

Climate-Resilient Housing Design Challenge

BC Urban Streams & Watersheds

A UNIT PLAN FOR **GRADE 7**



This resource is part of the BC Urban Streams & Watersheds lesson plans, assembled in 2025. Learn more and download additional resources at www.engagewithnbs.ca/for-schools

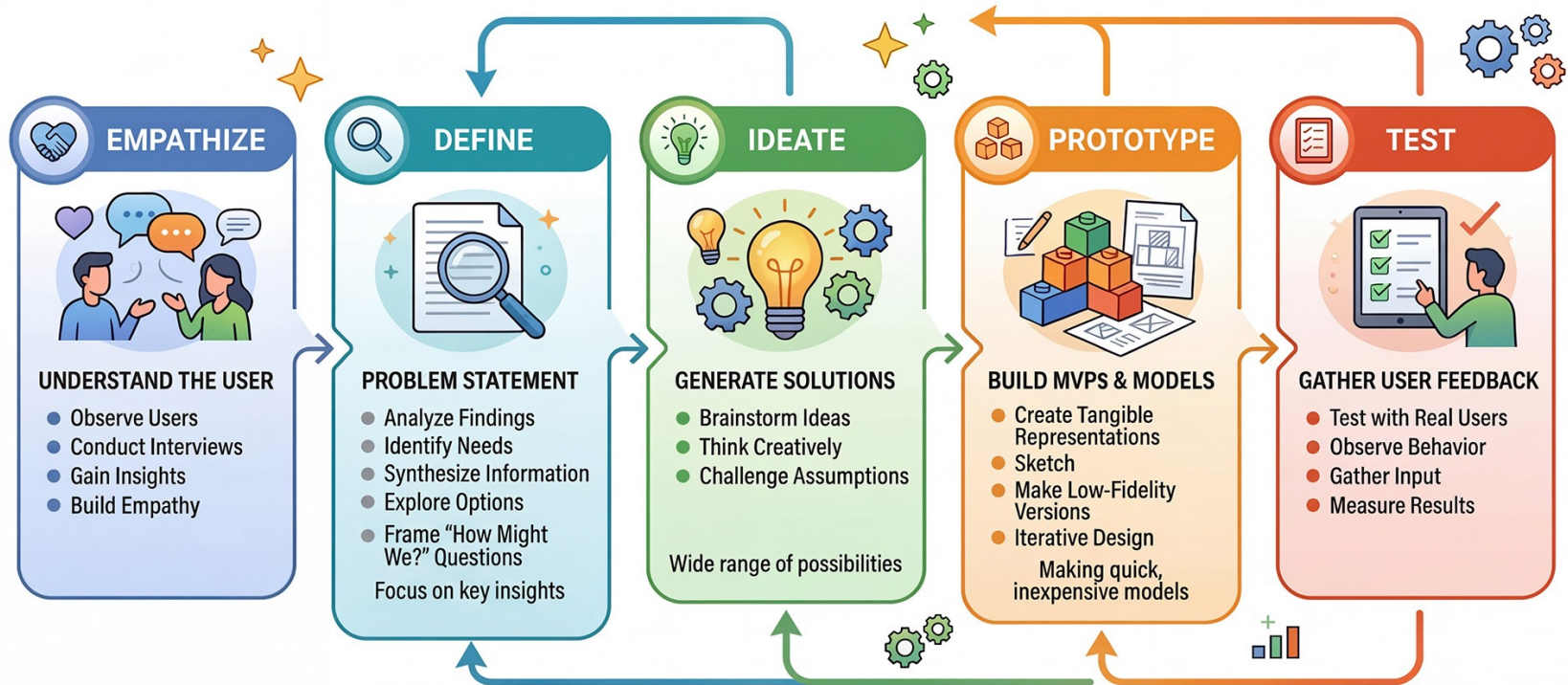
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*What can design do to
provide affordable
climate-resilient housing?*

DESIGN THINKING PROCESS

A structured, human-centered approach to innovation and problem-solving



The Problem

- Climate change brings new weather conditions that most homes are not prepared for.
- Natural disasters such as floods or storms can damage or destroy homes, leaving many people homeless.
- In many places, especially near creeks and rivers, these problems are made worse by how we've built our cities, such as covering land with impervious surfaces (like concrete or asphalt), removing natural buffers, and interrupting the water cycle. When water can't soak into the ground, it rushes into urban streams and watersheds, causing pollution, erosion, and flash floods.



DEFINE



PROBLEM STATEMENT

- Analyze Findings
- Identify Needs
- Synthesize Information
- Explore Options
- Frame "How Might We?" Questions

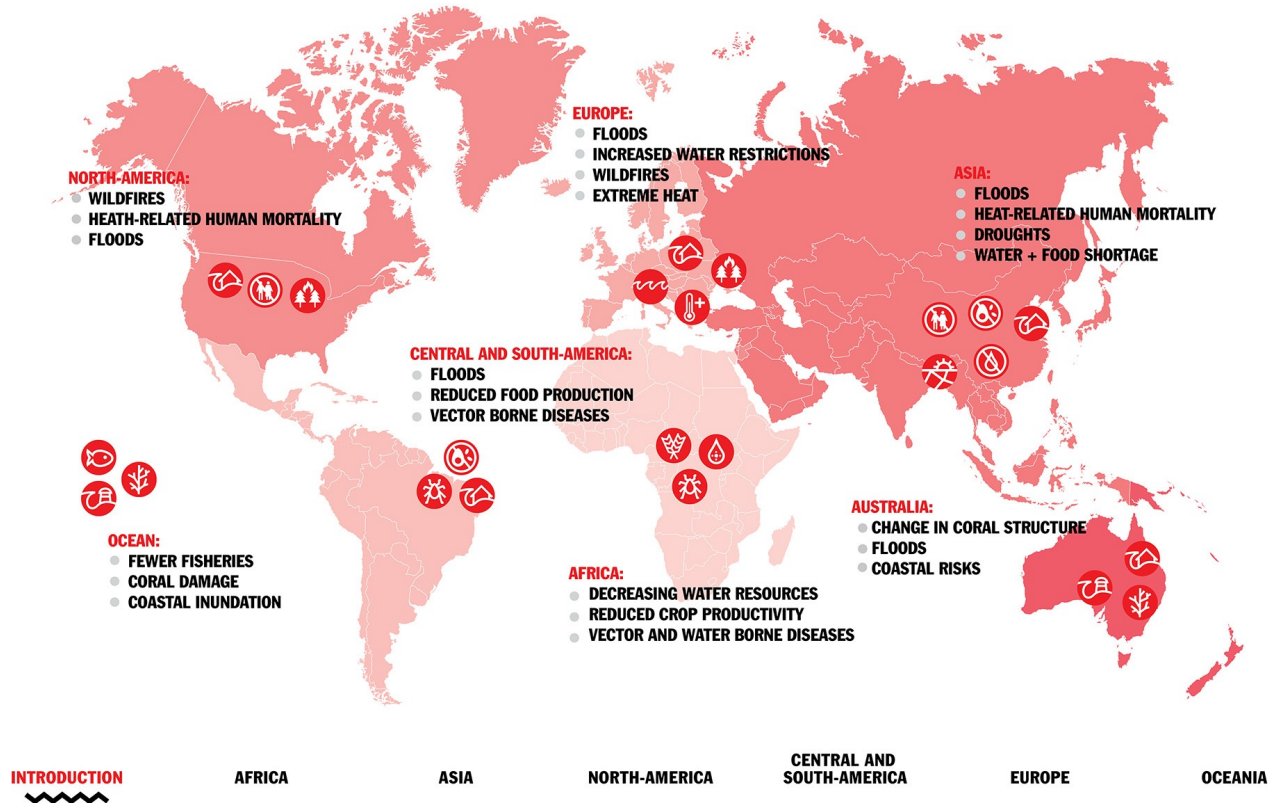
Focus on key insights



From the US National Oceanic and Atmospheric Administration (NOAA)
<https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts>

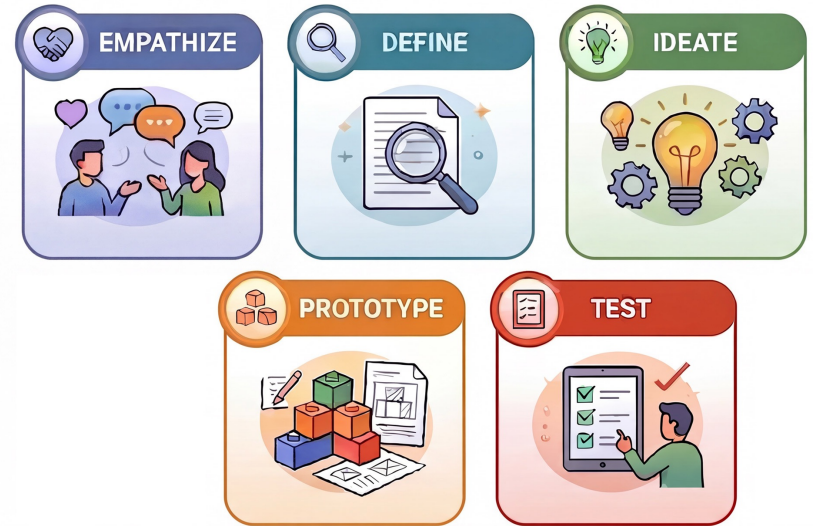
REGIONAL KEY RISKS

SOURCE



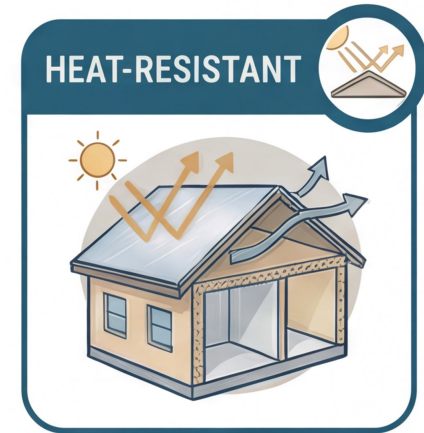
The Opportunity

- Consider creating affordable homes that safeguard people living in areas that are at risk from climate change consequences such as rising seas, floods, landslides, and heatwaves.
- Think about how to strengthen existing homes so people don't have to move. Explore the use of passive heating and cooling technologies and renewable energy to ensure that the homes still have energy after natural disasters.
- List ideas and design considerations that protect people and reduce the impact on streams, wetlands, and riparian zones.



Why it's important?

- Design products and environments that empower people to cope with climate change.
- The objects, buildings and places designers create can empower people to deal with the changes they will experience in their supply of water, food, and energy, and the threats to their home and health.



EXAMPLE:

A Living Green Wall

Gary Grant of Green Roof Consultancy designed this “living wall” on the exterior wall of the Rubens at the Palace hotel in Victoria, London, to reduce urban flooding and air pollution. The wall containing 10,000 plants and 16 tons of soil and is designed to attract bees, butterflies and birds. The 10,000 plants are irrigated by harvested rainwater from storage tanks on the roof, which Grant says will reduce flooding at ground level. Covering an entire facade of a hotel, the 350 square metres wall of vertical plants is the largest in London.



EXAMPLE:
Bowl-shaped Roofs
to Collect Water



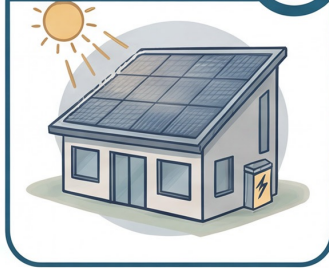
BM Design Studios have proposed buildings with bowl-shaped vessels on their roofs to collect rainwater in hot and dry climates like this primary school in Iran.

DEFINE Your Design Challenge

FLOOD-PROOF



SELF-POWERED



WATER-SMART



HEAT-RESISTANT



STORM-DURABLE



DEFINE



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Focus on key insights

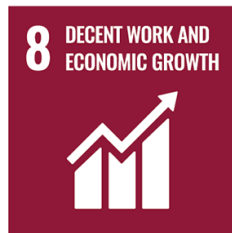
Your Design Challenge

Considering **Goal 11: Sustainable Cities and Communities**, **Goal 13: Climate Action**, and one other goal of your choice, design an affordable disaster-proof house.

- Present your prototype to the class.
- Explain your design process, watershed context, and climate solution.
- Reflect on what you learned and how your design could make a difference.



SUSTAINABLE DEVELOPMENT GOALS



Design Considerations

- **REGION or LOCATION**
 - **MATERIALS**
 - **CLIMATE CONCERNS**
-

Climate Considerations

- **ENERGY:** Research “clean” energy solutions (like solar, wind, hydro, geothermal)
 - **COST:** Consider affordable materials
 - **SUSTAINABILITY:** Long-lasting housing and materials
 - **DESIGN:** Disaster-proof housing
-


Brainstorm & share ideas

Use the Climate-Resilient Housing Design Challenge map


Climate-Resilient Housing Design Challenge map

Name: _____

Group Members: _____



EMPATHIZE: Who/what would be the user of my prototype?	DEFINE: What is the design problem we are solving and why is it worth solving?	DEFINE: What do we want our design to do so it helps solve the problem?
IDEATE: What are some ideas that I have?	IDEATE: What are some ideas that my partners have?	IDEATE: What is one combined idea?

 This resource is part of the DC College Resilience & Weather-Ready Future plan, committed to equity, equity and digital and additional resources at engagewithnsf.org/

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IDEATE

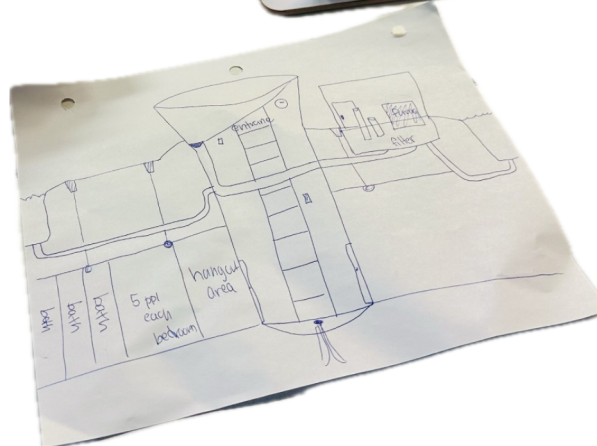


GENERATE SOLUTIONS

- Brainstorm Ideas
- Think Creatively
- Challenge Assumptions

Wide range of possibilities

Build a prototype using LEGO



PROTOTYPE



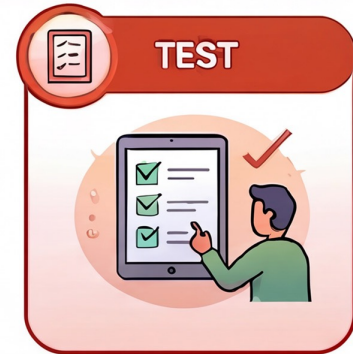
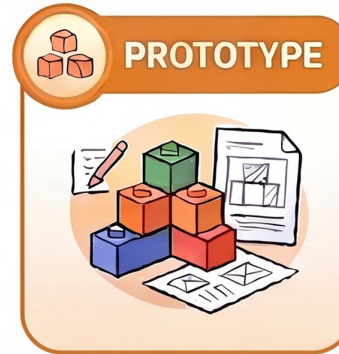
BUILD MVPs & MODELS

- Create Tangible Representations
- Sketch
- Make Low-Fidelity Versions
- Iterative Design

Making quick,
inexpensive models



Design Thinking!





engage with Nature-Based Solutions

communities in local stewardship of lands & waters

Learn more at www.engagewithnbs.ca