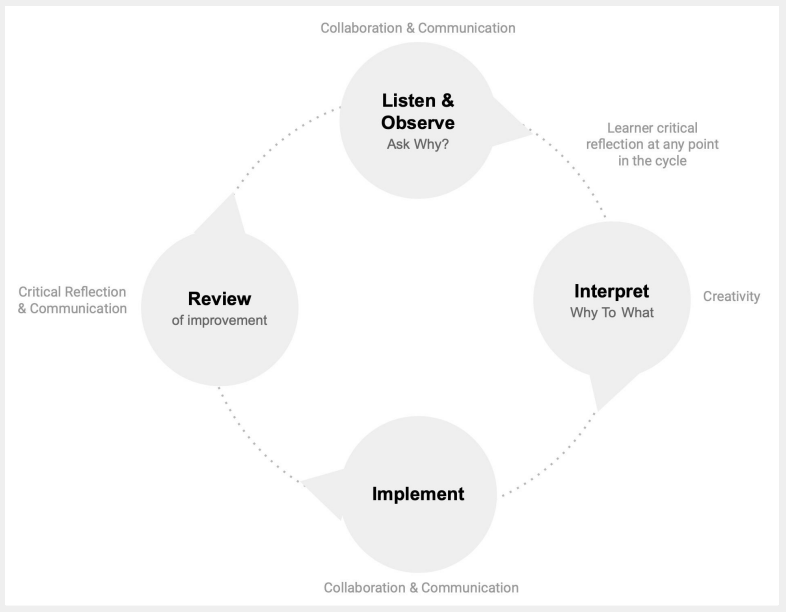
Supported Self-Driven Learning Operating System

Improvement Cycle

Including how the selfdriven Improvement Cycle (*SDIC*) can be used to support project based learning.

Version 0.3

Background



A key component of the *Support Self Driven Learning Framework (SSDLF) and selfdrivenOS* is the improvement cycle *(SDIC)* to support continuous incremental improvement.

The improvement cycle includes learner critical reflection at any point.

The improvement cycle and associated project/task/action management components within the *selfdrivenOS* can support project-based-learning and determining general fitness (physical/mental) within an ecosystem (community) as a person or a product.

Listen & Observe	Who & Why	Collaboration & Communication
Interpret	Why to What	Creativity
Implement	What to How	Collaboration & Communication
Review	Reflect back to Why, What, How on the improvement	Critical Reflection & Communication

The improvement cycle can also be used to conceptualise:

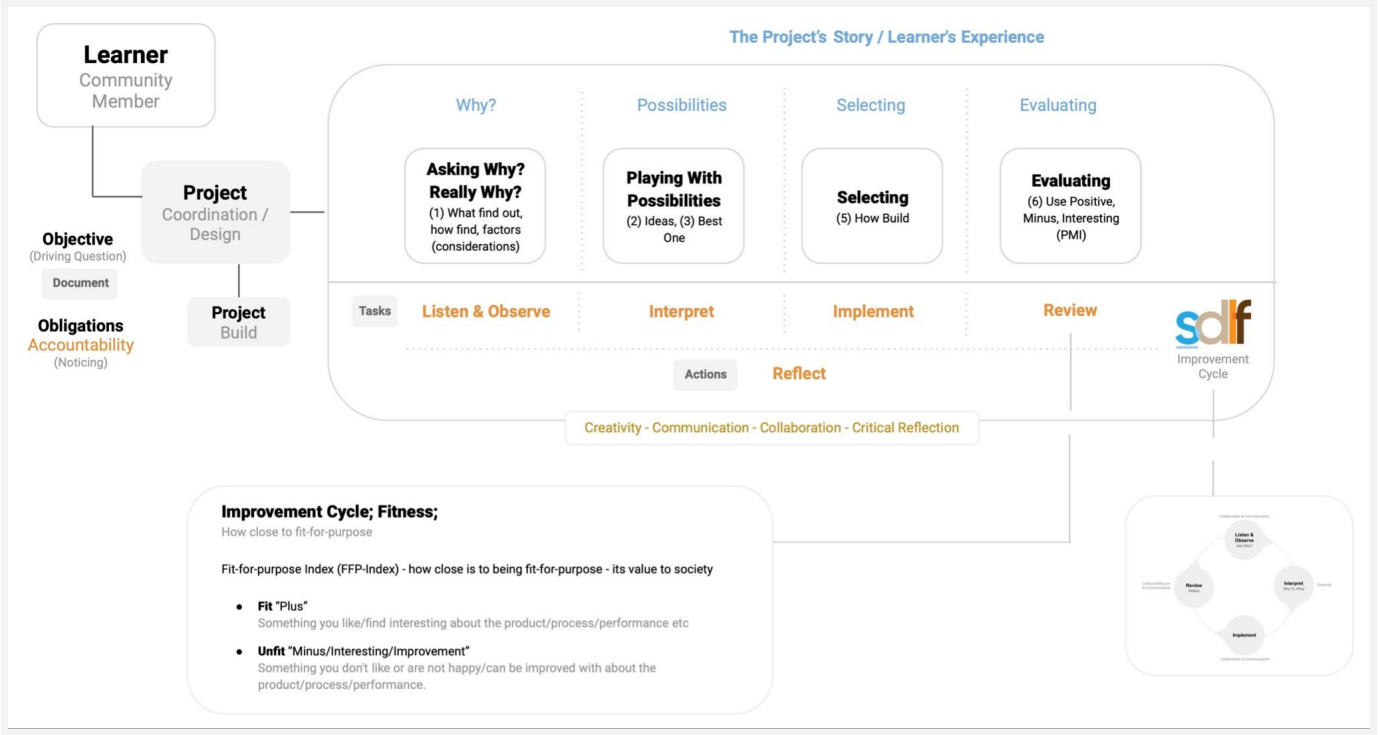
- Darwinism “Survival of the fitting”
- Playing the “Infinite” game
- Healthy/least-harmful eco-systems.

Project Based Learning

Project based learning is a form of authentic learning that allows a learner to work through a project as an individual or part of a team.

The *selfdriven Improvement Cycle (SDIC)* and project/task/action functions within *app.selfdriven.cloud* are designed to support project based learning.

Following is a mapping between a typical PBL framework and the *SDIC* - showing how a learner can use the project/task/action functions.



https://docs.google.com/presentation/d/1n4VXsyL3rtagPWaQSteA00K-DvbEfUOxvshr6Vu2Fuo

How it works

In this case the learner is creating two projects; one to track the progress of their design project and the other to communicate how to build the outcome of their design project i.e the product.

This includes capturing their own and team members' reflections on their learning experience and also the outcome of the project i.e. the usefulness of the product - i.e. how fit for purpose is it?

This can then all be communicated to learning partners via the Project Story. The tasks/actions (reflections) etc are also accumulated and available for pathway decision making and applications for more learning etc.

Listen & Observe	Why?	**Asking Why? Really Why?** (1) What find out, how find, factors (considerations)
Interpret	Possibilities	**Playing With Possibilities** (2) Ideas, (3) Best One
Implement	Selecting	**Selecting** (5) How Build
Review	Evaluating	**Evaluating** (6) Use Positive, Minus, Interesting (PMI)

The Improvement Cycle *Review* step includes a fit-for-purpose categorisation, which guides if the cycle needs to continue;

Fit	Plus	Something you like/find interesting about the product/process/performance etc
Unfit	Minus, Interesting, Improvement	Something you don't like or are not happy/can be improved with the product/process/performance.

Within the improvement cycle, reflection can occur at any time i.e. a reflection on what was learnt from doing a particular task.

The selfdriven app supports community level user experience - ie changing the “language” within the user interface.

Mapping of other common design/fit-for-purpose cycles;

Phase	Design Thinking	Scientific Cycle	Engineering Cycle
Listen & Observe	Empathise (why?) / define	Ask a question	State problem
Interpret	Ideas	Hypothesis	Generate ideas & select solution
Implement	Prototype	Experiment	Build
Review	Test	Analyse & conclude	Evaluate & present

Putting it to work

1	**Create the design project**	Register a project with app.selfdriven.cloud using *My > Projects*.
2	**Create the design document**	Link to existing Google Doc or create a document with app.selfdriven.cloud.
3	**Create the design project tasks**	Create tasks for *Listen & Observe*, *Interpret*, *Implement* and *Review.* You can use a template to create the common tasks you will need.
4	**Add detail to the tasks**	Start your design and add details to your tasks as you work through the design process
5	**Add reflection**	As you work add reflections to the project or for a particular task.
6	**View project story**	At any point you can view the project story and download it as a PDF.
7	**Create the build project**	For someone else to build your product. Teams. Link to design project. At any point you can view the project story and download it as a PDF.

Mapping to PBLworks.org

The following explores using *selfdriven* as a tool to assist with a *PBLworks* based learning project.

Worked Examples

Based on Sustainability Projects
Looking for common structures and language.

Making Space for Change STEM	Students are charged with the task of creating an environmentally sustainable redesign for a community space, such as a park, library, public square, empty lot, or community centre. Students visit the space; research the local context, needs, resources, and constraints; and investigate principles of environmentally sustainable design. They engage in critique and revision processes that involve local community members and then present their solutions to key stakeholders.	• Community project • Connections to 3rd party learning partners • Record research • Principles of design (IC) • Revision (IC) • Present
Waiting on the World to Change ELA	Students learn about political activism and actively engage in the political process in their community. After identifying a problem or an issue of concern, students write an issue statement about this challenge. They then design and implement an action plan that raises awareness and/or provides a solution to the problem.	• Record issue statement • Action plan (IC) • Solution
Ultimate Design Challenge Science, Maths	Product packaging often uses materials and processes that negatively affect the Earth. In their role as design engineers, students use the engineering-design process and geometric modelling to redesign a product's packaging to render it more sustainable. Students explore volume, surface area, and dimensions of complex shapes to develop prototypes that meet the product's packaging design constraints while limiting the packaging material used and/or waste generated.	• Design engineer (IC) • Engineering-design process (IC) • Explore dimensions
The Healthy School Challenge ELA, Health / PE	One out of two American children suffer from chronic health problems. This project connects nutrition and diet with fitness and exercise, exploring how healthy choices in each of these areas improves overall wellness. Students undertake research that exposes often conflicting	• Document research • Explore questions • Recommendations • Community policy

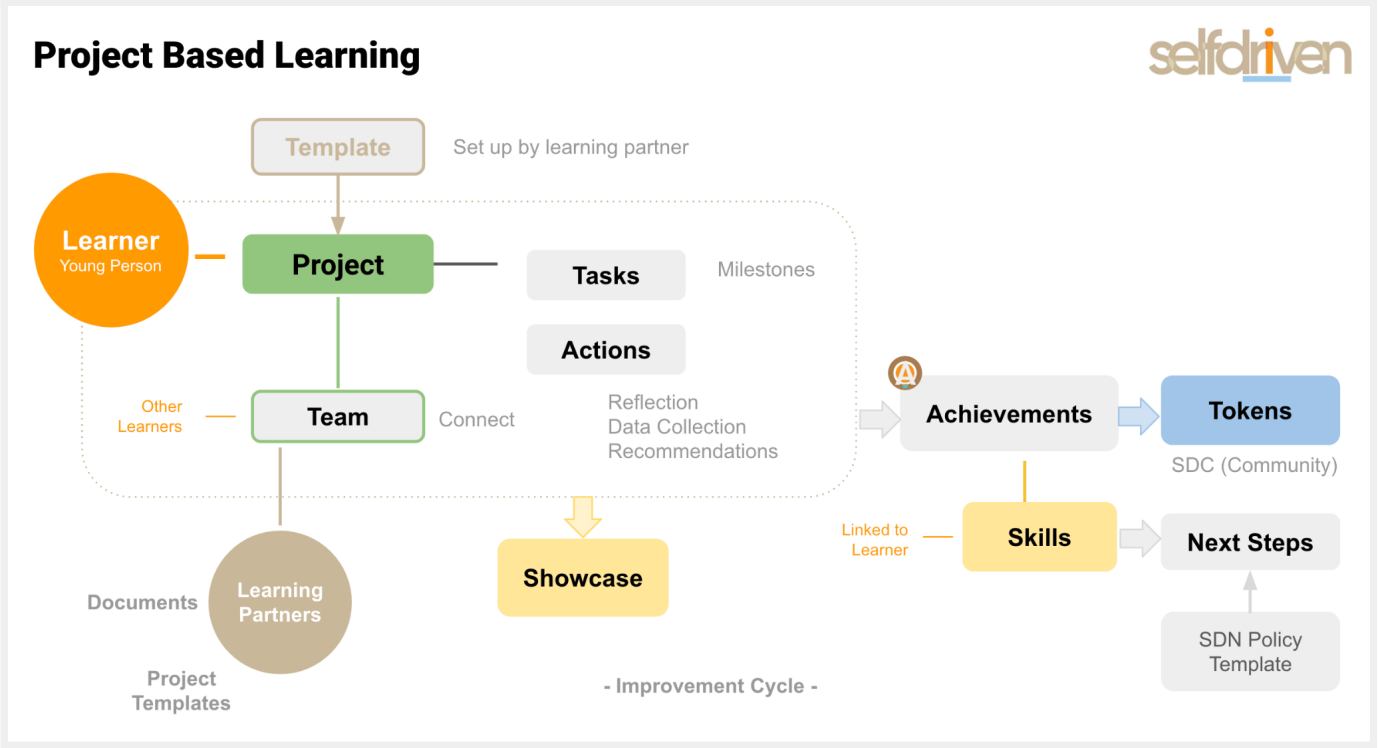
	ideas and beliefs on health and wellness approaches, and they explore questions about school practices. They arrive at informed, justifiable recommendations that the school community can support, either through changes in policy or through improved implementation of policy.	
Shrinking Our Footprints Science, Maths	In this project, students use measurement, data, and fraction concepts to develop, implement, and monitor an action plan for reducing their family's impact on the environment. Each student team focuses on one resource: water, garbage, food waste, electricity, or car gas use. Teams research information, such as the amount of water per minute of shower or the number of miles per gallon used by a family car, and then they conduct home inventories of their family's use of these resources for 1 week (e.g., timing the length of showers, the weight and volume of garbage, or the number of watt hours used by key household devices). Students graph their individual family data and collective team data on line plots. After measuring their families' current use of resources, students set goals for reducing resource use by a given fraction and identify strategies to help their families achieve these goals (e.g., "We will reduce our use of water by one-quarter through taking shorter showers and making sure the dishwasher is full before running it.") Students communicate these strategies and goals to their families in the form of an informative/explanatory letter and then measure and graph changes in their families' resource use as they implement their action plans. As an alternative, if there are barriers to measuring data about resource use at home, students might consider measuring the use of resources in the classroom or across the school.	• Action plan • Research • Data collection • Home Inventory • Visualise • Recommendations • Presentation to stakeholders (family) • Data collection - change

The Language of PBLworks

Common terms and references based on the projects reviewed.

KWL	https://www.lucidchart.com/blog/what-is-a-kwl-chart https://www.theteachertoolkit.com/index.php/tool/kwl
KWHLAQ	https://www.groupmap.com/map-templates/kwhlaq/
Milestones	Project tasks
Present	To stakeholders / team-members/ learning-partners
Research	Action type
Revision	Review action type
Issue Statement	Action type = Issue
Action Plan	Series of tasks
Solution	Action type (recommendation)
Engineering-design Process	Improvement Cycle
Explore	By Human
Recommendations	Action type
Community Policy	Action type
Data Collection	Action/Activity
Skills	Create skills for linking to achievements

SMART Goals	• SMART goals
	  • Specific
	  • Measurable
	  • Achievable
	  • Actionable
	  • Attainable
	  • Realistic
	  • Relevant
	  • Time-based
	  • Timely
	  • Tangible



Setup	Create a config file like SDN Policy to hold language and parameters.
Prescribed	Structures pre-created / activity created with use.
Unprescribed	Informal by using the tool and creating structures and activity created with use.
UI	Tasks - add milestone flag

Project Template Set up

Name	
Tasks	Prescribed tasks - all at once or one-by-one on completion
Actions	Prescribed actions - all at once or one-by-one on completion
Success Skills	Link the skills that will be included with the achievement once the project is completed.

Action Types

Each core structural component of the Supported Self-Driven Learning Framework has a corresponding document, and each action type is linked to the matching document as a form of categorisation.

Name	Notes	Document
Data	Collected data e.g. from in field measuring, experiments etc	Structured Thinking
Policy	Community policy	Accountability
Recommendation	Outcome recommendation	Structured Thinking
Research	Fact Find	Structured Thinking

Project Template Definition

Each PBL project template within *selfdrivenOS* can have its own definition file.
The definition includes the metadata to describe the project, including:

- Name, Version, Description, Summary
- Outcomes - ie planned outcome of the project - why do it?
- Milestones - key steps in the project, which includes:
    - Reference, Subject, Description
    - Duration in days (Minimum, Maximum)
    - Tasks (and who by; learner / team)
    - Support Items,
    - Notes
- Links
- Skills - that can be earned on successful completion of the project
- Skills Capacities that can be allocated; Gets It [G], Knowledgeable [K], A Natural [N]

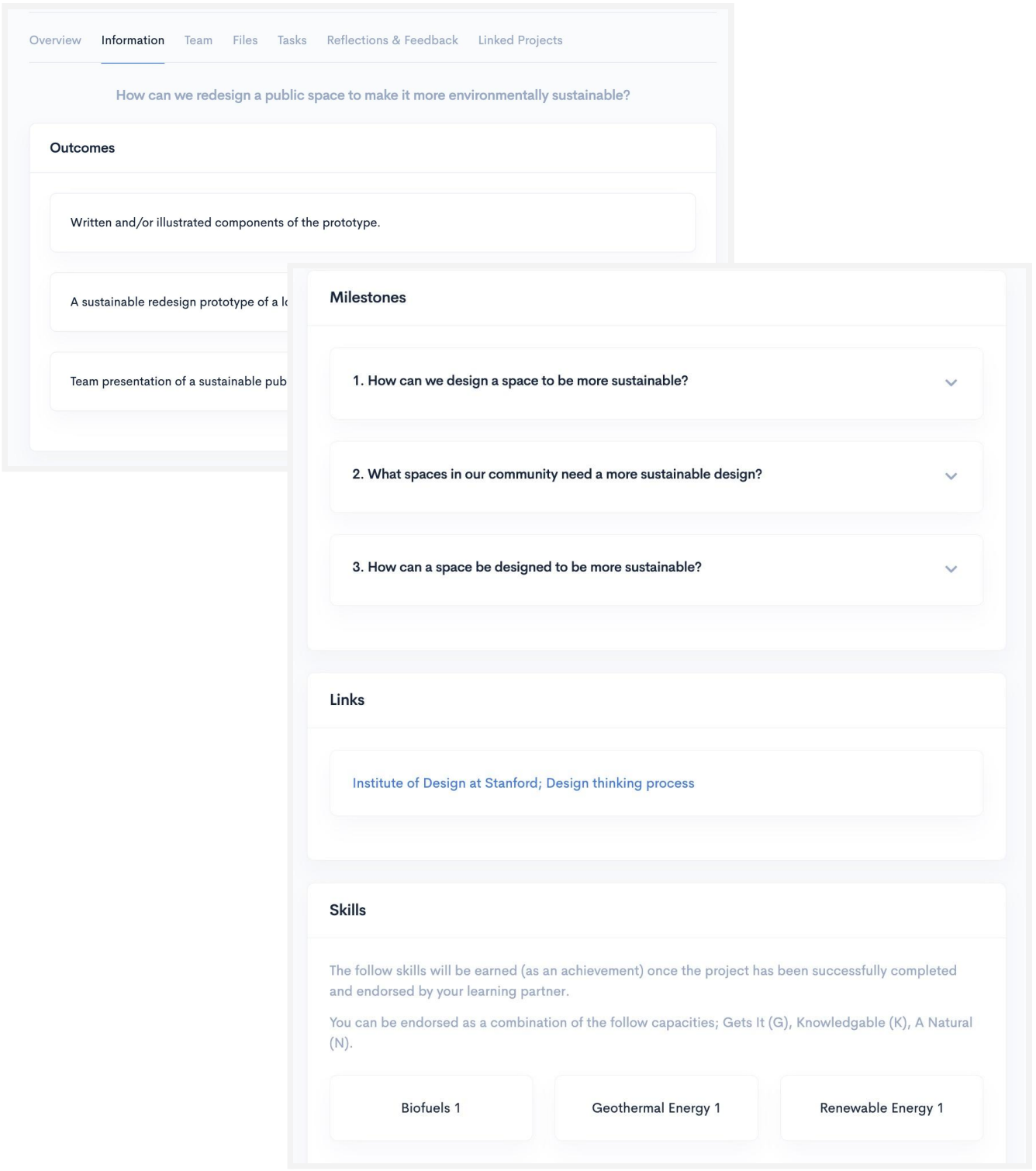
Example Definition File


```
{
   "template":
   {
      "project":
      {
         "name": "pblworks-making-space-change",
         "title": "PBLworks; Making Space for Change",
         "url": "https://my.pblworks.org/project/making-space-change",
         "urlCaption": "Making Space for Change",
         "version":
         {
            "number": "0.0.1",
            "date": "01 MAR 2022",
            "notes": "Initial set up"
         },
         "usage": "This is a template based on a PBLworks project.  To use this template, you must
         "description": "How can we redesign a public space to make it more environmentally sustai
         "summary": "Students are charged with the task of creating an environmentally sustainable
         "outcomes":
         [
            {
               "by": "learner",
               "description": "Written and/or illustrated components of the prototype."
            },
            {
               "by": "team",
               "description": "A sustainable redesign prototype of a local public space."
            },
            {
               "by": "team",
               "description": "Team presentation of a sustainable public space redesign to commu
            }
         ],
```


https://www.selfdriven.foundation/selfdriven-template-example-1.json

User Interface Based on Example Definition File

User interface is updated based on the definition file linked to the template that their project is based on.



References

https://www.pblworks.org/blog/supporting-pbl-design-thinking-framework

Working with other PBL (pblworks.org)

Engineering cycle:

1. State to problem
2. Generate ideas
3. Select a solution
4. Build the item
5. Evaluate
6. Present Results

Scientific method:

1. Ask a question
2. State a hypothesis
3. Conduct an experiment
4. Analyses the results
5. Make a conclusion

Problem improvement based thinking.

Project design thinking:

1. Empathise
2. Define
3. Ideas
4. Prototype
5. Test

Make it authentic - authenticity promotes empathy.