

The Art & Science of AB Test Development

by Bill Coloe



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Stuff about me.

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Go forth and test.

Who Am I?



Bill Coloe

**Front End Optimization Dev
Lovevery**



Stuff I Like



What is AB Testing?

A method of showing several different variations of a web page or app to visitors at random, and comparing which variant converts better.

Variation 0 (control)

Recipe Saver

My Recipes Chrome Extension Account Login / Register

Recipe Saver

It's never been easier to save recipes online!

Recipe Saver

MY RECIPES CHROME EXTENSION Search Recipes ACCOUNT LOGOUT

All Recipes sort by: ...

- Spanish-Style Potatoes 3/18/14
- Roast Chicken With Spring Vegetables 4/2/17
- Coconut Panna Cotta 4/2/17
- Fluffy Pancakes 12/24/16
- Roasted Rack of Lamb 12/23/16
- Brioche Burger Buns 11/30/16
- Avocado on Toast with Lemon Zest 10/25/16
- Shake Shack Burger 10/23/16
- Eggplant with Spicy Garlic Sauce 9/17/16
- Ham, Butter, Asparagus Tartine 9/11/16
- Tartine with Grilled Peaches 9/10/16
- Fried Sardines in Chimichurri 9/12/16
- Grilled Corn on the Cob with Garlic Butter 6/2/16
- Gourmet Steak Burgers 4/20/16
- Grilled Flank Steak with Chimichurri 4/14/16
- Oven-Roasted Sweet Potato Wedges 3/18/16
- Vegan Jalapeno Poppers 2/8/16
- Steamed Mussels With Smoky Bacon & Cider 1/1/16
- Blue Apron Ribeye Steak and Potato Hash 1/1/16

Coconut Panna Cotta

Ingredients:

- 4 ripe figs
- 1 tablespoon honey
- 1 teaspoon unflavored powdered gelatin
- 2 tablespoons cold water
- 1 cup canned, full-fat coconut milk
- 2 tablespoons honey
- ¼ teaspoon fine sea salt

First, make the fruit topping: Wash, trim, and quarter the figs. Cover them with the honey, stir, and let them marinate for at least 1 hour, but up to 1 day.

Next, add the gelatin and cold water to a small bowl. Stir to dissolve the gelatin, then let it rest for 5 minutes.

Meanwhile, in a 2-quart saucepan, heat the coconut milk, honey, and salt. Taste the mixture and adjust it to your taste — more honey, more salt, perhaps a little vanilla extract if it's your call.

Bring the coconut milk almost to a boil — steam will rise

Login / Register

Variation 1 (v1)

Recipe Saver

My Recipes Chrome Extension Account Login / Register

Recipe Saver

Save recipe online. Free to start!

Save Any Recipe

With Recipe Saver you can add recipes from any site or add your own custom recipes from scratch. You can access them with any device - bring your laptop, mobile or tablet device to the kitchen and follow along with your favorite recipe!

YOUR PLAN

The best way to save and organize online recipes

- Add custom notes, images, and tags
- Save unlimited recipes
- Share recipes with friends and family
- Recipe Saver Chrome extension

Free

Fast and free signup, start today

10 second sign up →

Optimization Team



Optimizer

- Formulates testing ideas
- Manages team resources
- Champions program internally



Developer

- Translates creative to functional code
- Deploys and manages code
- Assesses technical feasibility



UX Designer

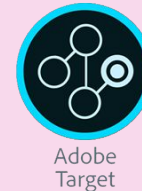
- Researches problems
- Designs experience
- Develops creative assets



Analyst

- Validates problems w/ data
- Evaluates test performance
- Builds recommendations based on results

Choose Your Platform



Implementation

```
1 <!DOCTYPE html>
2 <html lang="en">
3   <head>
4     <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
5     <!-- Add other meta information here -->
6     <!-- Add stylesheets here -->
7     <script src="https://cdn.optimizely.com/js/12345678.js"></script>
8     <!-- Add scripts and other content here -->
9   </head>
10  <body>
11
```


What's the Problem?

The screenshot displays the FAT CATTITUDE website interface. At the top, the brand logo features a cat wearing a top hat. Below the navigation bar, a blue banner reads "Show off your Fat Cattitude". Three t-shirt products are featured in a grid:

- I'm Busy**: A white t-shirt with a cat illustration and a laptop, priced at \$25.
- Gansta Cat**: A white t-shirt with a cat illustration and the text "When I walk you to a party", priced at \$25.
- I Do What I Want**: A pink t-shirt with a cat illustration and the text "I DO WHAT I WANT", priced at \$25.

Below the t-shirts, a section titled "Don't be a Sticky Vicky" promotes stickers. It includes the text "And get yourself a sticker!" and three sticker designs:

- A cat rolling a pin with the text "That's how we roll."
- A cat with a fish and the text "PATHETIC".
- Three brown rolls with a cat face and the text "They suspect nothing."

A blue box on the left highlights a "NEW: Fat Cat Mug" with the tagline "Sometimes there's a place in our heart for something and we don't even know". To the right, a white baseball cap with the "FAT CATTITUDE" logo is shown.

Hypothesis



“I believe if we add a minicart to the header, we will make it easier for users to checkout. If I am right, we will see an increase in order conversion rate (OCR).”

Test Plan



Overview

Hypothesis,
Benefit to biz



Metadata

URL / audience
targeting, Traffic
allocation



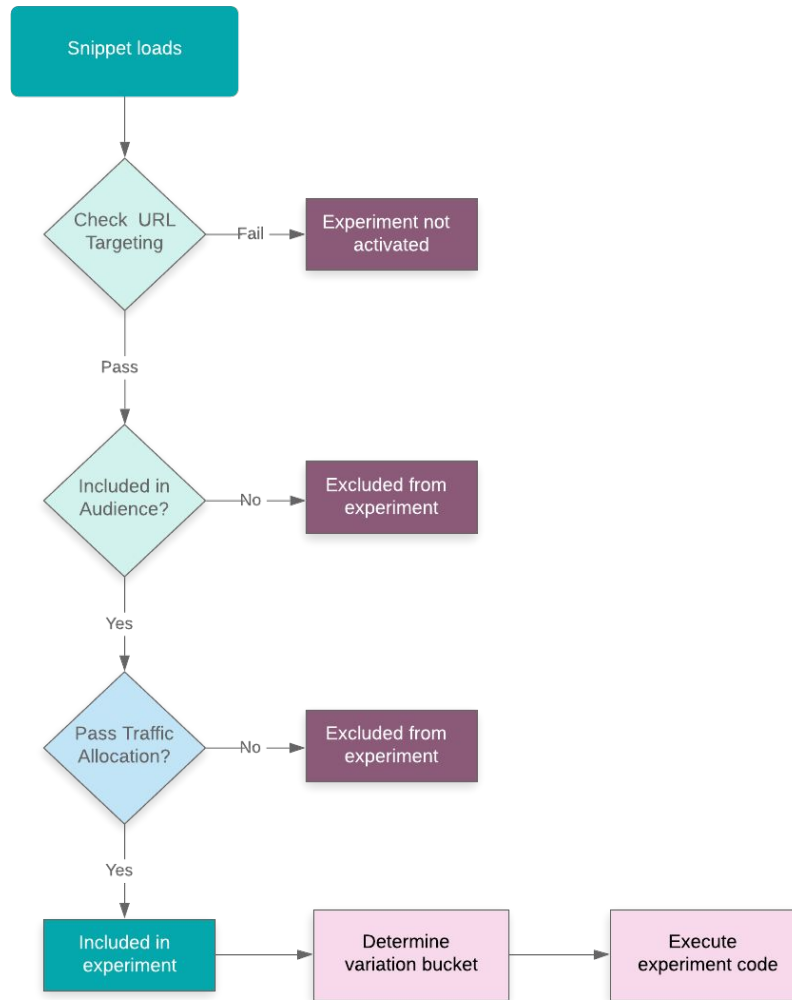
Specs

Mockups, Dev
specs, QA
checklist



Metrics

Analytics info,
goals tracking





Dev Strategy

The quirks of A/B test development



In House vs. 3rd Party Dev

In House	3rd Party
Source code access	No source code access
Hide/Show tests possible	All changes made via injected JS
Tightly coupled-logic easier to tweak	Search for global functionality
Total control over deployments	Unknown context, dependencies could break



Setting Up The Test

The screenshot shows a web interface for setting up an experiment. On the left is a sidebar with navigation icons and a menu. The main content area is titled 'Settings' and contains a 'Name' field with the value 'exp-1.0-add-minicart' and a 'Description' field with the placeholder 'Add a description'. At the bottom right of the settings area are 'Revert' and 'Save' buttons.

Left Sidebar:

- Top icon: Rocket ship
- Text: Fat Catitude < Experiments Overview
- Experiment Name: exp-1.0-add-minicart
- Status: A/B Test • Not Started
- Buttons: Start Experiment, Pause, Chart, Eye, Wallet
- Warning: Please add a metric to start this experiment
- Menu items: Variations (0/0), Targeting, Audiences, Integrations, Metrics (with warning icon), Shared Code, Traffic Allocation, Schedule, API Names, History, Settings (highlighted)

Main Content Area:

Settings

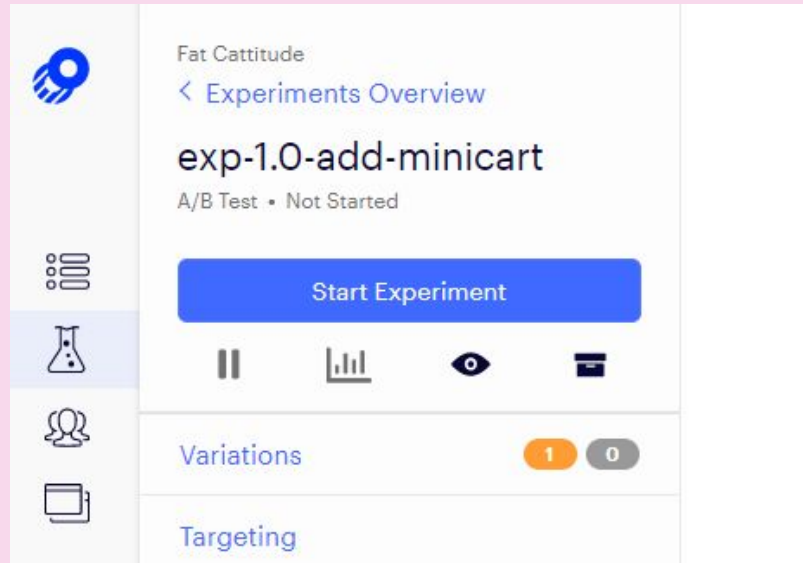
Name

Description (Optional)

Add a description or the goal of this experiment.

Buttons: Revert, Save

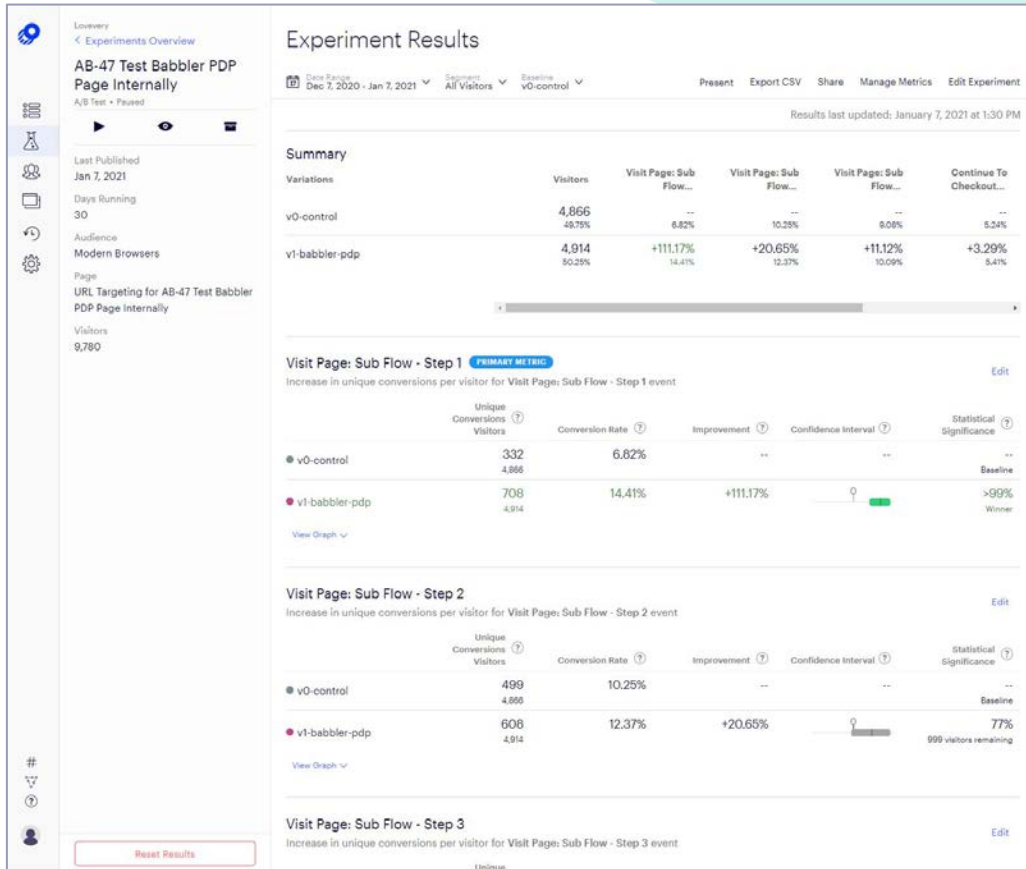
Launching



The screenshot shows a web interface for managing an experiment. On the left is a vertical sidebar with icons for a rocket, a list, a flask, a person, and a document. The main content area displays the following information:

- Company: Fat Catitude
- Navigation: < Experiments Overview
- Experiment Name: exp-1.0-add-minicart
- Status: A/B Test • Not Started
- Primary Action: A large blue button labeled "Start Experiment".
- Secondary Actions: A row of icons including a pause symbol, a bar chart, an eye, and a document.
- Variations: A section with the label "Variations" and two toggle buttons, the first of which is orange and labeled "1".
- Targeting: A section with the label "Targeting".

Analyze Results



Now What?



My Test Lost

You learned something and didn't have to go all-in.



My Test Won

Good job! Now let's show the experience to everyone!

Set to 100%

The screenshot displays the 'Traffic Allocation' section of an A/B testing tool. The left sidebar contains navigation options: Home, Experiments Overview, Variations, Targeting, Audiences, Integrations, Metrics, Shared Code, Traffic Allocation (selected), Schedule, and API Names. The main content area is titled 'Traffic Allocation' and includes a 'Publish Experiment' button and a timestamp 'Last published Jan 14, 2021 3:07 PM'. Below this, there are icons for pausing, viewing, and other actions. The 'Variation Traffic Distribution' section shows three variations: 'v0-control' (0%), 'v1-update-step2' (0%), and 'v2-update-step2-with-sticky-cta' (100%). The 100% value for the third variation is underlined in red. At the bottom right, there are 'Revert' and 'Save' buttons.

Lovevery
< Experiments Overview

AB-46 Update Step2 To New Designs - 100% v2

A/B Test • Running

Publish Experiment

Last published Jan 14, 2021 3:07 PM

Variations 0 2

Targeting

Audiences

Integrations

Metrics

Shared Code

Traffic Allocation

Schedule

API Names

Traffic Allocation

Change the portion of site visitors who meet your audience conditions and see the campaign.

100 %

Variation Traffic Distribution

Change the percentage of visitors who see any given variation.

v0-control

0 % Stop

v1-update-step2

0 % Stop

v2-update-step2-with-sticky-cta

100 % Stop

Revert Save

Coding Tips

-
- *“Historically, software development has leaned heavily on architecture analogies. Strong foundations build good houses, Maintenance is vital, etc.*

Experimentation, however, is the art of building sandcastles. Beautiful structures, but complete facades. Intended to delight, facilitate learning and be washed away by the tide.”



—Aaron Montana
Developer

Avoid concurrent tests on same page(s)

Explodes complexity, introduces noise in attributing results.

Namespace classes/ids and global vars

Prevent conflicts, makes it easy to understand where changes are coming from.

Always QA on actual devices

Emulates can perform different than the real hardware.

Check logged-in / logged-in states

Anything dynamic should be carefully considered.

Confirm control state when bugs are found

First thing you should do when encountering a bug: make sure it's not already on control



```
var div = document.createElement('div');
div.id = 'headline';
div.innerHTML = 'Welcome to our site';
div.style.fontWeight = 'bold';
div.style.color = '#000';
div.style.border = 'solid 1px red';
document.body.prepend(div);
```

Keep styling logic separate.
Use style tags!



```
document.body.insertAdjacentHTML('afterbegin', `
  <div id="headline" style="font-weight: bold; color: #000; border: solid 1px red;">
    Welcome to our site
  </div>
`);
```



```
document.head.insertAdjacentHTML('beforeend', `<style>${style}</style>`);
```

Mutation Observer

```
const observer = new MutationObserver(() => {
  console.log('A mutation happened');
});

observer.observe(document.querySelector('#search-bar'), {
  attributes: true, childList: true,
});
```

Intersection Observer

```
const observer = new IntersectionObserver(() => {
  console.log('Scrolled into view');
}, { root: null, rootMargin: '0px', threshold: 0 });

observer.observe(document.querySelector('#main'));
```

XHR Override

```
const origOpen = XMLHttpRequest.prototype.open;

XMLHttpRequest.prototype.open = function(method, url) {

  this.addEventListener('load', function(e) {
    if (this.readyState === 4 && cartActionURL_RegEx.test(url)) {
      console.log(JSON.parse(this.response));
    }
  });

  origOpen.apply(this, arguments);
};
```

Polling Function

```
function waitFor(conditionFn, callback, interval = 50, expiration = 20000) {

  const conditionFnResult = conditionFn();

  else if (conditionFnResult) callback(conditionFnResult);
  else if (expiration <= 0) return;
  else {
    expiration -= interval;
    return setTimeout(waitFor.bind(null, conditionFn, callback, interval, expiration),
      interval);
  }
}
```

Debugging: Query Params

?optimizely_log=true

Log Optimizely events. Figure out what audience you're in, see warnings/errors.

?optimizely_disable=true

Disable Optimizely snippet on current page.

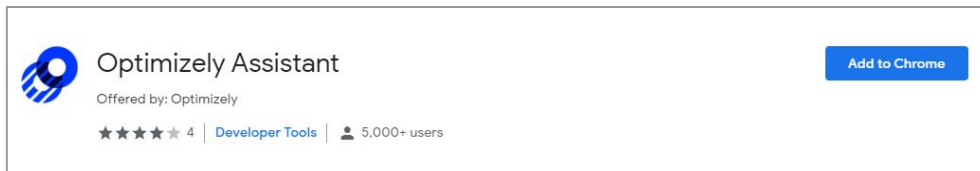
?optimizely_opt_out=true


Disable Optimizely on current session.

?optimizely_x={{variation ID}}

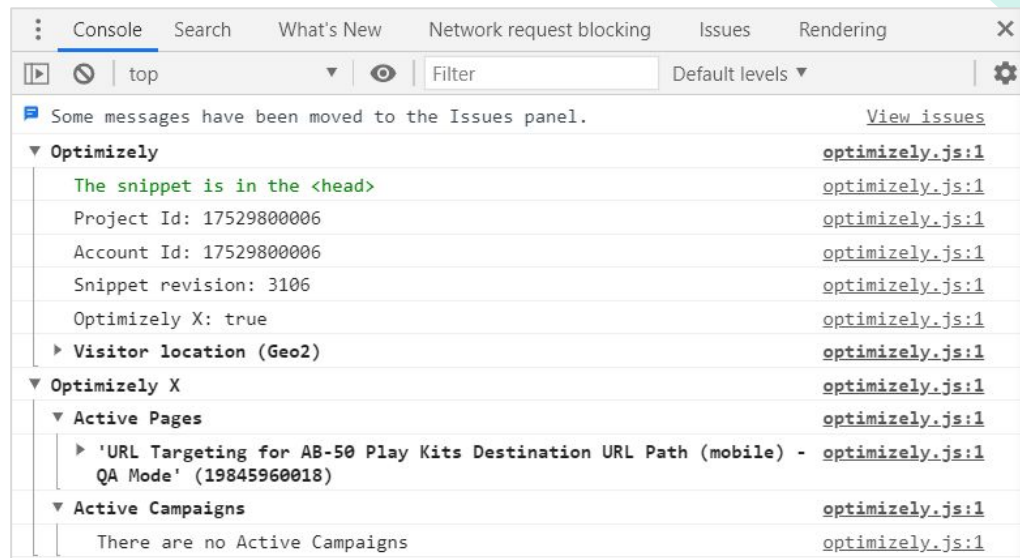
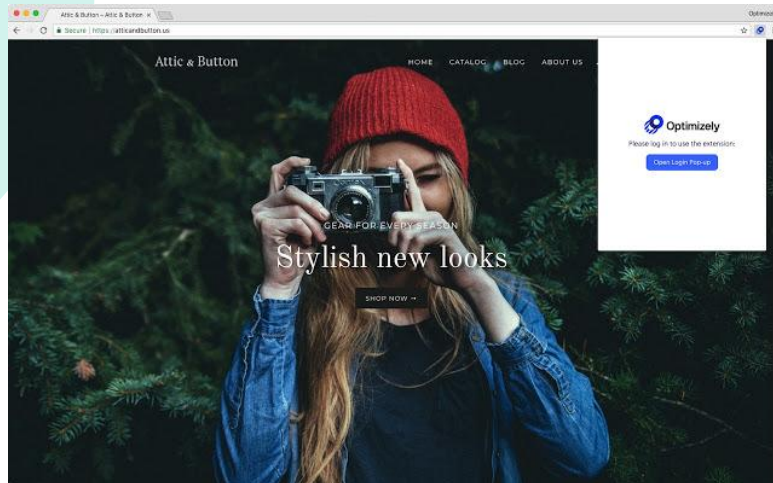
Preview a variation, overriding audience conditions

Debugging: Extension



 **Optimizely Assistant**
Offered by: Optimizely
★★★★★ 4 | [Developer Tools](#) | 5,000+ users

[Add to Chrome](#)



Console Search What's New Network request blocking Issues Rendering

top Filter Default levels

Some messages have been moved to the Issues panel. [View issues](#)

- Optimizely** `optimizely.js:1`
 - `The snippet is in the <head>` `optimizely.js:1`
 - `Project Id: 17529800006` `optimizely.js:1`
 - `Account Id: 17529800006` `optimizely.js:1`
 - `Snippet revision: 3106` `optimizely.js:1`
 - `Optimizely X: true` `optimizely.js:1`
 - Visitor location (Geo2)** `optimizely.js:1`
- Optimizely X** `optimizely.js:1`
 - Active Pages** `optimizely.js:1`
 - `'URL Targeting for AB-50 Play Kits Destination URL Path (mobile) - QA Mode' (19845960018)` `optimizely.js:1`
 - Active Campaigns** `optimizely.js:1`
 - `There are no Active Campaigns` `optimizely.js:1`

Submit an Idea

<https://forms.gle/ky26PSqwr5xL8Ff29>

AB Testing Ideas

Please submit your experiment idea:

The name and photo associated with your Google account will be recorded when you upload files and submit this form.

Not [bill@lovevery.com](#)? [Switch account](#)

* Required

What is your test idea? *

Your answer

Please upload any supporting images or files:

[Add file](#)

Submit

Follow Our Testing Journey

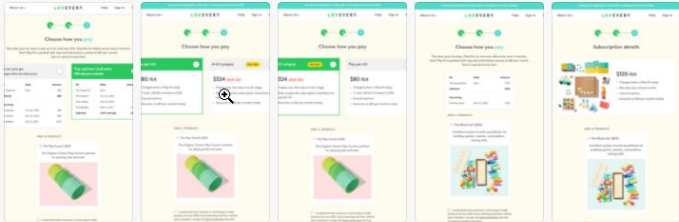
Slack Channel

#site-testing ☆
Add a topic

October 20th, 2020

Bill 5:54 PM
AB-43 Step 3 Choose How You Pay Iteration is live! 🎉
This is an iteration of AB-39. We redesigned the prepaid option to look more attractive and added a second variation to set prepaid as the default option. We also spruced up the payment table when there's only one payment option.

5 files



1 2

4 replies Last reply 3 months ago

October 26th, 2020

Desmond 11:30 AM
was added to #site-testing by Brenna.

October 28th, 2020

Bill 12:07 PM
AB-43 Step 3 Choose How You Pay Iteration has now been paused while we get ready to deploy the winning design.

Alex Ritter 12:48 PM
@Bill what was the winner?

9 replies Last reply 3 months ago

Parting Advice



Keep a hypothesis library



Small, iterative changes are most insightful



Have enough traffic for meaningful results



Always be testin'

Thank You!



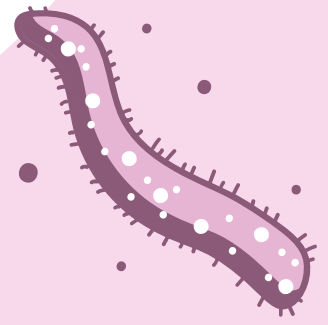
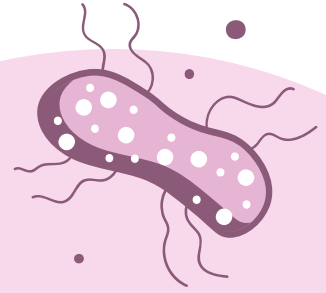
Twitter:
[@Cilly_Boloe](https://twitter.com/Cilly_Boloe)



Blog:
jsbits-yo.com



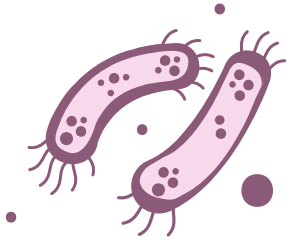
LinkedIn:
linkedin.com/in/williamcoloe



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

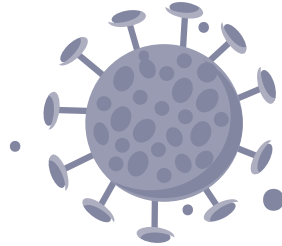
—**Someone Famous**

Study Objectives



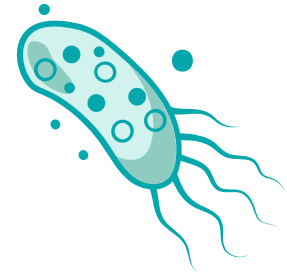
Mercury

Despite being red, Mars is actually a cold place full of iron oxide dust



Neptune

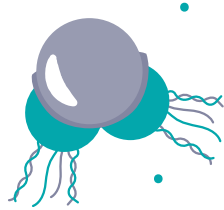
Saturn is composed mostly of hydrogen and also helium



Mars

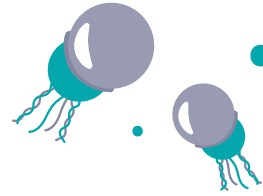
Jupiter is a gas giant and the biggest planet in the Solar System

Literature Review



Chapter 1

Mercury is the closest planet to the Sun and the smallest one in the Solar System

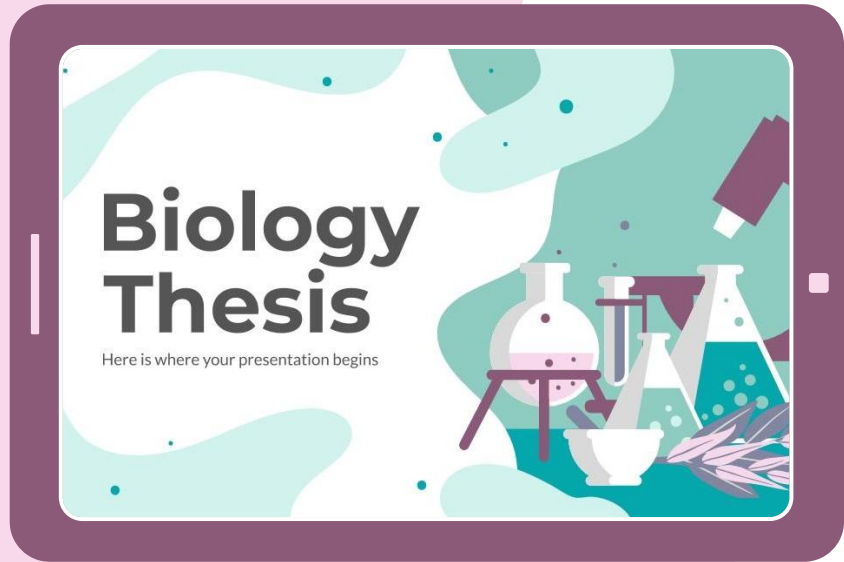


Chapter 2

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



**A Picture
Is Worth a
Thousand
Words**



Multimedia Content

You can change the image on the screen with your own. Delete this one, add yours and center it properly



Methodology



Research

Mercury is a bit larger than the Moon



Analysis

Despite being red, Mars is actually a cold place



Data Study

Venus is the second planet from the Sun



Comparison

Neptune is the farthest planet from the Sun

Schedule



March

Mercury is the smallest planet



May

Jupiter is the biggest planet



June

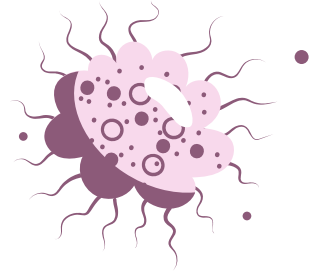
Mars is a cold place, not hot



July

Saturn is a planet with several rings

Resources



Did you like the resources on this template? Get them for free at our other websites.

Photos:

- Circle shape with virus bacteria
- Hand with gloves beside bacteria virus

Vectors:

- Chemistry
- Person in hazmat suit cleaning the city

- Infection bacteria and pandemic virus flat design
- Various forms of pandemic virus flat design
- Bacteria and germs colourful flat design set
- Set of hand drawn microscopic viruses of various colour
- Bacteria and germs colourful hand drawn set

03

Results Analysis

You can enter a subtitle here

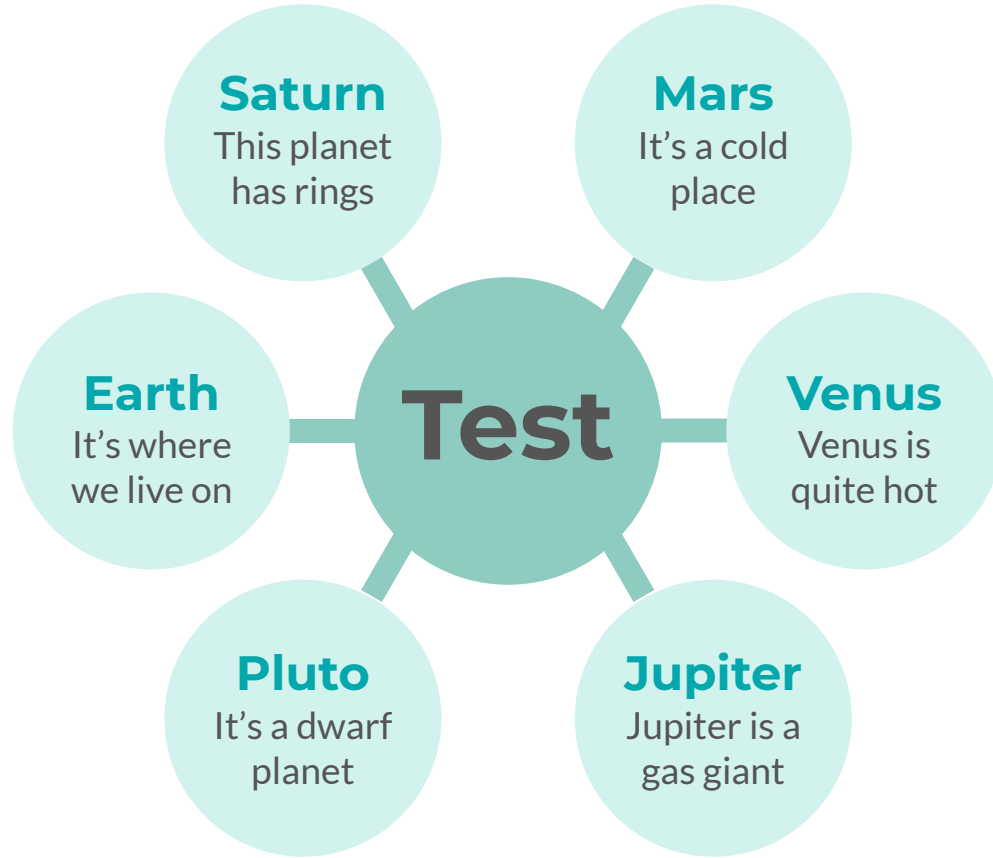




Table of Tests

X	Test 1	You could state one of your tests or processes here
•	Test 2	You could state one of your tests or processes here
X	Test 3	You could state one of your tests or processes here
X	Test 4	You could state one of your tests or processes here





Around the World



This is a map where you can mark the size of your audience

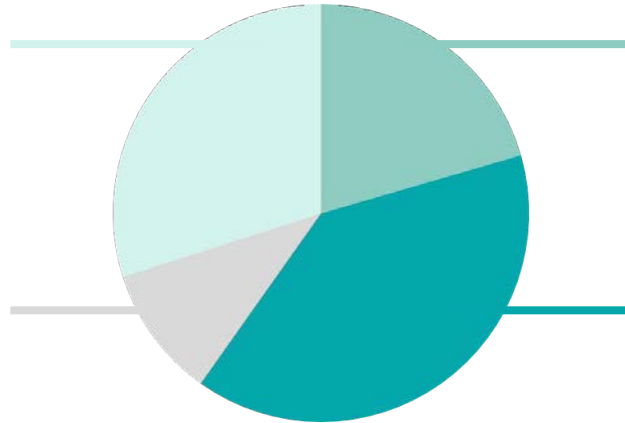
Jupiter is the biggest planet in the Solar System and the fourth-brightest object in the night sky



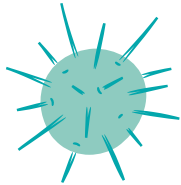
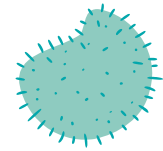
Results Analysis



30%
Venus



20%
Saturn

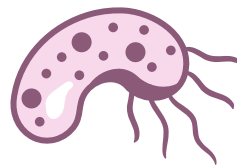


10%
Mercury

40%
Neptune

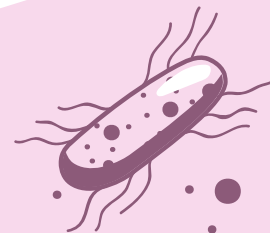
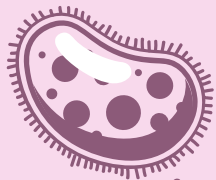


To modify this graph, click on it, follow the link, change the data and paste the resulting graph here



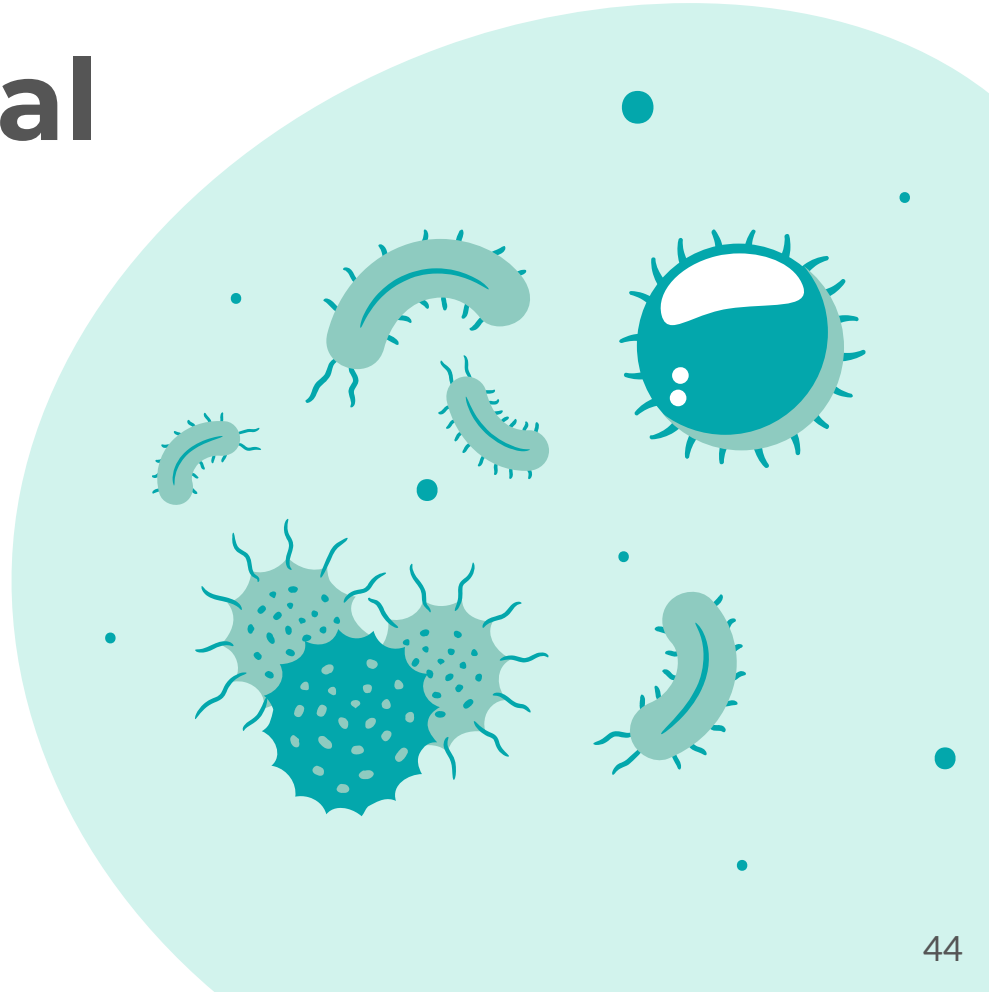
4,098,300

Big numbers catch your audience's attention



Bibliographical References

- AUTHOR (1992).
Title of the publication. Publisher
- AUTHOR (2005).
Title of the publication. Publisher
- AUTHOR (2008).
Title of the publication. Publisher
- AUTHOR (2010).
Title of the publication. Publisher





Conclusions

Mars

Despite being red,
Mars is a cold place

Venus

Venus is the second
planet from the Sun

Mercury

It's the closest planet
to the Sun

Jupiter

It's the biggest planet
in the Solar System

Saturn

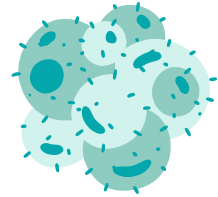
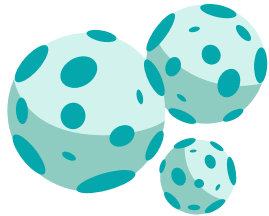
Saturn is a gas giant
and has rings

Neptune

It's the farthest planet
from the Sun

Thanks!

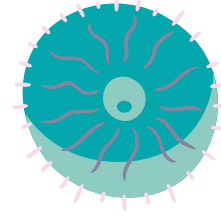
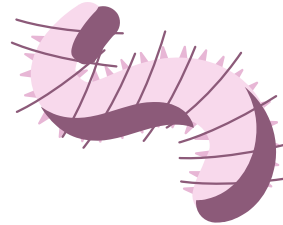
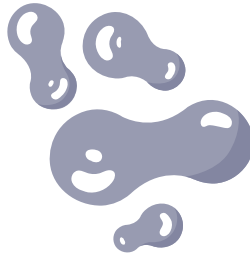
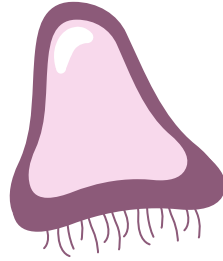
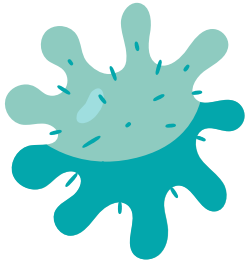
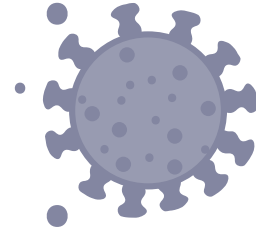
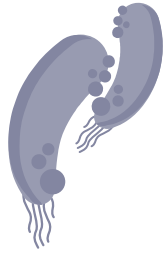
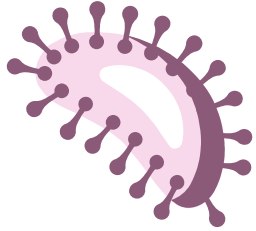
Do you have any questions?
youremail@freepik.com
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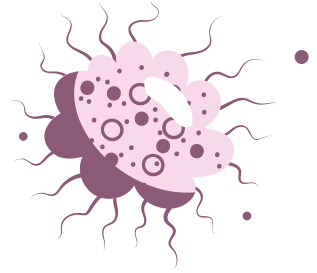
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Photos:

- Circle shape with virus bacteria
- Hand with gloves beside bacteria virus

Vectors:

- Chemistry
- Person in hazmat suit cleaning the city

- Infection bacteria and pandemic virus flat design
- Various forms of pandemic virus flat design
- Bacteria and germs colourful flat design set
- Set of hand drawn microscopic viruses of various colour
- Bacteria and germs colourful hand drawn set

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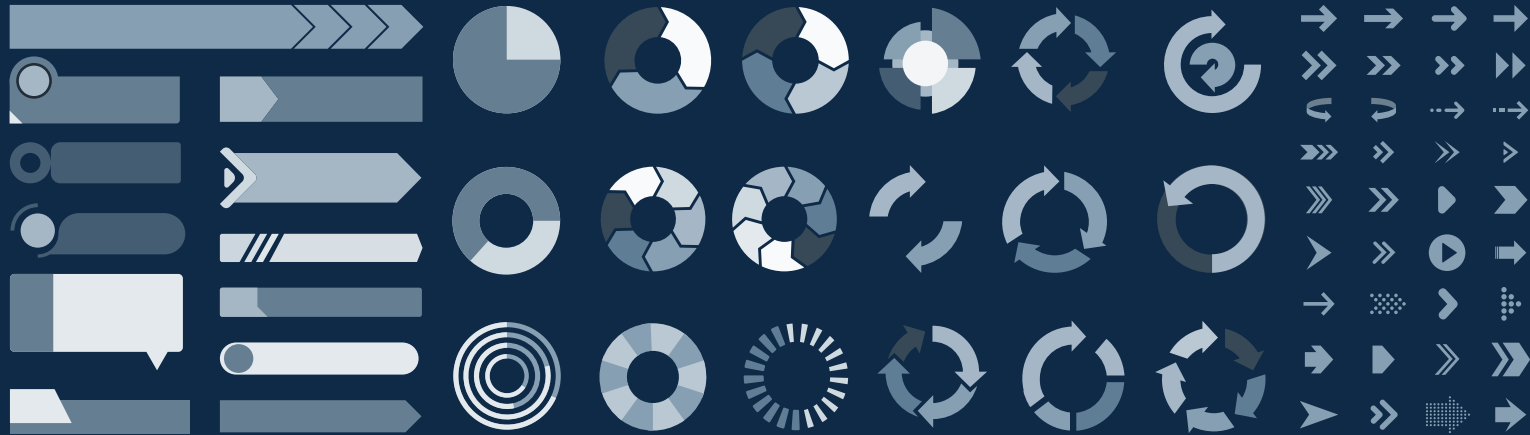


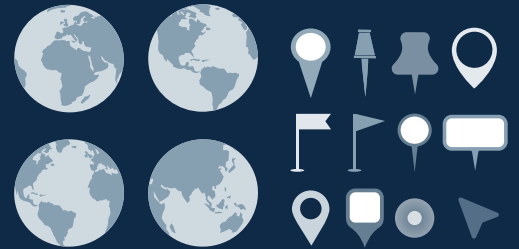
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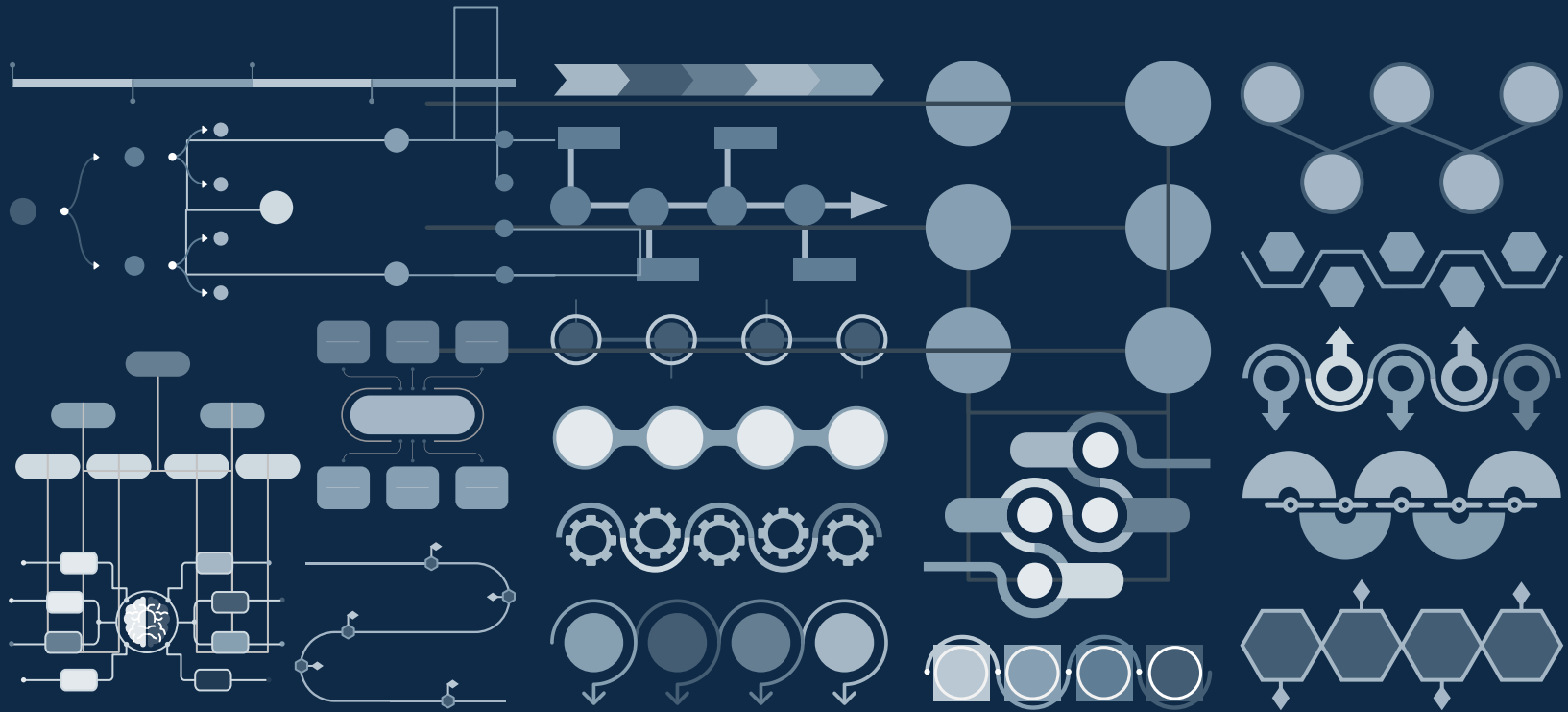
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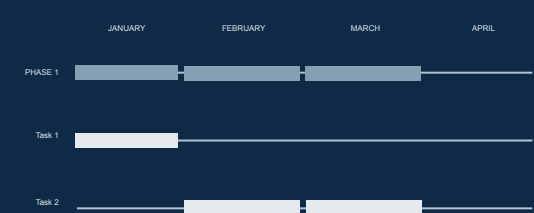
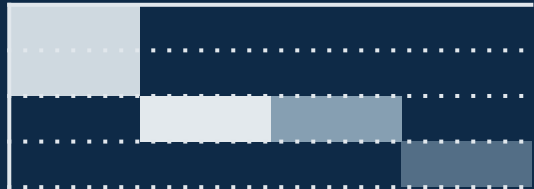
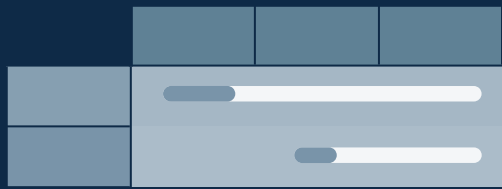
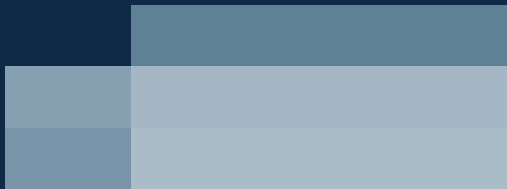
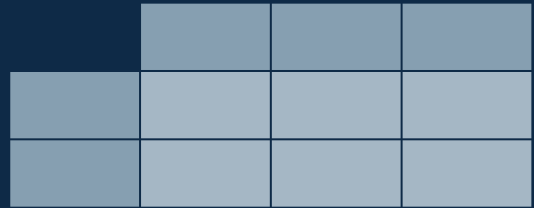
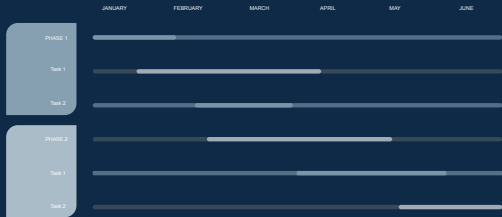
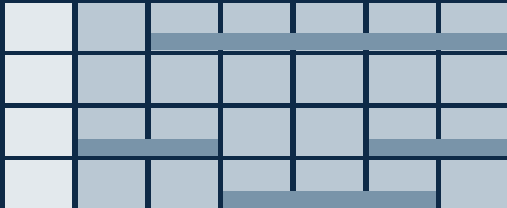
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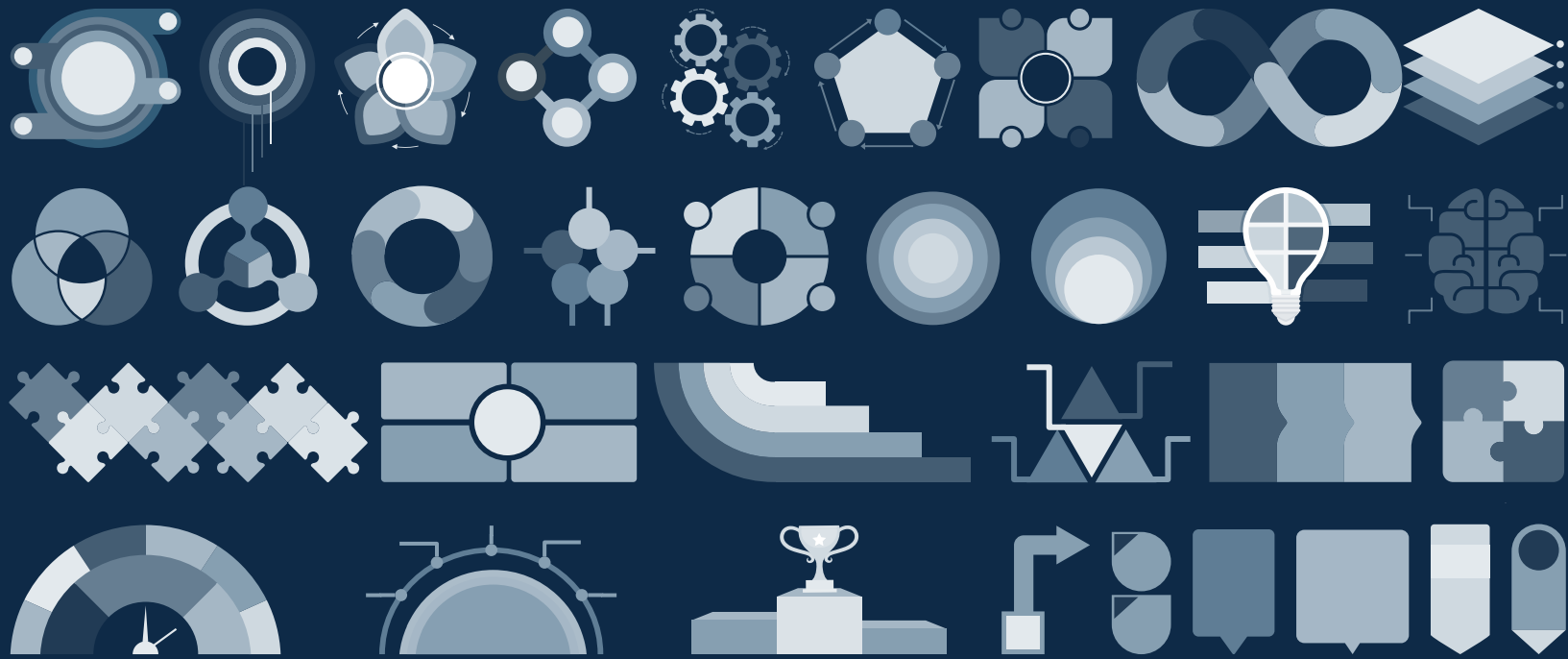
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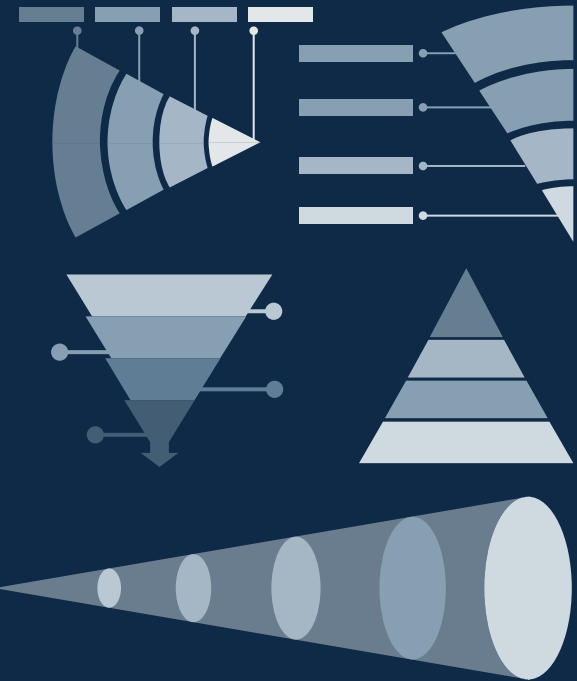
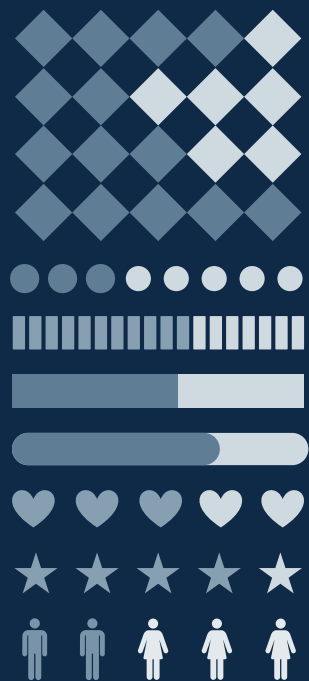
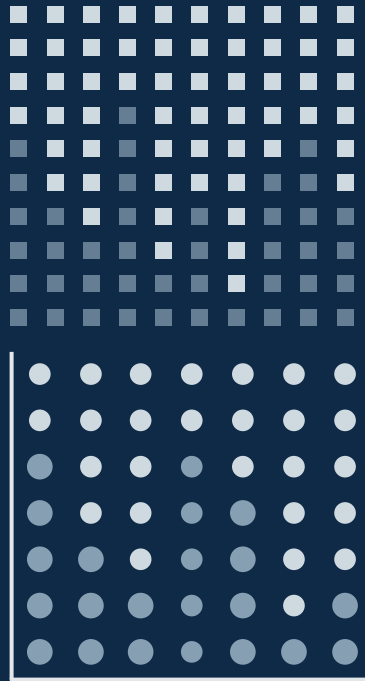












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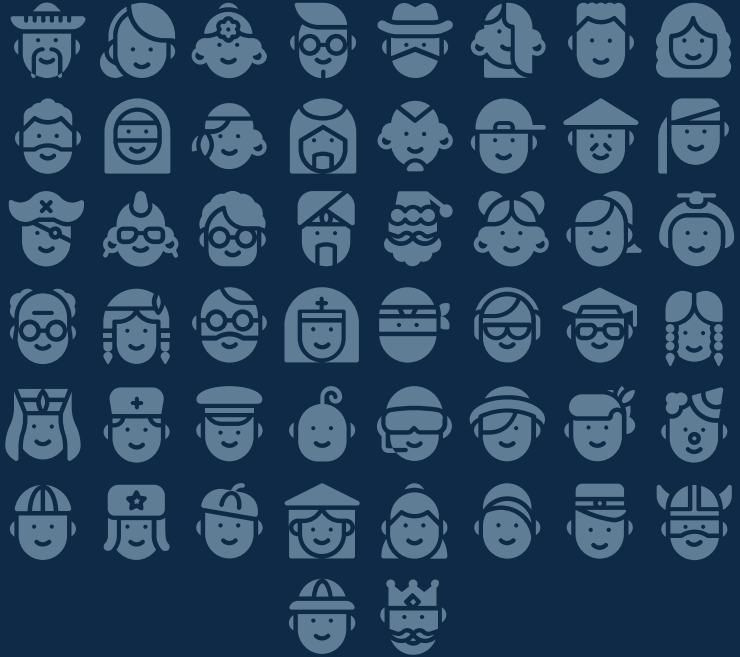
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