NextGeN ENTREPRENEURS

Education Package

Lesson 5 - DESIGN

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Design

Now the learners begin to hammer out the initial framework for the solution they are developing to apply to the initial challenge. The starting points for this stage are our two key focal points again: the audience and the purpose.

Overview

Learning Areas: English, HASS, HPE, Technologies, Science

Year Levels: 5-10

Teaching Time: 55 mins.

Resources required:

- 3 packets of toothpicks, play dough
- Device capable of presenting a video to the class
- Devices to produce a presentation slide or poster materials
- Black/white board or chart paper
- Word wall
- Journal (exercise or scrapbook) 1 per student
- Conference file (formative assessment)

Level of teacher scaffolding:

- Medium - facilitate class discussion
- Conference with students regarding project development

Learning Intentions

The learners develop a feasible design for a solution to suit the purpose and audience. They also have a clear and achievable plan as to how to develop this solution.

Keywords: Design

Carbon Zero Future - The Challenge (remind students)

Create a new idea or innovate on an existing sustainable solution. You do not need to make the product nor know how to design it - just come up with an innovative idea. Develop your idea to the pitch/presentation stage. Include a poster or slide. You can present your idea in person or via video, 3 minutes in length. A panel of judges will provide feedback.

Refer to the 6 Stages of Solutions Thinking.

Innovation Challenge

5 minutes

Toothpick Towers

Small groups (3-4 students) build the tallest tower they can from toothpicks and play dough (squash ball sized amount).

Solution Thinking Focus: Design

10 minutes

DESIGN:

Formative assessment via conferencing and single-point rubrics by the teacher is critical at this point. If your learners don't get accurate and timely feedback, they may attempt solutions that are inappropriate or unachievable. However, there is also value in allowing the students to make mistakes and develop alternative solutions from this. It's a tap dance!

A great DESIGN thinking task is backcasting.

Backcasting is a Futures Studies method that starts with a preferred future and works back to the present, identifying actions over time needed to achieve the preferred future

Activity: "Back from the Future"

Imagine, you have finished your successful pitch. The panel's feedback was positive, and you were able to answer all questions with confidence. What had to happen for you to get there?

1. You practiced and rehearsed your revised presentation.
2. Consider possible questions from judges.
3. You adjusted pitch after feedback from teacher and peers
4. You practiced and rehearsed your pitch to your peers and teacher.
5. You completed your final adjustment to your slide/poster.
6. Your slide and poster capture the appropriate information in regard to your sustainable solution. Every element is useful and guides your audience to agree with your idea.
7. You agree on your final iteration of your concept and begin drafting the best way to communicate your solution.
8. You dream of many ideas and discover different aspects to your iterations before deciding on your chosen solution.
9. You taste different ideas with solution trees.
10. You research your chosen problem/solution using the internet, books, magazines, interviews with industry partners.

11. You believe you have the ability to co-create a sustainable future and you have a strong 'why'.

Add 'backcasting' to your toolbox of strategies to give form to your idea. In your journal, flesh out your backcasting steps as it pertains to your idea, e.g. research sustainable building material selector apps.

Below is an example of backcasting for a possible solution.

Concept - An app for new home builders which helps them to select Carbon Zero materials. App allows builder to enter preferred material to get information of eco-rating comparison, best option/alternative. If you can't compromise it comes up with a carbon neutralising tip, e.g. build a vertical garden across entire backfence.

Backcasting;

1. Rehearse pitch again.
2. Pitch rehearsed and practiced in front of family and friends, feedback received and acted upon.
3. Slideshow/poster ready, palm cards ready
4. Design Logo & Slogan
5. Name of the app.
6. Research cost of app or could it be sponsored?
7. How much carbon could be saved by implementing ap choices.
8. Select Images and info for slide
9. What choices of housing components, choices of materials
10. Who is it for?
11. Benefits
12. Setbacks
13. Applicable across country / world

Other thoughts...

Scope for new materials to be added, backed by research?

Further uses - renovations, commercial buildings, playgrounds, roads/driveways.

Prioritise backcasting stages, set dates, assign tasks if working in a group.

Group Work Option

Feeling overwhelmed? Idea/concept not coming together? It might be time to form a group.

NextGen honours different ways of working and obtaining a sustainable solution. For some, taking full ownership of their idea is natural and for this challenge, they are feeling the wind beneath their wings. Others work best if they can combine skills, bounce ideas to and fro and result in a team effort toward a wonderful and viable sustainable solution.

This point in the process is optimal for making the decision if you carry on alone or join forces with a few classmates. Be honest and ensure you can all bring something to the solutions table. Ask yourself and your group the following questions;

1. Can you identify the superior idea?
2. Are you great at artwork or digital design?
3. Is research your jam?
4. Are you a presenting powerhouse?

Collaborate to Innovate!

Industry Partner

10 minutes

Industry partner incursion or video (videos will continue to be made available on our website).
Ask your guest if they use the backcasting strategy in their concept development.

Journey Map

5 minutes

You are getting close to your destination, chart which thinking step you believe you need to visit before moving along. Add an arrow but remember to track your time with a star. Did you veer off course? Perhaps you found treasure on your journey anyway!

Word Wall

5 minutes

Review understanding of existing vocabulary.
Add Design & Backcasting to the word wall.

Carbon Zero Journey

20 minutes

Keep in mind your audience (adults). You want to demonstrate that you are capable of conceiving of a great idea and you have the tenacity to back it up with research and development. Also, most importantly is your purpose, a Carbon Zero Future your solution must revolve around sequestering carbon or using renewable energy. These factors will guide your solution design.

Conclusion

5 minutes

Chart where you spent your project time on your Journey Map.
Review final assessment rubric.

Sleep on it

Start visualising yourself giving a great presentation. You are prepared, relaxed and confident.

NEXTGEN: CARBON ZERO FUTURE PROJECT

In addition to the following formative and summative assessment rubrics, the student NextGen journal will provide a portfolio style means of assessment solutions thinking and reflection.

SINGLE POINT RUBRICS FOR FORMATIVE ASSESSMENT (conferencing)

Name

Date	Needs more attention	Learning Point	On track
		Define: Problem Identified and understood	

Date	Needs more attention	Learning Point	On track
		Discover: Research the problem and existing solutions	

Date	Needs more attention	Learning Point	On track
		Dream: Begin documenting ideas of different idea/concept iterations	

Date	Needs more attention	Learning Point	On track
		Design: Plan how you are going to communicate the big idea and details of your sustainable solution	

Date	Needs more attention	Learning Point	On track
		Deliver: Present your sustainable solution (See final assessment rubric)	

Date	Needs more attention	Learning Point	On track
		Debrief: Actively receive, act on and offer constructive feedback.	