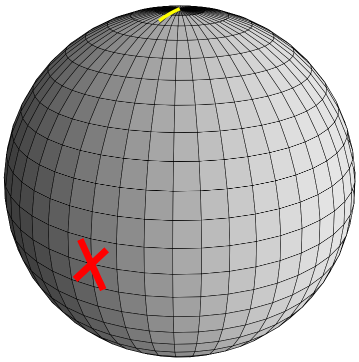


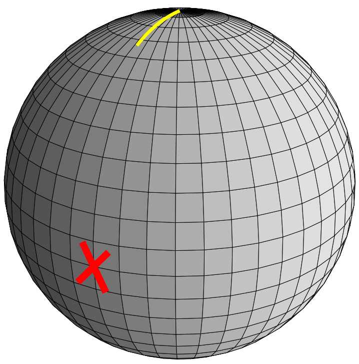


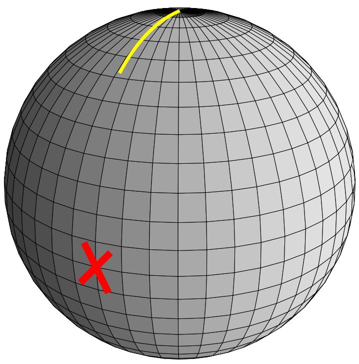
The projectile is fired at 45 degrees North of South-West, at 9401 m/s. It is in the air for approximately 22 minutes.

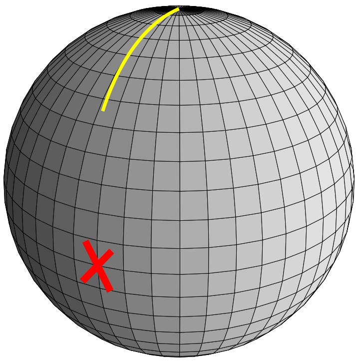


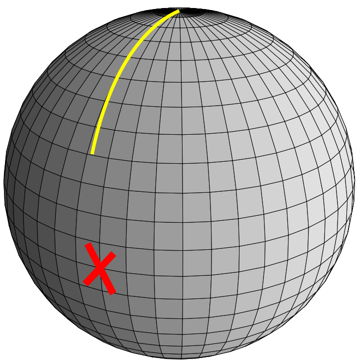
The earth rotates approximatley a quarter of a degree each minute.

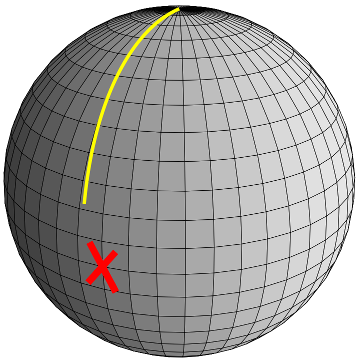


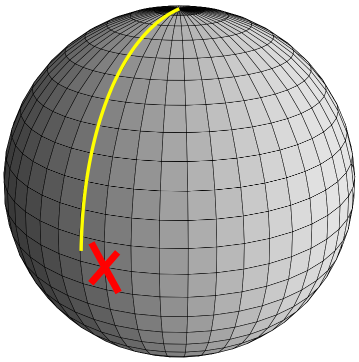


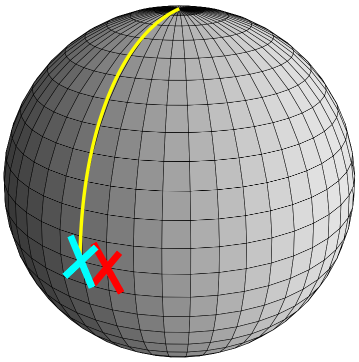












The Earth has rotated 5.5 degrees during the projectile's time of flight.
The target is displaced to the west by about 611 metres.