Innovation Project

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Play · Experience · Learn

Innovation Project

- Don’t rush into your prototype
  - Think of a few good problems
  - Do your research
- Allocate lots of time
  - Iteration is important (...you’ll get points for this)
  - You may need to investigate a few different problems
  - You may need to create more than one prototype

Workflow

1) **Identify** a few potential problems
2) **Plan** your research
3) **Select** a problem
4) **Design and Build** your prototype
5) **Test** your solution and get feedback
6) **Iterate** through steps 4 – 6 (Important!)

IDENTIFY

- Theme for 2022 (Superpowered)
- Energy
  - Source (how it is generated)
  - Distribution
  - Storage
  - Used
- Explore improving...
  - Efficiency, reliability, affordability, accessibility, sustainability

IDENTIFY

- Come up with a few different problems, write it down (target to have 1 for each group member)
- Don’t worry if it’s not perfect, we can add on later
- Any problems will do, doesn’t matter if the problem doesn’t seem like a good one or if you don’t have a solution
- Read up a little on each problem; this is not a full research, it’s just to gain a basic understanding

IDENTIFY

Some questions to help you get started…

IDENTIFY

- Renewable Energy
  - Are renewable energy sources reliable?
  - How can we store energy when the wind is not blowing or the sun is not shining?
  - How do we make the use of renewable energy technologies more widespread?
  - What is the impact of using these renewable technologies?

IDENTIFY

- Hydroelectric
  - How could surplus energy from renewable sources be used in your community?
  - How is energy used in industries and homes?
  - How is water in the oceans used to capture energy?
  - Could water be used to capture energy where you live?

IDENTIFY

- Non-Renewable Energy
  - How widespread is the use of nonrenewable resources?
  - Why is it difficult to stop using nonrenewable energy?
  - What solutions combine the use of renewable and nonrenewable energy sources?
  - What are the impacts of using nonrenewable energy sources?
  - What carbon capture technologies are being developed?

IDENTIFY

- Storage and Transmission
  - What are smart grids? How do they supply electricity to consumers?
  - How could we alter the demand for electricity so that consumers use it when the electricity is abundant?
  - How could energy be stored in your community so it is available when you need it?
  - How do rechargeable batteries work? Why is this better than using disposable batteries?

IMPORTANT

- Document everything, notes, sketches, websites that you have read, etc
- You should start a slides deck NOW, and use it to record everything (...don’t need to be neat or nice looking)
- You’ll need to show your learning journey during your presentation

PLAN

- Shortlist 2 or 3 problems to research on
- Make sure you read up on the problems before you start shortlisting
  - This is not a lottery or popularity contest; don’t choose randomly or without understanding the problem

PLAN

- What do you need to research on? Start with these questions…
  - If energy is wasted, how much is wasted? Research on how to calculate or measure this.
  - Are there existing solutions to the problem? If there are, what are the issues with these solutions?
  - Is the problem related to people's behavior? How can you research this? Survey?
  - Are there experts that you can talk to? Where can you find these experts? What will you ask them?

PLAN

- Online research
  - Easiest. You will definitely do this, but don’t just rely on this.
- Survey
  - Good for some types of problems. Will take some effort.
  - Create new knowledge instead of just using existing knowledge
- Measure
  - Take measurements at home and in school (eg. energy usage)
- Interview Experts
  - Can be useful when you don’t know what to research on
  - Takes effort to arrange. Be brave and just ask. Many experts will be happy to talk to you. Worst case is that they’ll ignore you and you waste 5 mins emailing them.

SELECT

- Choose a problem to solve
  - You don’t need a ready solution; it’s OK to choose a problem that you don’t have a solution for yet
  - Make sure you understand the problem thoroughly
  - Think Global, Act Local
    - Best to have a problem with a global impact, but also small enough that you can solve within your own community

DESIGN AND BUILD

- Coming up with solutions
  - Brainstorming
  - Worst Possible Ideas
  - Random Image Technique

- Sketch your idea
  - Provides clarity on the idea (Dumb ideas often seem great… until you put it down on paper)
  - Make sure everyone in the team understand the solution

DESIGN AND BUILD

- Build your first prototype
  - Don’t plan to complete your prototype before the presentation date…
  - ...plan to complete 10 prototypes before the presentation date
  - Thomas Edison created 10,000 prototypes before he got one light bulb that worked and he’s a really smart guy. Do you expect your first prototype to be successful?

DESIGN AND BUILD

- Work fast
- Build lots of prototype
- Keep making improvements
- Document everything (...including the failures, you'll need to present it)

TESTING

- Test your prototypes
- Measure performance
  - eg. Energy saved, energy produced, cost savings.
  - Don’t know how to measure? You should have researched that during the planning phase
- Get feedback
  - Can be from regular users…
  - ...but better if it’s from experts

ITERATE

- Repeat the design, build, test process
- Document everything

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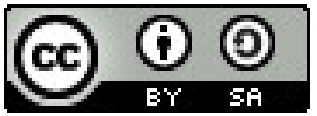

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