



Summer School 2022

# Toolbox DATA TALKS

## LaSciL

Large Scientific Infrastructures enriching Online and  
Digital Learning

July 2022

ÖSTERREICHISCHES WELTRAUM FORUM  
AUSTRIAN SPACE FORUM



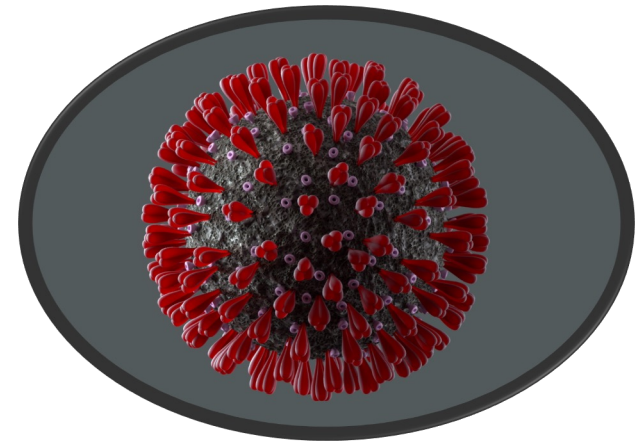
[oewf.org](http://oewf.org)

Co-funded by the  
Erasmus+ Programme  
of the European Union



## What is DATA?

- %90 of Data has been created in last 2 years
- Understand Data
- Communicate by Visualization
- Bringing Data Science to educations



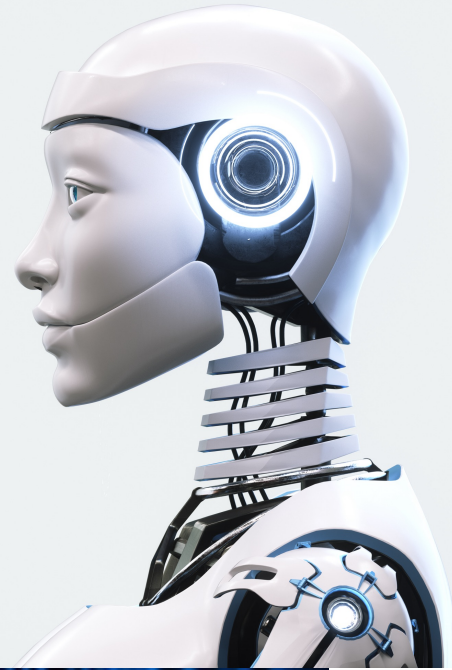
LaSciL

# What is DATA?



LaSciL

# What is DATA?



## How to do DATA TALKs? – [www.youcubed.org](http://www.youcubed.org)

- Re-think **TEACHING** and **LEARNING**
- Incorporating with tools and technologies
- Communicate by Visualization
- Bringing Data Science to educations
- No expertise needed!
  
- Age: 7-18 years
- Key words: Data Literacy, Data Visualization
- @AT curriculum changing to include DATA SCIENCE




# How to understand Data Graphics?

What do you notice? What do you wonder?

- Giving time for :
  - Process-understand each item
- Asking key questions
- Commenting
- Comparing
- Interpreting the DATA

# OeWF's suggested TOOL: [youcubed.org](https://www.youcubed.org)

Stanford | GRADUATE SCHOOL OF EDUCATION

Inspire ALL Students with Open, Creative,  
Mindset Mathematics

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 **youcubed**<sup>®</sup>

**56,681,490**  
visits and counting!



Exploration in :  
**DATA SCIENCE**

# TOOL: [youcubed.org](https://www.youcubed.org)



Donate

Sign Up

- Ideas
- Tasks
- Data Science
- Teaching to Big Ideas
- Summer Camps
- Films
- Courses
- Evidence
- News
- Search

## Data Science Online Course Lessons

Lessons from "21st Century Teaching and Learning." Grade ranges suggested, but with creativity, they can be used in any grade!

Download Elementary Lesson: Sorting Buttons

Download Elementary Lesson: Data Tells Us about Ourselves

Download Elementary Lesson: Supply Parade

Download Elementary/Middle Lesson: Swimming with Whales (thanks to MidSchool Math)

Download Middle/High Lesson: What's in the Bag?

Download Middle/High Lesson: What's the Chance of That?

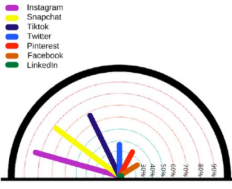
Download Middle/High Lesson: Can They Say That?




# TOOL: youcubed.org



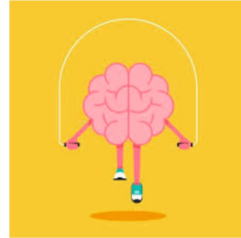
**Housing, Education & Wages**  
Grades 6-12



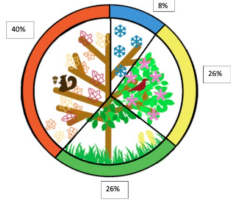
**Social Media**  
Grades 5-12




**Melting Ice**  
Grades K-12



**Growth Mindset**  
Grades K-12




**Favorite Season**



**What do you notice? What**



**What is a "Data Talk"?**



**Women's Soccer**

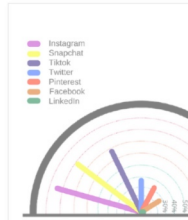
# TOOL: youcubed.org

↳ Data Science  
↳ Data Talks



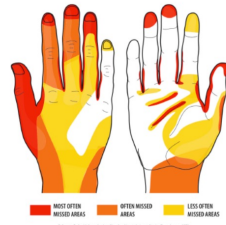
**Housing, Education & Wages**

Grades 6-12



**Social Media**

Grades 5-12

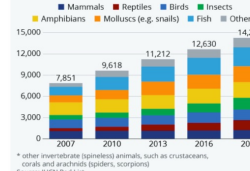


**Hand Washing**

Grades K-16

## The Number of Endangered Species is Rising

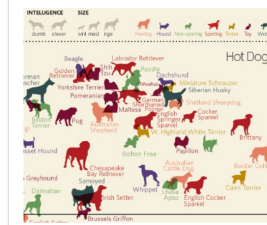
Number of animal species of the IUCN Red List, by class



\* other invertebrate (spineless) animals, such as crustaceans, corals and arachnids (spiders, scorpions)  
Source: IUCN Red List

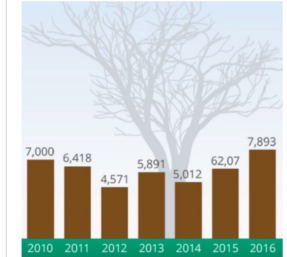
**Endangered Species**

Grades 3-16



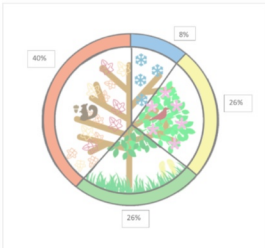
**Dogs!**

Grades K-16

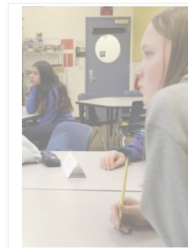


**Deforestation**

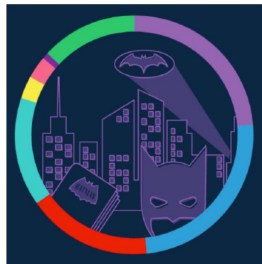
Grades 3-16



**Favorite Season**

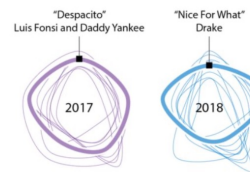


**What do you notice?**



**Batman**

Grades K-16



## The New York Times

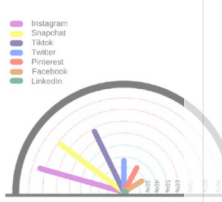
**What's Going On in This Graph?**

# TOOL: [youcubed.org](http://youcubed.org)

↳ Data Science  
↳ Data Talks



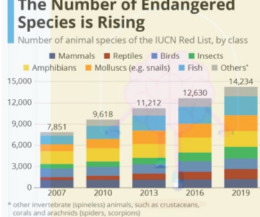
**Housing, Education & Wages**  
Grades 6-12



**Social Media**  
Grades 5-12



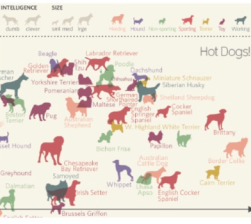
**Melting Ice Hand Washing**  
Grades K-12



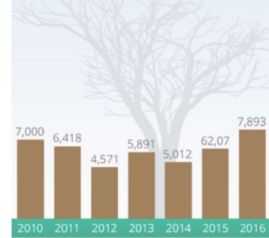
**The Number of Endangered Species is Rising**  
Number of animal species of the IUCN Red List, by class

| Year | Total Species |
|------|---------------|
| 2007 | 7,851         |
| 2010 | 9,618         |
| 2013 | 11,212        |
| 2016 | 12,630        |
| 2019 | 14,234        |

**Growth Mindset Endangered Species**  
Grades 3-16

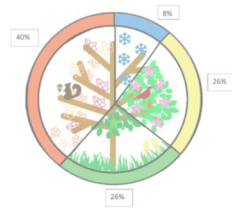


**Dogs!**  
Grades K-16



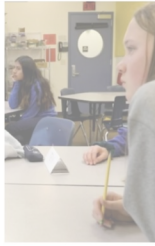
**Deforestation**  
Grades 3-16

| Year | Value |
|------|-------|
| 2010 | 7,000 |
| 2011 | 6,418 |
| 2012 | 4,571 |
| 2013 | 5,891 |
| 2014 | 5,012 |
| 2015 | 62.07 |
| 2016 | 7,893 |

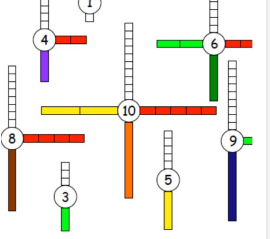


**Favorite Season**


| Season | Percentage |
|--------|------------|
| Spring | 40%        |
| Summer | 26%        |
| Fall   | 26%        |
| Winter | 8%         |



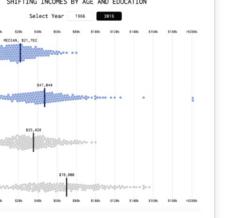
**What do you notice**



**One Through Ten**  
Grades K-16



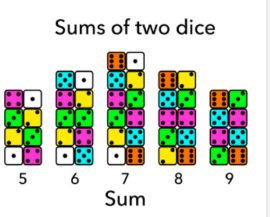
**Water Usage**  
Grades K-16



**Shifting Incomes**  
Grades 4-16



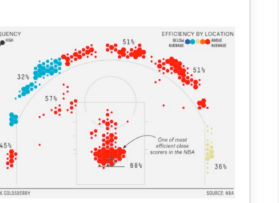
**Popular Fruits**  
Grades K-16



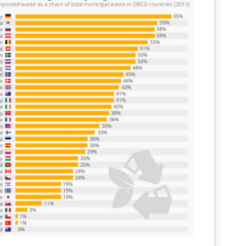
**Sums of two dice**

| Sum | Frequency |
|-----|-----------|
| 5   | 4         |
| 6   | 6         |
| 7   | 8         |
| 8   | 6         |
| 9   | 4         |

**Dice Sums**  
Grades K-16



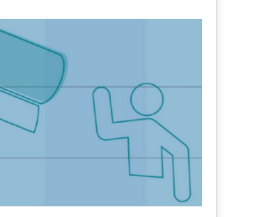
**Basketball**  
Grades 4-16



**The Countries Winning The Recycling Race**

| Country        | Rate |
|----------------|------|
| Germany        | 65%  |
| South Korea    | 55%  |
| Austria        | 54%  |
| Sweden         | 51%  |
| Japan          | 49%  |
| Denmark        | 48%  |
| United Kingdom | 47%  |
| France         | 46%  |
| Canada         | 45%  |
| Spain          | 44%  |
| Italy          | 43%  |
| China          | 42%  |
| USA            | 41%  |
| India          | 40%  |
| South Africa   | 39%  |
| Brazil         | 38%  |
| Mexico         | 37%  |
| China          | 36%  |
| USA            | 35%  |
| India          | 34%  |
| South Africa   | 33%  |
| Brazil         | 32%  |
| Mexico         | 31%  |
| China          | 30%  |
| USA            | 29%  |
| India          | 28%  |
| South Africa   | 27%  |
| Brazil         | 26%  |
| Mexico         | 25%  |
| China          | 24%  |
| USA            | 23%  |
| India          | 22%  |
| South Africa   | 21%  |
| Brazil         | 20%  |
| Mexico         | 19%  |
| China          | 18%  |
| USA            | 17%  |
| India          | 16%  |
| South Africa   | 15%  |
| Brazil         | 14%  |
| Mexico         | 13%  |
| China          | 12%  |
| USA            | 11%  |
| India          | 10%  |
| South Africa   | 9%   |
| Brazil         | 8%   |
| Mexico         | 7%   |
| China          | 6%   |
| USA            | 5%   |
| India          | 4%   |
| South Africa   | 3%   |
| Brazil         | 2%   |
| Mexico         | 1%   |
| China          | 0%   |

**Recycling**  
Grades 4-16



**Paper Towels**  
Grades 4-16

# Topic Solving Problems with Data: Cars-Data creation:LAUNCH



Source: Image by [Shutterstock.com/Aleksei Kazachok](https://www.shutterstock.com/Aleksei-Kazachok).

# Topic Solving Problems with Data: Cars-Data creation:EXPLORE



Source: Image by [Shutterstock.com/Aleksei Kazachok](https://www.shutterstock.com/Aleksei_Kazachok).

What is the most common car color in your area?

# Topic Solving Problems with Data: Cars-Data creation:DISCUSS





Source: Image by [Shutterstock.com/Aleksei Kazachok](https://www.shutterstock.com/Aleksei-Kazachok).

# How to implement into a Space Mission?

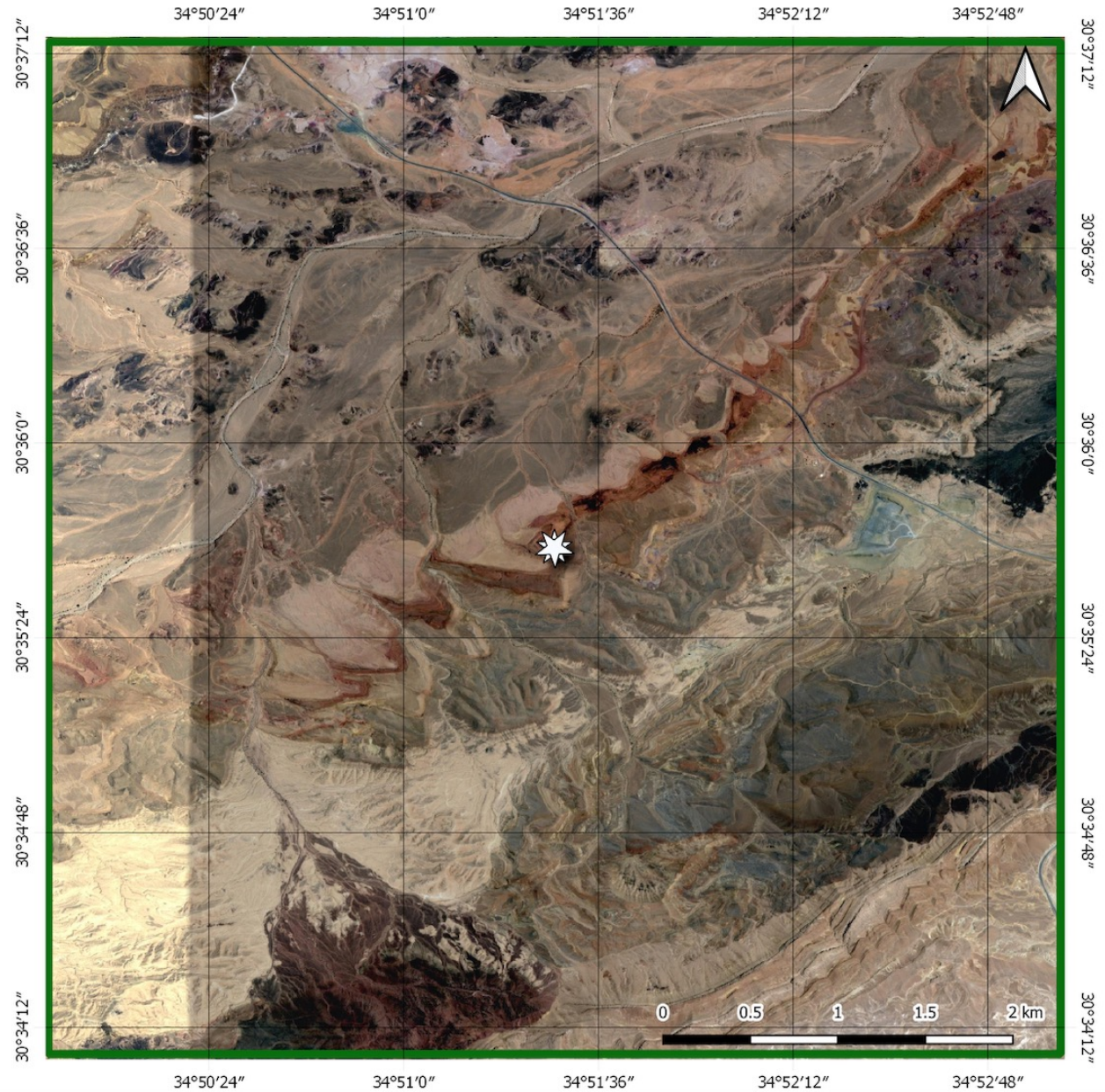
## Legend

Map boundaries

 5 x 5 km

 Base Station

Map source: Google Maps, 2020



# What is the most common geological formation?

## Rock-color-map

### Legend

Map boundaries

5 x 5 km

Base Station

tectonics

Main road

Road

Trail

Path

Bike trail

ROI

rock color map

1 yellow

2 beige to dark grey

3 black

3a bright blue

4 bright beige

5 brown grey shaded

6 red

7 white

8 white beige

9 dark red

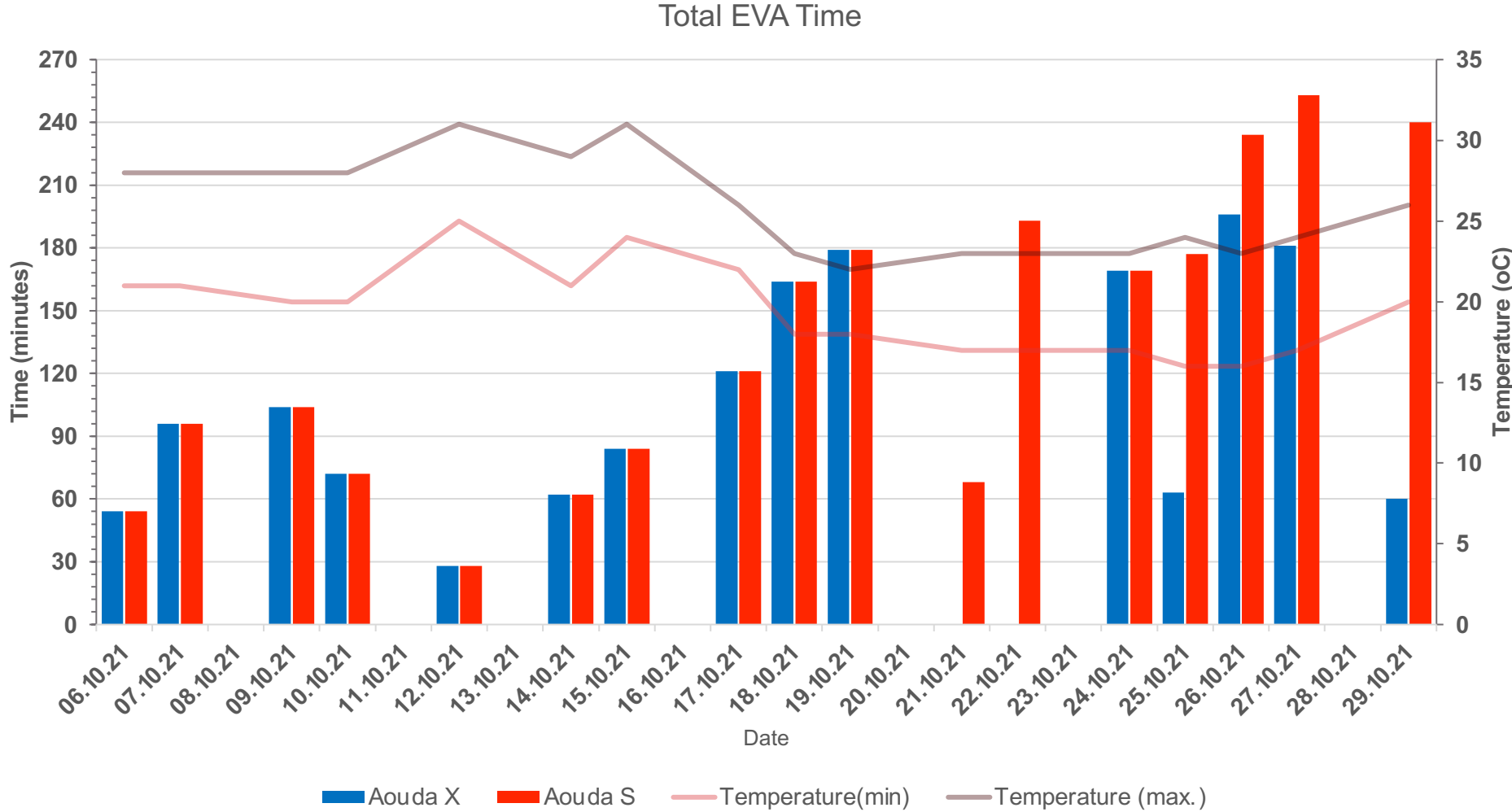
10 grey

Map source: Google Maps, 2020





# Data Talk: an example and DATA SET from AMADEE20



- 1- Giving time
- 2- Asking key questions
- 3- Commenting
- 4- Comparing
- 5- Interpreting the DATA



Wir ermöglichen  
die Leidenschaft Weltraum  
zu leben.

**Dr. Seda Özdemir-Fritz**  
[seda.ozdemirfritz@oewf.org](mailto:seda.ozdemirfritz@oewf.org)

**Dr. Klaus Albrecht**  
[klaus.albrecht@oewf.org](mailto:klaus.albrecht@oewf.org)

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