Weather Station V2 Design Brief

Our goal

Our goal is to improve the design and deployment of our weather stations before the development of V2.Your help and designed solutions created today will be used by our team to improve the weather stations for the future.

Criteria for success

The design can include improvements to the weather stations themselves, or the improvements might be connected to the deployment and maintenance of the weather stations. The weather stations are currently $150 per unit. You need to calculate how much additional cost your improvements will add to the cost per unit.

Your job

- Today you will be working in groups to solve a design issue the weather stations currently have.
- Once you have read through your problem, work as a team to develop some questions you can ask us (Dylan, Jordan, or Lauren) to learn more about the problem.
- Use the design proposal worksheet to answer all our questions about your solution. Make sure you draw how the new solution would look as well!
- Once you and your team are happy with the solution, prepare how you are going to present your work to the rest of the class.

Due dates

- Your work is due back to us today!
- You have 25 minutes to plan your solutions. This 25-minute block includes drafting and brainstorming as a team, filling in the design brief worksheet, AND drawing a copy of your solution.
- You then have 10 minutes to finalise the design, and prepare to present to your class. Use the prompt finalising questions to help you.
- One group at a time, you will present your solution to your teacher, the Townsville City Council staff, and the rest of your class.

Weather Station V2 Brainstorming Questions

What problem are you solving?

What are some key ideas?

What do you need to know more about to solve the problem?

What ideas do you have already?

How are you going to work as a team to solve this problem?

What questions do you want to ask your Environmental Sustainability Team Member?

Weather Station V2 Finalising Questions

What problems are you solving?

How are you going to solve the problem? What are you going to change?

What are the costs of your solution? what is the cost per weather station if you include your changes? (The weather stations currently cost $150 each)

Why do your changes improve the weather station?

Does your solution meet the design brief?

How are you going to set out your information to share with the class?

Weather station V2 Fact Sheet

Water resistant and waterproof

- Water resistant is able to stop water from damaging the technology to some degree, but not entirely. Waterproof means that the technology cannot be damaged by water. Water resistant and waterproof materials include things like rubber, silicone and wax. These materials unfortunately would impede on the environmental sensors ability to take measurements.
- Waterproofing would cost roughly $..... but would also have a greater negative impact on the data collection process in the weather station.
- To make the weather station water resistant, it would cost roughly $....

Wind energy

- Wind energy can work in the sun or shade, and it can still work at night-time. But what happens on a day with little to no wind? How big or small will the wind turbine need to be? How can we get a wind turbine to fit on the weather station?
- The cost is roughly $150 per wind turbine.
- This wind turbine produces heat when operating and is connected with metal screws that will also add heat to the weather station. Is there a way to replace these metal screws and reduce the heat emitted from the turbine? How are you going to connect the wind turbine to the weather station? How can you make sure it will be secure?

Is it a bomb?

- Residents, who have not been told about our projects, can sometimes be confused by our weather stations. We have had reports to our customer service teams of concerned residents thinking that the blinking lights on the weather station are a bomb.The lights on the weather station are a part of the sensor circuit board. Is there an effective way to educate our residents about the weather station, to avoid confusion? Or is there a way to camouflage the weather station and its blinking lights?
- The way we typically inform residents about council works is through mailbox flyer drops, advertising and signage. Which option do you think would be the most cost-effective way of informing residents? Do we need a sign at every weather station? How many mailboxes would we need to drop flyers into? Is advertising too expensive? Is there another way to let people know that the devices are weather stations?

Materials

- Plastic is also not the most sustainable material. It will also deteriorate in the sun over time. What other materials could be used in replacement of plastic? The cost of plastic per weather station unit is $8.

Steel: $40 per weather station

- Heavy
- Strong
- Rigid
- Absorbs heat - material would heat up under sunlight
- Would withstand environmental conditions

Bamboo: $30 per weather station

- Strong
- Light
- Heat resistant
- Would withstand environmental conditions
- Bamboo shrinks more than any other type of timber

Recycled Plastic: $16 per weather

- Strong as regular plastic
- Would withstand environmental conditions
- Same benefits of the current material (plastic) but is made from plastic waste - saving space in landfill station

Treated Timber: $40 per weather station

- Heavy
- Rigid
- Strong
- Heat resistant
- Would withstand environmental conditions

Plant Based Plastic: $40 per weather station

- Strong
- Light
- Heat resistant
- Would decompose in the environment in 3 - 6 months

Carbon Fibre: $70 per weather station

- Really Strong
- Very light
- Heat resistant
- Would withstand environmental conditions

Weather station V2 design proposal

Diagrams for weather station proposal