Meteorite Landings:
An Interactive Dashboard

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Purpose of Project

The goal of the project was to build a full-stack data application that users could interact with and use their curiosity to learn more about our data.

Our team collectively thought that meteorites are “out of this world” We ourselves wanted to learn more about their trajectories, impacts, and where not to buy real estate.

Data and Data Cleaning

Our Dataset:
The dataset was obtained from Kaggle from the user *Jay Panderson* who had pre-cleaned up a meteor strike dataset called: cleaned_meteorite_data

Data Cleaning Performed:
We changed the “year” column from a float to an integer data type.

Rows containing NaN values were dropped.

Columns were dropped due to repetitive nature, or not being needed for the project.

Examples: name_type, location_type, fall, unnamed, and geo_location

Research Questions

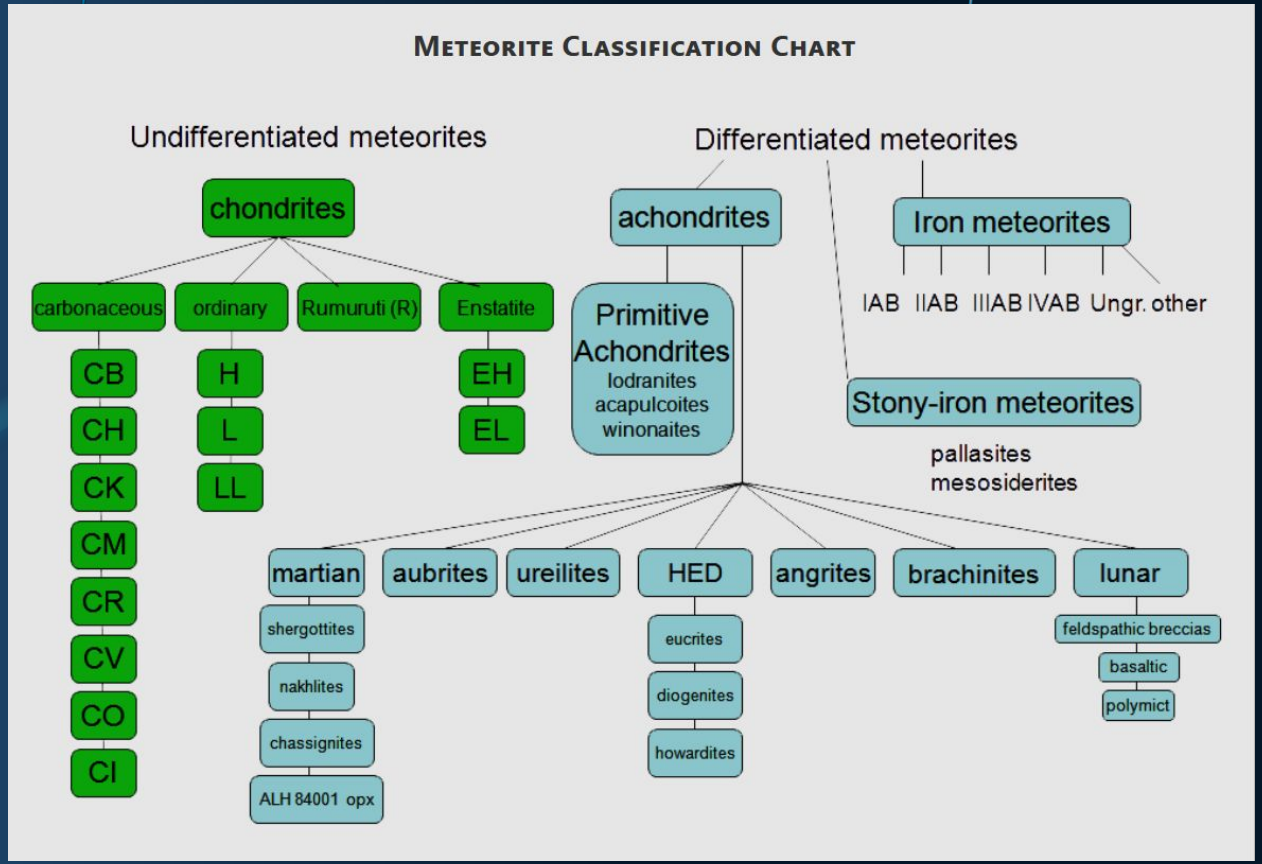
Is there a pattern where meteors are more likely to hit?

How many meteor strikes occur within a set time frame?

What meteor class more frequently encounters Earth?

Check out our interactive app

Learn all you want about Meteorite Landings!


Meteorite Classification Chart
Undifferentiated meteorites
Differentiated meteorites
chondrites
achondrites
Iron meteorites
carbonaceous
ordinary
Rumuruti (R)
Enstatite
IAB IIAB IIIAB IVAB Ungr. other
Primitive Achondrites
Iodranites
acapulcoites
winonaites
CB
CH
CK
CM
CR
CV
CO
CI
H
L
LL
EH
EL
Stony-iron meteorites
pallasites
mesosiderites
martian
aubrites
ureilites
HED
angrites
brachinites
lunar
shergottites
nakhlites
chassignites
ALH 84001 opx
eucrites
diogenites
howardites
feldspathic breccias
basaltic
polymict

Data Limitations

- Our dataset was from a year ago. It is not up to date information like an API would be.
- Our map filter year is set to 2013. It does not account for last 11 years of data.
- When filtering for a wider time period. It is hard to visualize the size of the datasets due to its size.

Bias

- Human-Reported biases:

The more populated the area the more likely the meteorite will be recorded, leading to under reporting in remote locations.

- Geographic Biases:

More meteorites are spotted in flatter geographic locations such as Antarctica or the desert because they are easier to see.

Conclusion

Q: Is there a pattern where meteors are more likely to hit?

A: In looking at the map with no filter based on time we find that the eastern hemisphere is more impacted by meteors. Also, the results show similar effects when filtering for the past 100 years.

Q:How many meteor strikes occur within a set time frame?

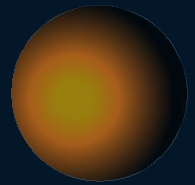
A: From 1950 to 2013 there were 15,251 meteorites that were recorded landing. Using the application you can search between what years you are interested in researching.

Conclusion (Cont.)

Q:What meteor class more frequently encounters Earth?

A: From the dashboard we see that the meteorite L6 is the most frequent meteorite found from the years 1950-2013.

An L6 is a low iron(L) containing Chondrite The six refers to the metamorphic heat level that was exposed to the meteor.



Call to Action

- Keep looking up
- Keep light pollution at a minimum if wanting to stargaze.
- Search for a DarkSky Park in your area.

  https://darksky.org/what-we-do/international-dark-sky-places/all-places/

Future Work

- We would like to include a chart to our app that accounts for the average size of a meteor.
- Look into new datasets about craters.
- Take a deeper look into the classes of meteors and how they are different.

Works Cited

- National Aeronautics and Space Administration “ Curation Petrographic Thin Section Program” https://curator.jsc.nasa.gov/education/classification.cfm
- “Meteorite Strike Dataset” https://www.kaggle.com/datasets/jaypanderson/cleaned-meteorite-data/data
- The Meteoritical. “Meteoritical Bulletin Database” https://meteoritical.org/

Questions?