

# La harpe laser

Clara – Timur – Clémence – Adam



# PROBLEMATIQUE

Comment relier l'art et la  
photonique ?

# Sommaire

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02

Avancement  
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Avancement  
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# 01

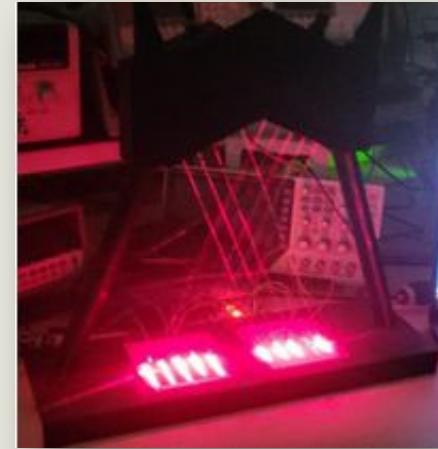
## Présentation

Nos idées pour ce projet

# Une harpe fonctionnant avec des lasers

## FONCTIONNALITÉS SOUHAITÉES

- 1- Produire un son lorsque l'on passe sa main à travers un faisceau
- 2- Pouvoir jouer toutes les notes de la gamme (12 faisceaux laser)
- 3- Pouvoir passer d'une octave à une autre
- 4- Pouvoir changer facilement de banque de sons
- 5- Être transportable et facile d'utilisation
- 6- Pouvoir alterner les couleurs de laser



*Harpe réalisée par les élèves  
de l'an dernier*

# Notre cahier des charges (1/2)

Encombrement	Forme de la harpe	Triangulaire
	Poids	2 kg
	Dimensions	55x105 cm
Nombre de lasers	12	
Distance de détection (max)	90 cm	
Nombre de notes possibles	36	
Usage	Spectacle mêlant l'optique et la musique	
Design	Sobre et élégant	

# Notre cahier des charges (2/2)

Alimentation	Prise secteur
Nombre de pistes de sons	3
Système de changement de piste sonore	Boutons pousoirs
Matériaux/Couleur du cadre	Plastique noir
Système pour véhiculer l'information	Haut-parleur, lecture de fichiers audio préenregistrés
Tension d'alimentation	Entre 2,6 et 6V
Volume des notes jouées	~ 60 dB

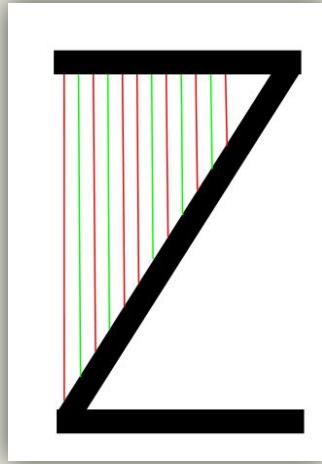
# Le design

Stylisation du modèle de harpe classique

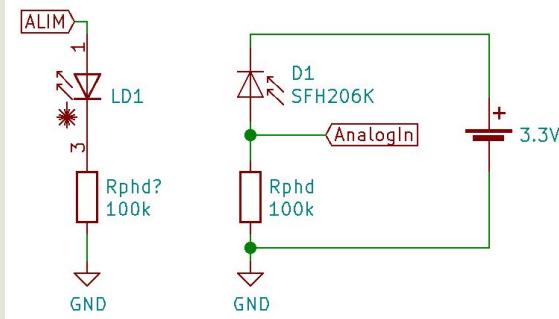
Inspiration :



Notre design :



# La répartition du travail cette semaine



Câblage et codage

Clara, Timur



Création du cadre

Clémence, Adam

# 02

## Avancement esthétique

Où en est-on ?



# Comment va-t-on faire?



## Création des pièces

Usage de Solidworks:  
compétence en cours  
d'acquisition pour chaque  
membre



## Découpe des pièces

Usage de la machine à  
découpe laser

# Première pièce produite



Une plaque de bois trouée pour  
laisser passer les 12 lasers

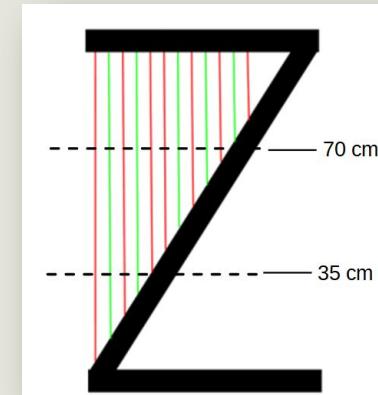
# Un point technique difficile

Taille des pièces limitée par la machine de découpe laser



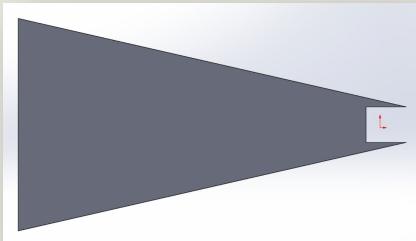
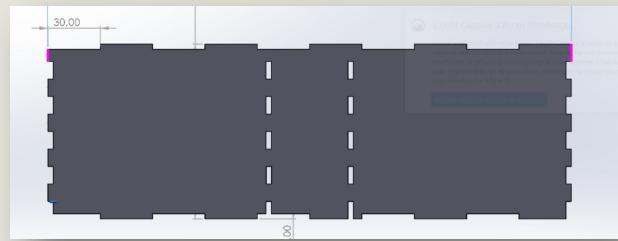
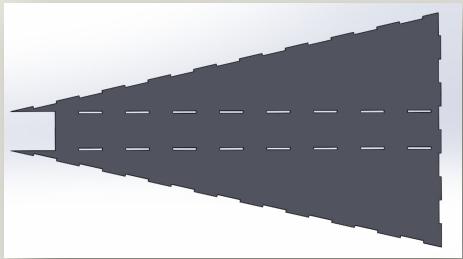
Max: 40x60 cm

Solution: Découper la structure en 3 parties  
(35x55 cm)



Attention à la stabilité!

# Quelques pièces dessinées



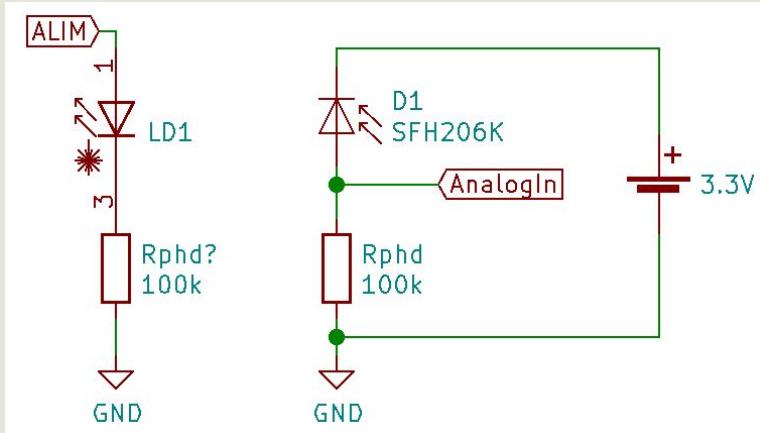


03

# Avancement technique

Où en est-on ?

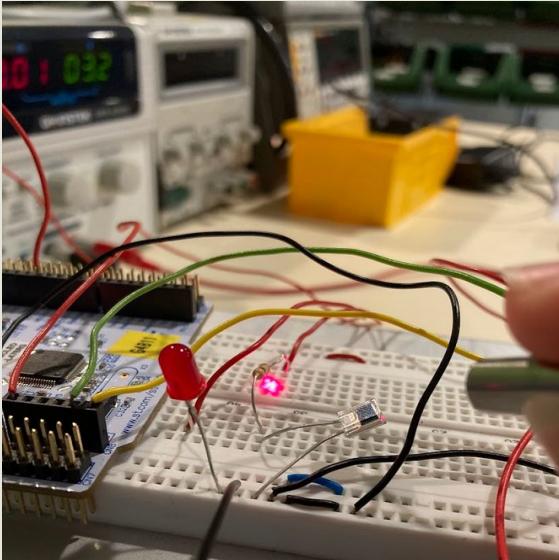
# Premier circuit et code



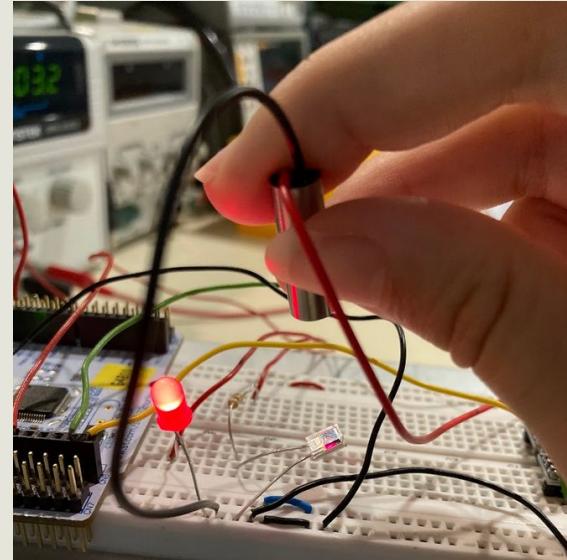
Code basé sur le tutoriel "Comment récupérer un signal analogique ?" de 1A

Définition d'un seuil de puissance pour que la diode s'allume

# Résultats



Photodiode non éclairée:  
la diode est OFF



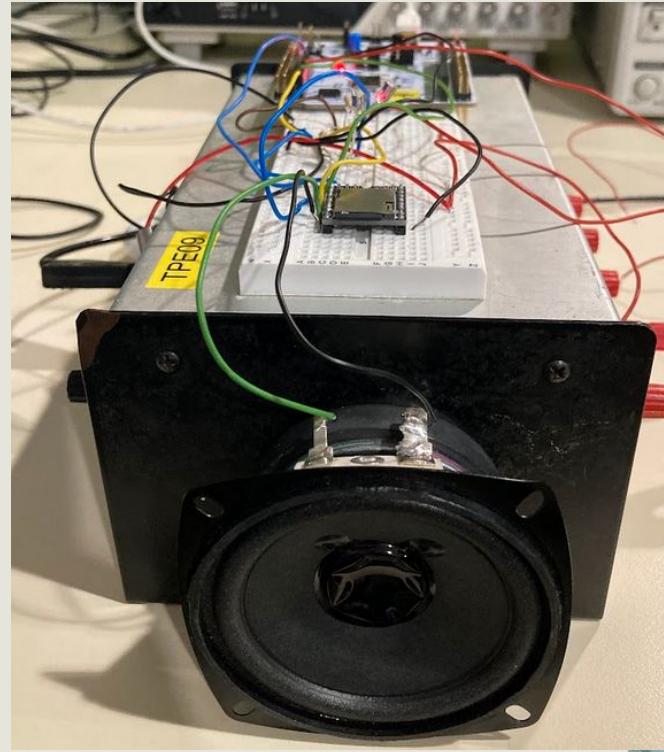
Photodiode éclairée par le  
laser:  
la diode est ON

# Deuxième circuit et code

Fichiers mp3 sont stockés dans une carte SD reliée à la carte Nucleo et au haut-parleur

Notre code permet de lire n'importe quel fichier audio mp3

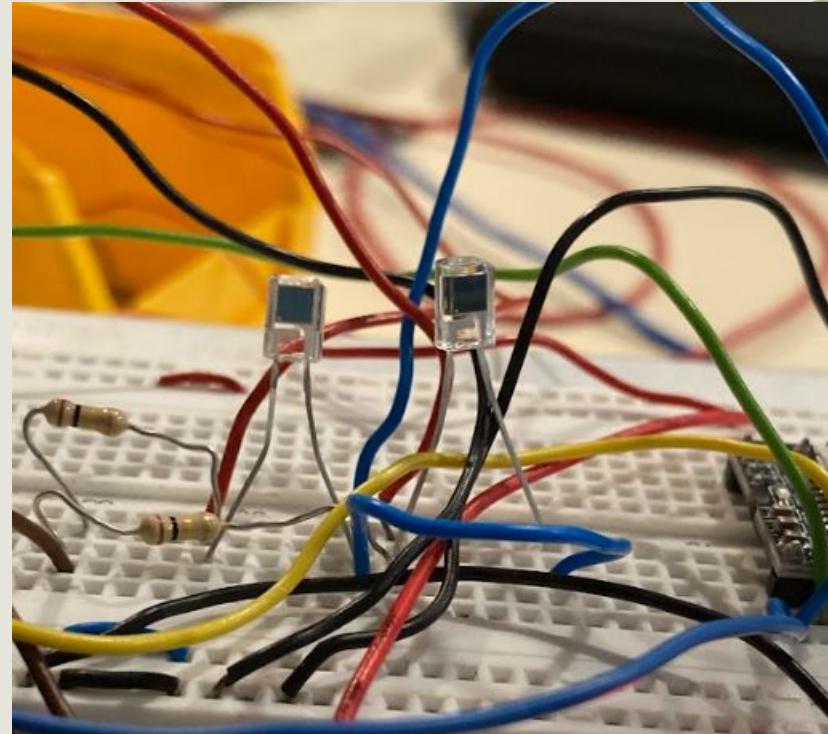
Par la suite, on a combiné ces 2 codes ensembles



# Dernière avancée

Câblage et codage de 2 photodiode, qui envoient un son différent au haut-parleur lorsque le laser pointe l'une d'elles

2 banques de sons implémentées + codage d'un bouton poussoir permettant de passer d'une banque à l'autre



# Démonstration



# Prévisions du travail à venir

	Semaine n°2	Semaine n°3
Cadre	<ul style="list-style-type: none"><li>- Fin des dessins Solidworks</li><li>- 1er essais de découpe + assemblage dans du bois</li><li>- Commande du matériau final souhaité</li></ul>	<ul style="list-style-type: none"><li>-Découpe finale de la harpe</li><li>-Ajout de la structure en métal interne</li><li>- Fixation du haut-parleur et détails esthétiques</li></ul>
Codes et circuits	<ul style="list-style-type: none"><li>- Usage d'une carte Raspberry pour jouer 2 sons en même temps</li><li>- finalisation des banques de son</li></ul>	<ul style="list-style-type: none"><li>- Fin des codes</li><li>- Montage des circuits finaux</li><li>- Ajout d'un bouton exterieur</li></ul>

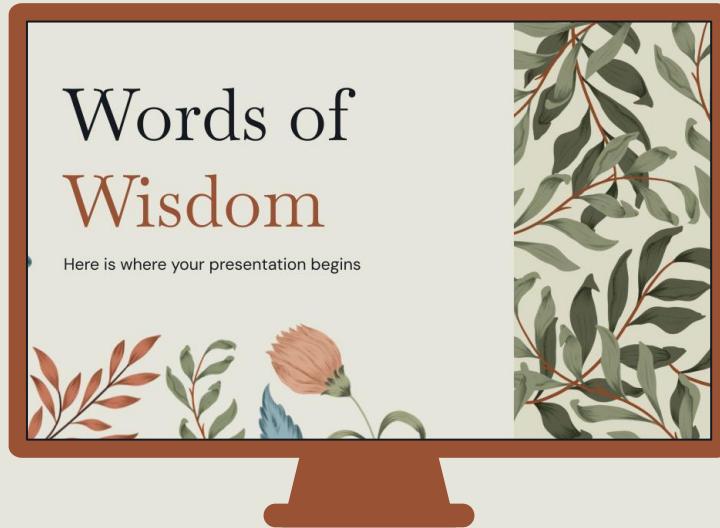
# Merci!

AVEZ-VOUS DES QUESTIONS?



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# 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 very poisonous atmosphere



# PROBLEMATIQUE

Comment relier l'art et la photonique ?

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# 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





# 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

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

Mars is actually a very cold place

## 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

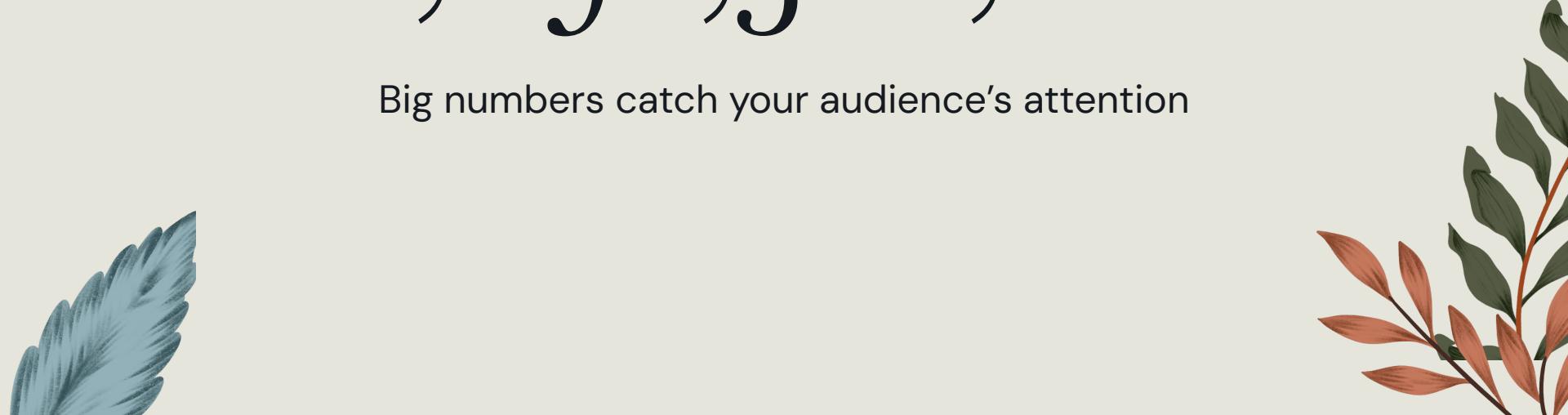
A picture is worth a thousand words



# A picture always reinforces the concept

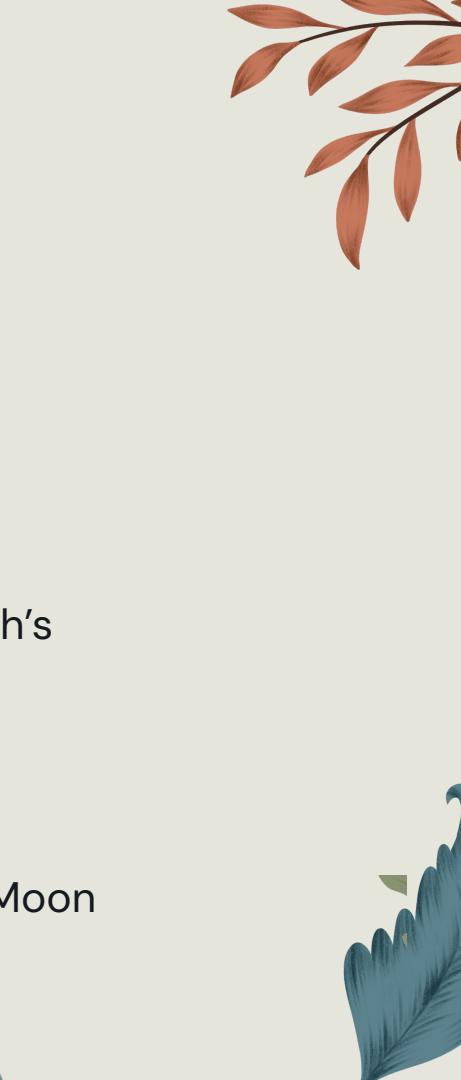
Images reveal large amounts of data, so remember: use an image instead of a long text. Your audience will appreciate it





4,498,300,000

Big numbers catch your audience's attention



9h 55m 23s

Jupiter's rotation period

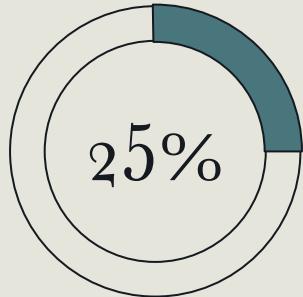
333,000

The Sun's mass compared to Earth's

386,000 km

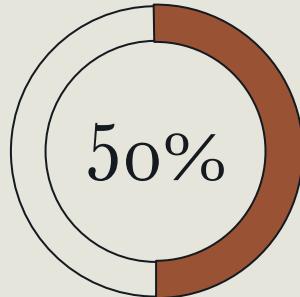
Distance between Earth and the Moon

# 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

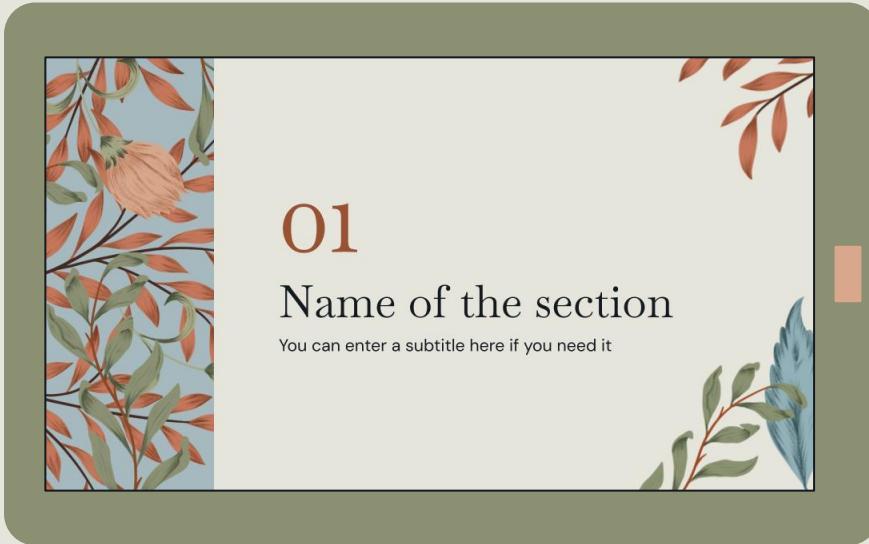
Despite being red, Mars is actually a cold place. It's full of iron oxide dust



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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

Mars is actually a cold place. It's full of iron oxide dust.

# This is a map

Venus

Venus is the second planet from the Sun

Mercury

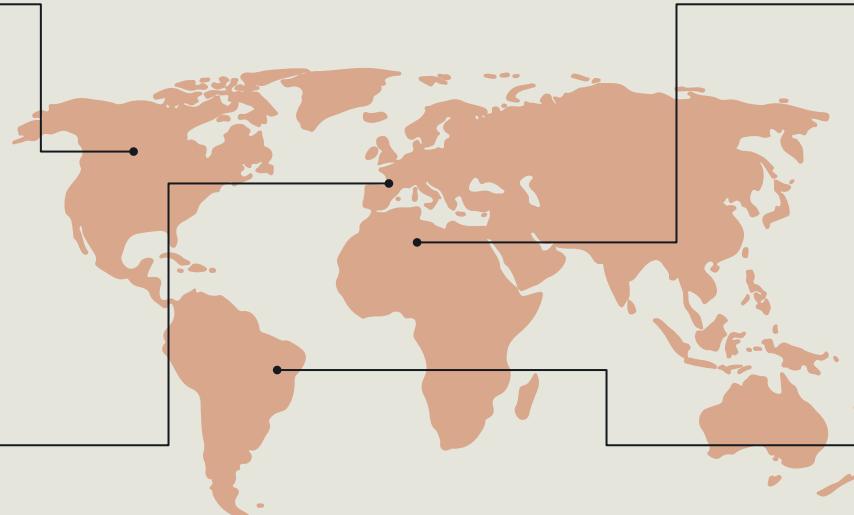
Mercury is the closest planet to the Sun

Mars

Despite being red, Mars is a very cold place

Jupiter

Jupiter is the biggest planet of them all



# A timeline always works well

Venus is the second planet from the Sun

Venus



Despite being red, Mars is a very cold place

Mars



Mercury

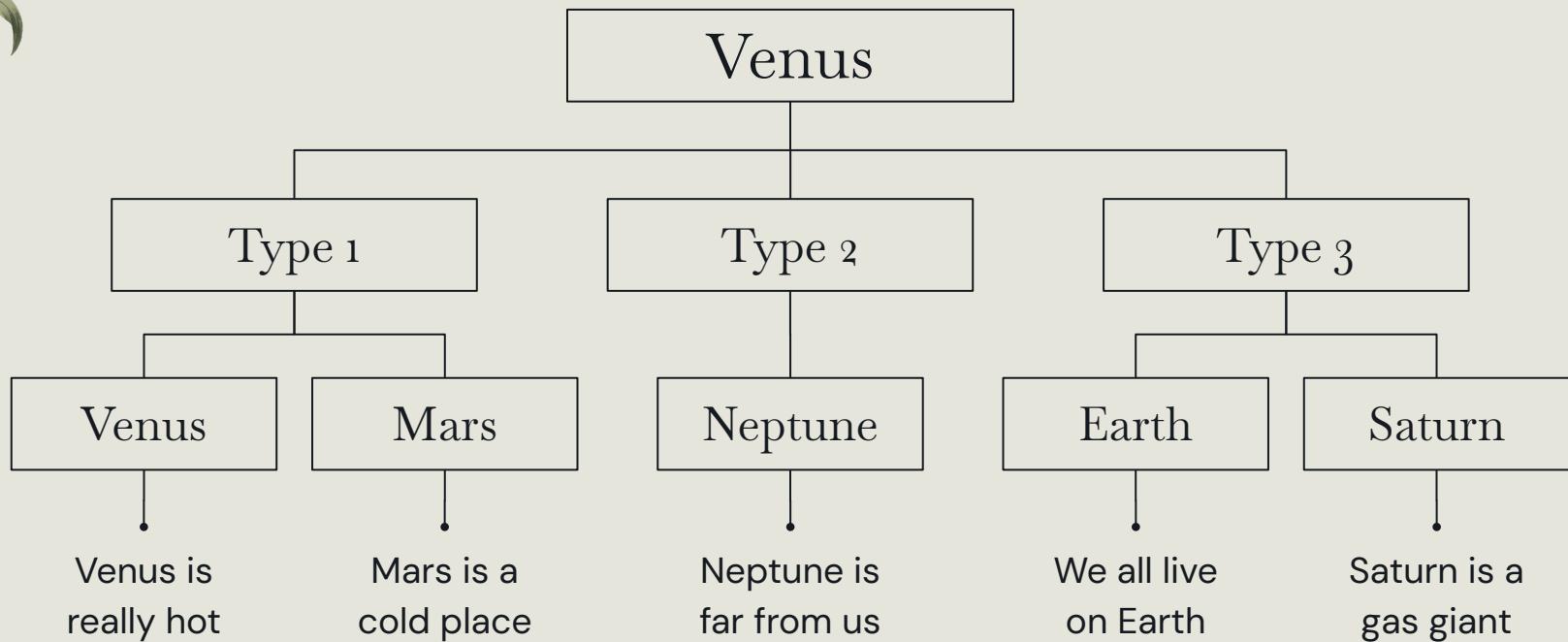
Mercury is the closest planet to the Sun

Jupiter

Jupiter is the biggest planet of them all



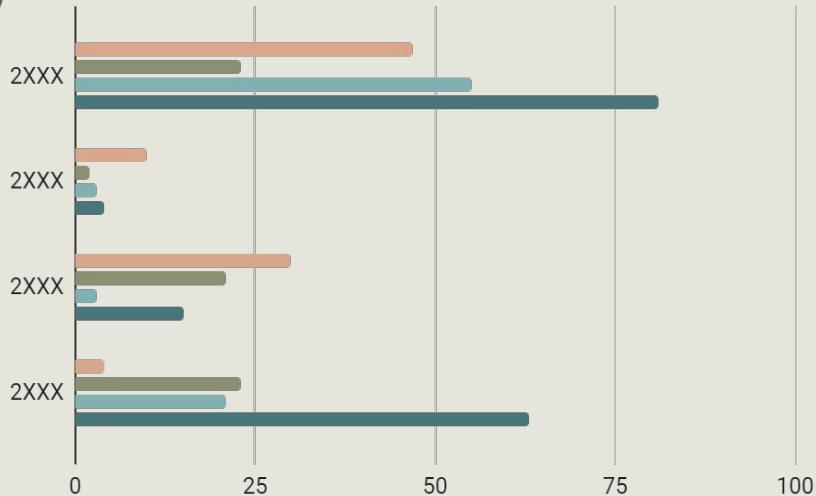
# Diagram



# Tables represent your data

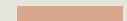
	Mass (earths)	Diameter (earths)	Surface gravity (earths)
Mercury	0.06	0.38	0.38
Mars	0.11	0.53	0.38
Saturn	95.2	9.4	1.16

# You can use this graph



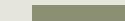
## Mercury

Mercury is quite a small planet



## Venus

It has very high temperatures



## Jupiter

Jupiter is an enormous planet



## Saturn

Saturn is a gas giant with rings



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



# Always making lists is useful

## Mars

- Insert your text here



## Venus

- Insert your text here

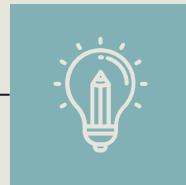
## Mercury

- Insert your text here



# Infographic

Venus  
Venus is the second planet from the Sun



Saturn  
Saturn was named after a Roman god



Mars  
Despite being red, Mars is a cold place

Jupiter  
It's the biggest planet in the Solar System





# Write 2 reflections that inspire you

## Reflection 1

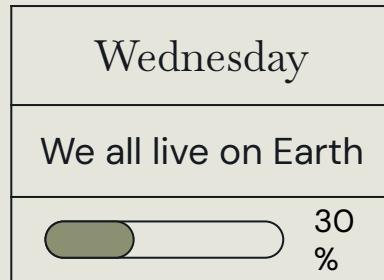
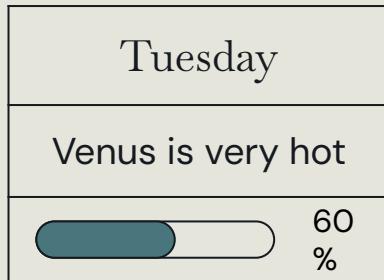
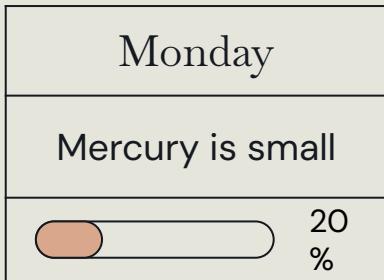
Mercury is the closest planet to the Sun and the smallest one in the entire Solar System. This planet's name has nothing to do with the liquid metal, since Mercury was named after a god

## Reflection 2

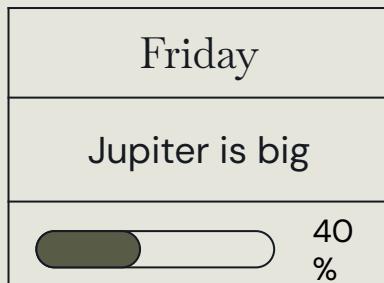
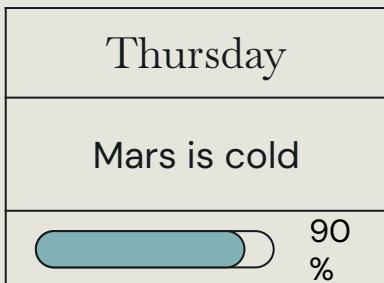


Venus has a beautiful name and is the second planet from the Sun. It's terribly hot, even hotter than Mercury, and its atmosphere is extremely poisonous. It's the second-brightest natural object in the night sky after the Moon

# Week overview



- Additional tasks
- Write down your tasks
  - Write down your tasks
  - Write down your tasks
  - Write down your tasks



Notes

Write your notes  
Write your notes  
Write your notes



# Personal profile

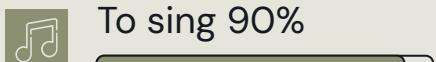
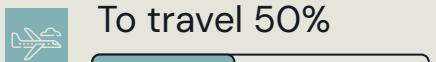
Age: 24

Level: Academic

Studies: Degree

Race: Advertising

## Hobbies:



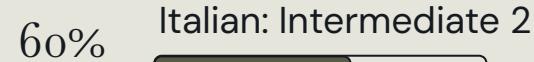
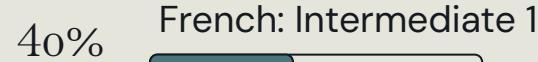
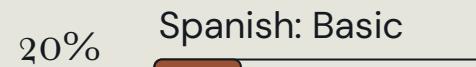
Job: Publicist

Salary: \$1,500

5 years 5 years

Postgraduate: Sales

## Languages:



# Thanks!

DO YOU HAVE ANY QUESTIONS?

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#81b0b5

#ffffff

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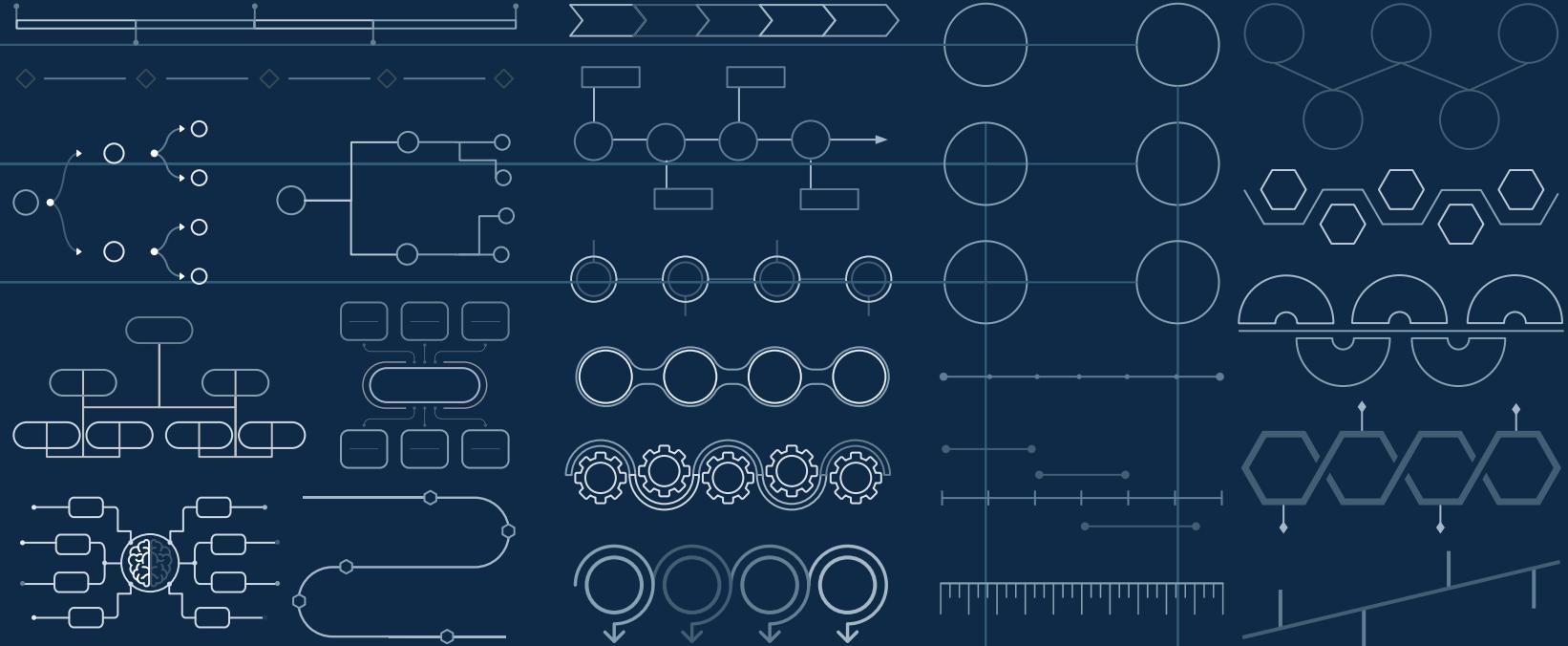
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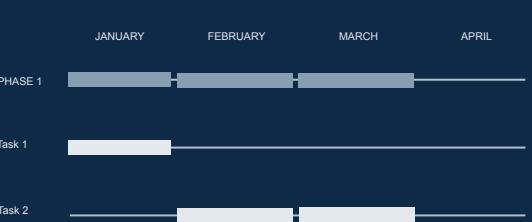
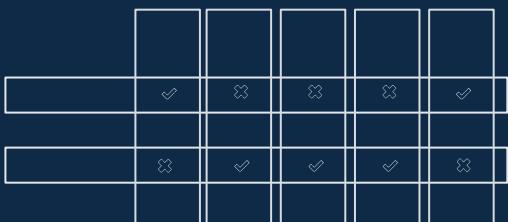
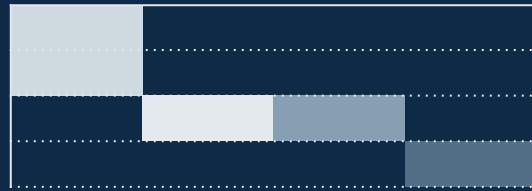
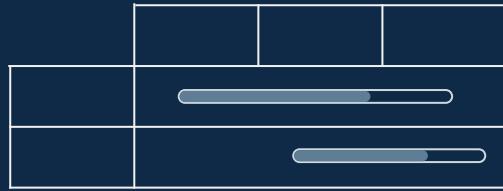
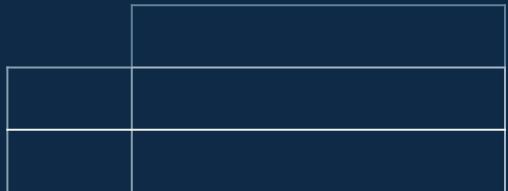
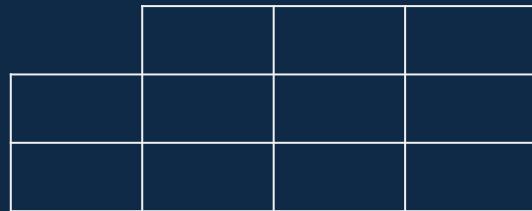
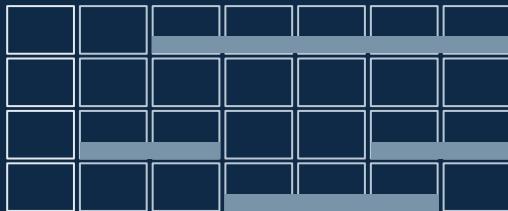
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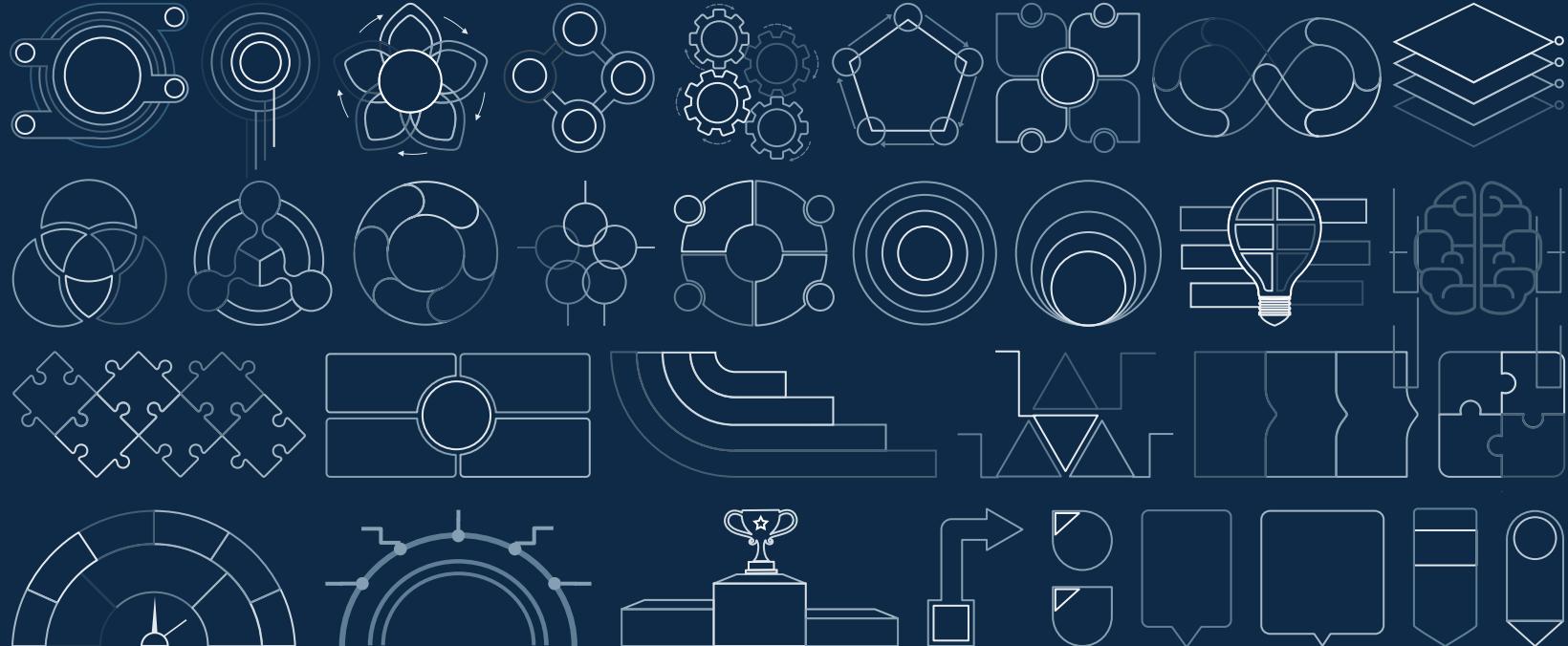
You can easily **resize** these resources without losing quality. To **change the color**, just ungroup the resource and click on the object you want to change. Then, click on the paint bucket and select the color you want. Group the resource again when you're done. You can also look for more **infographics** on Slidesgo.

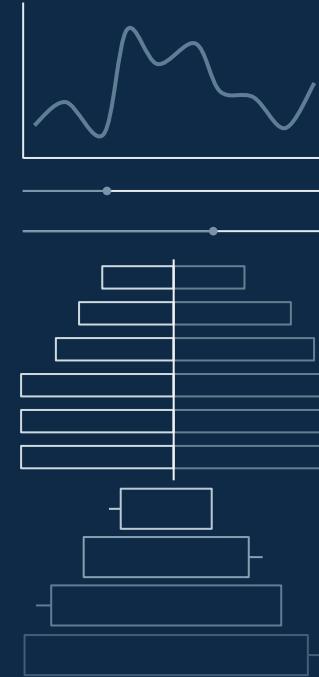
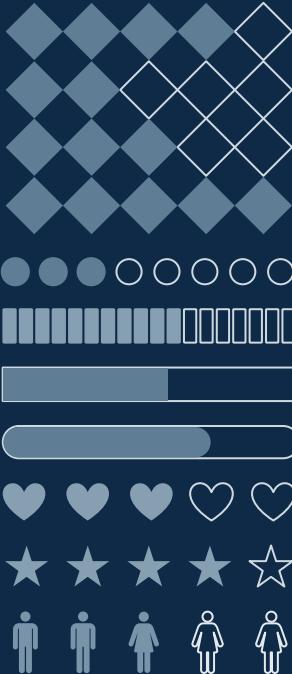
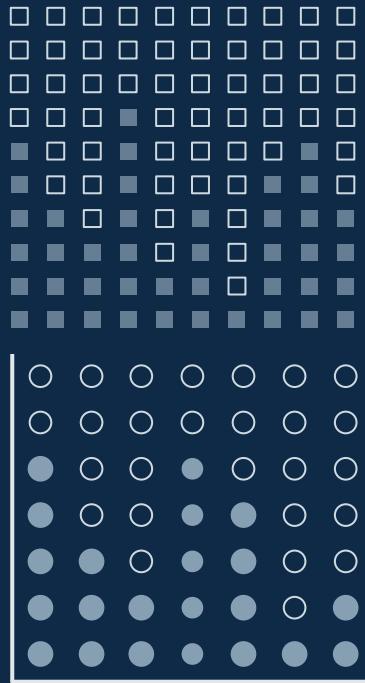












# ...and our sets of editable icons

You can **resize** these icons without losing quality.

You can **change the stroke and fill color**; just select the icon and click on the **paint bucket/pen**.

In Google Slides, you can also use **Flaticon's extension**, allowing you to customize and add even more icons.



# Educational Icons



# Medical Icons



# Business Icons



# Teamwork Icons



# Help & Support Icons



# Avatar Icons



# Creative Process Icons



# Performing Arts Icons



# Nature Icons



## SEO & Marketing Icons

