

A valuable source of data:

YOU

- What you watch on Netflix
- What you search for on Google
- What you buy on Amazon
- Where you go with your iPhone GPS
- Who you retweet on Twitter
- Who you're friends with on Facebook

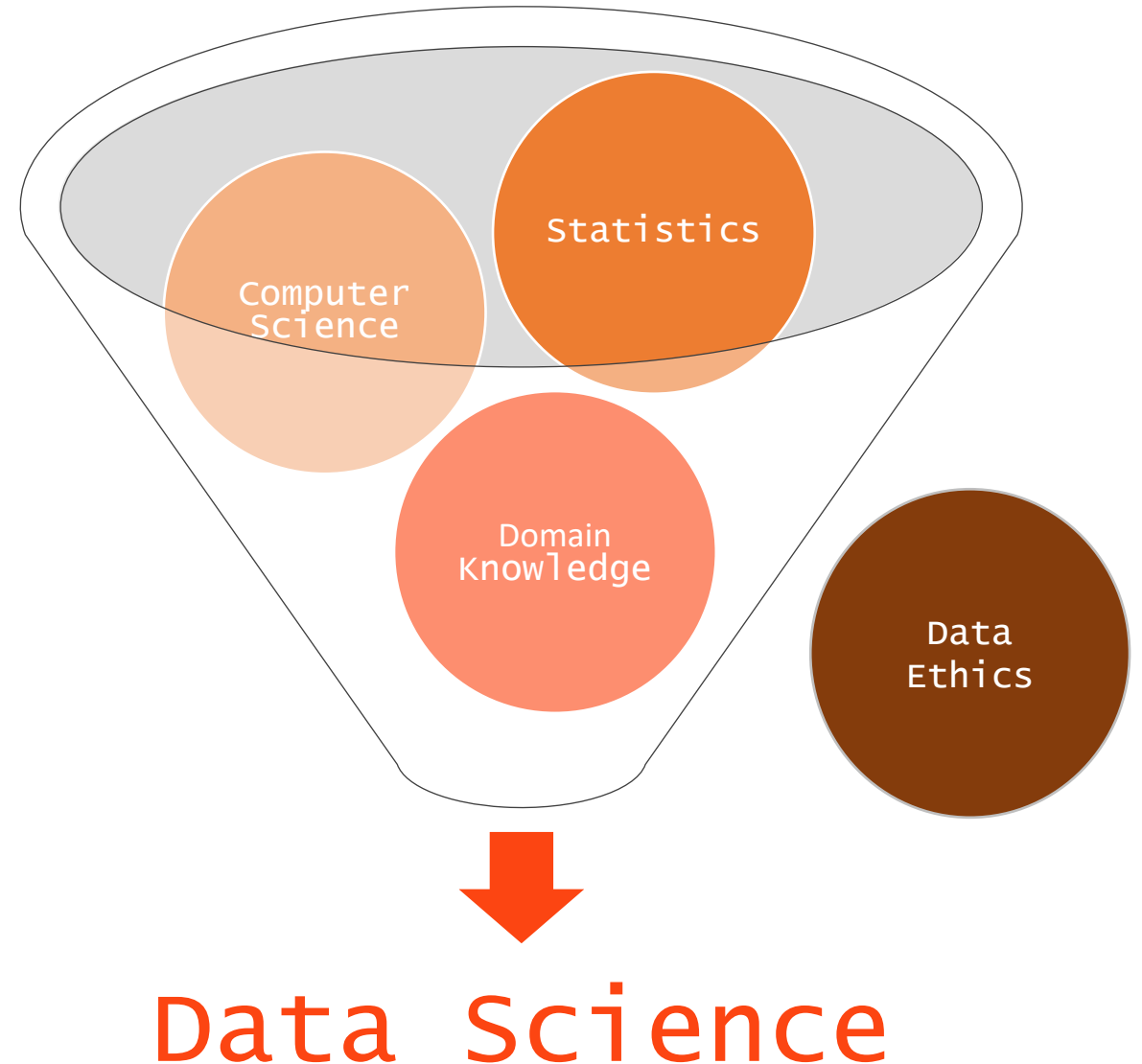
Many business opportunities but also privacy and ethical concerns

What is data science?

Data science is a multidisciplinary field that draws upon *statistics*, *computer science*, domain expertise, and data ethics.

It's the study of how to gain insights from data (especially big, messy data) and how to use data to solve real-world problems.

Data literacy (or data fluency) is the basic ability to read, work with, analyze, and communicate with data. It is foundational for all learners and professions.



Jobs in data are hot:

LinkedIn Top 20 Emerging Jobs

Data science specialists

According to the 2020 U.S. Emerging Jobs Report, data roles, specifically data scientist and data engineer roles, are increasing steadily — reflecting about a 35% average annual growth for both roles.



Top titles

Data Management Analyst, Data Scientist, Data Science Specialist, Data Engineers, and Data Architect



Top skills

Tableau, SQL, R

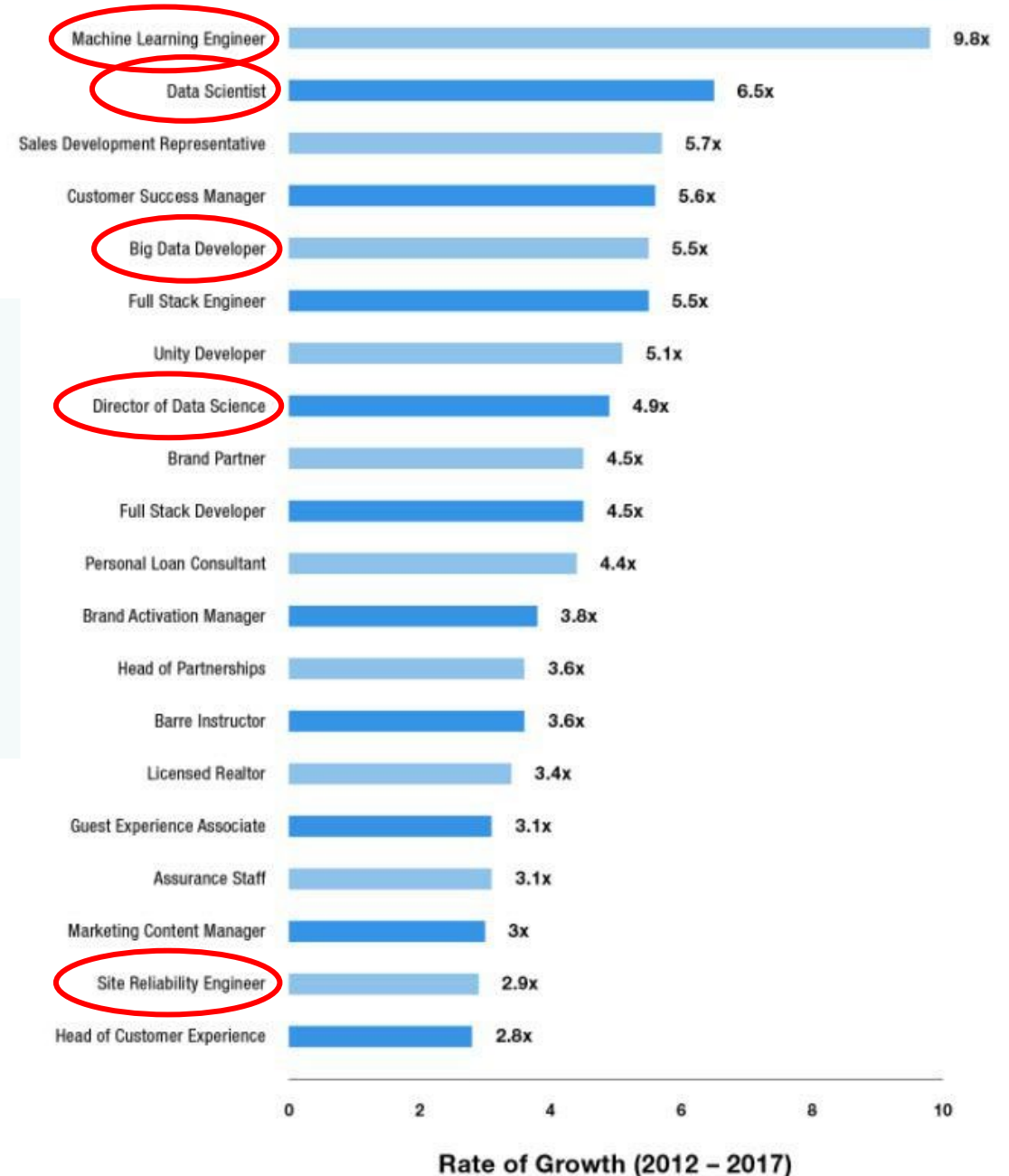


Top regions

Washington, DC–Baltimore area, Greater Chicago area, Atlanta metropolitan area

Top 20 Emerging Jobs

LinkedIn Economic Graph



Source:
LinkedIn, Top 20 Emerging Jobs 2012 - 2017
LinkedIn, Jobs on the Rise in 2021

And every sector – including places you wouldn't expect:



Agriculture:

Internet of Things (IoT) devices collect and stream data on weather conditions, soil quality, crop growth, and livestock health to help maximize yields and prevent crop damage.

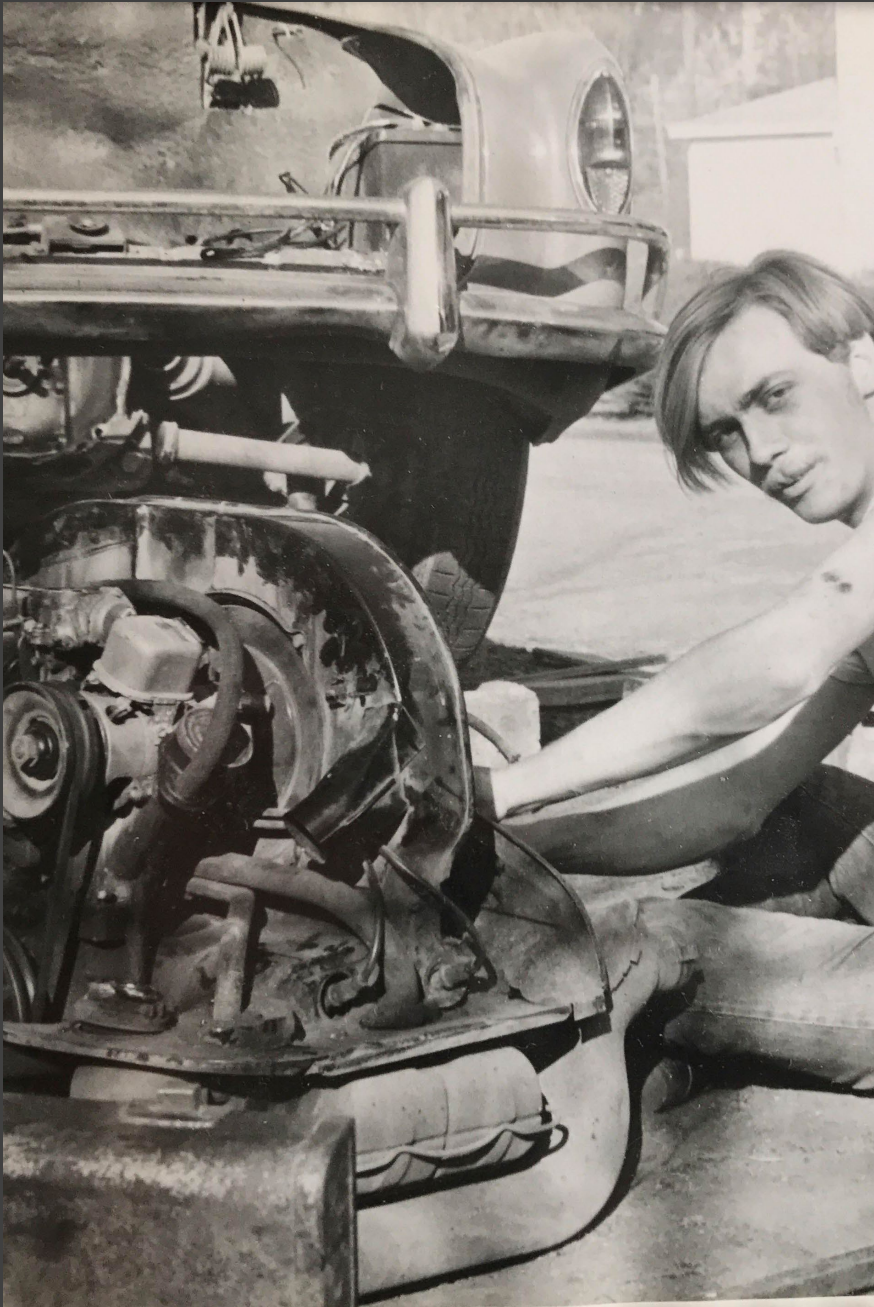
Manufacturing:

Production lines now use advanced data analytics for quality control and managing operations.



Medicine:

Doctors & nurses query massive patient databases on a regular basis.



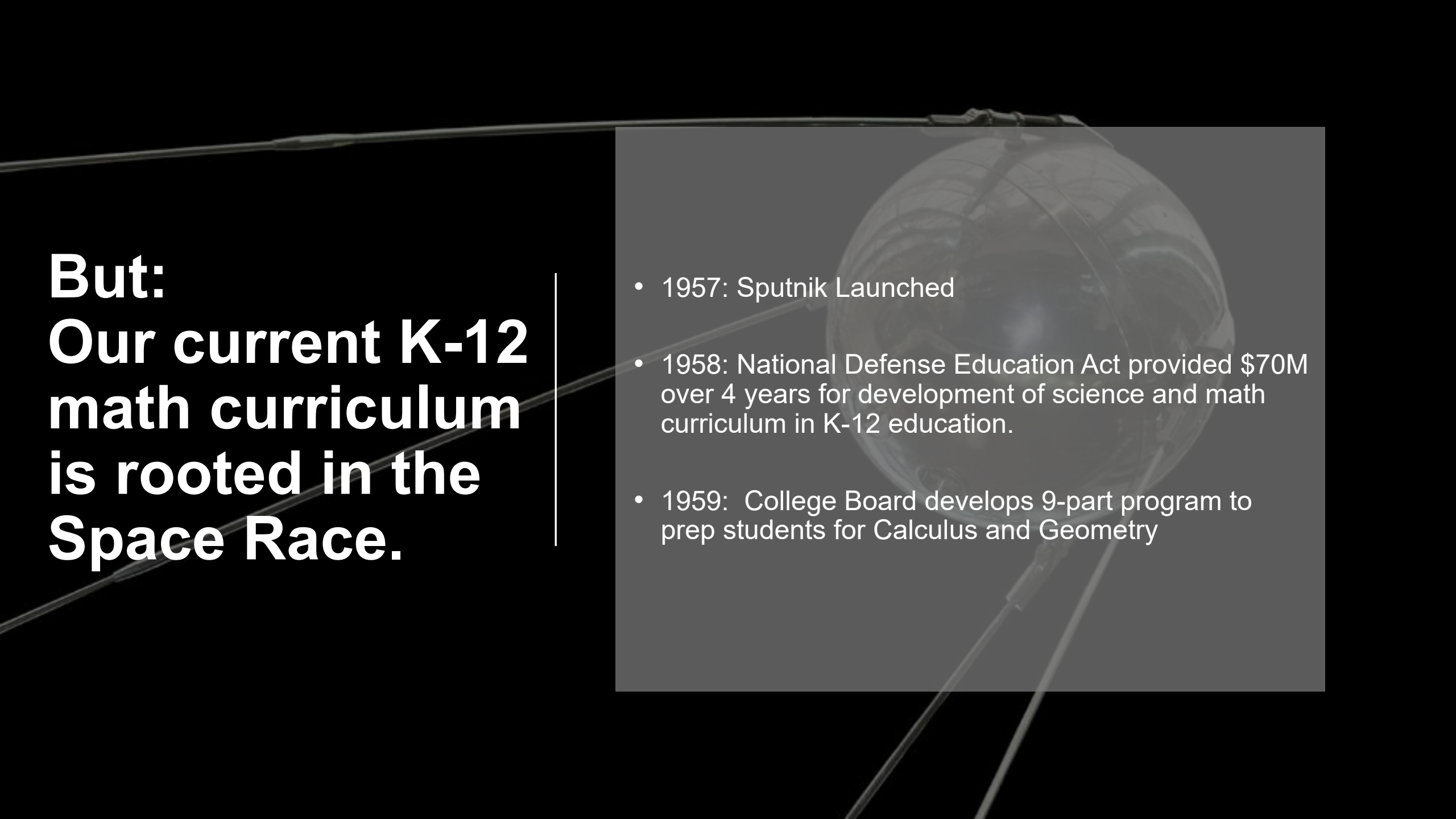
**A perfect example: fixing a car
used to be very different.**

Image 1: <https://historicpittsburgh.org/islandora/object/pitt%3AMSP117.B016.F02.I02>

Image 2: https://historicpittsburgh.org/islandora/object/pitt:MSP117.B015.F05.I04/from_search/-45



EVs and autonomous vehicles are complex – today's mechanics are immersed in data.



**But:
Our current K-12
math curriculum
is rooted in the
Space Race.**

- 1957: Sputnik Launched
- 1958: National Defense Education Act provided \$70M over 4 years for development of science and math curriculum in K-12 education.
- 1959: College Board develops 9-part program to prep students for Calculus and Geometry

When computers and data were far less important to our success:

- The Apollo Guidance Control computer had less computing power than a classic Nintendo GAME BOY (first introduced in 1989).
- NASA scientists relied on hand-estimated calculations to verify rocket trajectories.

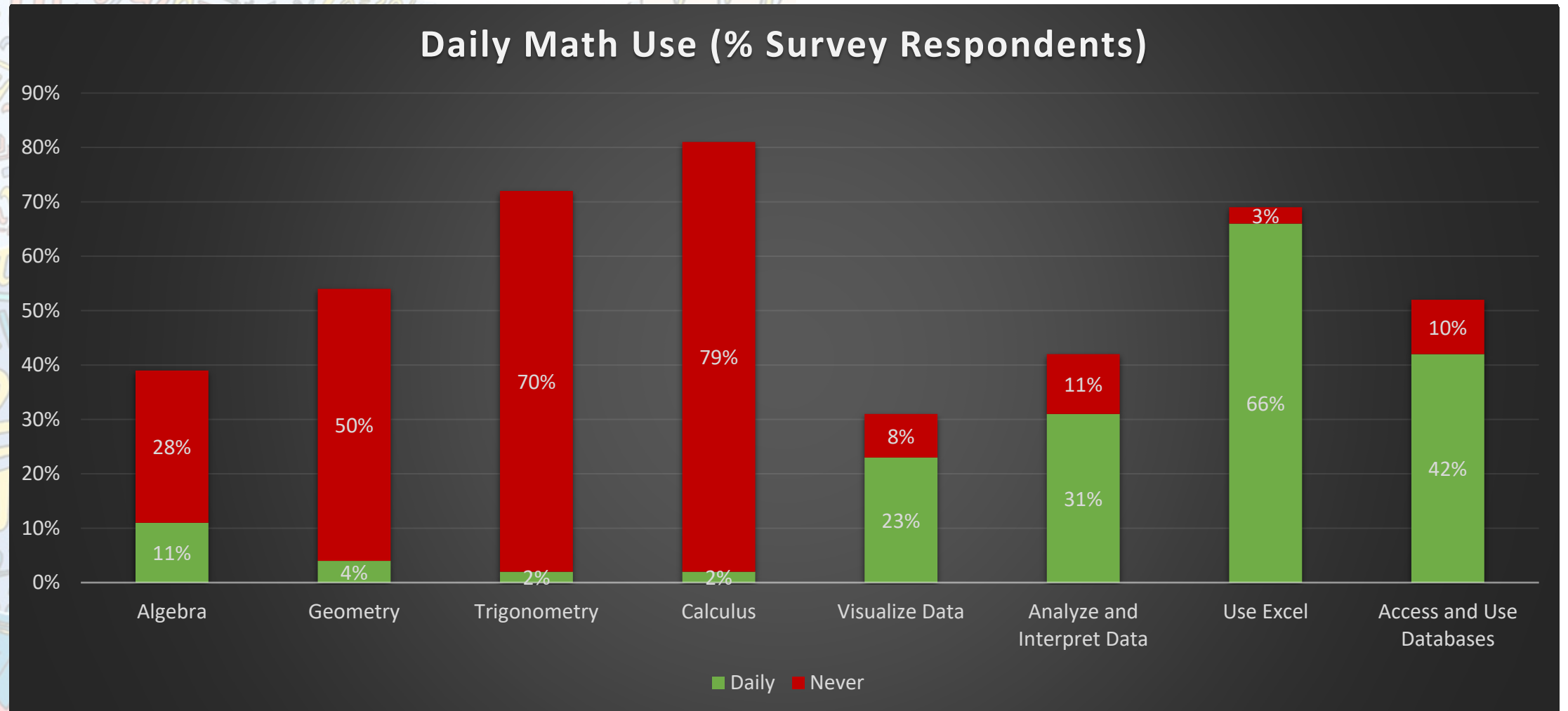
Source: https://en.wikipedia.org/wiki/Apollo_Guidance_Computer;

Nintendo Estimate: <https://www.nintendo.co.uk/Support/Game-Boy-Pocket-Color/Product-information/Technical-data/Technical-data-619585.html>

NASA Saturn V Calculations: https://www.nasa.gov/audience/forstudents/5-8/features/CalculatingByHand_Feature_5_8.html

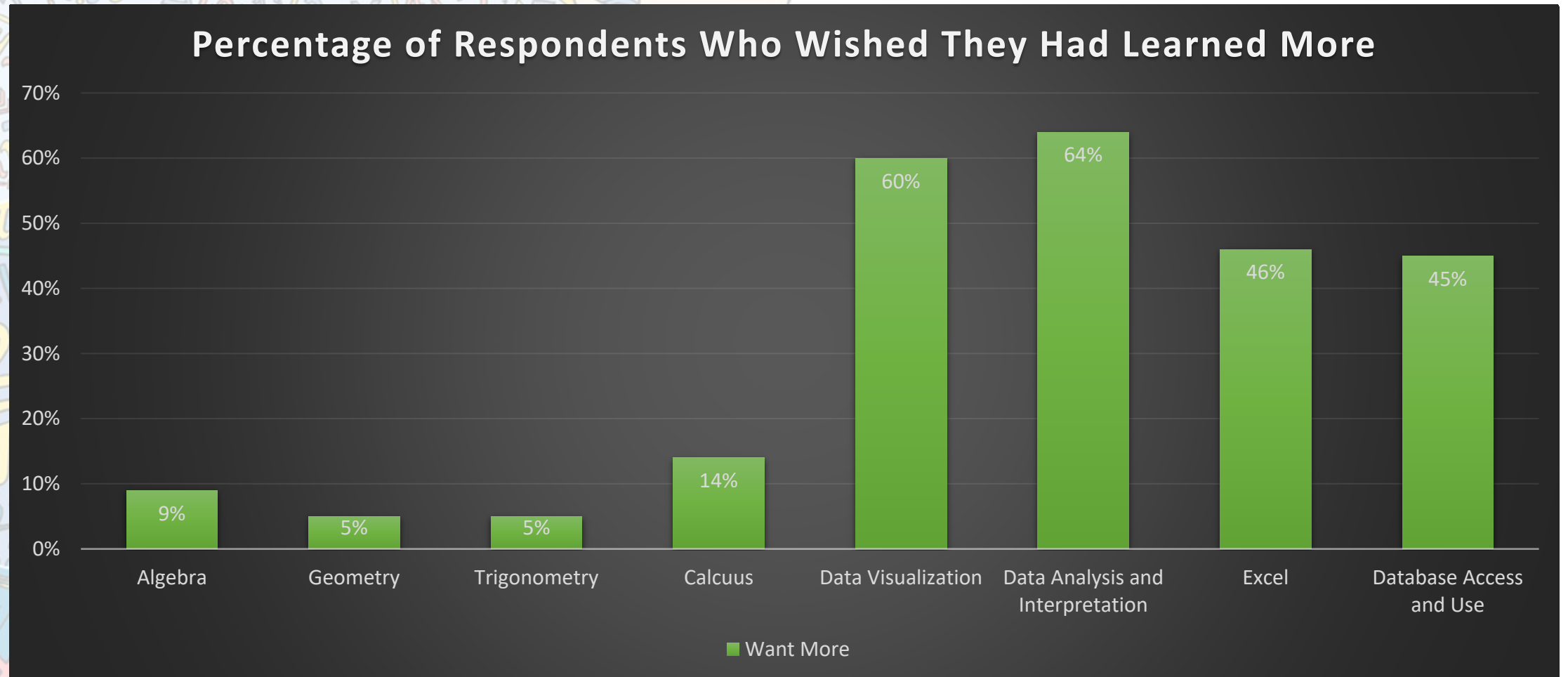


Today's workers use data regularly:



Source: Survey distributed via Freakonomics tweets and web site; respondents not representative—skewed male, higher income, higher education

And many wish they had more school:



Source: Survey distributed via Freakonomics tweets and web site; respondents not representative—skewed male, higher income, higher education

name	species	sex	age	fixed	legs	pounds	weeks
Sasha	cat	female	1	false	4	6.5	3
Snuffles	rabbit	female	3	true	4	3.5	8
Mittens	cat	female	2	true	4	7.4	1
Sunflower	cat	female	5	true	4	8.1	6
Felix	cat	male	16	true	4	9.2	5
Sheba	cat	female	7	true	4	8.4	6
Billie	snail	hermaphrodite	0.5	false	0	0.1	3
Snowcone	cat	female	2	true	4	6.5	5
Wade	cat	male	1	false	4	3.2	1
Hercules	cat	male	3	false	4	13.4	2
Toggle	dog	female	3	true	4	48	1
Boo-boo	dog	male	11	true	4	123	24
Fritz	dog	male	4	true	4	92	3
Midnight	dog	female	5	false	4	112	4
Rex	dog	male	1	false	4	28.9	9
Gir	dog	male	8	false	4	88	5
Max	dog	male	3	false	4	52.8	8
Nori	dog	female	3	true	4	35.3	1
Mr. Peanutbutter	dog	male	10	false	4	161	6

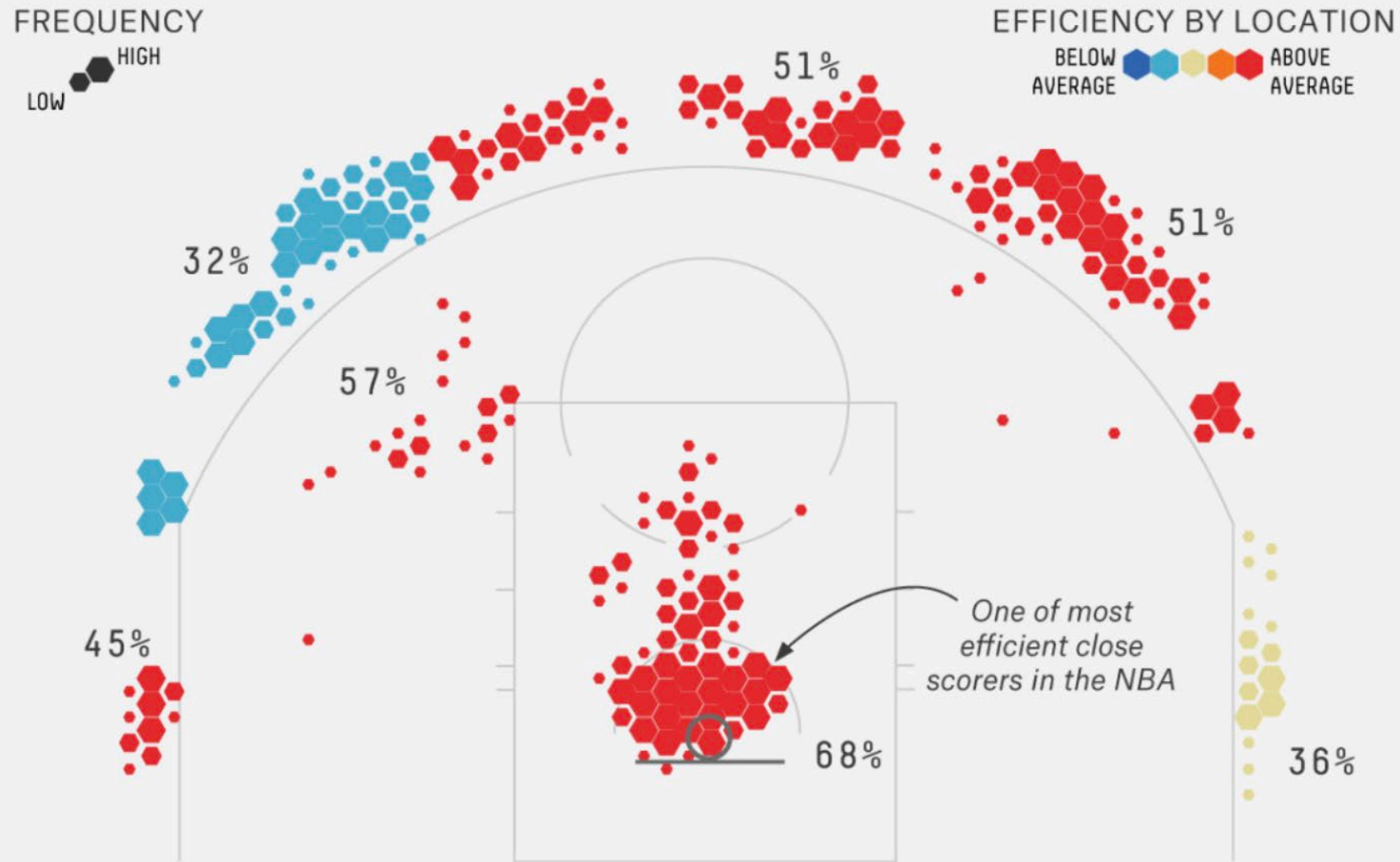
The Animals Dataset

(from bootstrapworld.org)

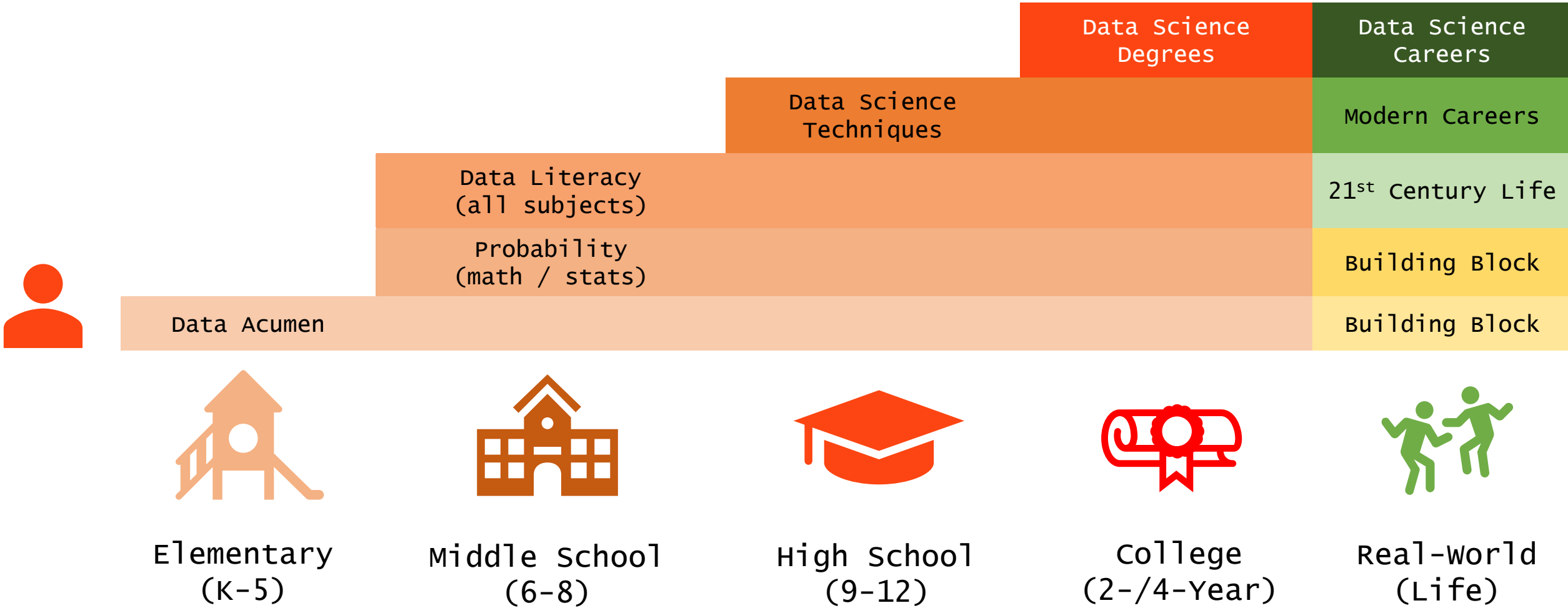
Stephen Curry Is One Of The Best

All of his shots, 2015-16 regular season

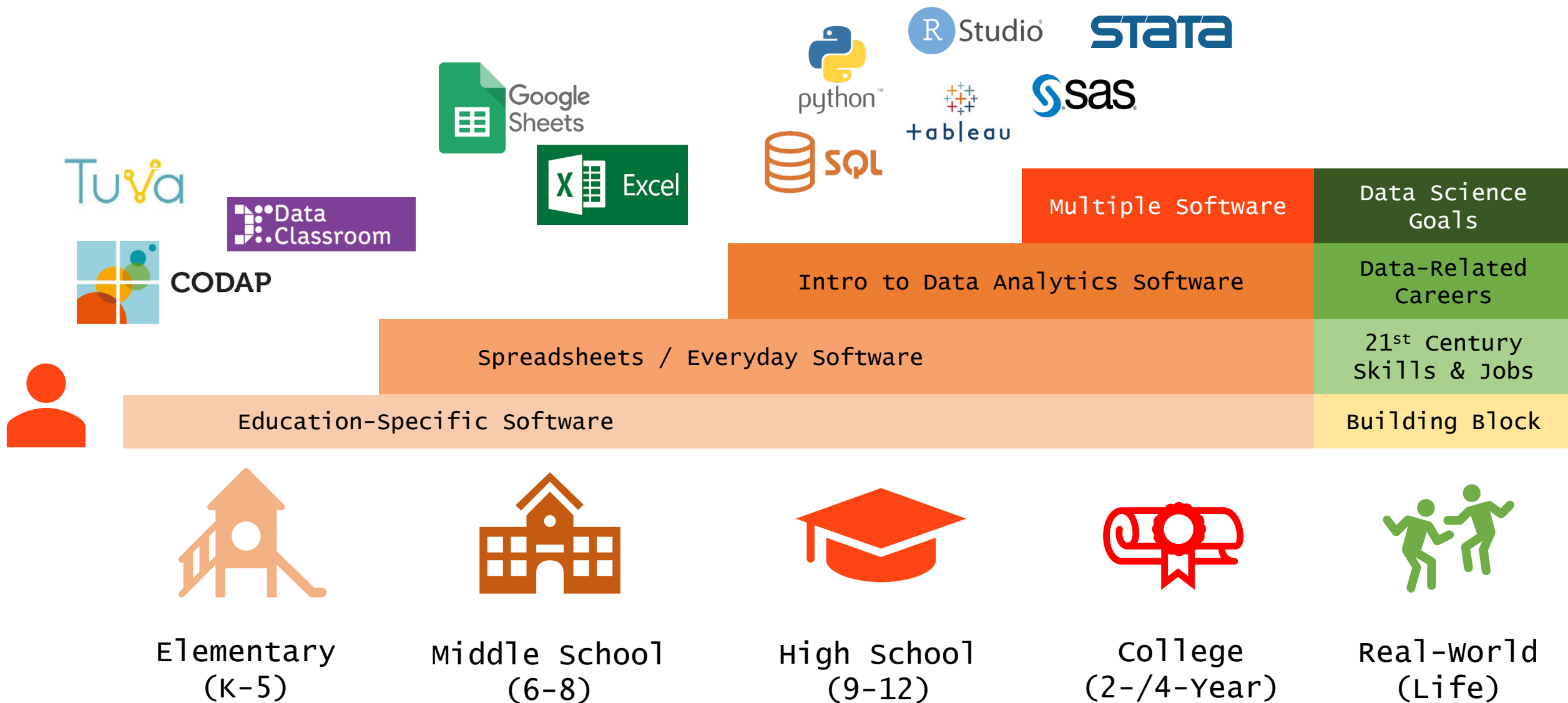
What do you notice?
What do you wonder?



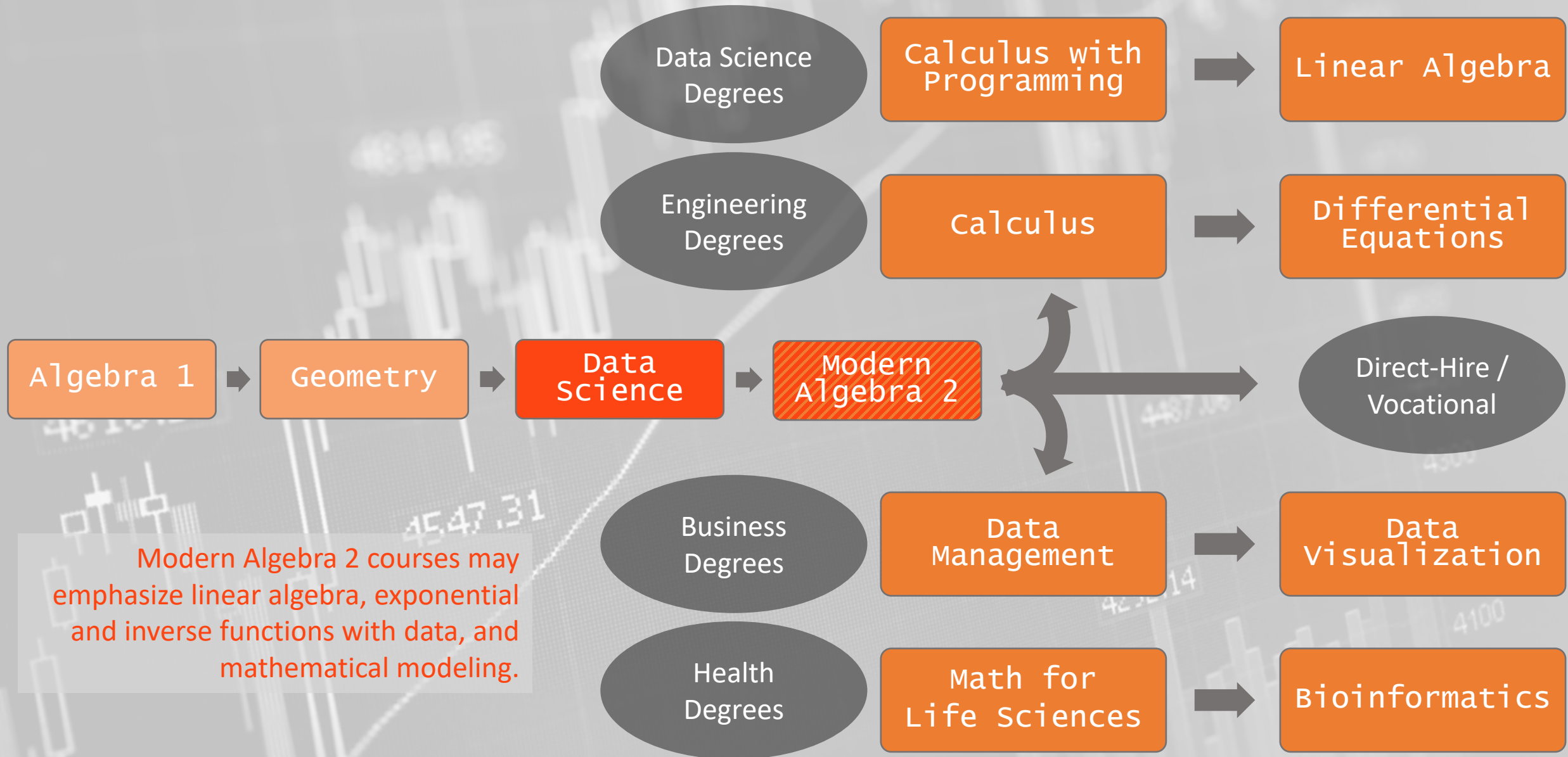
Building modern data education:



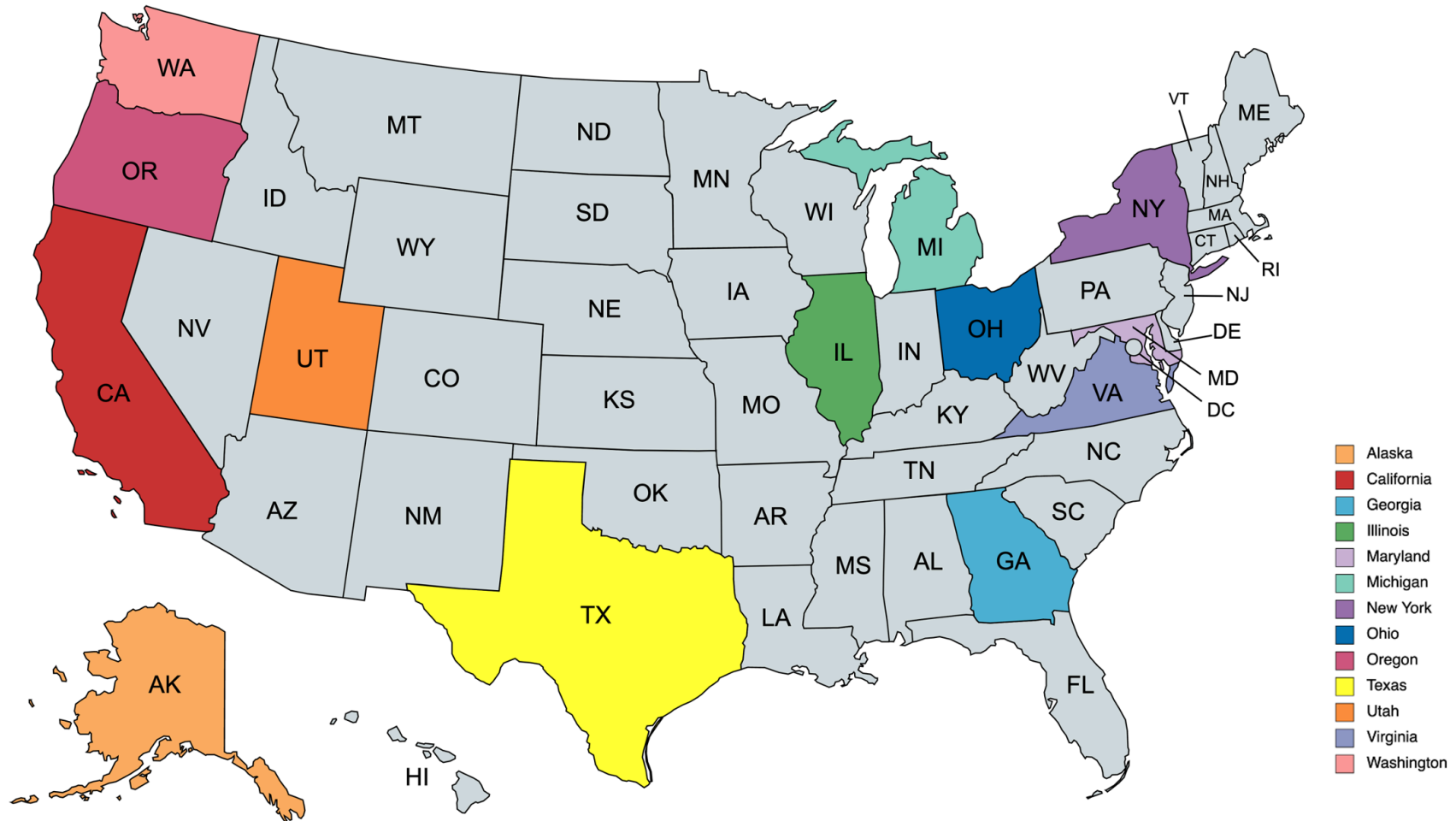
With relevant tech tools:



Example Student Pathways (just one model)



States moving to data science pathways



Learning Data Science in K-12 Education

Data Science 4 Everyone
The University of Chicago
August 2022

<https://bit.ly/dataedudeck>

Where to learn more

- Data Science 4 Everyone (U Chicago)
- Bootstrap (Brown)
- YouCubed K-12 Data Science (Stanford)
- Introduction to Data Science (UCLA)
- Concord Consortium – Data Science Education
- CourseKata – Statistics and Data Science

(with apologies to many other good resources not listed here...)