edu-fy
Aspire. Accomplish. Attain.

PLAYBOOK

for Collaborative Global Changemaker Program

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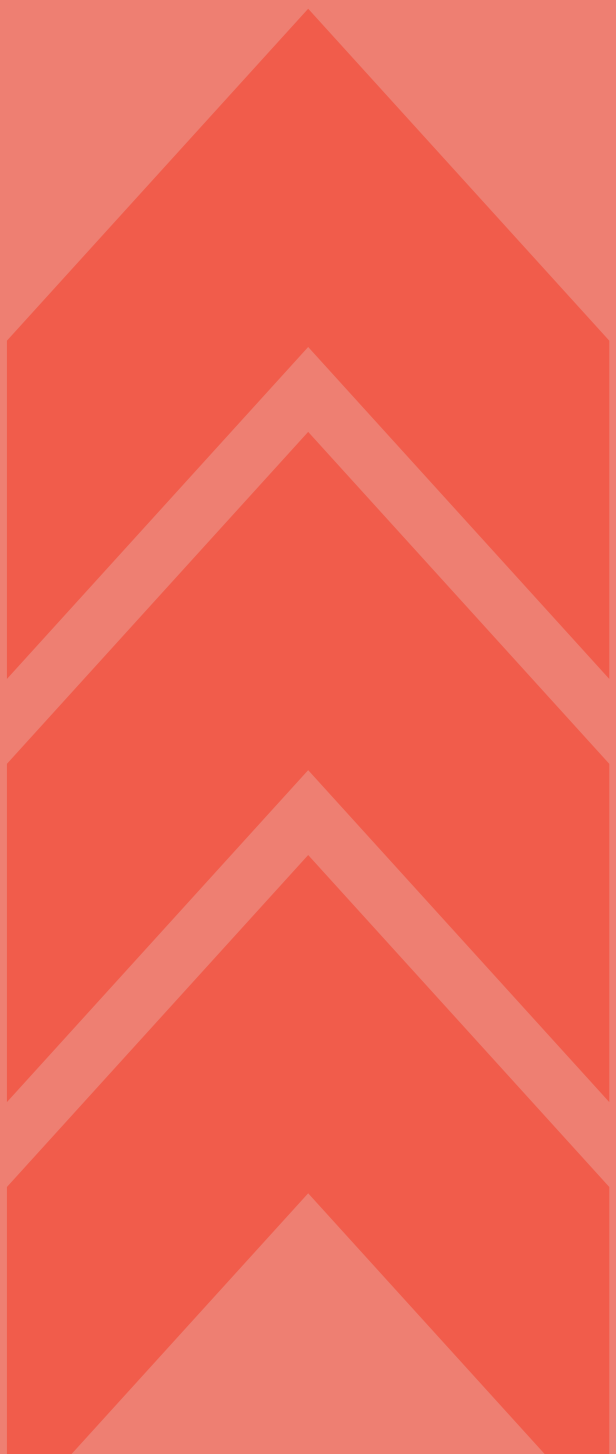
Part 1
Introduction



About Us

Edu-fy Pty Ltd (Edu-fy) is a for-purpose enterprise with the aim of making education equitable to all learners in line with SDG 4: Quality Education. Edu-fy's vision is to uplift and edify people of all creeds and from all walks of life, as well as their communities, through the power of quality education. Our mission is to provide equitable access to resources for all learners regardless of location or socio-economic situations, making quality education a reality in line with SDG4: Quality Education. We believe that quality education is a two-way process of learning. Guides (Teachers) and Explorers (Students) discover and make connections together in face to face, online or hybrid learning situations. Learning spaces are everywhere!

Through the Collaborative Global Changemaker Program, that we have co-created with the United Nations Association of Australia NSW Division (UNAA NSW) we are implementing our objective to connect learners and teachers anywhere to quality teaching resources that teach 21st century skills and help them link everything they learn to face the global challenges that are ahead. We aim to develop creative, collaborative and culturally aware 21st century thinkers. through well-crafted game play and activities relating to the 17 UN Sustainable Development Goals (SDGs)

Edu-fy is a member of Catalyst 2030, a global movement of 1500+ social entrepreneurs and social innovators in 195 countries.

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WHO is this for:

This playbook is for teachers who are looking for new ways to engage their students while ensuring that curriculum aspects are addressed.

It will be particularly useful for teachers who already use project-based and game-based learning in their classrooms. The playbook addresses how such lessons can be delivered in online or hybrid formats.

For others, it will provide a guide to begin exploring project-based and game-based learning and the design-thinking framework as a means to offer engaging challenges to their students in online or hybrid lessons.

The NEED for this Playbook

Many learners want:

- meaningful and engaging content; and
- to find solutions to real-word issues like discrimination and climate change

But they do not have the opportunity to do this.

Many teachers are often:

- required to provide engaging digitally delivered content such as game-based or project-based learning for both in-person and online delivery;
- required to integrate subject knowledge with 21st century skills such as creativity, computation, collaboration and cultural understanding;
- required to teach about the United Nations Global Goals – the 17 Sustainable Development Goals (SDGs); and
- expected to use frameworks such as Design Thinking for project-based learning.

But they lack adequate training and expertise in the initiatives to effectively create and implement such lessons.

Through understanding the needs of the teachers who want to use the new pedagogies but are unsure of how to begin we realised the need for this playbook.

What it is NOT

This playbook is not designed to be a training manual for the various methods being discussed.

We recommend that it is used as a starting-point referral to informative sites and relevant and challenges. Some links will change over time. We will endeavour to update the online version of his playbook from time to time.

The sites we mention are by no means an exhaustive list of what is available an we recommend further investigation.

What it IS

Children are changemakers not in the future but right now! We need to equip them with the relevant knowledge and 21st century skills to address the world's most pressing issues now and in the future.

We believe that having students use design thinking principles when addressing tasks and issues while using game-based learning principles and creative play makes the challenging task enjoyable and meaningful.

One of the best ways to integrate these is through project-based learning of real-world issues. What could be better than the issues related to the 17 United Nations Sustainable Development Goals(SDGs). By relating projects to the SDGs learners can put their skills to finding innovative and effective solutions to the identified global problems.

Part 2
The Components of the Challenge

Design Thinking Skills

Design thinking is a non-linear, iterative process that is very useful in tackling problems that are not well defined or unknown. It challenges assumptions and redefines problems to create innovative solution.[1]

The design thinking model we describe here is the one proposed at Stanford University's Hasso-Plattner Institute of Design also known as d.school. It is the leading university when it comes to teaching Design Thinking. The five stages of Design Thinking, according to d.school, are briefly described below. Oracy in the Classroom: Strategies for Effective Talk from Edutopia shows why dialogue skills in discussion are crucial for good decision-making.

Empathy Phase

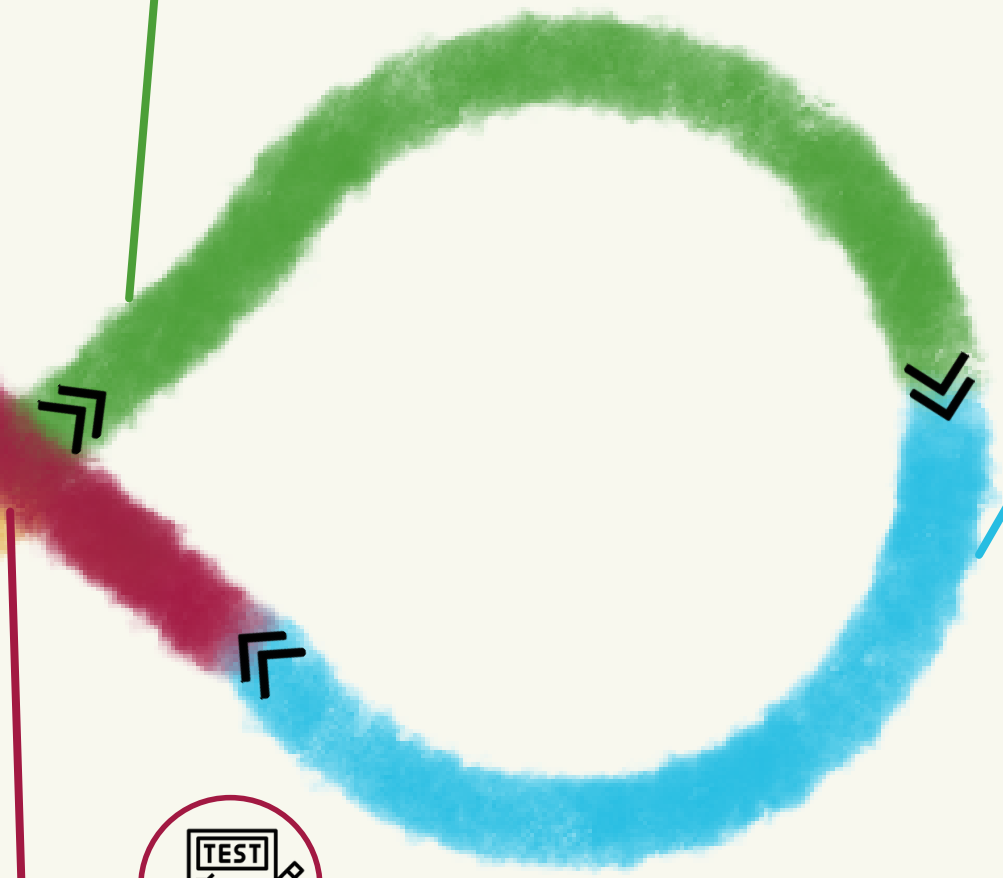
Is there a need for a solution?

Define Phase

Do the research. What is the exact nature of the problem? What has been done before in other contexts? What will the solution need to do to be successful?

Ideate Phase

Think outside the box.
Think about how some of the solutions in other contexts will work in these conditions. What needs to be changed? What else can be done? Sketch the idea.



Prototype Phase

Build a model of the idea. What materials and tools will be needed? What skills and techniques will be needed to accomplish it?

Test Phase

Think about the test design. What will be needed to Test the model that has been built? Evaluate the prototype and re-design or re-build if necessary.

Finally celebrate what you have created and Share your prototype with the community it is designed to serve. Tell others how your prototype works. Create community involvement in using the prototype. How will you communicate with each other?

Extra Information

Some courses and tools that are designed specifically for educators:

1. https://dschool.stanford.edu/resources/dschool-starter-kit (A starter course (3 hours) for teachers who want to introduce design thinking in their classrooms).
2. https://pages.splat3d.com/designplaybook (This playbook is based on the NSW Department of Education Design Thinking Across the Curriculum Framework and is packed with action statements on what can be done).
3. https://www.designathonworks.com/ (Design-a-thon Works is an organisation that not only provides training for teachers but also runs global design challenge workshops and competitions for children ages 8-12).
4. https://youtu.be/DGQBylxTIzI (Cambridge Primary - Oracy Lesson - Part #1)
5. https://adventure.generation.global/about (The Ultimate Dialogue Adventure from the Tony Blair Institute for Global Change)

21st Century Skills

Overview

21st Century skills are sometimes known as soft skills. However there is nothing soft about these skills. They are immensely important for the jobs of today and will be increasingly needed in the future. Initially there were the 4Cs of the 'soft' skills – Critical thinking, collaboration, communication and creativity. These were expanded over the years. Character and Citizenship. These 6Cs were termed the New Pedagogies for Deep Learning by Michael Fullan.

Over time the 21st Century skills were also associated with lifelong learning skills and became the 7Cs which are listed below.

Creativity

Collaboration

Critical Thinking

Communication

Cross-cultural understanding

Computing

Career & lifelong learning

An eighth C might be added – **Caring**! This is an essential skill for the changemakers of the future!

Extra Information

For further reading:

1. https://www.oecd.org/site/educeri21st/40756908.pdf
2. https://www.oecd.org/education/2030-project/contact/E2030_Position_Paper_(05.04.2018).pdf
3. https://files.eric.ed.gov/fulltext/ED519462.pdf
4. https://www.edsurge.com/news/2018-02-25-the-5th-c-of-21st-century-skills-try-computational-thinking-not-coding
5. https://www.teacheracademy.eu/course/the-seven-cs/
6. https://www.acer.org/au/discover/article/teaching-and-assessing-21st-century-skills

Game-based Learning

Overview

When we see images of a child absorbed in a video game we tend to see this as a negative situation. That may or may not be so.

Listen to Prof. Paul Howard-Jones talking about Neuroscience, Games and Learning.

But what if we ask what it is within the game that is eliciting the child's full attention and focus? Professor James Gee looked into this question and came up with a list of 16 key features.

James Paul Gee is often considered the godfather of game-based learning (GBL) thanks to his significant academic research on effective learning methods via video games. His Principles of Good Learning are listed below. He wrote a paper called **Good Video Games and Good Learning** more than a decade ago that outlines 16 components critical to strong GBL. The essay can be found in his seminal book of the same title, now in its second edition.

16 Principles Of Good Video Game Based Learning[2]

Here are the 16 principles of good video-game based learning outlined in his text.

1. Identity: Players build a sense of identity throughout the video game, either through direct input or an on-screen character they inherit.
2. Interaction: Communication occurs between the player and the game.
3. Production: Gamers help produce the story through some form of interaction, such as solving a puzzle or completing a level.
4. Risk Taking: Failing in a game holds few consequences in comparison to real life, empowering players to take risks.
5. Customized: Games usually offer a level of customization so that users can play — and succeed — at their competency level.

7. Well-Ordered Problems: The gaming environment contains problems that naturally lead into one nnanother, allowing a player's mastery to grow and evolve.
8. Challenge and Consideration: Games offer a problem that challenges students' assumed expertise.
9. Just in Time or On Demand: Players receive information as they need it, not before, which teaches them patience and perseverance and improves critical-thinking abilities.
10. Situated Meanings: Students learn new vocabulary words by experiencing them within game situations.
11. Pleasantly Frustrating: The game should frustrate the student enough to challenge them but be easy enough that they believe and can overcome the problem(s) faced.
12. System Thinking: Games make players think in a bigger picture, not just individual actions taken, helping them see how the pieces fit or can be fitted together.
13. Explore, Think Laterally, Rethink Goals: Games force players to expand their situational knowledge and consider courses of action other than linear ones.
14. Smart Tools and Distributed Knowledge: In-game tools help students understand the world. Through using them, they gain confidence to share their knowledge with others.

15. Cross-Functional Teams: In multiplayer environments, players have different skills, forcing them to rely on each other—a needed soft skill for students.
16. Performance before Competence: Competency occurs through taking action in the game, reversing the typical model in which students are required to learn before being allowed to act.

What do you think of James Paul Gee's 16 Principles of Good Video Games and Good Learning? How might you incorporate them into your teaching style and curriculum?

Are we able to use those principles in the classroom and help our students "absorb" the lessons we teach?

Neuroscience shows us that games with well-designed mechanics match the "needs" of the brain when it comes to acquiring and retaining skills and knowledge.

Different Perspective of Brain[3]

Visual Brain

Video games create attentional benefits

Motivated Brain

Victory in games would stimulate the reward centre of the brain

Creative Brain

Games contains elements that would stimulate creativity. For example, games enable ‘act as if’, symbolic thinking, visualization, mentalizing and curiosity.

Social Brain

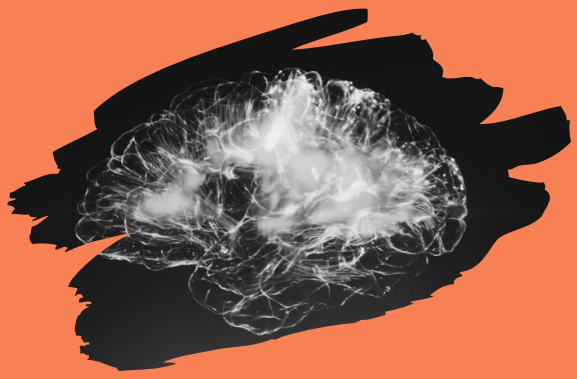
Playing against a human opponent would enhance the feeling of reward. In-game cooperation or competition also evoke distinct reaction in brain.

Emotional Brain

Emotions would influence our thinking and memory. Games contain emotionally engaging nature and help us remember contents better.

Story to Tell

Neuroscientists in California are using novel ways to collect and display data on how the learning brain develops.



On a typical day at the Synapse School in Menlo Park, California, where our team of Stanford University neuroscientists works hand in hand with teachers, students might drop by the Brainwave Learning Center, an on-site research lab where they can wear stretchy caps with more than a hundred small, spongy sensors on their heads. These sensors measure the naturally occurring brain waves that fluctuate as they play educational games or engage in guided meditation. The students can also watch live computer displays to witness how their own brain waves change as they concentrate on a task or engage in mindfulness. This interactive experience provides each child the chance to see and think about their own brain activity, how it changes with learning, and even how it changes with moment-to-moment shifts in mindset, which helps instill in students a sense of ownership of their learning process. Meanwhile, the brain activity evoked by the educational games provides important data to ongoing studies of brain and skill development.

Read more

Some educational games that are currently in use in schools do not align with how the brain learns. These are generally very good games that teach but they not necessarily lead to the content being “learnt”.

The games that fully align with brain function are the ones which include the game mechanics to maintain cognitive flow. Educational games that use Minecraft, Roblox, or Lego tick most or all these boxes.

Read the Lego Foundation's Whitepaper on Learning through Play at School here.

Project-based Learning

Overview

Project based Learning (PBL) is more than doing a project! It prepares students for the workplaces of the future as outlined in Building a Culture of Innovation in Our Schools Through Open Way Learning.

PBL is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem or challenge.

PBL Works have created a guide to help teachers who want to implement PBL in their classrooms.

The effectiveness of project-based learning is demonstrated by Open Way Learning.

Underlying the effectiveness of this methodology is the understanding that to be successful in projects students need to be mentored by experts in the field who guide them to become competent in the skills that are required to complete the project tasks.

Here are some case studies on schools that have adopted this approach.

Project based learning is an effective method for incorporating the 7Cs, 3Rs and 3Ms of 21st century learning into the curriculum.

Part 3
The Lens for the Challenge

The Lens

Using the UN Sustainable Development Goals as the basis for projects empowers learners to be change-makers not only of the future but in the present.

SUSTAINABLE DEVELOPMENT GOALS

The SDG goals provide the authentic real world problem tasks that are needed for effective project -based learning.

SDG2: Zero Hunger

Topics related: definition of hunger, root causes of hunger & malnutrition, concepts of sustainable agriculture

SDG4: Quality Education

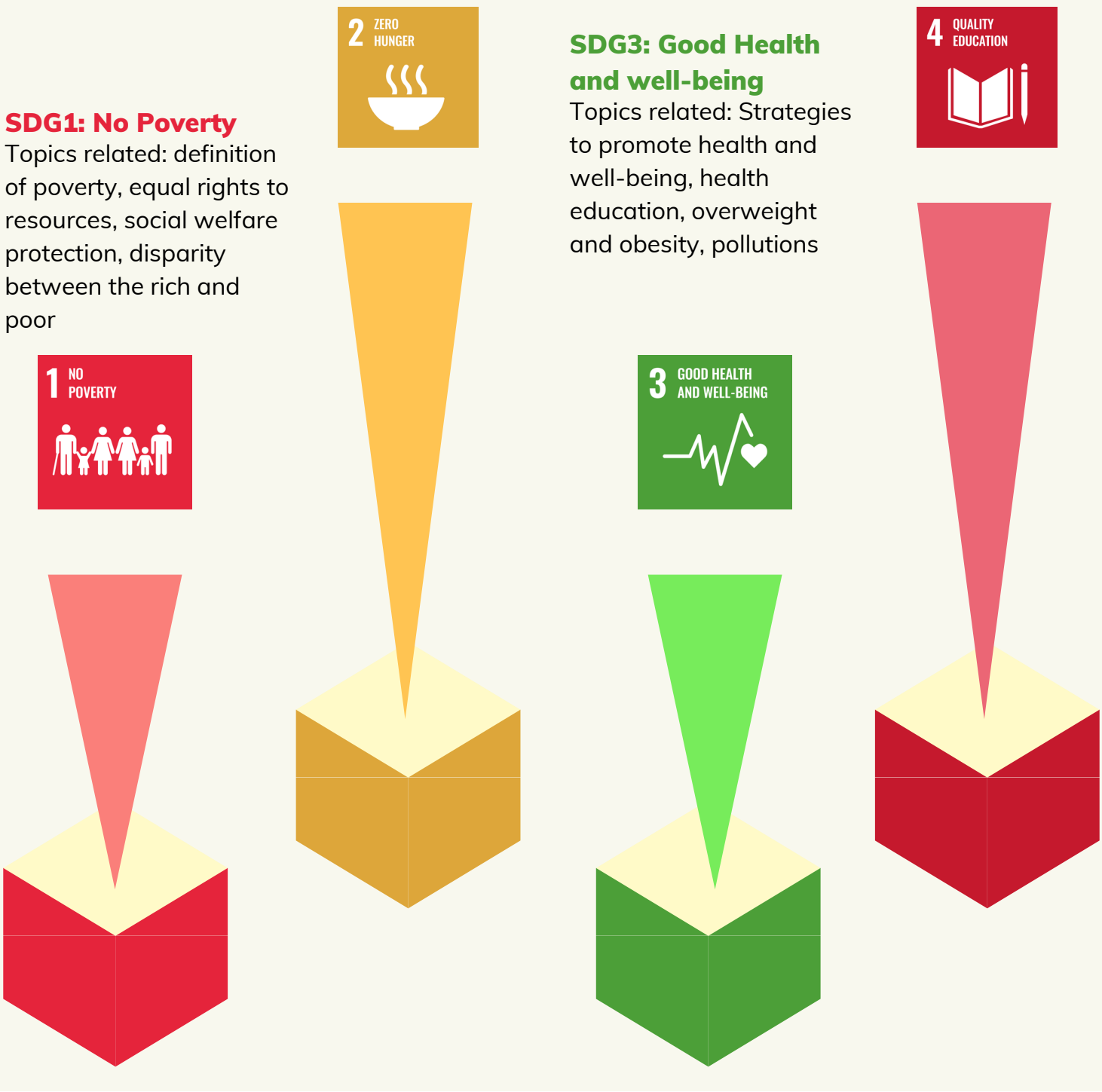
Topics related: inclusive and equitable quality education, basic skills needed in the 21st century, youth empowerment, access to education

SDG3: Good Health and well-being

Topics related: Strategies to promote health and well-being, health education, overweight and obesity, pollutions

SDG1: No Poverty

Topics related: definition of poverty, equal rights to resources, social welfare protection, disparity between the rich and poor



SDG8: Decent Work and Economic Growth

Topics related: effects of unemployment, alternative economic indicators, inequalities in the labour market, sustainable economic development

SDG6: Clean Water and Sanitation

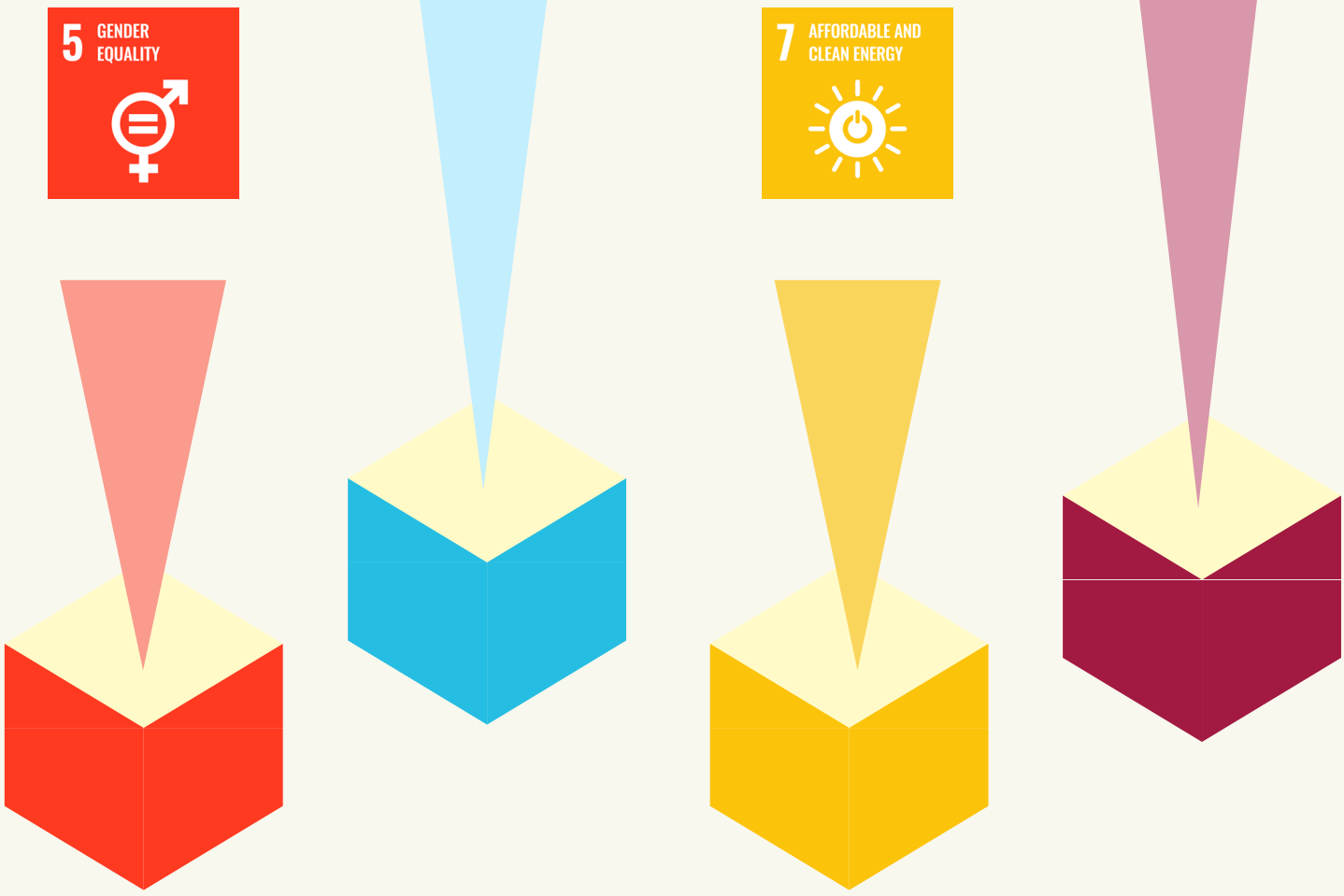
Topics related: global water distribution, access to safe and affordable drinking water, water scarcity

SDG7: Affordable and Clean Energy

Topics related: energy efficiency and sufficiency, energy security, political, economic and social dimensions of energy, development of low carbon energy solutions

SDG5: Gender Equality

Topics related: Gender as a product of social construction, structural discrimination, Gender and labour, Gender and education, rightsGender and poverty



SDG10: Reduced Inequalities

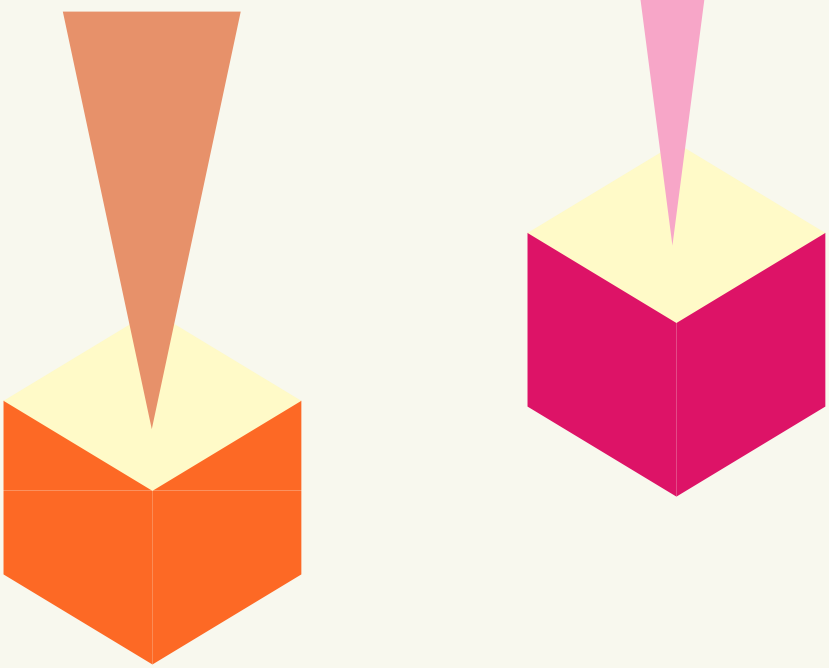
Topics related: inequalities on national and global levels, social protection policies, representation of different groups, roots of current inequalities, migration of people

SDG9: Industry, Innovation and Infrastructure

Topics related: need for basic infrastructure, sustainable innovation and industrialization, sustainable supply chain, sustainability of the internet

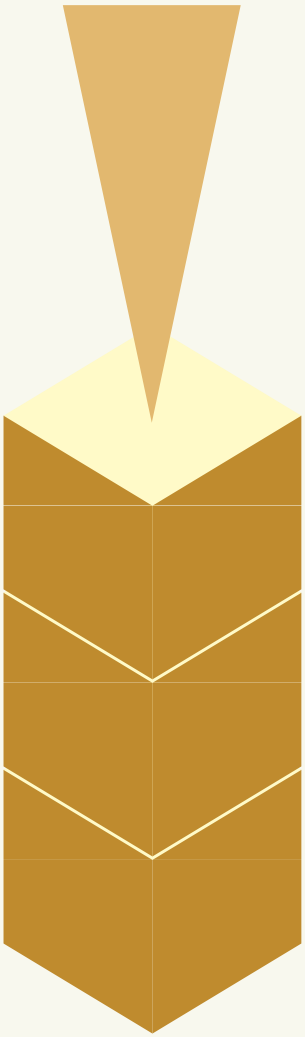
SDG11: Sustainable Cities and Communities

Topics related: need for shelter, urban ecology, sustainable resilient buildings and spatial planning, resilience to weather problem



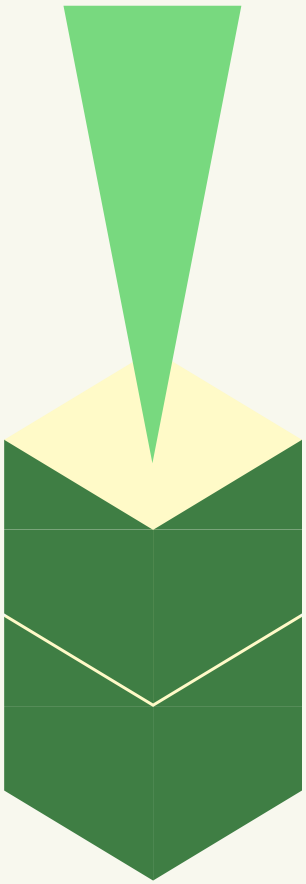
SDG12: Responsible Consumption and Production

Topics related: management and use of natural resources, waste generation and management, sustainable lifestyles, green economy



SDG13: Climate Action

Topics related: management of greenhouse gas emissions, strategies to protect the climate, Climate change-related hazards prevention and adaptation

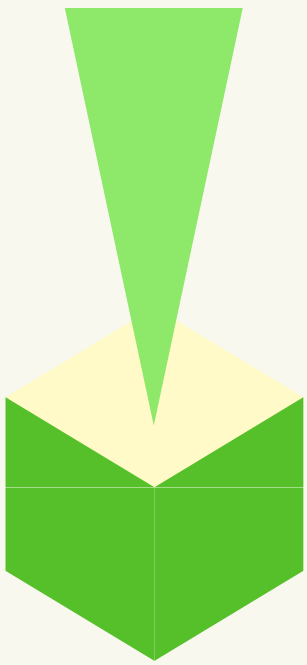


SDG14: Life below Water

Topics related: management and use of marine resources, sustainable marine energy, ocean pollutants, risks of rising sea level

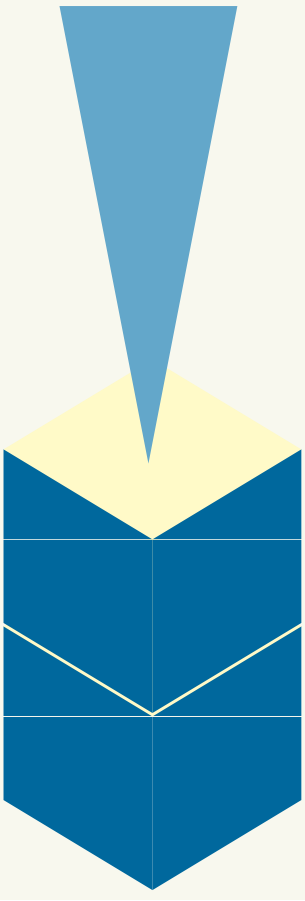
SDG15: Life on Land

Topics related: threats to biodiversity and the risks of extinction, restoration of wildlife , strategies to combat desertification, deforestation



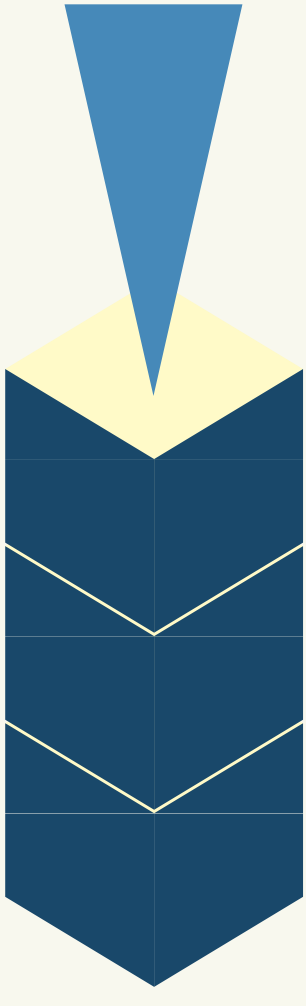
SDG16: Peace, Justice and Strong Institutions

Topics related: strategies to promote peaceful and inclusive societies, agreements related to war, peace and refugees, child labor, drug abuse and trade



SDG17: Partnerships for the Goals

Topics related: development and implementation of global policies on goals, citizens as change agent, global partnerships between governments, the private sector and civil society



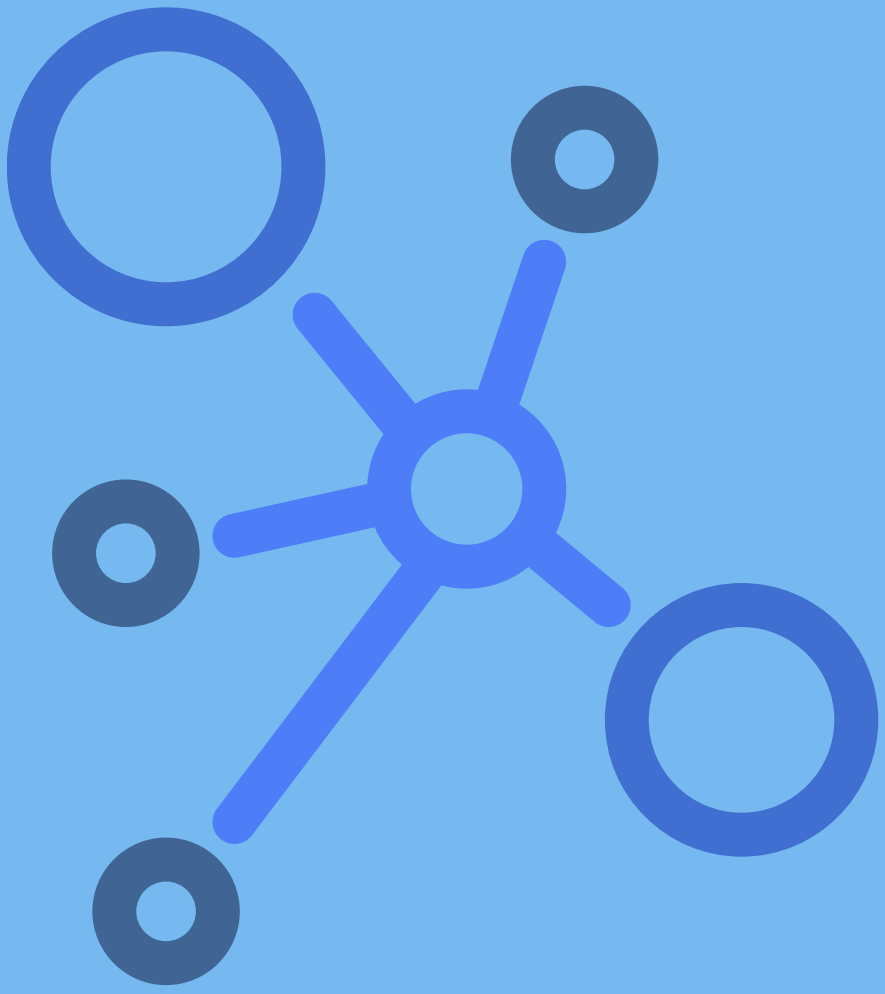
To help teachers include SDG related problems into classroom projects, the UN has created school resources. https://www.un.org/sustainabledevelopment/student-resources/

Many organisations have seen the usefulness of using the SDGs or SDG related themes as a basis for competitive challenges. Below is a list of some of these challenges.

Extra Information

The United Nations Regional Information Centre in Western Europe (UNRIC) has also created some Minecraft and board game challenges relating to the SDGs.
Project Rangeet has created a fun social and emotional learning app that also addresses some of the SDGs.
https://projectrangeet.com/
A Minecraft Edu Peace with Nature Challenge
https://unric.org/en/minecraft-unesco-global-build-challenge-peace-with-nature/
The Southern Cross University in Australia has a project called Climate Action Adventure
https://ccme.app/
From Benjamin Kelly and BBTNB we have The SDG Shuffle
https://education.minecraft.net/content/minecraft-edu/language-masters/en-us/lessons.html/the-sustainability-shuffle

Part 4
Bringing it all Together



--- Bringing it All Together ---

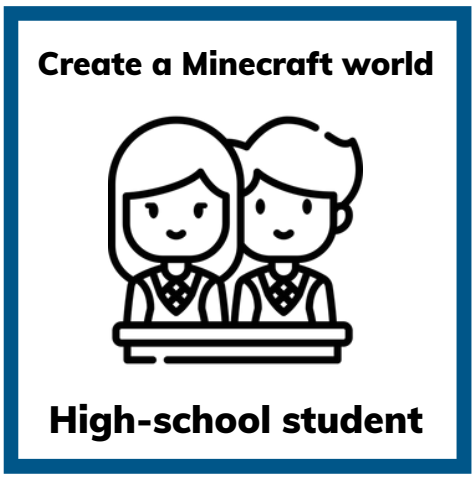
The EDU-FY GLOBAL GOALS CHALLENGE integrates Design-Thinking, Game-based learning and Project-based Learning methodologies into one student centred activity which develops 21st skills.

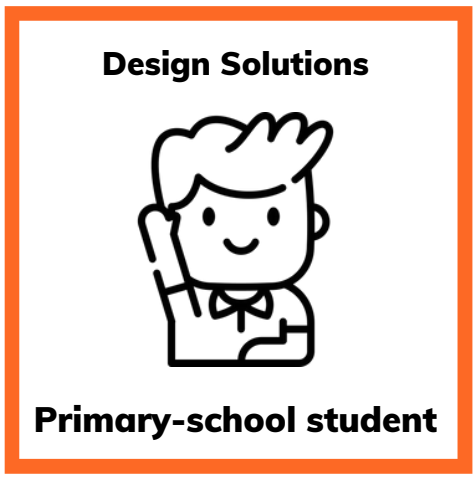
We recognise that there are many game platforms that can be utilised for the challenge. For the purposes of out first trail we will utilise Minecraft Education Edition (MEE). (See Why Minecraft)

The Challenge

For each of the 17 SDGs

- High-school students (Grades 7-9) are challenged to create a Minecraft world depicting the current issues associated with the SDG that need to be solved.





- Primary-school students (Grades 4-6) are challenged to design solutions that will alleviate or solve these issues to achieve the SDG targets.

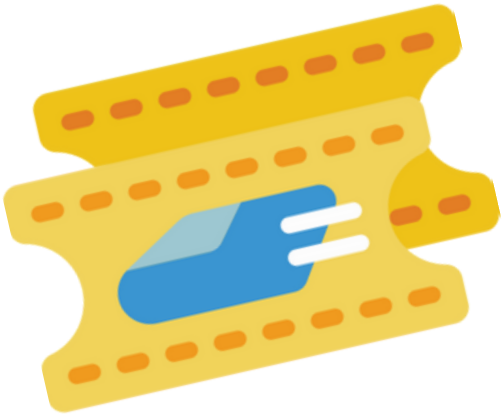
Approach/ How we do it?

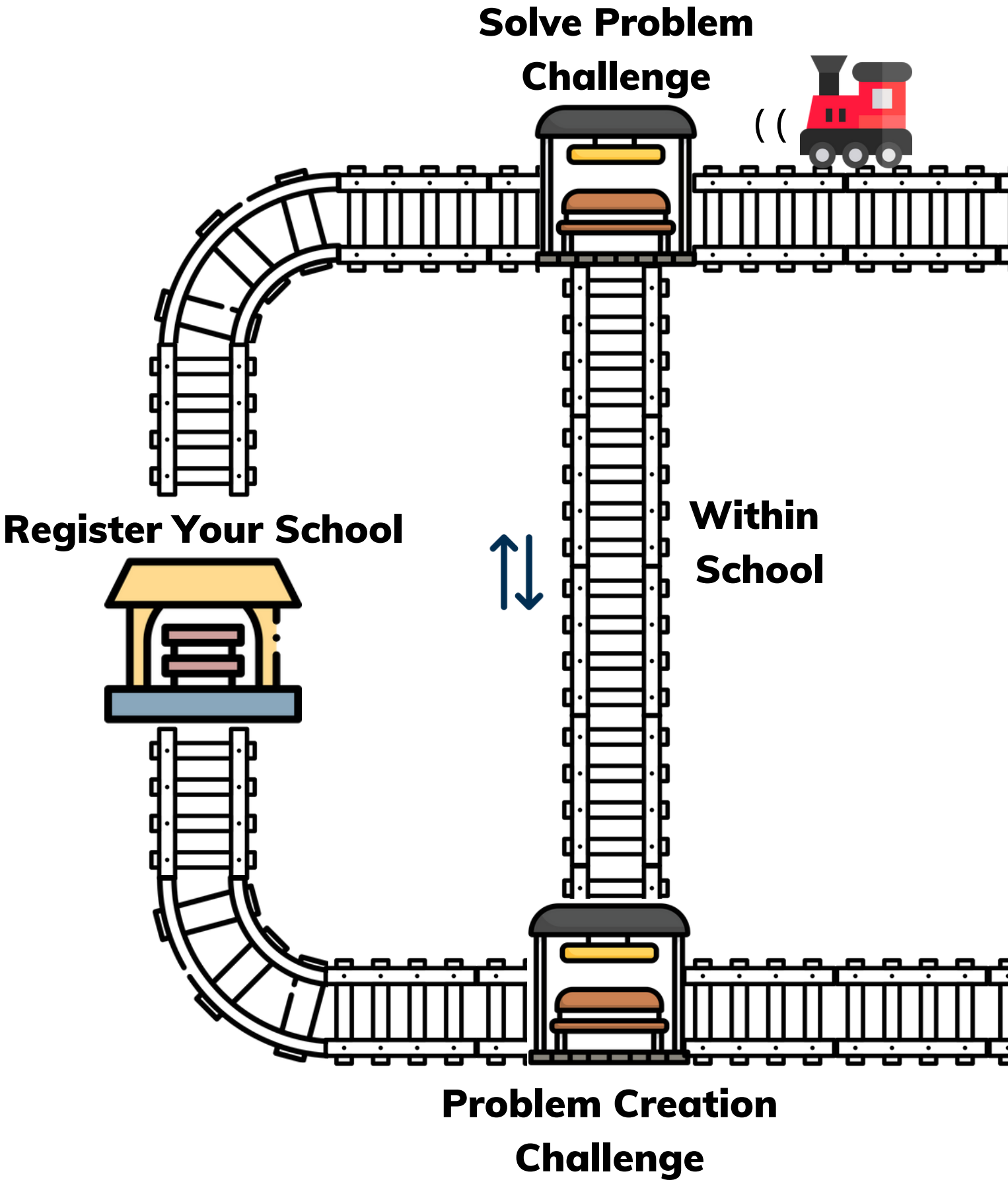
- We invite teachers to learn to become design thinking facilitators and practice the skills with their students (Open call to become guides).

- Open call for students to participate in a changemaker program using their Minecraft and Science, Technology, Engineering, Arts and Mathematics (STEAM) skills to create worlds that can be used in the SDG challenges.

Process

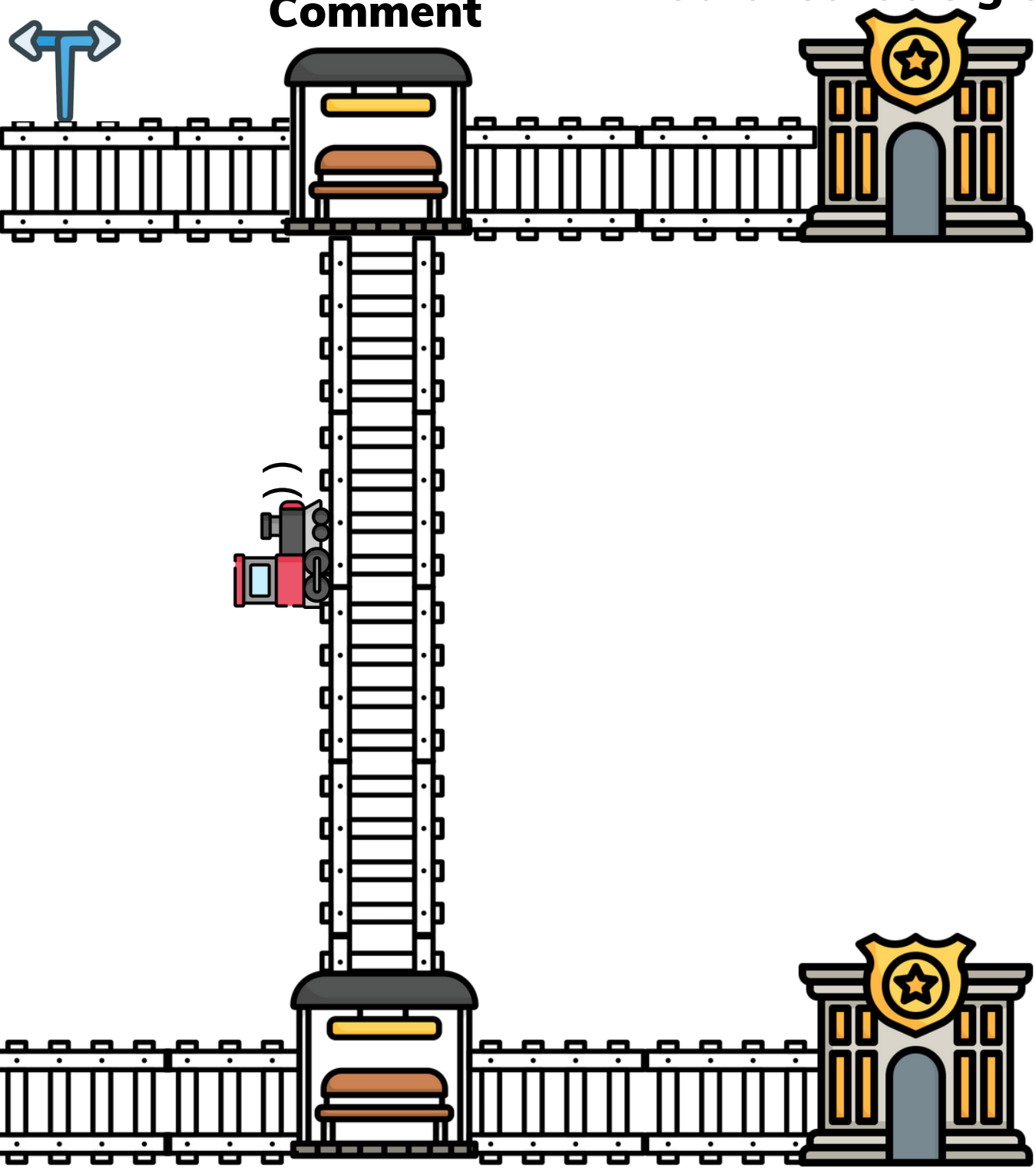
SEE NEXT PAGES!




Solve Problem
Challenge
Register Your School
Within
School
Problem Creation
Challenge

Collaborate with other schools globally

Comment



Upload created Worlds

Receive a Certificate

Support

Edu-fy will provide:

- guided support materials to be used within the challenges with links to stories of successes and failures from the past and to the latest research and innovations relating to solving the issues.
- modules relating to the SDGs where STEAM skills can be applied, e.g. https://www.thedais.co.in/uda
- support & resources for teachers to become design thinking facilitators to be able to help their students in their game-based challenges
- a platform to create an online-community of practitioners to offer and receive support to and from each other.

Why Minecraft?

Minecraft is increasingly being used as a tool in classrooms for innovative learning approaches.
https://www.edsurge.com/news/2019-02-12-playing-games-can-build-21st-century-skills-research-explains-how

https://phys.org/news/2019-04-minecraft-problem-collaboration-learningyes-school.html

https://funtech.co.uk/latest/11-reasons-why-minecraft-is-educational-for-kids

Minecraft can be used by teachers as a means to teach engaging lessons in person, remotely or in hybrid settings.
https://education.minecraft.net/en-us/blog/victoria-celebrates-remote-learning

https://digital.com/best-web-hosting/minecraft/education/

Part 5
Call to Action

Man is most nearly himself when he achieves the seriousness of a child at play.

— *Heraclitus 500 BCE, philosopher*

Serious play is not an oxymoron; it is the essence of innovation.

—*Michael Schrage, scholar*

Educators

- Register here for the Collaborative Global Goals Changemaker Program which Edu-fy runs jointly with the United Nations Association of Australia NSW Division (UNAA NSW) and mention the Collaborative Global Changemaker Program.

- View our Learning Planet session recording on how project-based learning (PBL), game-based learning (GBL), social and emotional learning (SEL) can be integrated in your classroom.

- Email for expression of interest for our course on Integrating Game-based Learning (GBL), Social and Emotional Learning (SEL) and Project-based Learning (PBL) with the Sustainable Development Goals (SDGs).

- Join our international community of changemaker educators. (Coming soon)

Schools/Clubs

- Email your expression of interest to become a Changemaker School/Club for the Sustainable Development Goals.

Endnotes

1. Quote from https://www.interaction-design.org/literature/topics/design-thinkin
2. James Paul Gee, "Good video games and good learning," https://www.legendsoflearning.com/blog/james-paul-gee-game-based-learning/
3. Eveline van Zeeland, "The neuroscience of game-based learning," Inchainge, on https://inchainge.com/resources/blogs/the-neuroscience-of-game-based-learning/

Credits

Graphics

Alina Grubnyak on Unsplash
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Canva Studio from Pexels
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Flaticon.com. This cover has been designed using resources from Flaticon.com
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Minecraft
Monstera from Pexels
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Polina Zimmerman from Pexels
Roblox
Sharon McCutcheon from Pexels
United Nations
Vlada Karpovich from Pexels

Information

UNESCO. Division for Inclusion, Peace and Sustainable Development, Education Sector. (2017). Education for sustainable development goals: Learning objectives.

THE EDU-FY TEAM

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