
Dynamic Web Design

Submission 2

An educational platform about science, with a main focus on astronomy and the cosmos.

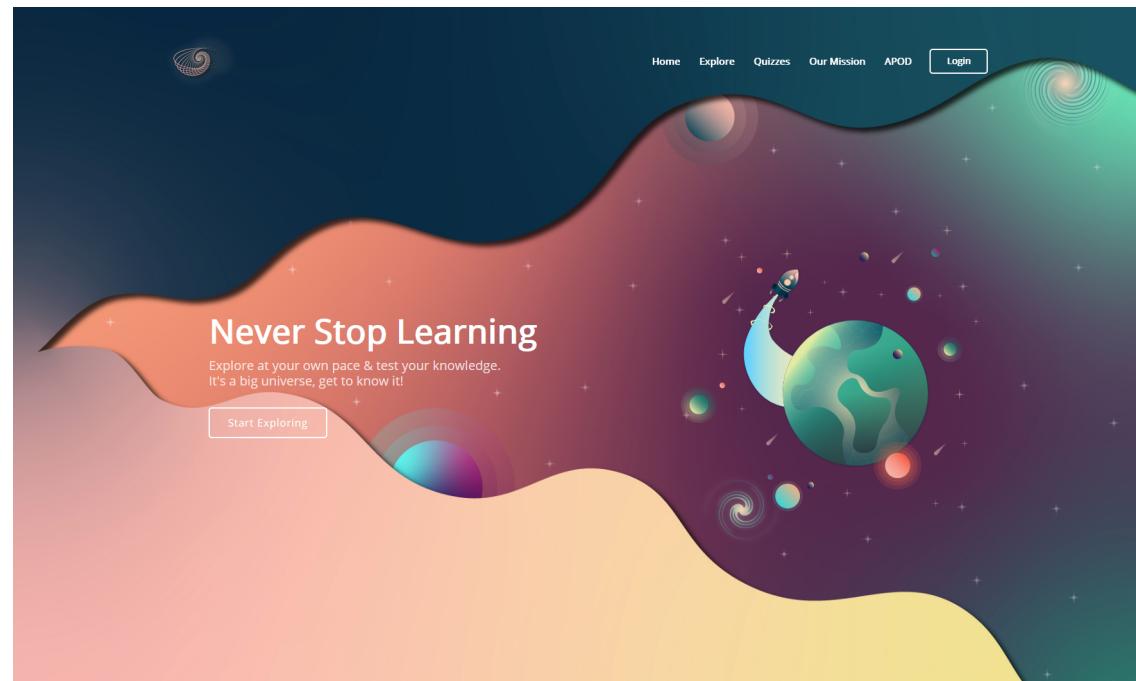
We understand that learning can be a stressful process and we aim to create a platform with human-centered design that supports and inspires the user through their learning journey. We also hope this platform feels inviting to a variety of ages and abilities.

We followed feedback and at this stage the platform is presented as a proof of concept rather than a fully complete platform.

Regarding revenue, ideally this would be a non-profit platform, funding based.

Main Goals:

- Make learning fun and accessible
- Inspire-Motivate-Reward
- Support self-motivated study
- Boost confidence around science topics
- Spark curiosity and excitement about the “magic of the universe”
- Shift our cosmic perspective, which has direct benefits to individuals but also indirect effects to communities and earth as a whole, as this new perspective is capable of raising people’s empathy towards the environment, stop prejudice and more (*see Mission and bibliography*)



Team: Space Odyssey 2021

Roles:

Julia Castillo Trujillo: Front and Back End development

Sofia Katsikadi: Design, UI/UX, Concept and Content research development

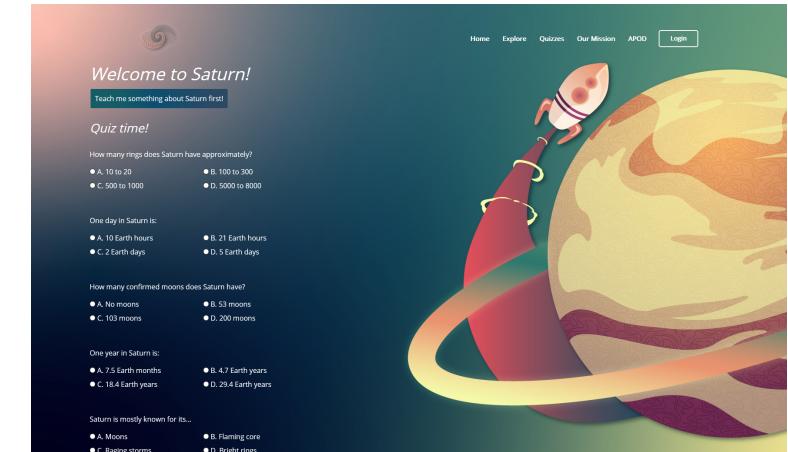
Screencast: https://media.ed.ac.uk/media/DWD+Beta+Submission+-+Space+Odyssey+2021/1_0u5ywf47

UI/UX and Design Considerations

- Colour Theme: Space, Universe | Colour Palette: Playful, Calming, Atmospheric
- The colour palette is colour-blind safe to support accessibility, color.adobe.com was used for this purpose
- Sans-Serif easy to read fonts - not too many variations
- Don't overwhelm/confuse user's focus with too many colours or overly busy designs
- Login function essential for tracking user's progress
- Responsive Design
- Access to navigation menu from all screens and back to top button
- Non-linear access to quiz and resources - smooth user journey
- Illustrations to help engagement and memorisation
- Virtual 3D Tours and real photos included as links
- Dynamic website for easy future updating
- Satisfying feel through micro-animations
- Reward-Motivate through features such as progression stars
- Positive reinforcement throughout
- Organised content, not overwhelming user with information
- Content had to be created carefully by highlighting information that feels inspiring and sparks curiosity
- The readings presented don't repeat the content of the linked resources, rather they are simplified introductions that assist in the learning process
- All resources had to be trustworthy to avoid misinformation [NASA, CERN and National Geographic]
- Allowing users to "cheat" on quizzes by freely studying the linked resources to alleviate stress
- During the development of this project some potential breakthroughs emerged regarding the speculations around Dark Energy and Matter. Really making obvious to us that the success and viability of this platform depends on keeping up to date with current updates

Potential future improvements that could assist the user's learning journey:

- "Favourite" resources or other organisation options
- Notepad feature
- More content and activities
- Newsletters
- Animations
- Include resources that assist self-motivated study, such as: Learning how to learn | Barbara Oakley | TEDxOaklandUniversity <https://youtu.be/O96fE1E-rf8>
- NASA Photo Library search API <https://images.nasa.gov/>

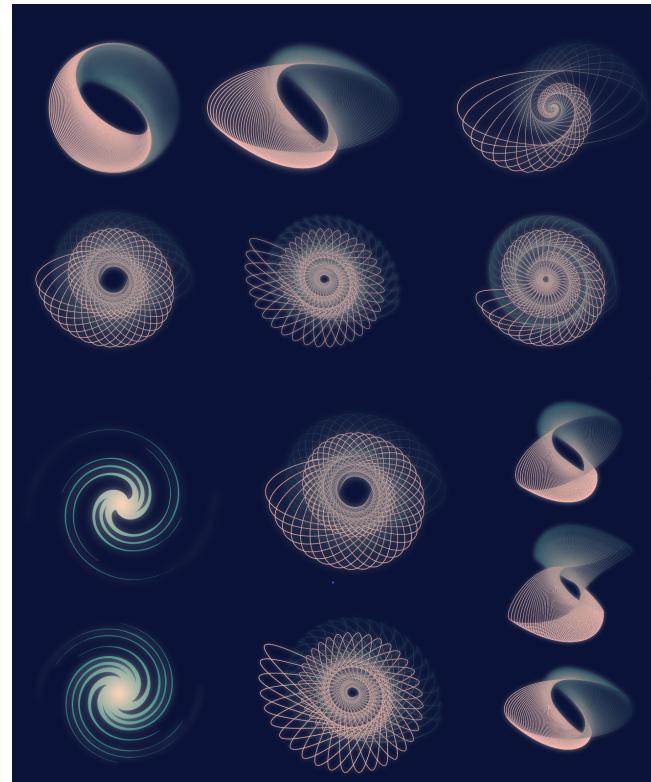


Base concepts of previous designs in Submission 1

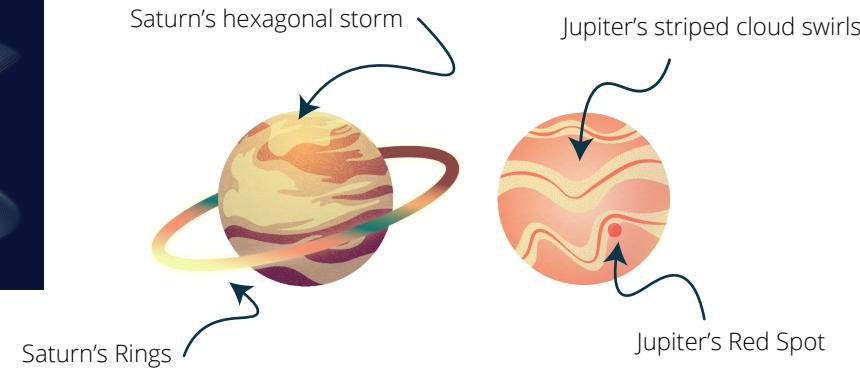


The screenshot shows the Adobe Color palette tool. At the top, there are color mode dropdowns for RGB and CMYK, and a 'Show RGB Sliders' button. Below these are four color swatches labeled A, B, C, and D, with their corresponding hex codes: #0A1237, #0A344A, #18796E, and #F6FAAE. Below the swatches is a 'Color Blind Simulator' section with three rows of color bars. The first row is for Deutanopia, the second for Protanopia, and the third for Tritanopia. Each row contains four color bars representing the same colors A, B, C, and D as above.

Logo Drafts



The Logo represents the universe and is inspired by our main motto "it's a big universe, get to know it"



- Designs that help memory, by showcasing key aspects of planets
- Cohesive Design Per Solar System

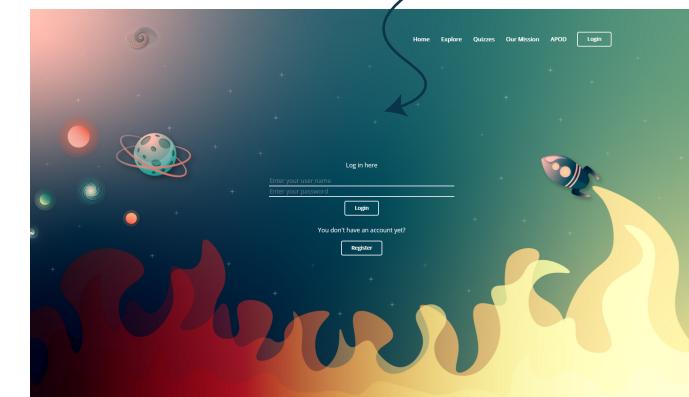
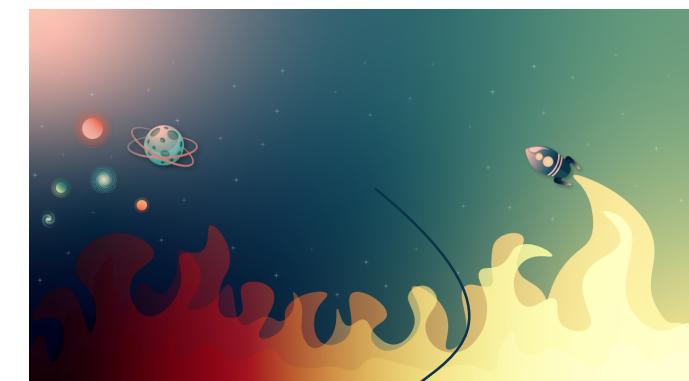
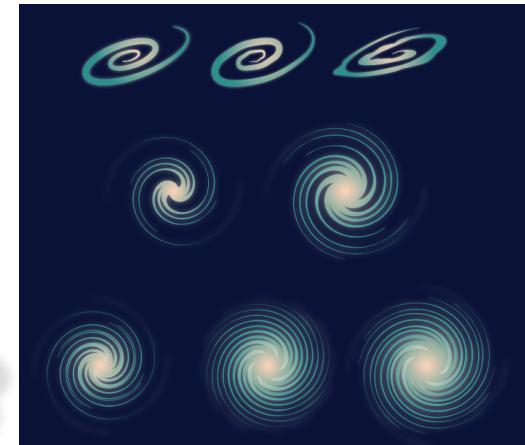
Easy to read styling and colours - soft contrast



Planets and Moons



Galaxy drafts



Freeform Gradient Backgrounds



Development Methodology

Navigation bar (in layout.html)

The navigation bar was part of the bootstrap template, but had to be moved to layout.html since this page is used as a template for all pages. We encountered some issues after editing the navigation bar, where it would not show up correctly in some of the pages or it would not show a background after scrolling, except on the homepage. This was all later solved by backtracking the versions where the navigation bar was edited, until we found the problem, and also added code to the JavaScript file to have the background of the navigation bar appear after scrolling.

When logged in, the nav bar displays a message to the user to let the user know they're logged in: "Hello, username".

Quizzes section (modules.html)

The quizzes section in the homepage shows the different quizzes available to the user as well as the quizzes that will be available soon. To display the modules f3 gets them from the quiz_modules table in the database and displays the image corresponding to that module.

The user can then click on one of the images and will be transferred to the corresponding quiz. This was achieved by making a post request through jQuery ^[1] on click, retrieving the ID of the module that was clicked and if the module exists, it sets the SESSION.currentModule variable in f3 and redirects the page to the quiz page using JavaScript ^[2].

If the user is logged in, the images of the modules show how many stars you have gotten on each quiz. This was achieved by sending a get request with AJAX and retrieving the progress of the user from the user_progress table.

NASA Astronomy Picture of the Day section (apod.html)

This section retrieves and displays information from the NASA Astronomy Picture of the Day API ^[3]. This was achieved by following the How To Use NASA APIs guide ^[4].

Explore page (explore.html)

This page displays information about different topics in Astronomy, which have been retrieved by f3 from the topics table. Each section is formed by a title and subtitle, information text, buttons and a YouTube video. The YouTube video is displayed using an iframe ^{[5][6]}. We also added a sticky table of contents ^[7].

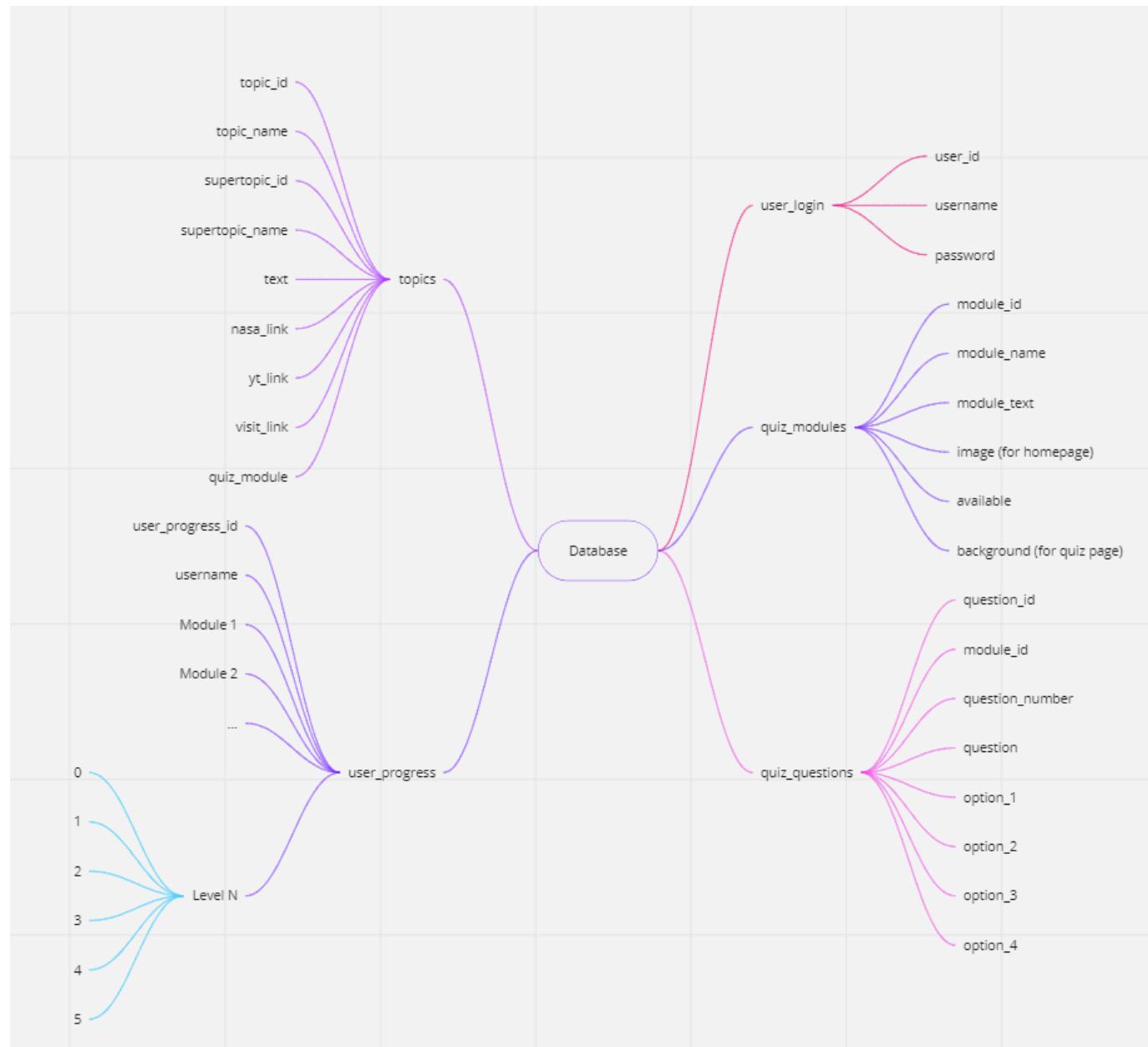
Quiz page (quiz.html)

The quiz page displays some information about the topic of the quiz, which can be hidden, and five questions about the topic. When the user clicks on the Check your answers button, the answers given on the quiz are checked and a modal with the number of correct answers opens up ^[8]. When the user closes the modal, they can see the correct answers. The buttons at the bottom have changed to "Try again" and "Next quiz", which will take the user to the next quiz. If it doesn't exist, it will display a Snackbar ^[9]. The background in the quiz changes dynamically depending on the topic of the quiz.

Login and Register page (login.html and register.html)

Followed SimpleExamplePet to implement the login and register.

Database Structure



Development References:

1. jQuery - AJAX get() and post() Methods. Retrieved from https://www.w3schools.com/jquery/jquery_ajax_get_post.asp
2. 4 Ways to Use JavaScript to Redirect or Navigate to A URL or Refresh the Page. Retrieved from <https://love2dev.com/blog/ways-to-use-javascript-redirect-to-another-page/>
3. NASA APOD API – GitHub. Retrieved from <https://github.com/nasa/apod-api>
4. How To Use NASA APIs. Retrieved from <https://willjame.github.io/how-to-nasa/>
5. HTML YouTube Videos. Retrieved from https://www.w3schools.com/html/html_youtube.asp
6. How to apply CSS to iframe?. Retrieved from <https://stackoverflow.com/questions/217776/how-to-apply-css-to-iframe>
7. Sticky Table of Contents with Scrolling Active States. Retrieved from <https://css-tricks.com/sticky-table-of-contents-with-scrolling-active-states/>
8. How TO - CSS/Javascript Modal. Retrieved from https://www.w3schools.com/howto/howto_css_modals.asp
9. How TO - Snackbar / Toast. Retrieved from https://www.w3schools.com/howto/howto_js_snackbar.asp

Collaborated via GitHub, OneDrive, Miro, Teams, and WhatsApp for communications

Website template:

Techie - Modern Bootstrap Startup Template

<https://bootstrapmade.com/techie-free-skin-bootstrap-3/>

Additional information resources that could be included in the future:

<https://www.nasa.gov/curiousuniverse>

<https://www.startalkradio.net/>

<https://www.albert.io/earth-and-space-science>

<https://spacerockethistory.com/>

<http://www.astronomycast.com/>

<https://www.youtube.com/user/minutephysics>

<https://www.youtube.com/user/TheRoyallInstitution>

Inspirations:

<https://brilliant.org/>

<http://datamonkey.pro/>

<https://teamtreehouse.com/>

<https://www.codecademy.com/>

<https://www.pbs.org/wgbh/nova/>

<https://www.pbs.org/wgbh/nova/topic/space/>

<https://betterexplained.com/>

Space Content References:

Our Mission:

A Conversation with Dr. Neil deGrasse Tyson (Full Session) | Interactive 2014 | SXSW <https://youtu.be/0FMGTVCIDbU> [Accessed 02 May 2021]

Spaceplace.nasa.gov. 2021. All About Jupiter | NASA Space Place – NASA Science for Kids. [online] Available at: <<https://spaceplace.nasa.gov/all-about-jupiter/en/>> [Accessed 02 May 2021]

Solarsystem.nasa.gov. 2021. In Depth | Jupiter – NASA Solar System Exploration. NASA Solar System Exploration. <<https://solarsystem.nasa.gov/planets/jupiter/in-depth/>> [Accessed 02 May 2021]

Spaceplace.nasa.gov. 2021. All About Saturn | NASA Space Place – NASA Science for Kids. [online] Available at: <<https://spaceplace.nasa.gov/all-about-saturn/en/>> [Accessed 02 May 2021]

Spaceplace.nasa.gov. 2021. Saturn Rings | NASA Space Place – NASA Science for Kids. [online] Available at: <<https://spaceplace.nasa.gov/saturn-rings/en/>> [Accessed 02 May 2021]

Solarsystem.nasa.gov. 2021. In Depth | Jupiter – NASA Solar System Exploration. NASA Solar System Exploration. <<https://solarsystem.nasa.gov/planets/saturn/in-depth/>> [Accessed 02 May 2021]

Spaceplace.nasa.gov. 2021. The Big Bang | NASA Space Place – NASA Science for Kids. [online] Available at: <<https://spaceplace.nasa.gov/big-bang/en/>> [Accessed 02 May 2021]

Spaceplace.nasa.gov. 2021. What is a Planet | NASA Space Place – NASA Science for Kids. [online] Available at: <<https://spaceplace.nasa.gov/planet-what-is/en/>> [Accessed 02 May 2021]

Solarsystem.nasa.gov. 2021. In Depth | Our Solar System. NASA Solar System Exploration. <<https://solarsystem.nasa.gov/solar-system/our-solar-system/in-depth/>> [Accessed 02 May 2021]

Spaceplace.nasa.gov. 2021. What is a Galaxy | NASA Space Place – NASA Science for Kids. [online] Available at: <<https://spaceplace.nasa.gov/galaxy/en/>> [Accessed 02 May 2021]

Solarsystem.nasa.gov. 2021. Beyond Our Solar System. NASA Solar System Exploration. [online] Available at: <<https://solarsystem.nasa.gov/solar-system/beyond/overview/>> [Accessed 02 May 2021]

Spaceplace.nasa.gov. 2021. What is Dark Matter | NASA Space Place – NASA Science for Kids. [online] Available at: <<https://spaceplace.nasa.gov/dark-matter/en/>> [Accessed 02 May 2021]

Science.nasa.gov. 2021. Dark Energy, Dark Matter | Science Mission Directorate. [online] Available at: <<https://science.nasa.gov/astrophysics/focus-areas/what-is-dark-energy>> [Accessed 02 May 2021]

Nationalgeographic. 2021. Dark Matter and Dark Energy's Role in the Universe [online] Available at: <<https://www.nationalgeographic.com/science/article/dark-matter>> [Accessed 02 May 2021]

CERN. 2021. Dark Matter [online] Available at: <<https://home.cern/science/physics/dark-matter>> [Accessed 02 May 2021]

Exoplanets.nasa.gov. 2021. Overview | What is an Exoplanet? – Exoplanet Exploration: Planets Beyond our Solar System. [online] Available at: <<https://exoplanets.nasa.gov/what-is-an-exoplanet/overview/>> [Accessed 02 May 2021]

Exoplanets.nasa.gov. 2021. What is the Universe? | What is an Exoplanet? – Exoplanet Exploration: Planets Beyond our Solar System. [online] Available at: <<https://exoplanets.nasa.gov/what-is-an-exoplanet/what-is-the-universe/>> [Accessed 02 May 2021]

Exoplanets.nasa.gov. 2021. Overview | Planet Types – Exoplanet Exploration: Planets Beyond our Solar System. [online] Available at: <<https://exoplanets.nasa.gov/what-is-an-exoplanet/planet-types/overview/>> [Accessed 02 May 2021]

Youtube Videos on Explore page:

National Geographic Channel

<https://www.youtube.com/channel/UCpVm7bg6pXKo1Pr6k5kxG9A>

Bibliography:

Neil deGrasse Tyson. 2007. "The Cosmic Perspective" Natural History Magazine. The 100th essay in the "Universe" series. Available at: <<https://www.haydenplanetarium.org/tynson/essays/2007-04-the-cosmic-perspective.php>> [Accessed 02 May 2021].

Michael S. Turner. 2014. The Power of Curiosity. Available at: <<https://science.sciencemag.org/content/344/6183/449>> [Accessed 02 May 2021].

Campbell E.,2015. Six Surprising Benefits of Curiosity. Available at: <https://greatergood.berkeley.edu/article/item/six_surprising_benefits_of_curiosity> [Accessed 02 May 2021].

Richter, G. & Raban, D. & Rafaeli, S. 2015. Studying Gamification: The Effect of Rewards and Incentives on Motivation. [online] Available at: <https://www.researchgate.net/publication/283211242_Studying_Gamification_The_Effect_of_Rewards_and_Incentives_on_Motivation> [Accessed 02 May 2021].

Featherstone, M., n.d. Using Gamification to Enhance Self-directed, Open Learning. [online] Core.ac.uk. Available at: <<https://core.ac.uk/download/pdf/42542163.pdf>> [Accessed 02 May 2021].

Kirdina, A. 2018. Level up for UX: Design lessons from video games. [online] Martian Chronicles. Available at: <<https://evilmartians.com/chronicles/level-up-for-ux-design-lessons-from-videogames>> [Accessed 02 May 2021].

Medium. 2019. User Experience: 10 Big Reasons to Apply Illustrations in UI Design. [online] Available at: <<https://uxplanet.org/user-experience-10-big-reasons-to-apply-illustrations-in-ui-design-196aab6185c2>> [Accessed 02 May 2021].

Medium. 2021. Applying Human-Centered Design Methods to Your Process. [online] Available at: <<https://dispatch.moonfarmer.com/applying-human-centered-design-methods-to-your-process-27b783147e8>> [Accessed 02 May 2021].

Designkit.org. 2021. The Field Guide to Human-Centered Design. [online] Available at: <<https://www.designkit.org/resources/1>> [Accessed 02 May 2021].

Batchu, V., 2018. Micro-interactions: why, when and how to use them to improve the user experience. [online] UXDesign. Available at: <<https://uxdesign.cc/micro-interactions-why-when-and-how-to-use-them-to-boost-the-ux-17094b3baaa0>> [Accessed 02 May 2021].

UXPlanet. 2016. Animated Interactions. Motion on Purpose. [online] Available at: <<https://uxplanet.org/animated-interactions-motion-on-purpose-943bebcaf438>> [Accessed 02 May 2021].

Skytskyi, T., 2018. The ultimate guide to proper use of animation in UX. [online] UXDesign. Available at: <<https://uxdesign.cc/the-ultimate-guide-to-proper-use-of-animation-in-ux-10bd98614fa9>> [Accessed 02 May 2021].