Slide 1: Executive Summary

Objective: Predict Falcon 9 launch success probability.
Techniques: Data collection, EDA, visualization, SQL, ML.
Business value: Estimate launch costs and improve decision-making.

Slide 2: Introduction

SpaceX revolutionized space industry with reusable rockets.
Launch costs depend on successful landing.
Data collected from SpaceX API for analysis and prediction.

Slide 3: Data Collection & Wrangling

Data from SpaceX API processed into Pandas DataFrames.
Missing values handled, categorical encoding applied.
Key variables: FlightNumber, PayloadMass, Orbit, LaunchSite, LandingPad, Class.

Slide 4: EDA & Visualization

Charts with Matplotlib and Seaborn.
Bar plots: Launches per site.
Catplot: FlightNumber vs LaunchSite colored by Class.
Correlation analysis.

Slide 5: EDA Results

Most launches from CCAFS SLC 40 and KSC LC 39A.
Overall success rate: ~67%.
Mixed success for GTO launches.

Slide 6: SQL Results

Queries performed to count launches by site, success rate, and orbits.
Results presented in tables (screenshots inserted in slides).

Slide 7: Interactive Map (Folium)

Map shows launch sites with markers and launch counts.
Folium used to create interactive map.

Slide 8: Dashboard (Plotly Dash)

Interactive dashboard built with Plotly Dash.
Payload Mass vs Success.
Success rate by Launch Site.

Slide 9: Predictive Analysis

Models: Logistic Regression, SVM, Decision Tree, KNN.
Best model: SVM with RBF kernel.
Decision Tree accuracy on test data: 0.8333.

Slide 10: Conclusions

Predicted launch success probability with >80% accuracy.
ML models support cost estimation and decision-making.
Tools: API, Pandas, SQL, Folium, Dash, ML.

Slide 11: Creativity & Innovation

Added space-themed visuals and design.
Innovative integration of interactive dashboards and maps.