

# AIA Climate Action Design Challenge

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Discover how architecture & design support climate action!

Learn how design elements and strategies can address climate issues such as natural disasters, rising sea levels, high temperatures, and more.

Students will be prompted to build and/or modify a pre-designed building using “building materials” to help solve ten climate-related environmental issues.



# Getting started

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## REQUIRED SUPPLIES

- AIA game cards
- Building materials (e.g., LEGO bricks; building blocks; pen and paper; cardboard; popsicle sticks, etc.)

If using LEGO bricks and pre-building structures, watch any of the following sample videos for instructions.



BUILDING  
SAMPLE ONE



BUILDING  
SAMPLE TWO



BUILDING  
SAMPLE THREE



BUILDING  
SAMPLE FOUR



# Instructions

# Instructions

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- Discover how architecture & design support a healthy planet through ten fun activities!
- Consider how different features can address climate issues such as natural disasters, rising sea levels, high temperatures, and more.
- Use bricks, household items, or pen and paper to build or sketch solutions to ten environmental issues.
- Activities can be done as a group or independently. Share your creation with friends, family or classmates. Take a photo and ask a teacher or adult to post your solutions on social media [#becomeanarchitect!](#)
- Scan the QR code on each challenge card for a sample case study.

Keep exploring on [aia.org/becomeanarchitect](https://www.aia.org/becomeanarchitect)



# Definitions

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**Climate action and climate justice:** Engagement, advocacy, planning, and design that lowers emissions; builds resilience and capacity; supports human, cultural, and ecological health; and protects all communities from climate change.

**Embodied carbon:** The greenhouse gas emissions from manufacturing, transportation, installation, maintenance, and the disposal of building materials.

**Alternative energy/renewable energy:** Substitutes for petroleum products that generate and store electrical power, such as wind, solar, hydropower, and others.

**Ventilation:** The provision of fresh outdoor air into a room, building, or public area and distributing the air within the space.

**Sustainability:** The development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

**Resilience:** The ability of a system to anticipate, absorb, accommodate, or recover from the effects of a hazardous event, while ensuring the preservation, restoration, or improvement of its essential basic structures and functions.

**Heat waves:** Prolonged excessive temperatures associated with atmosphere-related heat stress. In 2019, extreme heat was the most common cause of death among all weather-related disasters in the US.

**Rainwater harvesting:** The collection and storage of rainwater in a tank, cistern, reservoir, or aquifer.



# AIA CLIMATE ACTION DESIGN CHALLENGE

1

**Design for  
pedestrians  
& traffic flow**



# 1

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**Traffic jam! Architects plan design elements to encourage people to walk, bus, or bike to buildings.**

## **TASK**

Use the building materials to create ways to reduce vehicle use and traffic.

## **ENVIRONMENTAL BENEFITS**

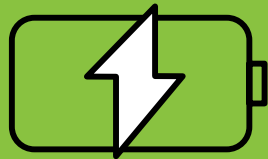
- Reduces carbon emissions from traffic congestion
- Encourages exercise
- Reconnects people with nature



# AIA CLIMATE ACTION DESIGN CHALLENGE

2

**Design for  
renewable  
energy**



# 2

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**Buildings are responsible for 40% of carbon emissions every year! Architects add renewable energy sources to their designs to reduce carbon emissions.**

## **TASK**

Use the building materials to create ways for your building to produce its own energy using natural energy sources.

## **ENVIRONMENTAL BENEFITS**

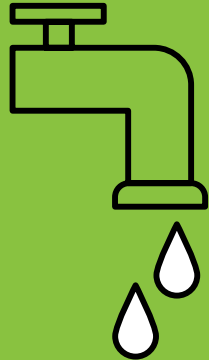
- Reduces carbon emissions
- Reduces stress on the existing electrical grid
- Utilizes natural renewable energy sources like wind, water, and sun



# AIA CLIMATE ACTION DESIGN CHALLENGE

3

**Design for  
water  
conservation**



# 3

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**Water conservation helps save money and the environment. It's the architect's responsibility to make a building and its surrounding site water efficient.**

## **TASK**

Use the building materials to create ways to conserve water and/or collect rain.

## **ENVIRONMENTAL BENEFITS**

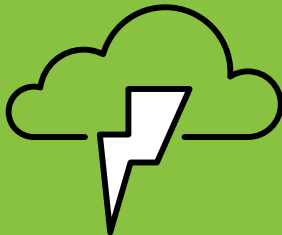
- Reduces stress on the existing municipal water system
- Reduces run-off pollution into bodies of water
- Utilizes natural renewable energy sources



# AIA CLIMATE ACTION DESIGN CHALLENGE

4

**Design for  
extreme  
weather**



# 4

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**Storm incoming! Architects use special design strategies to keep buildings safe and make communities more resilient to the extreme weather caused by natural disasters.**

## **TASK**

Use the building materials to create ways to make your building more resilient to the high winds caused by a hurricane or tornado.

## **ENVIRONMENTAL BENEFITS**

- Reduces building damage & environmental pollution
- Reduces injury and loss of life
- Considers the environment & natural weather to inform design





# AIA CLIMATE ACTION DESIGN CHALLENGE

5

## Design for earthquakes



# 5

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**Earthquakes can cause serious damage. Architects use a variety of design strategies, such as shear walls, pendulums, and the removal of ground floor columns, to keep buildings standing and people safe.**

## **TASK**

Use the building materials to make your building able to withstand or recover quickly from an earthquake.

## **ENVIRONMENTAL BENEFITS**

- Reduces building damage & environmental pollution
- Reduces injury and loss of life
- Considers the environment & natural weather to inform design



# AIA CLIMATE ACTION DESIGN CHALLENGE

6

**Design for**  
**healthy living**



# 6

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**Lettuce (let us) promote healthy eating through design!  
Designers incorporate renewable food sources to promote  
healthy living & eating in buildings and communities.**

## **TASK**

Use the building materials to create ways to add renewable food sources.

## **ENVIRONMENTAL BENEFITS**

- Reduces carbon emissions from travel to grocery stores
- Encourages healthy eating and living
- Reconnects people with nature



# AIA CLIMATE ACTION DESIGN CHALLENGE

7

**Design for  
high heat**



# 7

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**AC isn't the only way to keep cool in the summer. Architects design buildings to be heat-resilient using windows, shade, green roofs, and more.**

## **TASK**

Use the building materials to create ways to naturally cool your building and adapt to rising temperatures.

## **ENVIRONMENTAL BENEFITS**

- Reduces carbon emissions from air conditioning
- Encourages natural ventilation
- Reconnects people with nature



# AIA CLIMATE ACTION DESIGN CHALLENGE

8

**Design for  
flooding**



# 8

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**Climate change causes rising sea levels, which leads to flooding for millions of people. It's an architect's job to make a building resilient to floods.**

## **TASK**

Use the building materials to create ways to help your building adapt to rising flood waters.

## **ENVIRONMENTAL BENEFITS**

- Reduces building damage & environmental pollution
- Reduces injury and loss of life
- Considers the environment & natural weather phenomena to inform design





# AIA CLIMATE ACTION DESIGN CHALLENGE

9

**Design for  
drought**



# 9

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**Some parts of the country experience droughts year-round. Architects use design strategies to collect and contain rainwater for irrigation and other purposes.**

## **TASK**

Use the building materials to create ways to collect and retain rainwater on-site for future uses.

## **ENVIRONMENTAL BENEFITS**

- Reduces stress on the existing municipal water system
- Reduces run-off pollution into bodies of water
- Utilizes natural renewable energy sources



# AIA CLIMATE ACTION DESIGN CHALLENGE

10

**Design for  
equitable  
communities**



# 10

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**Equitable communities remove barriers and burdens, physical or abstract, empower and enable people to gather and connect, live, and function to their highest potential.**

## **TASK**

Use the building materials to create ways to create an equitable community that considers the needs of the residents. Consider a design with residential, businesses, services, schools, jobs, recreation and transit in close proximity, has good lighting and landscaping to support mixed uses, and is walkable.

## **ENVIRONMENTAL BENEFITS**

- Clean environment & healthy food access
- Safe and diverse public places, parks, and open spaces
- Provides social, physical, and mental well-being to generations

