

Water Access Analysis

Using Machine Learning to predict water stress in
Canadian river basins.

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Overview

Water is becoming scarce in many communities across Canada. The current situation warrants a detailed analysis of the available data

Problem statement: pollutants present on river basins across Canada are affecting drinking water supplies and our food security

Opportunity: the right machine learning solution could help mitigate adverse effects.

Vision

Using machine learning, we could predict the long term effects of different chemicals polluting our water supply

By targeting different affected sectors, business stakeholders will learn about potential opportunities

And, as more models are trained and new solutions are created, more individuals could benefit





Impact

Corporations could optimize their consumption by identifying and replacing water intensive processes

Non-governmental organizations could allocate resources to mitigate human impact (e.g. prepare for water shortages)

Federal and Provincial agencies could plan infrastructure projects more efficiently. For instance, they could plan and build water treatment plants faster

Data Dictionary

Variable	Column Name	Description
SAMPLE DATE AND TIME	DATE_TIME_HEURE	SAMPLE DATE AND TIME IN DD/MM/YYYY HH:MM FORMAT USING LOCAL TIME ZONE
DATUM	DATUM	DATUM USED FOR LATITUDE AND LONGITUDE
MEASUREMENT FLAG	FLAG_MARQUEUR	FLAG APPLICABLE TO MEASUREMENT VALUE (<-LESS THAN, T-TRACE VALUE REPORTED BELOW DETECTION LIMIT BY LABORATORY)
LATITUDE	LATITUDE	LATITUDE IN DECIMAL DEGREES FOR THE NOTED DATUM
LONGITUDE	LONGITUDE	LONGITUDE IN DECIMAL DEGREES FOR THE NOTED DATUM
METHOD DETECTION LIMIT	MDL_LDM	METHOD DETECTION LIMIT REPORTED BY THE LABORATORY FOR THE NOTED METHOD
METHOD CODE	METHOD_CODE	NUMERIC ANALYTICAL METHOD CODE FROM THE NATIONAL VMV DICTIONARY
SHORT METHOD TITLE	METHOD_TITLE	SHORT METHOD TITLE FROM THE NATIONAL VMV DICTIONARY. FULL METHOD DESCRIPTIONS AVAILABLE UPON REQUEST AT EC.MSQEINFORMATION-
OCEAN DRAINAGE AREA	OCEANDA	OCEAN DRAINAGE AREA THAT MONITORING SITE IS LOCATED IN
PEARSE DRAINAGE AREA	PEARSEDA	PEARSE DRAINAGE AREA THAT MONITORING SITE IS LOCATED IN
PROVINCE/TERRITORY	PROV_TERR	PROVINCE OR TERRITORY THAT MONITORING SITE IS LOCATED IN
SAMPLE IDENTIFIER	SAMPLE_ID_ÉCHANTILLON	UNIQUE SAMPLE IDENTIFIER FROM MONITORING PROGRAM
SAMPLE DETECTION LIMIT	SDL_LDE	SAMPLE DETECTION LIMIT REPORTED BY THE LABORATORY FOR THE SPECIFIC ANALYSIS OF THE REPORTED MEASUREMENT. ELEVATED SAMPLE DETECTION LIMIT ABOVE METHOD DETECTION LIMITS MAY INDICATE DILUTION, MATRIX INTERFERENCE OR OTHER ISSUES WITH THE
SITE DESCRIPTION	SITE_DESC	SITE DESCRIPTION THAT MAY INCLUDE SPECIFIC SAMPLING LOCATION, RATIONALE FOR MONITORING LOCATION (E.G. REFERENCE, UPSTREAM/DOWNSTREAM, ETC.), AND LOCAL
SITE NAME	SITE_NAME	FULL SITE NAME FROM MONITORING PROGRAM
SITE NUMBER	SITE_NO	UNIQUE SITE NUMBER/IDENTIFICATION FROM MONITORING PROGRAM
SITE TYPE	SITE_TYPE	SAMPLE SITE TYPE (E.G. RIVER, LAKE, ETC.)
VALIDATION STATUS	STATUS_STATUT	LEVEL OF VALIDATION (P-PROVISIONAL, V-VALIDATED)
UNIT NAME	UNIT_NAME	FULL MEASUREMENT UNIT NAME FROM NATIONAL VMV DICTIONARY
UNIT	UNIT_UNITÉ	MEASUREMENT UNIT ABBREVIATION FROM NATIONAL VMV DICTIONARY
MEASUREMENT VALUE	VALUE_VALEUR	MEASUREMENT VALUE OR CONCENTRATION
VARIABLE NAME	VARIABLE	VARIABLE NAME FROM NATIONAL VMV DICTIONARY
VARIABLE CODE	VARIABLE_CODE	NUMERIC VARIABLE CODE FROM NATIONAL VMV DICTIONARY
VARIABLE TYPE	VARIABLE_TYPE	VARIABLE TYPE FROM NATIONAL VMV DICTIONARY
VMV CODE	VMV_CODE	NUMERIC VALID METHOD VARIABLE (VMV) CODE FROM NATIONAL VMV DICTIONARY

Progression

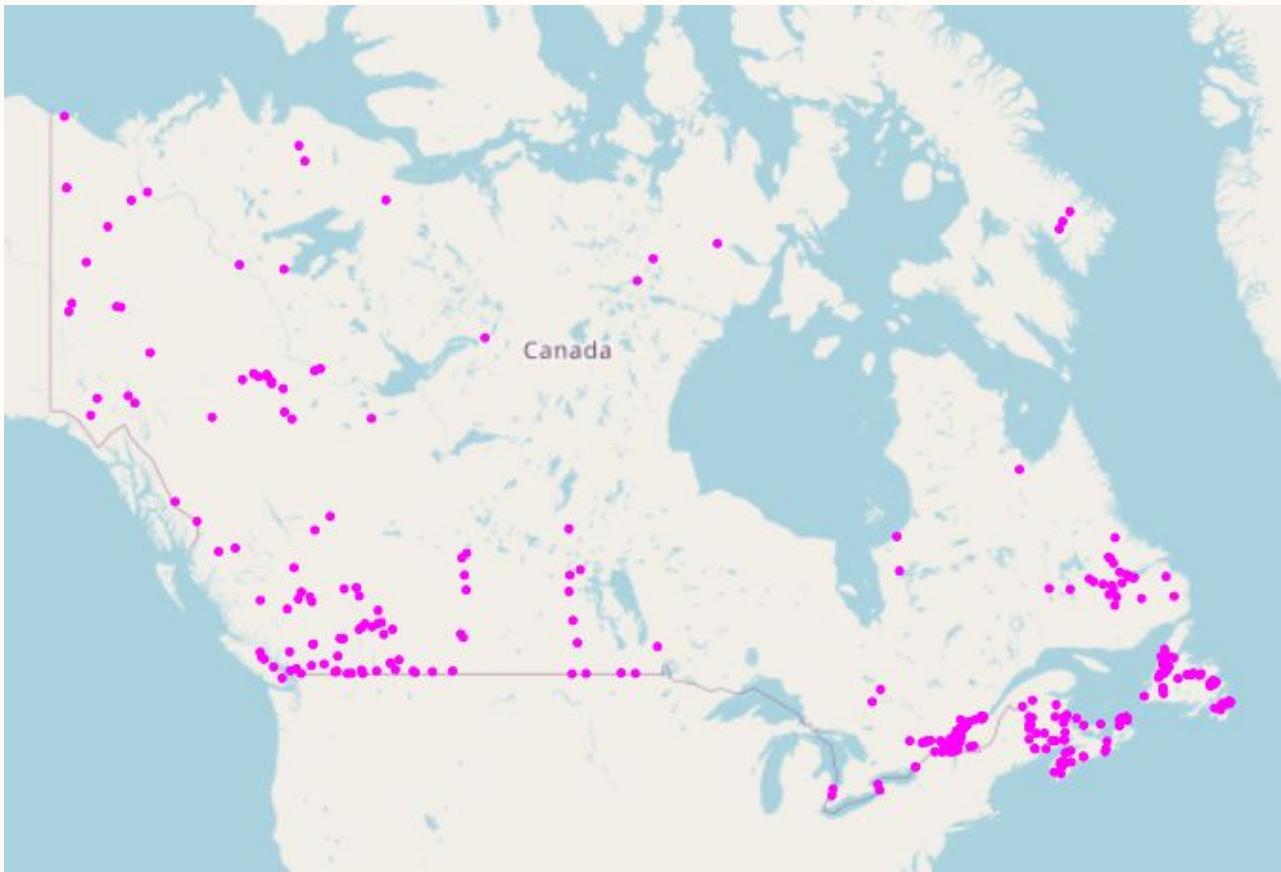
Exploratory Data Analysis

Basic Statistical Analysis

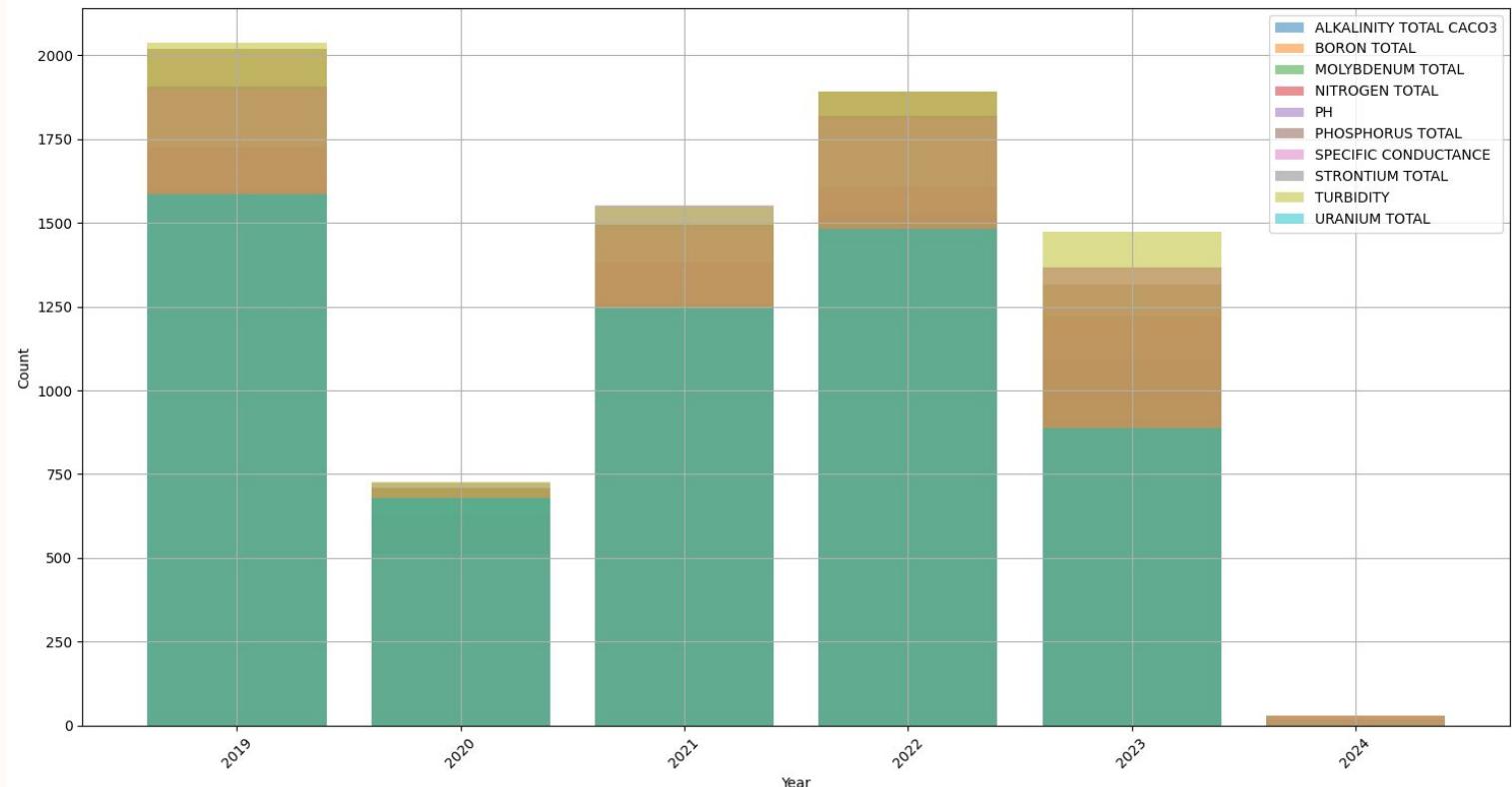
Baseline Modeling



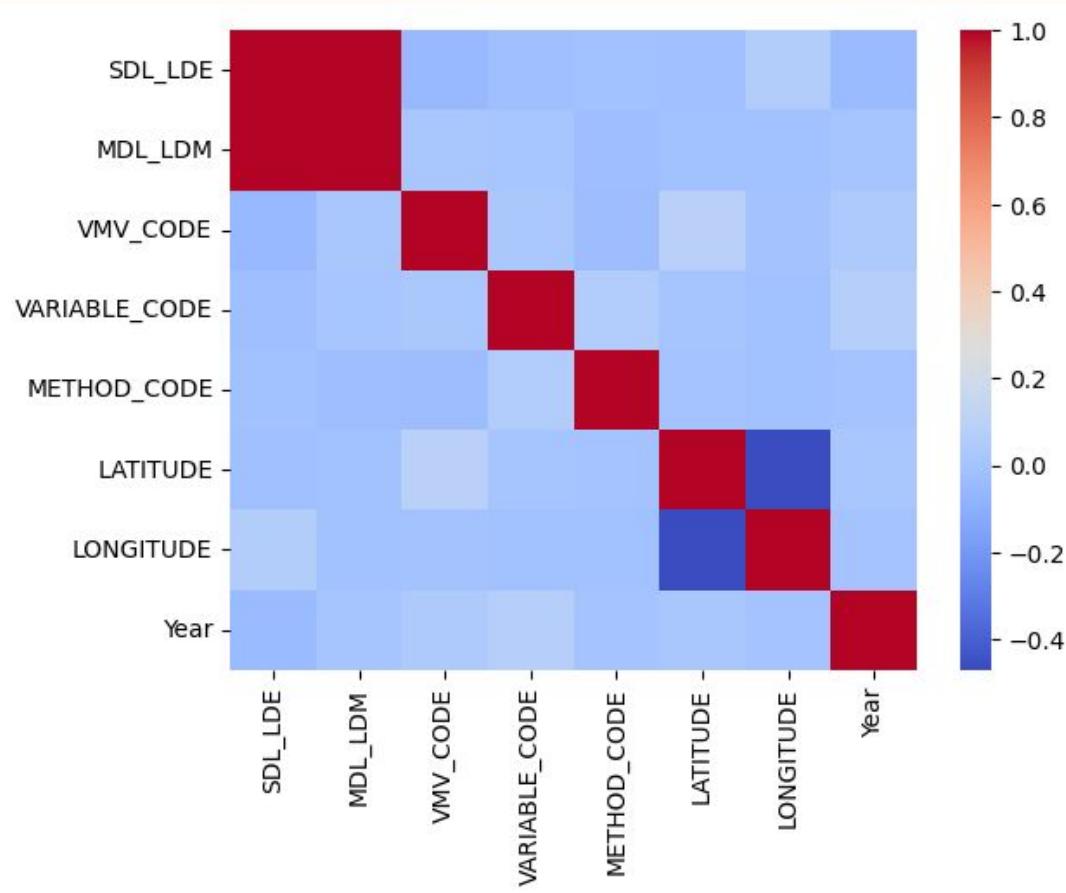
Water Monitoring Sites



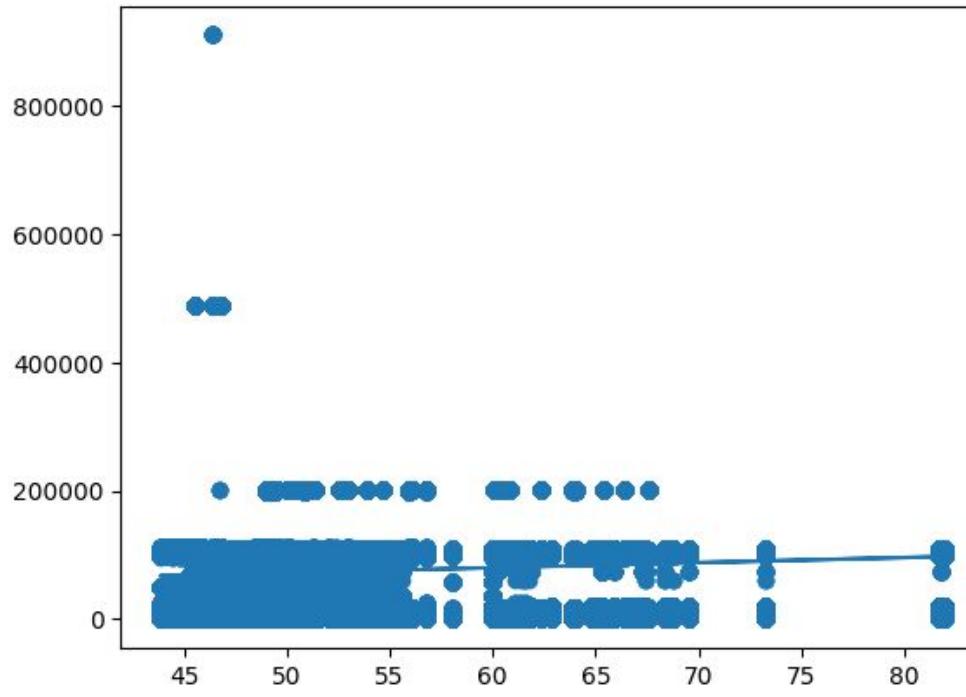
Top 10 pollutants since 2019



Heatmap (LATITUDE & VMV_CODE)



Prediction (weak relationship)





Next Steps

Feature engineering definition

ML Pipeline (Random Forest, AdaBoost)

Model comparison and interpretation

Product demo (Dashboard, Web App)



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Questions?

01

Name of the section

You can enter a subtitle here if you need it





Whoa!

This can be the part of the presentation where
you introduce yourself, write your email...



Do you need longer text?

Mercury is the closest planet to the Sun and the smallest one in the entire Solar System. This planet's name has nothing to do with the liquid metal, since Mercury was named after the famous Roman messenger god. Despite being closer to the Sun than Venus, its temperatures aren't as terribly hot as that planet's. Its surface is quite similar to that of Earth's Moon, which means there are a lot of craters and plains

Speaking of craters, many of them were named after artists or authors who made significant contributions to their respective fields. Mercury takes a little more than 58 days to complete its rotation, so try to imagine how long days must be there! Since the temperatures are so extreme, albeit not as extreme as on Venus, and the solar radiation is so high, Mercury has been deemed to be non-habitable for humans

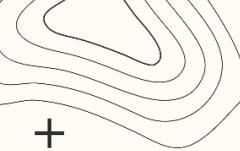


Table of contents

01

Section 1

You can describe the topic of the section here

02

Section 2

You can describe the topic of the section here

03

Section 3

You can describe the topic of the section here

04

Section 4

You can describe the topic of the section here

05

Section 5

You can describe the topic of the section here

06

Section 6

You can describe the topic of the section here

The slide title goes here!

Do you know what helps you make your point crystal clear? Lists like this one:

- They're simple
- You can organize your ideas clearly
- You'll never forget to buy milk!

And the most important thing: the audience won't miss the point of your presentation

Maybe you need to divide the content



Mercury

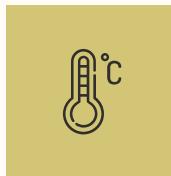
Mercury is the closest planet to the Sun and the smallest one in the Solar System—it's only a bit larger than the Moon



Venus

Venus has a beautiful name and is the second planet from the Sun. It's hot and has a poisonous atmosphere

Here are three important ideas



Mercury

Mercury is the closest planet to the Sun and the smallest of them all



Venus

Venus has a beautiful name and is the second planet from the Sun



Mars

Despite being red, Mars is actually a cold place. It's full of iron oxide dust



Divide the content in four ideas



Mars

Mars is actually a very cold place

Venus

Venus has extremely high temperatures



Jupiter

Jupiter is the biggest planet of them all

Saturn

Saturn is a gas giant and has several rings





Reviewing concepts is a good idea

Mars

Despite being red,
Mars is actually cold

Venus

Venus has extremely
high temperatures

Neptune

Neptune is the farthest
planet from the Sun

Mercury

Mercury is the closest
planet to the Sun

Saturn

Saturn is a gas giant
with several rings

Jupiter

Jupiter is the biggest
planet of them all

Awesome words





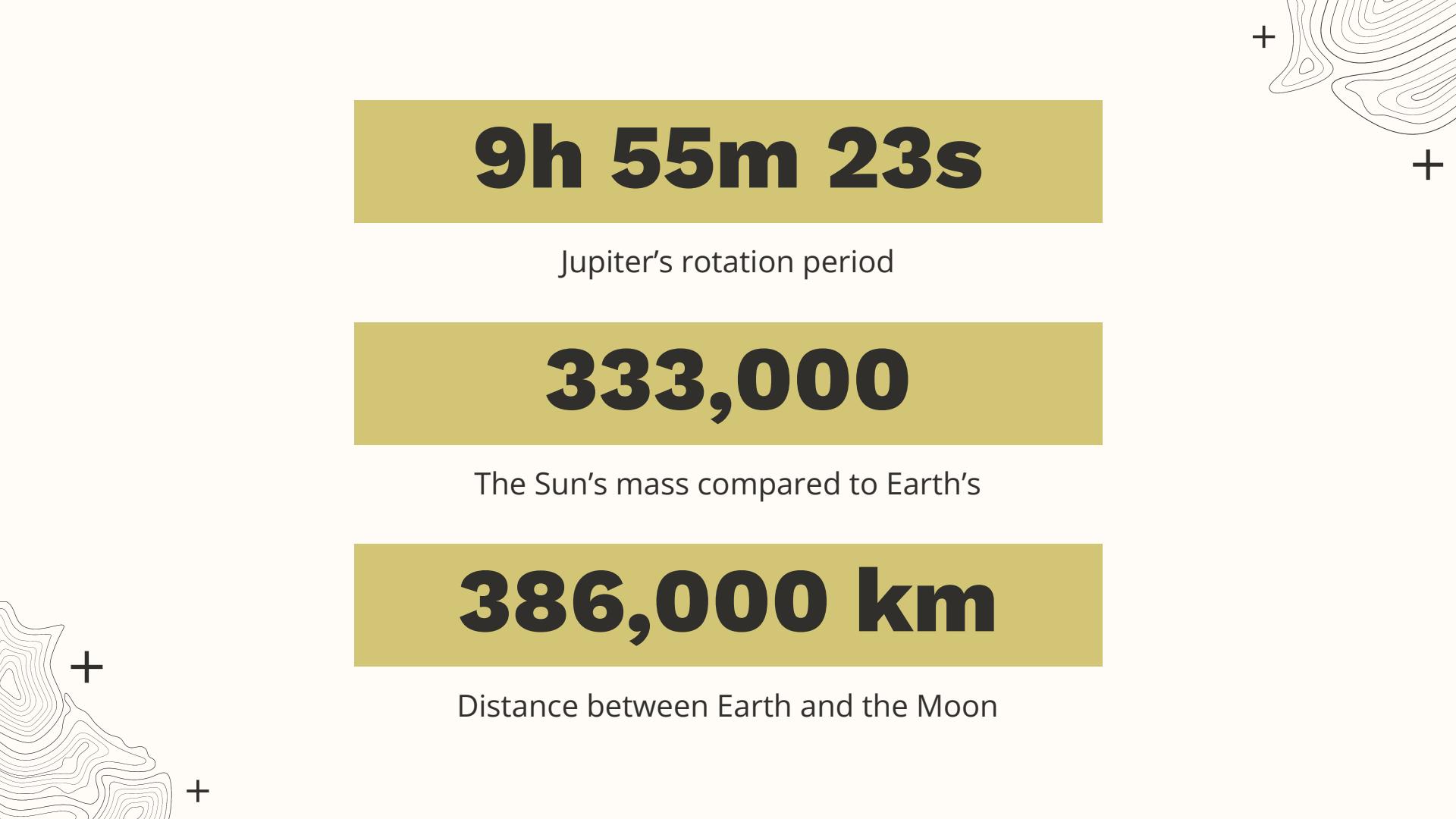
“This is a quote, words full of wisdom that someone important said and can make the reader get inspired”

—**Someone Famous**



4,498,300

Big numbers catch your audience's attention



9h 55m 23s

Jupiter's rotation period

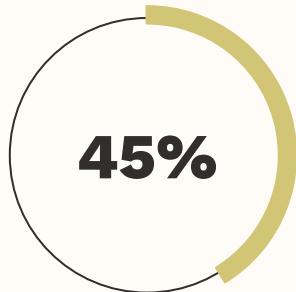
333,000

The Sun's mass compared to Earth's

386,000 km

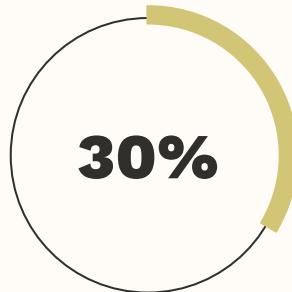
Distance between Earth and the Moon

Let's use some percentages



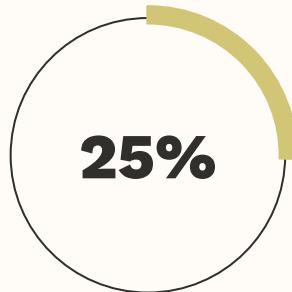
Mercury

Mercury is the closest planet to the Sun and the smallest of them all



Venus

Venus has a beautiful name and is the second planet from the Sun

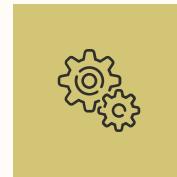


Mars

Despite being red, Mars is actually a cold place. It's full of iron oxide dust



Conservation VS Management



Conservation

- Jupiter is the biggest planet of the entire System
- Neptune the farthest planet from the Sun
- Saturn is a gas giant with several rings
- Despite is red, Mars is actually a very cold place

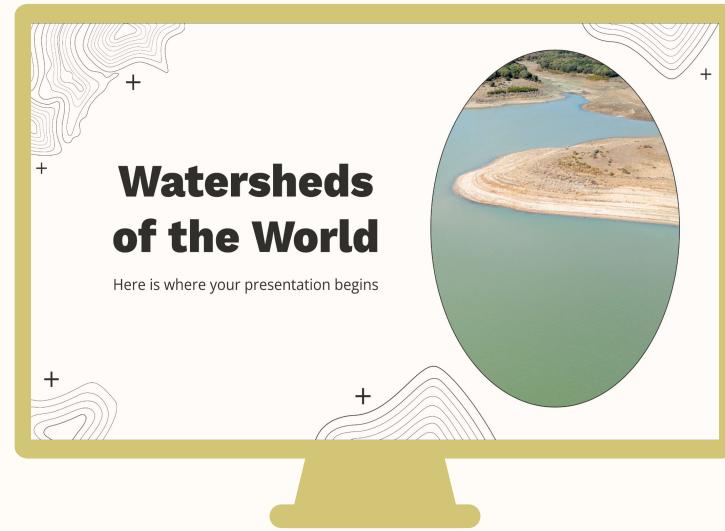
Management

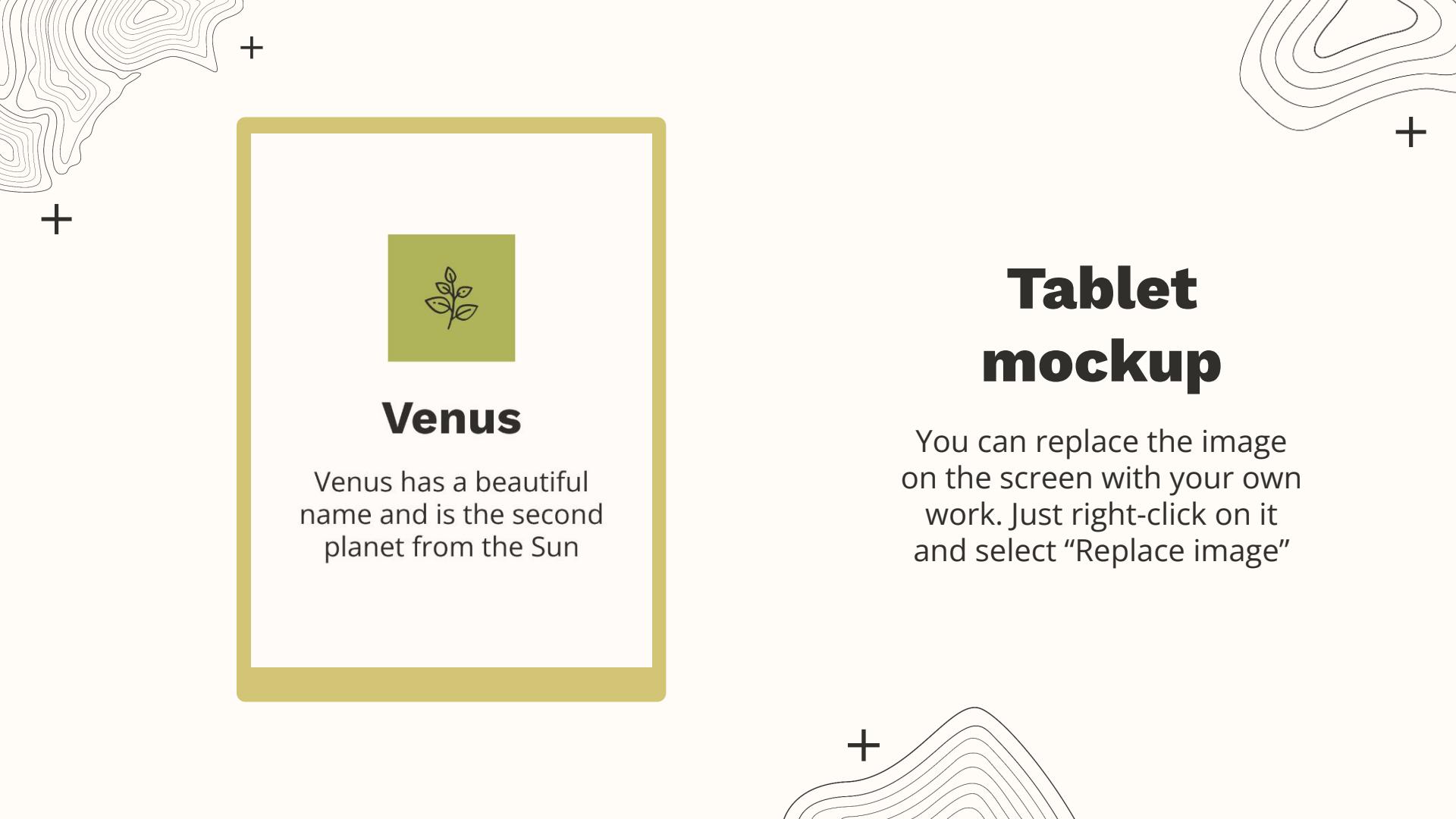
- Venus is the second planet from the Sun
- Saturn is composed of hydrogen and helium
- Earth is the only planet that harbors life
- Mercury is the closest planet to the Sun



Computer mockup

You can replace the image on the screen with your own work. Just right-click on it and select “Replace image”





Tablet mockup



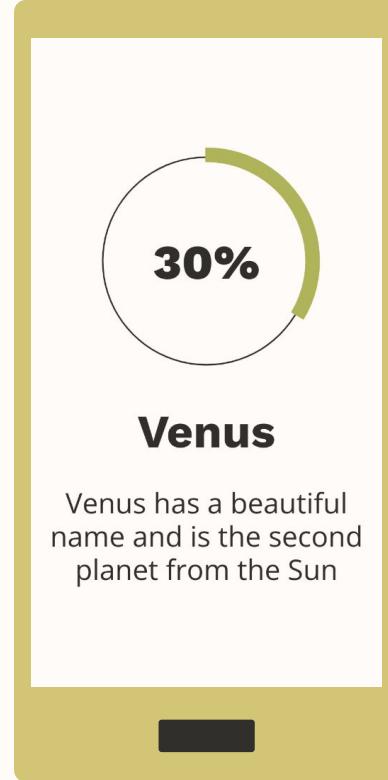
Venus

Venus has a beautiful name and is the second planet from the Sun

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Phone mockup

You can replace the image on the screen with your own work. Just right-click on it and select "Replace image"



This is a map



Venus

Venus is the second planet from the Sun



Mercury

Mercury is the closest planet to the Sun



Mars

Despite being red, Mars is a very cold place



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A timeline always work well

Earth

Earth is the only planet with human life



Saturn

Saturn is the ringed planet of the System



Neptune

Neptune is very far away from the Sun



Mars

Despite is red, Mars is actually very cold



Venus

Venus is the second planet from the Sun



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Importance of watersheds

Mars

Despite being red, Mars is actually very cold

Saturn

Saturn is a gas giant planet with rings

Jupiter

Jupiter is the biggest planet of the System

Neptune

Neptune is very far away from the Sun

Earth

Earth is the only planet with human life

Venus

Venus is the second planet from the Sun

Why are so important?

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Tables represent your data

	Mass	Diameter	Surface
Mercury	0.06	0.38	0.38
Mars	0.11	0.53	0.38
Saturn	95.2	9.4	1.16
Venus	10.5	2.3	0.6



You can use this graph

Mars

Despite being red, Mars is actually cold

Mercury

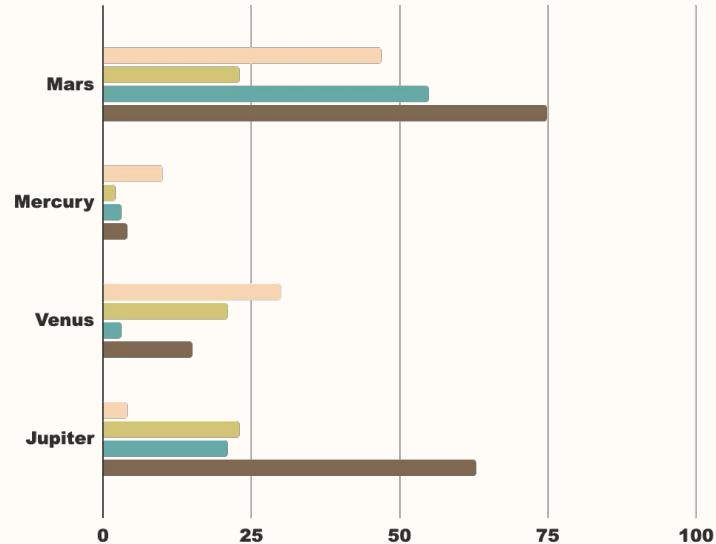
Saturn is a gas giant with several rings

Venus

Jupiter is the biggest planet of the System

Jupiter

Jupiter is the biggest planet of the System



Follow the link in the graph to modify its data and then paste the new one here. [For more info, click here](#)

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Or you can use this graph

10%

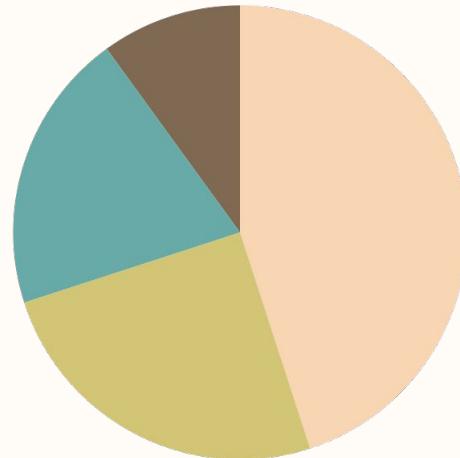
Venus

Venus is the second planet from the Sun

20%

Jupiter

Jupiter is also a gas giant planet

**Mars****45%**

Despite being red, Mars is actually cold

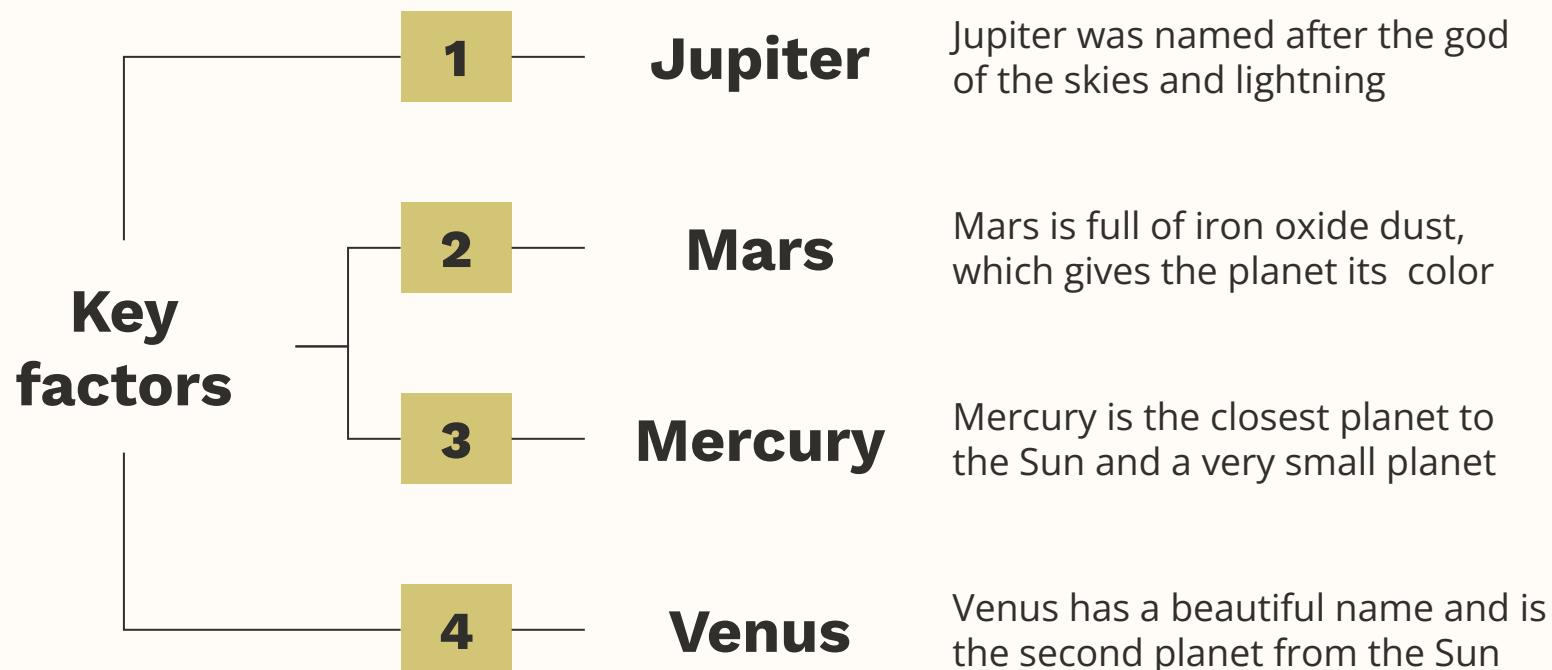
Saturn

25%

Saturn is a gas giant with several rings

Follow the link in the graph to modify its data and then paste the new one here. [For more info, click here](#)

Key characteristics of watersheds

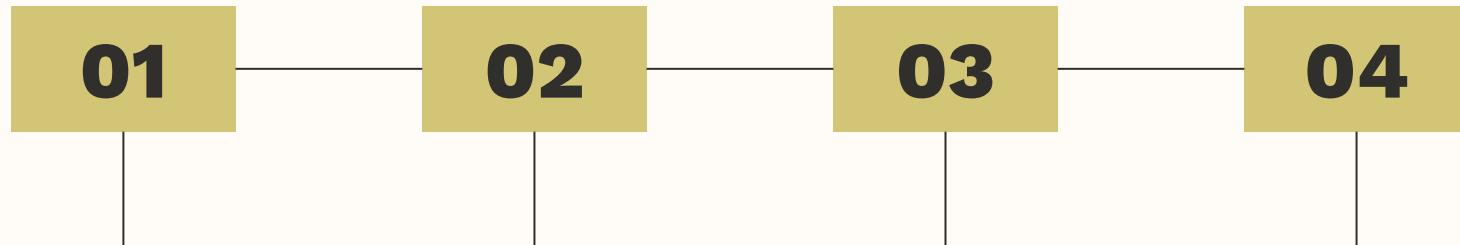




Geographic and climate regions

Alpine watershed	Mangrove watershed	Boreal watershed	Chaparral watershed
Despite being red, Mars is actually cold	Venus has such a very beautiful name	Jupiter is the biggest planet of them all	Saturn is a gas giant with several rings
<ul style="list-style-type: none">You can describe here how to do itYou can describe here how to do itYou can describe here how to do it	<ul style="list-style-type: none">You can describe here how to do itYou can describe here how to do itYou can describe here how to do it	<ul style="list-style-type: none">You can describe here how to do itYou can describe here how to do itYou can describe here how to do it	<ul style="list-style-type: none">You can describe here how to do itYou can describe here how to do itYou can describe here how to do it

Steps in the develop of watersheds



Mars

Despite being red, Mars cold and also full oxide dust

Earth

Earth is the only planet that harbors human life

Saturn

Saturn is a gas giant planet with several rings

Mercury

Mercury is the closest planet to the Sun

Human impact on watersheds

Earth

Earth is the only planet that harbors human life in the Solar System

Jupiter

Jupiter is a very big planet and was named after a Roman God

Human impact



Mercury

Mercury is the closest planet to the Sun and the smallest of them all

Venus

Venus has a beautiful name and is the second planet from the Sun



Our team



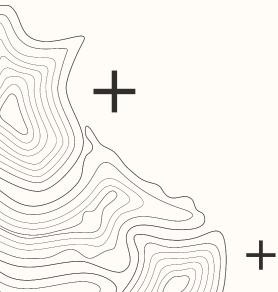
Sofia Hill

You can speak a bit about
this person here



Timmy Jimmy

You can speak a bit about
this person here



Thanks!

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youremail@freepik.com
+34 654 321 432
yourwebsite.com



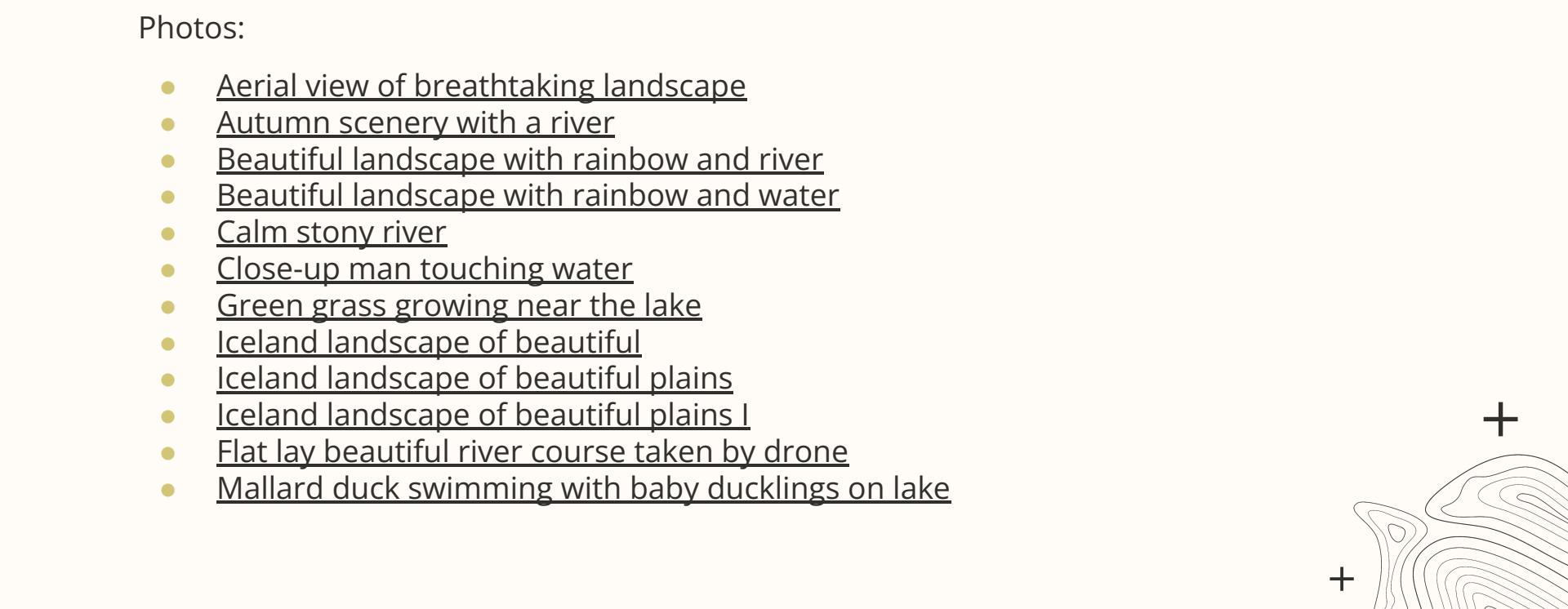
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Alternative resources



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- [Aerial view of breathtaking landscape](#)
- [Autumn scenery with a river](#)
- [Beautiful landscape with rainbow and river](#)
- [Beautiful landscape with rainbow and water](#)
- [Calm stony river](#)
- [Close-up man touching water](#)
- [Green grass growing near the lake](#)
- [Iceland landscape of beautiful](#)
- [Iceland landscape of beautiful plains](#)
- [Iceland landscape of beautiful plains I](#)
- [Flat lay beautiful river course taken by drone](#)
- [Mallard duck swimming with baby ducklings on lake](#)

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- [Rural concept with river](#)
- [Iceland landscape of beautiful plains](#)
- [Landscape full of rocky formations](#)
- [Long shot water stream in the grassland](#)
- [Beautiful landscapes of iceland while travelling](#)
- [Long shot of green pasture with water stream](#)
- [Long shot river crossing through farmland](#)

- [Rural concept with small river](#)
- [Long shot of green pasture with water stream](#)
- [Portrait of woman with curly hair](#)
- [Smiley man holding camera front view](#)

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Pana



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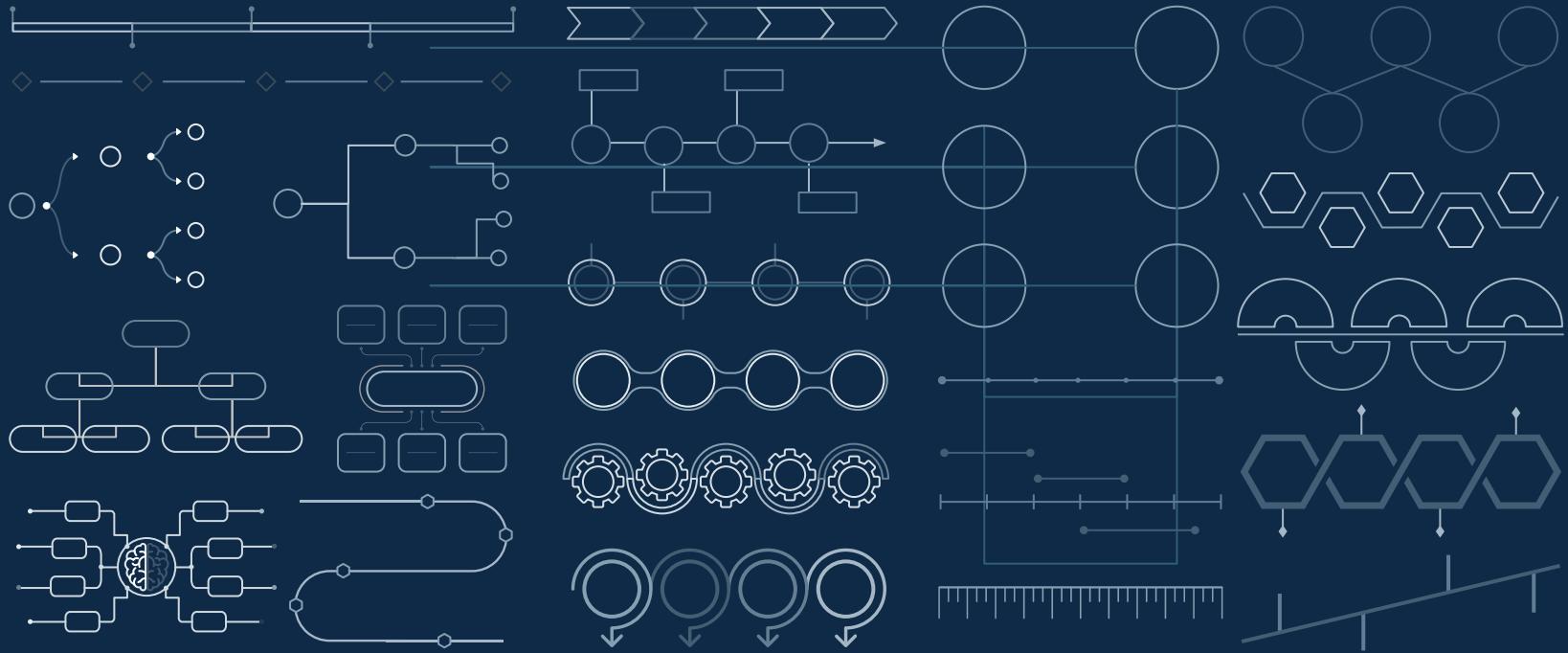
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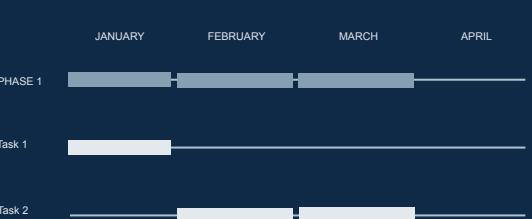
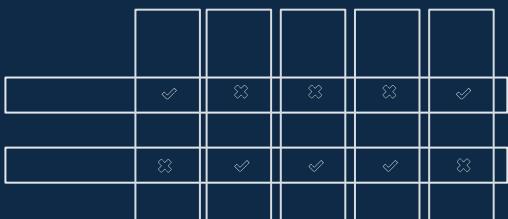
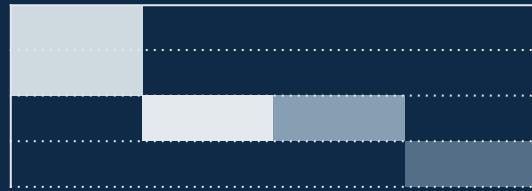
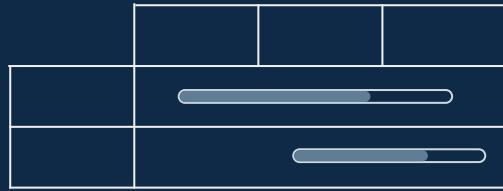
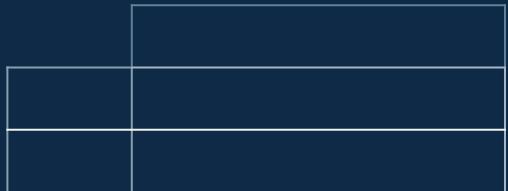
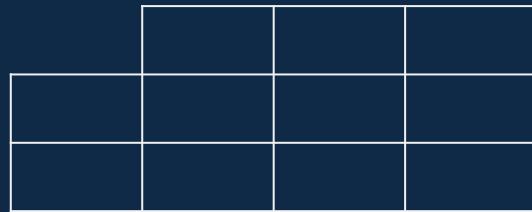
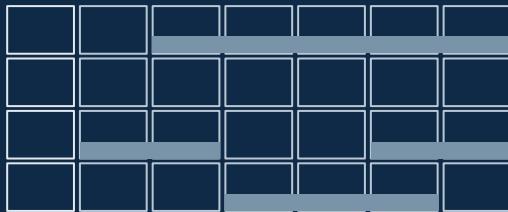
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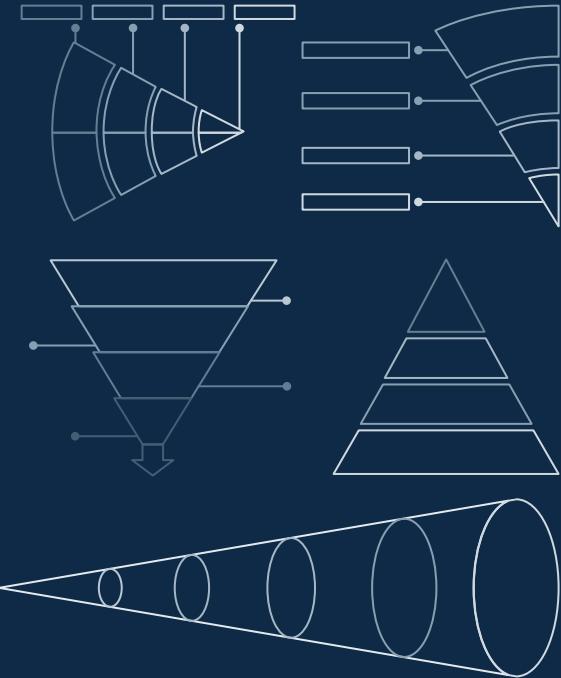
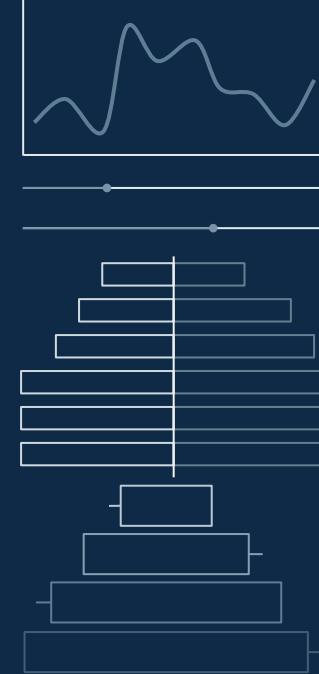
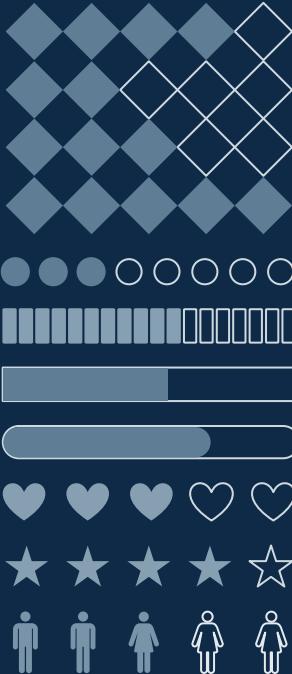
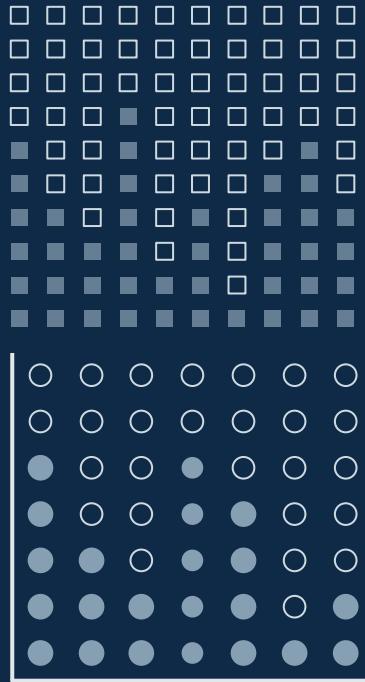












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Medical Icons



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Creative Process Icons



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SEO & Marketing Icons





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