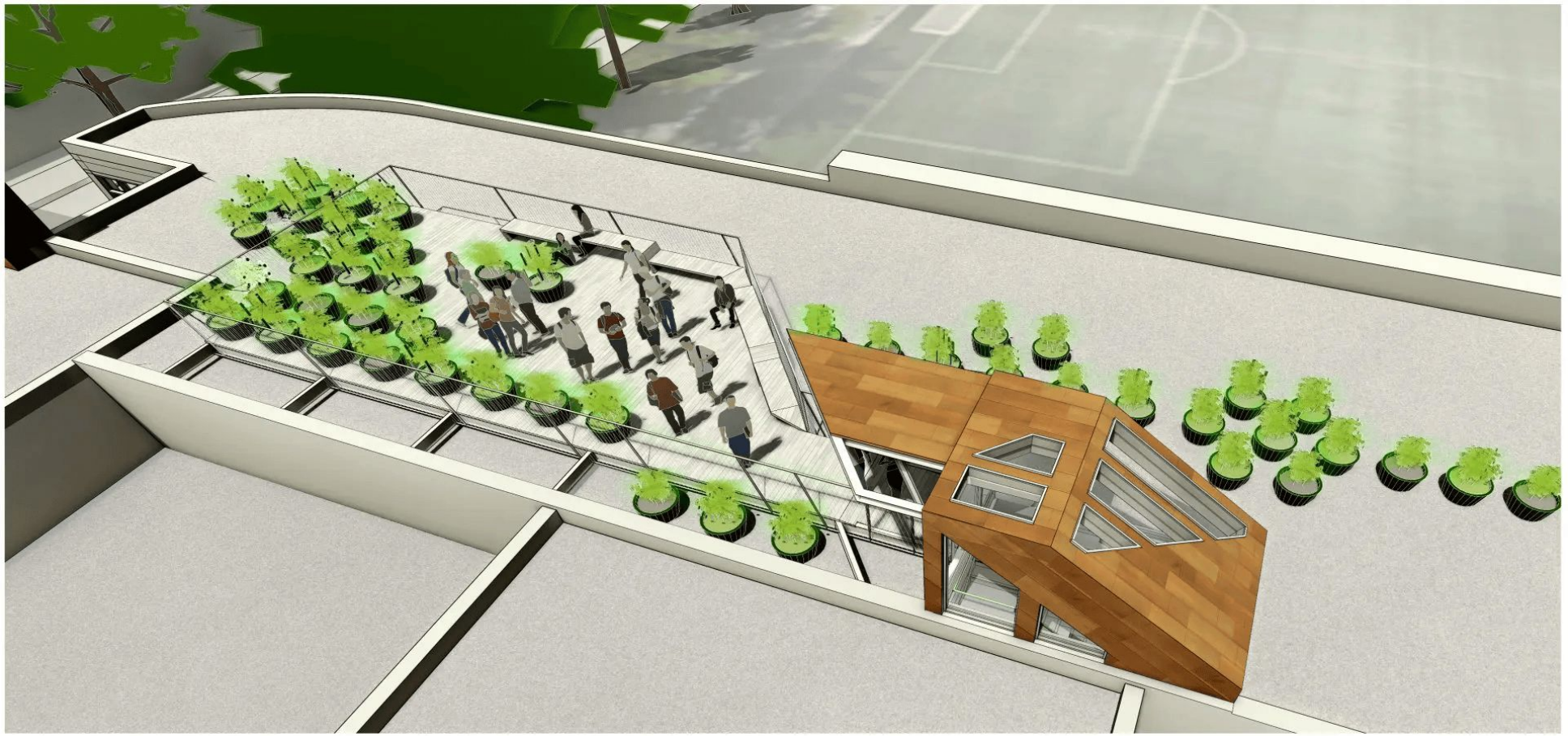
ECO FAIR DESIGN PROJECT

STUDENTS NAMES:



Key Concept: sustainability

Related Concepts: systems, form and function

Global context: globalisation and sustainability

STATEMENT OF INQUIRY

How can creative design solutions help address environmental challenges and raise awareness within a community?

Rationale: to explore ideas of **design for the environment** and how we can implement environmentally friendly practices to our immediate surroundings

Factual question: What design elements can support eco-friendly practices?

Conceptual question: How can design thinking be used to create solutions that address environmental challenges?

Debatable question: To what extent can a design project in a school setting inspire real-world change outside of the school community?

ASSIGNMENT SUPPORT

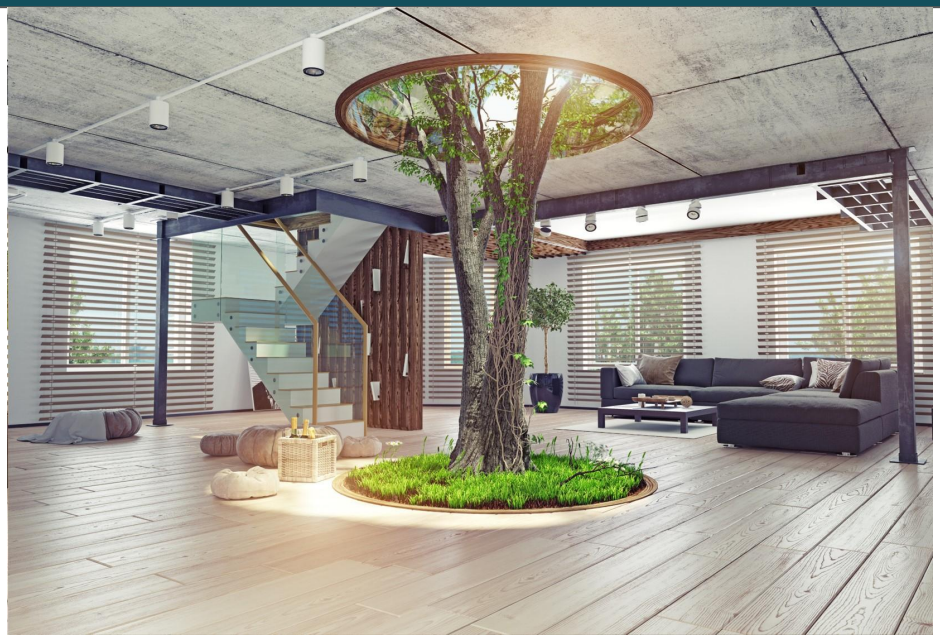
HOW TO DOCUMENT YOUR WORK

REFLECTING ON YOUR WORK

DESIGN JOURNAL TEMPLATES

DESIGN FOR THE COMMUNITY

How can your prototype inspire real-world change inside and outside of the school community?



THE CHALLENGE

Design and create a physical prototype that promotes awareness of your sustainability topic and inspires positive behavioral change.

The **eight topics are**:

- Food
- Energy
- Oceans
- Biodiversity
- Land
- Water
- Health
- Pollution

- Over the next **five weeks**, you will:
  - **Research** existing problems + existing solutions
  - **Brainstorm** & sketch possible solutions within your community
  - **Build** a working prototype
  - **Present** your houses final product during Eco-Fair & Design Fair

THE CHALLENGE

Design and create a physical prototype that promotes awareness of your sustainability topic and inspires positive behavioral change.

Specifications

- **Groups** will consist of your house members within your class. Each “group” must submit their own slides.
- **Size and space**: Your creation must fit within one of the storage bins found in the Fablab.
- **Physical prototype**: You must create a physical prototype, or Video. You are allowed to create organizational tools or systems (e.g., a system for sorting recyclables, a tool to help measure water use).
- **Visibility**: Your prototype should promote awareness of your sustainability topic and inspires positive behavioral change.
- **Materials:** Be creative in how you design the prototype. Use materials in the design class, and focus on form, function, and sustainability.
- **Tools:** You must use one the following tools: 3D printer - Laser Cutter - Micro Bit

Schedule

- ❑ Week 1 - Research the problem + Solutions + Eco Project
- ❑ Week 2 - Brainstorm + Sketch
- ❑ Week 3 - Build Prototype + 1st round of feedback
- ❑ Week 4 - Build Prototype + House Vote
- ❑ Week 5 - Presentation

RESEARCH LINKS

A good place to start

General Sustainable Design Resources:
Green Building Council (CGBC): www.cagbc.org
Green Building Information Gateway (GBIG): www.gbig.org
Architecture 2030: www.architecture2030.org
World Green Building Council (WorldGBC): www.worldgbc.org

Energy:
Energy.gov: www.energy.gov
National Renewable Energy Laboratory (NREL): www.nrel.gov

Water:
Water Research Foundation: www.waterrf.org
EPA WaterSense: www.epa.gov/watersense

Food:
Food and Agriculture Organization of the United Nations (FAO): www.fao.org
The Urban Farming Guys: www.theurbanfarmingguys.com

Oceans:
National Oceanic and Atmospheric Administration (NOAA): www.noaa.gov
The Ocean Conservancy: www.oceanconservancy.org

Biodiversity:
The Convention on Biological Diversity (CBD): www.cbd.int
The Nature Conservancy: https://www.natureunited.ca/

Land:
Environmental Protection Agency (EPA) Land and Waste Management: www.epa.gov/land-waste
Sustainable Sites Initiative (SITES): www.sustainablesites.org

Health:
Center for Health, Environment & Justice (CHEJ): www.chej.org
World Health Organisation: https://www.who.int/health-topics/climate-change

Pollution:
ECCC Canada: https://www.canada.ca/en/services/environment/pollution-waste-management.html
World Health Organisation: https://www.who.int/news-room/fact-sheets/detail/air-pollution

REVIEW

A // INQUIRING & ANALYZING

For this section your journal must provide evidence that:

Aii // CONSTRUCT

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

Aiii // ANALYZE

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

OUR GROUP'S TOPIC

Please insert your Topic & Create a Moodboard of your topic

Aii // CONSTRUCT

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

Define your topic. Why is it important to address this issue?

List a few problems that can be caused by this issue. Can you find examples of this happening? Provide sources.

KEEP YOUR ANSWERS BRIEF!

Aiii // ANALYSE

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

List two to three ways that your topic has been addressed in existing designs. Provide links to sources.

KEEP YOUR ANSWERS BRIEF!

REVIEW

B // DEVELOPING IDEAS

For this section your journal must provide evidence that:

Bi // Develop
develop design specifications, which clearly states the success criteria for the design of a solution

Bii // PRESENT
present a range of feasible design ideas, which can be correctly interpreted by others

Biii // PRESENT
present the chosen design and outline the reasons for its selection

Bi // Develop
develop design specifications, which clearly states the success criteria for the design of a solution

What do you want your design to address? What needs to be included in your design for you to consider it a success?

Relevance: Does the prototype address the environmental issue effectively?

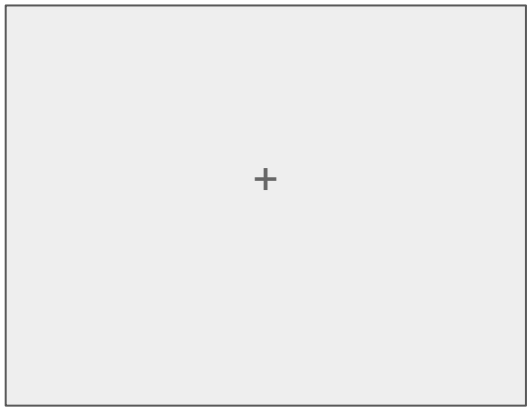
Creativity and innovation: Is the design unique and creative?

Practicality: Will the design be useful in the real world? Is it easy to implement or use?

Impact: Does the design have the potential to make a positive impact on the community?

Bii // PRESENT

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



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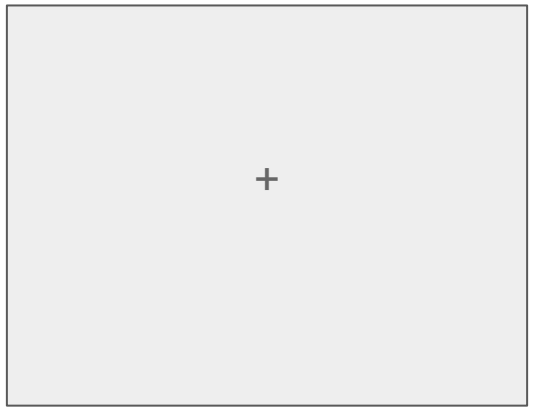

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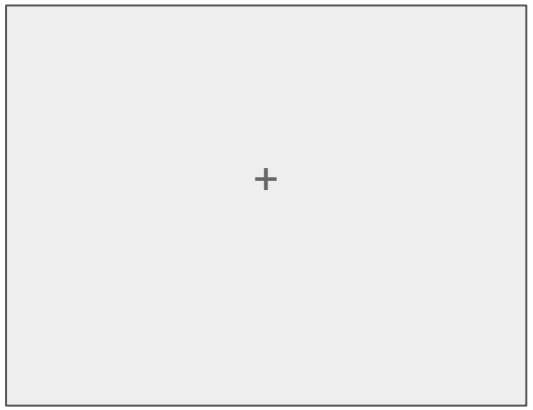

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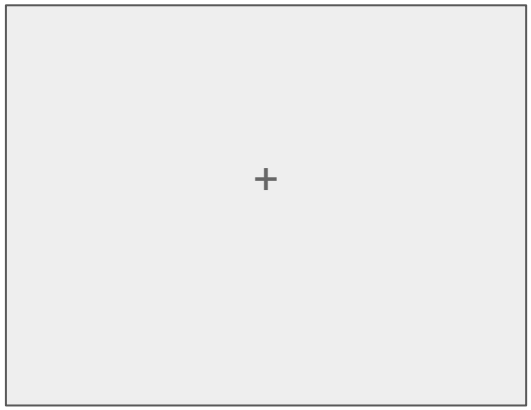

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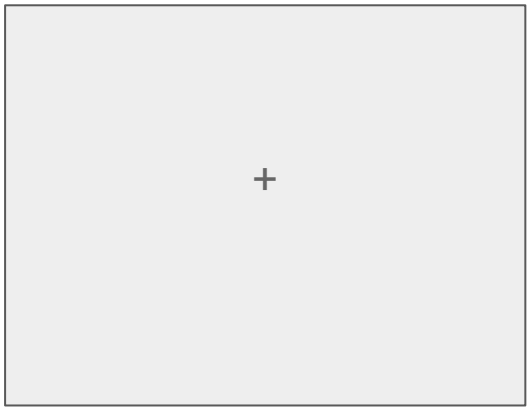

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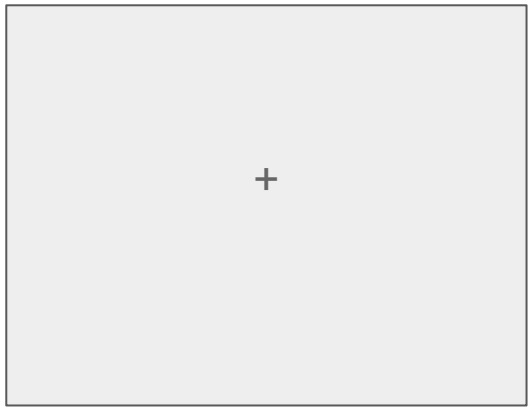
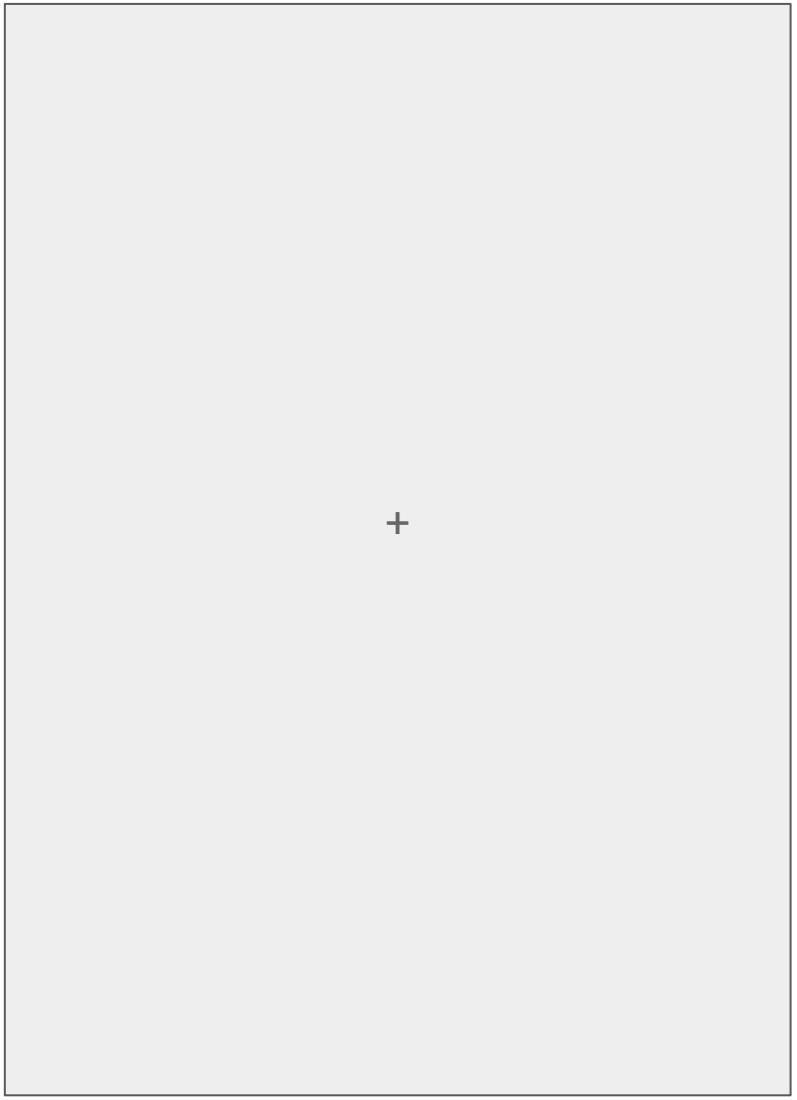


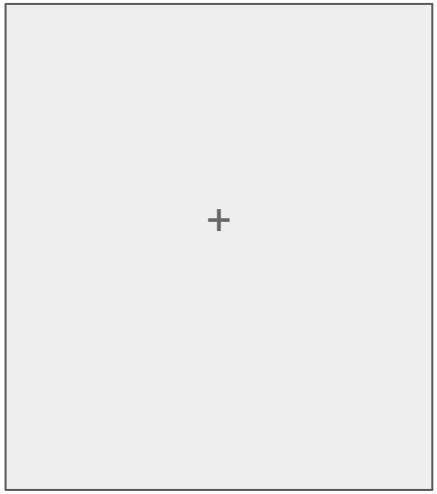
... insert a description of your design.

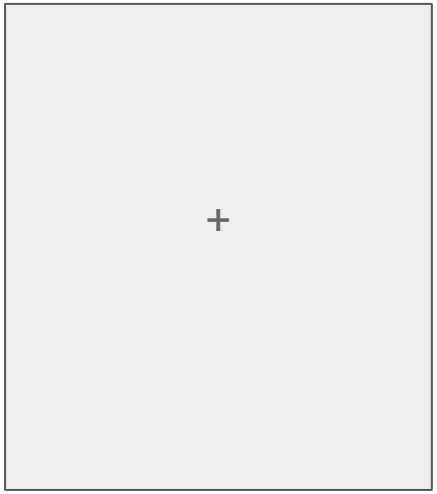
Biii // PRESENT

present the chosen design and outline the reasons for its selection



Sketches of your final design concept..





... describe why your group chose this design.

REVIEW

C // CREATING THE SOLUTION

For this section your journal must provide evidence that:

Cii // DEMONSTRATE

demonstrate excellent technical skills when making the solution

Ciii // CREATE

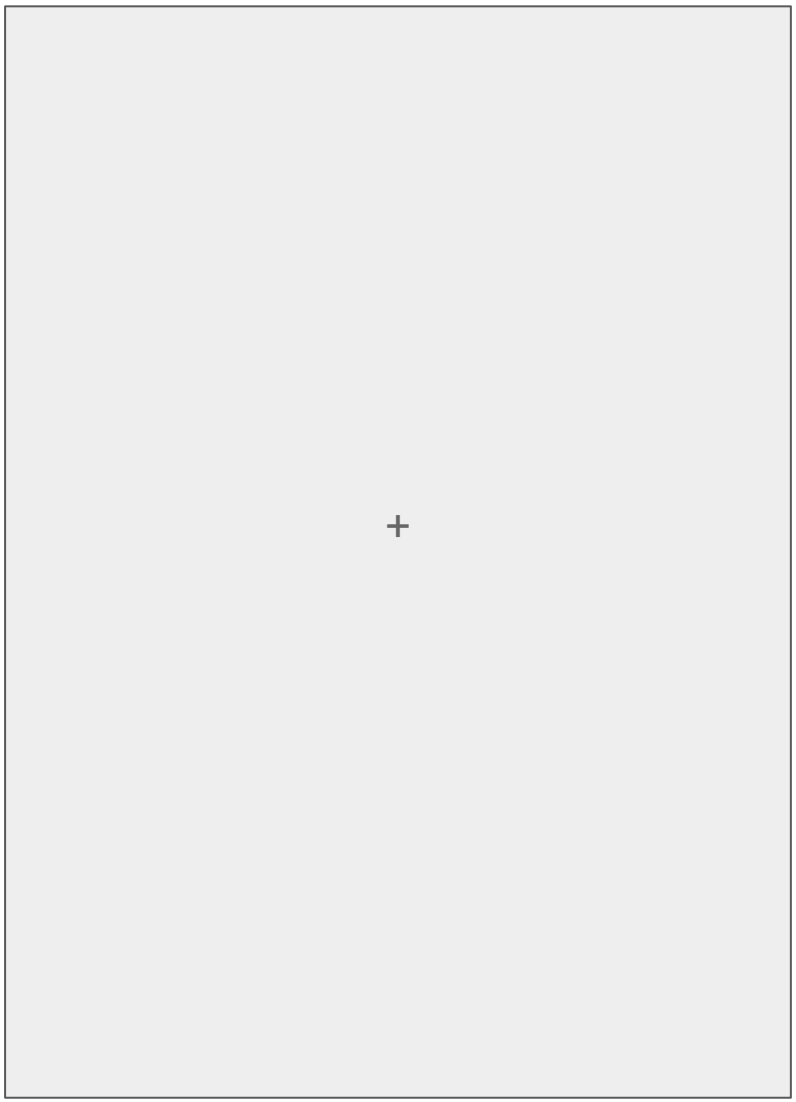
follow the plan to create the solution, which functions as intended

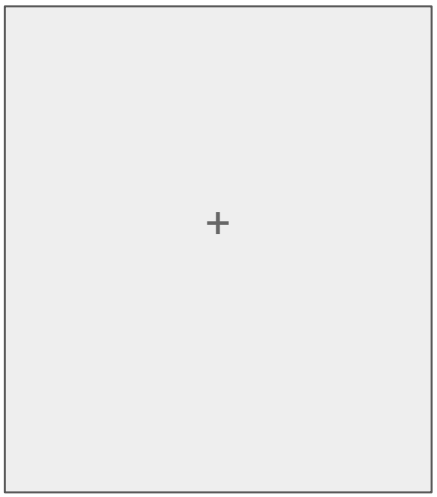
Cii // DEMONSTRATE

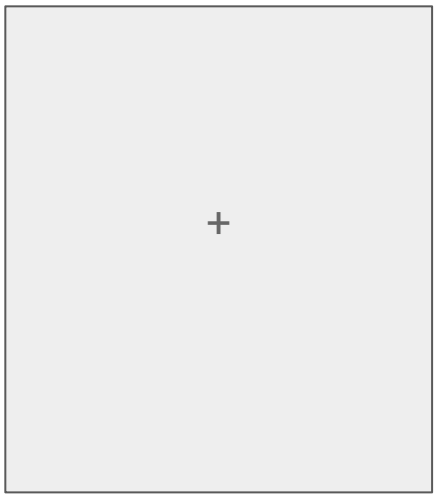
demonstrate excellent technical skills when making the solution

Cii

Document your process of building your physical prototype. Show me some of the steps you take while building your design.







... describe what is being depicted. (Add annotations and arrows to your pictures, too!)

Feedback Round 1

Get together with the different groups in your advisory. Each group should present their prototype. Provide feedback on how to improve their prototype.

Voting Criteria:

- **Relevance:** Does the prototype address the environmental issue effectively?
- **Creativity and innovation:** Is the design unique and creative?
- **Practicality:** Will the design be useful in the real world? Is it easy to implement or use?
- **Impact:** Does the design have the potential to make a positive impact on the community?

Reminder
It is not a competition, you are all helping each other create the best product.

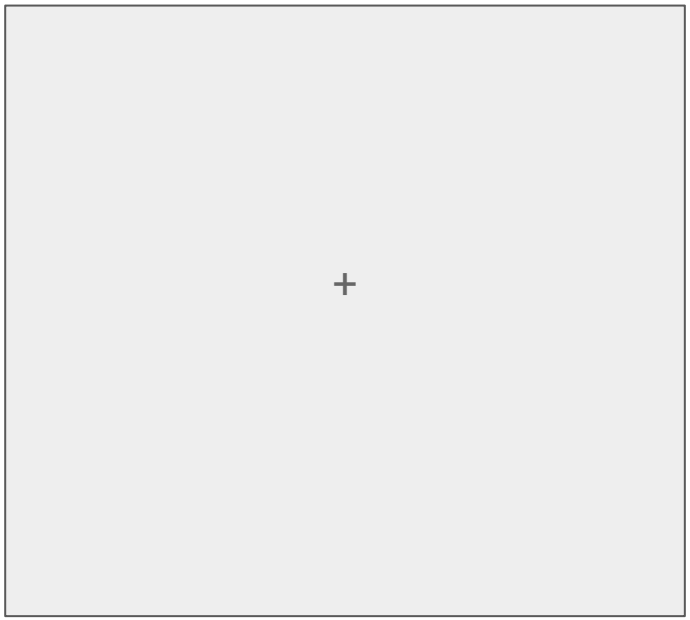
Reminder
Incorporate the feedback to improve your prototype

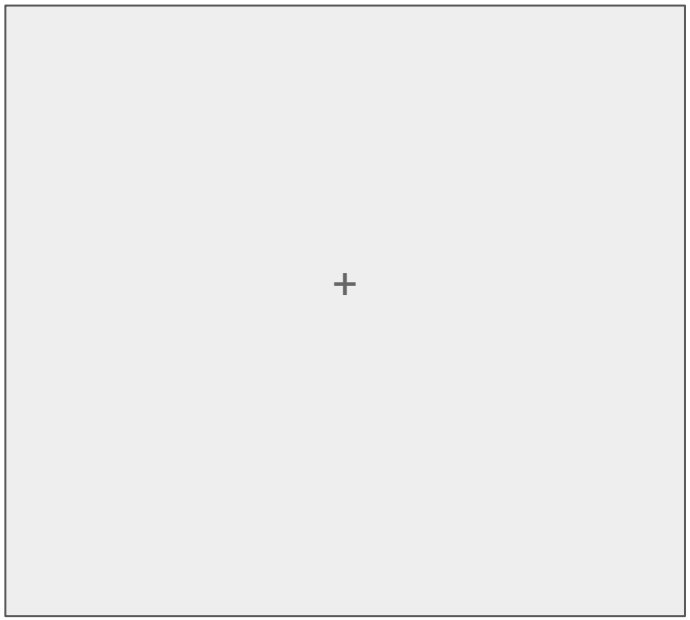
Document Feedback below:

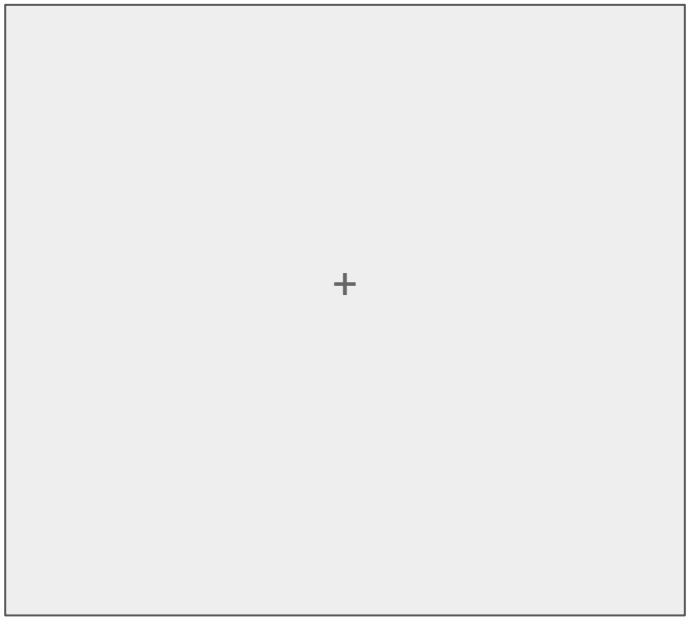
Ciii // CREATE

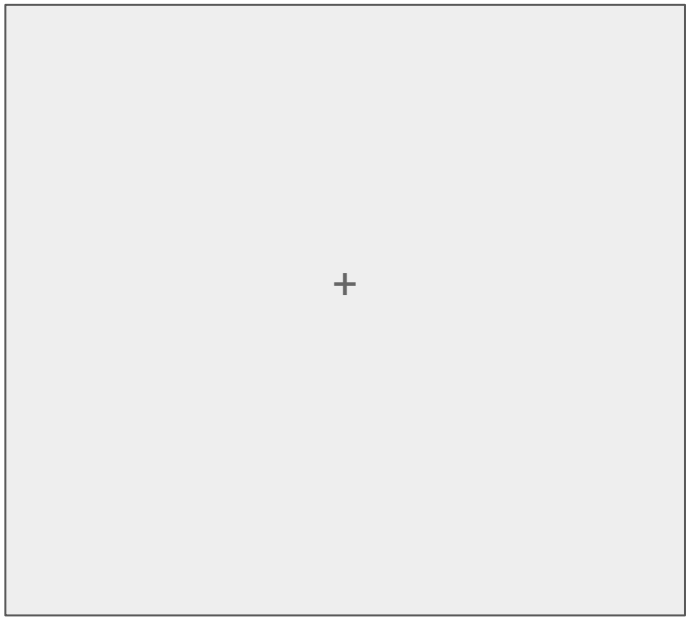
follow the plan to create the solution, which functions as intended

Ciii









CREATING THE SOLUTION

Documenting your process

... insert reflection / description / links here.

KEEP YOUR REFLECTION BRIEF! LET YOUR IMAGES SPEAK FOR THEMSELVES.

Vote

Once all the groups in your house have developed their prototypes, your entire house will gather together to vote on the best design. The winning design will represent your house at the ECO-FAIR & DESIGN FAIR.

Voting Criteria:

- **Relevance:** Does the prototype address the environmental issue effectively?
- **Creativity and innovation:** Is the design unique and creative?
- **Practicality:** Will the design be useful in the real world? Is it easy to implement or use?
- **Impact:** Does the design have the potential to make a positive impact on the community?

Reminder

Incorporate the feedback to improve your houses chosen prototype

REVIEW

D // EVALUATING YOUR IDEAS

For this section your journal must provide evidence that:

Diii // DESCRIBE

describe how the solution could be improved

Diii // DESCRIBE

describe how the solution could be improved

What challenges did you face while brainstorming solutions? How did your group overcome these challenges, and how did this improve your prototype?

What was your initial concept for the prototype, and how did it evolve during the project?

What changes or improvements did you make from the initial sketch to the final prototype, and why?

How did you decide on the materials and tools you used for your prototype? Were there any limitations or surprises when working with these materials, and how did you adapt?

In what ways did your prototype help address the environmental issue you researched? Do you feel your prototype effectively contributes to the solution, and why or why not?

KEEP YOUR REFLECTION BRIEF! ONE OR TWO SENTENCES SHOULD BE ENOUGH.

TEACHER FEEDBACK

(this slide stays at the end of your evidence journal)

Your work has been reviewed for evidence of your work according to the different criteria in the design cycle. Evidence comes in the form of documentation, class work, and presentations of your work.

INQUIRING & ANALYZING

Ai - **Explain** & Justify the need

7

1-2 3-4 5-6 

Aii - **Identify & Prioritize** the research

1-2 3-4 5-6 7-8

Aiii - **Analyze** existing products

1-2 3-4 5-6 7-8

Aiv - **Develops** a Design Brief

1-2 3-4 5-6 7-8

CREATING

Ci - **Constructs** a plan to follow

1-2 3-4 5-6 7-8

Cii - **Demonstrates** technical skills

1-2 3-4 5-6 7-8

Ciii - **Creates** product as intended

1-2 3-4 5-6 7-8

Civ - **Justifies** changes made to product

1-2 3-4 5-6 7-8

DEVELOPING IDEAS

Bi - **Develop** design specifications

1-2 3-4 5-6 7-8

Bii - **Develop** design ideas

1-2 3-4 5-6 7-8

Biii - **Present** the chosen design

1-2 3-4 5-6 7-8

Biv - **Develop** planning drawings/diagram

1-2 3-4 5-6 7-8

EVALUATING

Di - **Designs** testing methods

1-2 3-4 5-6 7-8

Dii - **Evaluates** successes

1-2 3-4 5-6 7-8

Diii - **Explains** potential improvements

1-2 3-4 5-6 7-8

Div - **Explains** impact of design experience

1-2 3-4 5-6 7-8

EXAMPLE

EXAMPLE

Cii // DEMONSTRATE

demonstrate excellent technical skills when making the solution

Cii

Document your process of building your physical prototype. Show me some of the steps you take while building your design.

Final prototype

Cutting cardboard

Tube idea

Our first idea was to make the net part tubular but then we noticed that not everything could fit through the smaller hole. So instead, we decides to make a box that lead into the garbage or recycling. We also recognized that the garbage bin has a different entrance shape than the recycling. So, we matched the shape and made net more rectangular to fit it better. Even though it might not look great, it works great and the real version will look more cleaned up.

19

Ciii

In Action

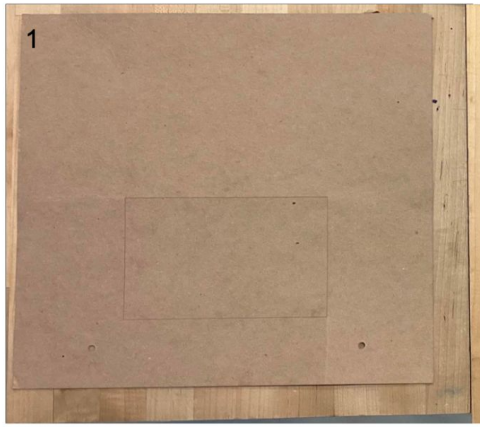
Test #1 with prototype

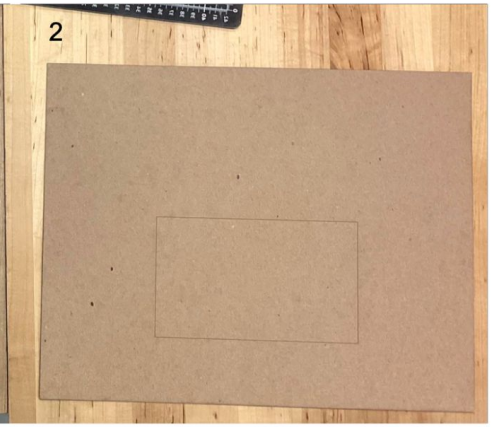
20

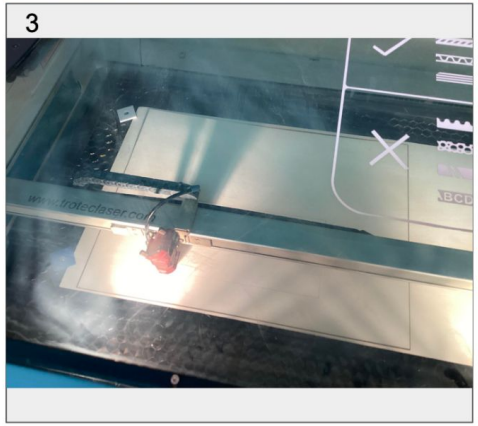
Ciii // CREATE

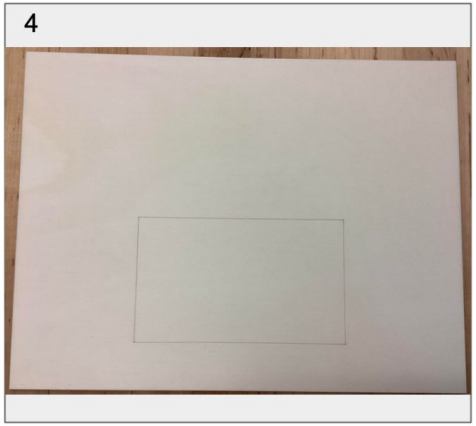
follow the plan to create the solution, which functions as intended

Ciii









CREATING THE SOLUTION

Documenting your process

The first photos are prototypes we built, we firstly, we realize that the first was too big, so we built the second one which could fit into the criteria. The criteria is: it has to fit in the white box. The third photo is the laser cutter cutting our backboard after testing with our prototypes. The fourth picture photo is the photo of the backboard final product.

KEEP YOUR REFLECTION BRIEF! LET YOUR IMAGES SPEAK FOR THEMSELVES.

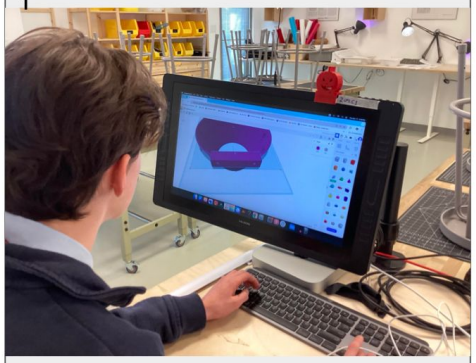
22

Ciii // CREATE

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

Ciii

1



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CREATING THE SOLUTION

Documenting your process

The first and second photo represents Luca building our rim design on Tinkercad spending two hours after school. The third photo shows the final 3D model of our rim inside the 3D printer. The fourth photo was us removing the support after it was finished in the 3D printer. After all these steps, our rim was complete.

KEEP YOUR REFLECTION BRIEF! LET YOUR IMAGES SPEAK FOR THEMSELVES.

23

Ciii // CREATE

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

Ciii

1

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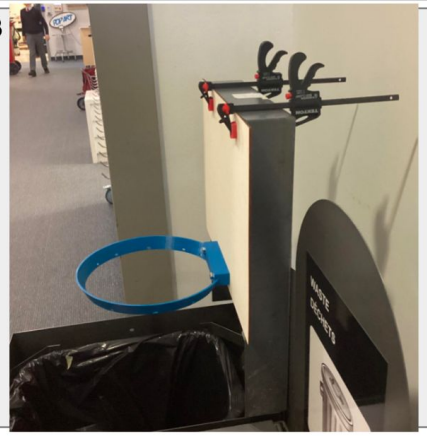

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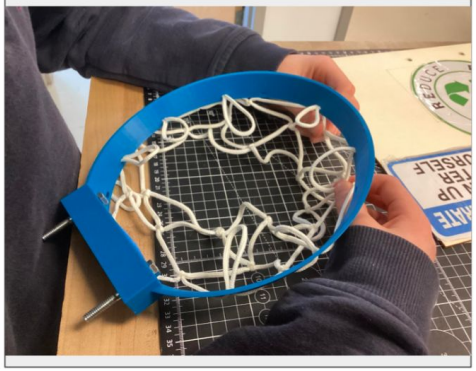

CREATING THE SOLUTION

Documenting your process

In the first photo, we were tracing out the outlines for the screws of the rim to go into the backboard. In the second picture Mr. Undeen was drilling in the holes and we had to make sure the screws was a bit bigger than the actual bolt. In the third photo we decided to lift up the back of the recycling bin and add clamps so that then it could stand up better without making a new attachment. We also made sure that its the LCC colours. In the last photo, we were attaching the net to the rim.

KEEP YOUR REFLECTION BRIEF! LET YOUR IMAGES SPEAK FOR THEMSELVES.

24

Cii

Final product:

Test with grade 7er

We decided to make stickers to encourage people to recycle and clean it up if they missed the entire net. We used clamps to attach the backboard to the recycling bin. We also added our house logo so people know we made it. In addition, we made our product easy to break down so it could fit into the white box.

25