Summary

[For Alex Only] Sustainable Design Draft

Subject	Year	Start date	Duration
Design	Gr. 7	Week 1, December	15 weeks 23 hours

Description

You are a waste conscious product designer who has noticed that people have been consuming more and more of our planet's resources, but you're not sure what to do about it. You saw a great video online of another designer who was repurposing an old material in a new way! One day, you meet your friend who tells you about an organization problem they're having. That's when you get the idea to help your friend organize themselves with materials that would have been thrown away!

Key and Related Concepts

Key Concepts

Key Concepts	Definition
Communities	**Communities** are groups that exist in proximity defined by space, time or relationship. Communities include, for example, groups of people sharing particular characteristics, beliefs or values as well as groups of interdependent organisms living together in a specific habitat.

Related Concepts

Resources, Perspective

Inquiry

Global Context & Explorations

Global Context & Explorations	Explorations to develop
Scientific and technical innovation	Products, Processes and solutions

Statement of Inquiry

Taking the perspectives of others allow designers to adapt the environment to their needs.

Inquiry Questions

Type	Inquiry Questions
Factual	Conceptual: How might we creatively utilize recycled materials to help us solve our community's problems?
Conceptual	Conceptual: Are people interconnected? How might individual problems impact others in our school community?
Debatable	Debatable: Is the client's perspective of the resources important?

Curriculum

Aims

Enjoy the design process, develop an appreciation of its elegance and power

Objectives

A: Inquiring and analysing

i. explain and justify the need for a solution to a problem

ii. construct a research plan, which states and prioritizes the primary and secondary research needed to develop a solution to the problem

iii. analyse a group of similar products that inspire a solution to the problem

iv. develop a design brief, which presents the analysis of relevant research

B: Developing ideas

i. develop a design specification, which outlines the success criteria for the design of a solution based on the data collected

ii. present a range of feasible design ideas, which can be correctly interpreted by others

iii. present the chosen design and outline the reasons for its selection

iv. develop accurate planning drawings/diagrams and outline requirements for the creation of the chosen solution

C: Creating the solution

i. construct a logical plan, which outlines the efficient use of time and resources, sufficient for peers to be able to follow to create the solution

ii. demonstrate excellent technical skills when making the solution

iii. follow the plan to create the solution, which functions as intended

iv. explain changes made to the chosen design and plan when making the solution

D: Evaluating

i. describe detailed and relevant testing methods, which generate accurate data, to measure the success of the solution

ii. explain the success of the solution against the design specification

iii. describe how the solution could be improved

iv. describe the impact of the solution on the client/target audience

Skills

- Research skills
- 3D modeling with TinkerCAD
- 3D modeling with SketchUp

ATL Skills

Approaches to Learning

Communication

- I. Communication skills

Exchanging thoughts, messages and information effectively through interaction

Negotiate ideas and knowledge with peers and teachers

Self-management

- III. Organization skills

Managing time and tasks effectively

Plan short- and long-term assignments; meet deadlines

Keep and use a weekly planner for assignments

Set goals that are challenging and realistic

Keep an organized and logical system of information files/notebooks

Developing IB Learners

IB Learner Profile

Inquirers

Thinkers

Communicators


Caring


Risk-takers (Courageous)

Connections

Information Communication Technology

"**Design Folder**". An all in one "hyperdoc" that allows for online learning to take place seamlessly. The redefinition in this case is that our class is blended and can easily vacillate between online or offline.
3D modeling. Students use TinkerCAD and/or SketchUp to create their final plans for their solutions.
Formative Feedback. The teachers will give **feedback** through Loom; the teacher can jump into the students' folders at any time because it's on Google Classroom and check their work. **ClassworkZoom** is also utilized to monitor the time and effort the students are putting into their work.
Client Interviews. Students interview one another through Flipgrid for documentation and because of distance.
Copyright. Students see the teachers model observation of copyright laws and they are required to conduct their own research, create a works cited page, and use in-text citations for their research into existing products and answers to their inquiry questions.

Assessment

Formative Assessment

Students will be formatively assessed at the end of each Criterion by verbal feedback in the form of a screencast. The teacher will go through the student's work and discuss the student's work relative to the rubric or mark bands.

Summative Assessment

At the end of the unit, students will submit their entire Design Folder as a portfolio in the form of a PDF on ManageBac. The students will not be judged on the function of their solution, but their design thinking.

Peer and Self-assessment

During our formative feedback stages, students will be invited to share their work with peers prior to the teacher's feedback.

MYP Assessment Criteria

N/A ☑ A: Inquiring and analysing

N/A ☑ B: Developing ideas

N/A ☑ C: Creating the solution

N/A ☑ D: Evaluating

Learning Experiences

Feedback

Students will receive ongoing "comments" in their Google Slides. They will also receive overall feedback on a Criterion by Criterion basis. Finally peer feedback will be utilized prior to the overall Criterion feedback from the teacher.

Differentiation

Students will be able to...

- Choose their own problem they want to have solved
- Choose how they would like to create their solutions for their partners
- Choose how they present their work
- The unit will have a blended approach in which the students can watch (or not watch) a video explaining each strand. It's up to the students to decide if they need to watch it.

Language Learners will have differentiation by...

- Choosing if they would like to use a written or video-based format to show their learning
- Having access to their Design Folder template that has command terms, translations into Korean and Chinese, and additional resources to understand the key vocabulary to the process.
- The teacher will complete an exemplar that *shows* a model for each strand of the unit.
- The videos mentioned above in the "blended approach" bullet point also have subtitles for language learners to enable.

Stream & Resources

Resources

Understanding the Problem:

The World is Slowly Running Out of Sand - materials, construction, environment, wealth gap

Books We Have on Sustainable Architecture:

Design Like You Give a Damn
Architechture - Biomimicry, chapter on how we can create zero waste system
Stuff Matters -Bamboo Architecture & Design

Examples of Sustainability:

How Bermuda's iconic white roofs overcome island's chronic freshwater shortage - Systems design, water, conservation
EarthShips
Gray water; toilets in Japan with handwashing before basin
Chadwick is LEED certified, campus tour
Bill Gates Netflix documentary with episode on toilets
William Kamkwamba of Malawi (TED Talks How I built a Windmill, How I Harnessed the Wind and Netflix Trailer)
Operation Sustainability: The World's Most Important Customer - animation, E-waste, technology, poverty, climate change, UNSDGs
This Bioplastic Made From Fish Scales Just Won the James Dyson Award - Product design, design from waste, product life
TV Series called "Building off the grid" - link to homepage
TV Series called Tiny House Nation - Netflix.
Kim's family member works at a water treatment plant. We could use FlipGrid to have kids pose questions and the she could respond to some of the kids. Like "skype a scientist", but asynchronously