

# Adapt & Protect

**BBC** EARTH

**WILD ASIA**

LIFE AT EXTREMES

SEE IT IN **IMAX** AND GIANT SCREEN THEATERS





WILD ASIA / ADAPT & PROTECT / ACTIVITY GUIDE

# Introduction

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Participants will explore the amazing senses and adaptations animals have developed to survive and thrive in some of the world's most extreme environments.

Participants will use these adaptations to design and build a superhero who can adapt to environmental challenges and protect the biodiversity and unique habitats across Asia.



*Giant panda cub in tree*



WILD ASIA / ADAPT & PROTECT / ACTIVITY GUIDE

# From the Film

BBC EARTH  
**WILD ASIA**  
LIFE AT EXTREMES

*Wild Asia: Life at Extremes* introduces some of the many amazing animals that live in the harsh conditions found across Asia.

Participants come to understand how these amazing animals are uniquely adapted to not only survive but thrive in these extreme conditions.



*Long-eared Jerboa*



WILD ASIA / ADAPT & PROTECT / GRADE LVL. 2-8 / **ACTIVITY GUIDE**

# Activity Overview

Participants will investigate some of the extreme habitats found across Asia and the animals adapted to live in them. Then they will uncover major threats to those habitats and the ways that animals living there are affected by them.

Using their knowledge of animal adaptations and Asian habitats, participants will utilize the engineering design process to design and build a superhero with animal adaptations to save their habitat.

## Materials:

- Animal Cards (1 per group)
- Habitat Cards (1 per group)
- Superhero Design Guide (1 per participant)
- Writing utensils
- Scissors and tape

## Superhero Build Materials:

- Glue
- Card stock, printer or construction paper
- Rubber bands or yarn
- Pipe cleaners
- Paper straws, paper clips, paper cups
- Recyclables (plastic bottles, bottle caps, plastic mesh, cardboard, packaging foam, paper/plastic bags, etc.)

*\*Build materials are suggestions*

# NGSS

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## 3-LS4-2

Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving.

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## 3-LS4-3

Construct an argument about how changes in habitat affect organisms.

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## 3-LS3-2

Use evidence to support the explanation that traits are influenced by the environment.

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## 4-LS1-1

Construct an argument that animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

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## 4-LS1-2

Use a model to describe how animals receive and process information

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## 3-5-ETS1-1

Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

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## 3-5-ETS1-2

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

# Preparation

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Print one full set of **Animal Cards** for each group

- Fold sheet in half, lengthwise.
- Tape or staple open end.
- Trim the (3) cards along the dotted line.

Print one full set of **Habitat Cards** for each group

Print one **Superhero Design Guide** for each participant

Gather all materials needed for the superhero build

- Arrange the materials in an easily accessible area of the room.

# Procedure

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1. In the film, *Wild Asia: Life at Extremes*, we were introduced to some of the amazing animals that live in habitats across Asia and the unique adaptations they use to survive in these extreme environments.

*What is an adaptation?*

**A:** An **adaptation** is a physical trait or characteristic that helps an animal survive in its environment such as having thick fur in cold mountainous regions or a strong sense of smell to locate food underground. Adaptations can be how an organism moves, fends off rivals, or catches and eats its prey.

# Procedure cont.

2. Let's explore some of the unique adaptations found in animals from habitats in Asia. Divide participants into groups of three to four and give each group a set of **Habitat Cards**.

These cards show some of the unique habitats that were highlighted in *Wild Asia: Life at Extremes*. Each of these habitats has challenges that the plants and animals that live there are specially adapted to.

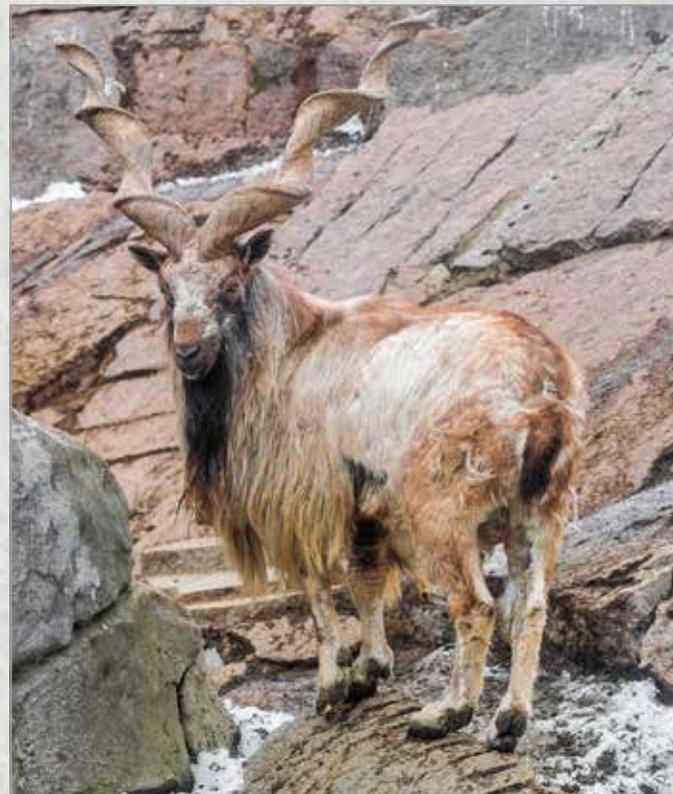
3. Explain that you are now giving each group a set of **Animal Cards** and their challenge is to sort the animals into their correct habitats.

As groups work together float through the room encouraging participants to notice features such as fur, coloration, body, size, claws, feet, and other structures that may hint at how the animal survives.

4. Once groups have finished sorting, they will discuss their reasoning.

*Were there any animals or adaptations that surprised you?*

**A:** Adaptations could include Markhor goat's "climbing shoe" like hooves, snow leopard's camouflage, Tibetan fox's well insulated fur, mudskipper's ability to breathe through its skin, long-eared Jerboa's keen hearing to detect both predators and prey, and the Sea Bunny's toxic defense system.



*Markhor goat*

# Procedure cont.

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*What do you notice about animals that live in the same habitat?  
Do they share the same adaptations?*

**A:** Animals in the same habitat may share similar adaptations—such as thick fur, blubber, or wide paws in cold environments. They may also solve the same challenge in different ways. Camouflage is common across many species, but the specific form it takes varies, depending on the habitat.

5. Habitats all over the world are under real threat from climate change, invasive species, and habitat destruction, and it is negatively impacting the species that live there.

*What do you think will happen to these animals if their habitat changes?*

What they need is a **superhero!** Using the super senses and adaptations explored on the cards, participants will design and build a superhero specially adapted to survive in a habitat and combat the habitat's threats.

6. Randomly assign each group a habitat to focus on and give each participant a **Superhero Design Guide**.

7. The first step in the engineering design process is “ask.”

*What are the threats impacting their assigned habitat? What adaptations are common in their habitat and how could they be used to protect it?*

Participants will record their answers and notes on their **Superhero Design Guide**.

# Procedure cont.

## 8. Step two is “research.”

Participants may want to review the **Habitat Cards** and **Animal Cards**. If time and resources allow, participants can conduct further research into their habitat to learn more about the threats and how they are directly affecting the plants and animals that live there.

9. Now it is time to “**imagine.**” Using the knowledge learned from asking questions, researching the threats to their habitat, and watching *Wild Asia: Life at Extremes*, participants will each sketch their own superhero. Their superhero should include at least three different adaptations and explanations of how they will use those adaptations to protect their habitat.

As participants are sketching, float through the room asking guiding questions and offering suggestions when appropriate.

*What habitat are you designing for? What are the threats you are trying to protect against?*

*Which animal’s adaptation inspired you? How will your superhero use it?*

10. Allow participants to view the materials they will be using to build their superhero. This will help them **plan** what materials they need and how they will use them to create their superhero.



*Flooding caused by typhoon in Thailand*

# Procedure cont.

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11. Once each participant has a sketch and a plan for their own superhero, they can move on to the **“create”** step.

While participants are creating, float through the room asking guiding questions and offering help as appropriate.

**Tell me about your superhero.**

*What adaptations does your superhero have that allow it to defeat your habitat's threats?*

*How can you help protect your habitat?*

12. The final step in the design process is to **“share.”** Participants will show off their hard work, teach others about their superhero's capabilities, and learn from each other.

13. Participants will set up their superhero models and **Superhero Design Guides** with their descriptions around the room.

14. Participants float through the room investigating each of the superheroes and discussing the design process and their superhero's characteristics.

# Debrief

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*When your superhero faced the challenge in their habitat, which feature helped them the most, and why was it important?*

**A:** Participants will explain survival features they designed and describe how they helped their superhero respond to the threat in their environment.

*When you explored the animals earlier in the activity, what is one adaptation you noticed that helps a creature survive where it lives?*

*How does your superhero use that adaptation?*

**A:** Participants will name a specific feature observed, such as thick fur, powerful legs, sharp senses, or camouflage. Explain how their superhero uses it to protect its habitat.



*Mudskipper*



SCENARIO ONE

## Himalayan Mountains

**Threat:** Melting Glaciers

**Glaciers are melting in the Himalayas.** A combination of deforestation and heavy usage of fossil fuel is causing temperatures to rise and glaciers to melt at an alarming rate.

This disruption is creating unstable lakes, increasing cloudbursts, flash flooding, and landslides.

**Design a superhero to save this snowy landscape and its inhabitants.**

TRIM



SCENARIO TWO

## Gobi Desert

**Threat:** Habitat Loss

**The Gobi Desert is intensifying.** At first glance deserts may appear empty and without life, but these extreme habitats are filled with specially adapted organisms that thrive in these conditions.

As land surrounding deserts are used for mining, agriculture, and development, the delicate balance of the desert ecosystem is shifting. Rising temperatures, severe drought, and increasing dust storms are altering the Gobi Desert faster than the plants and animals living there can adapt.

**Design a superhero to protect this changing habitat and secure the Gobi Desert.**



## Tibetan Plateau

**Threat:** Warming Temperatures

**The Tibetan Plateau is heating up.** Due to its geography, climate change affects temperatures in the Tibetan Plateau differently.

Warmer temperatures from surrounding industrial regions and greenhouse gases mean more rainfall and less snow, and higher elevation means more sunlight absorption. Combining these issues creates an even bigger, more amplified disruption to the water system, leading to flash flooding and landslides.

**Design a superhero to protect the warming plateau.**

TRIM



## Monsoon Forest

**Threat:** Deforestation

**The Monsoon Forests are shrinking.** Monsoon winds bring heavy rains in the summer and extreme dryness in the winter. Global warming disrupts and intensifies this system by producing more volatile storms in the summer and putting forests at risk for wildfires in the winter.

Deforestation worsens the problem by disrupting water regulation and releasing stored carbon into the atmosphere.

**Design a superhero to protect the shrinking monsoon forests.**



## Mangrove Forest

**Threat:** Land Conversion

**The Mangrove Forests are shrinking.** Vast areas of mangrove forests are being removed in order to develop coastal urban infrastructure and aquaculture (shrimp farming).

Mangroves are a natural coastline barrier, protecting the coast from erosion and flooding. Their removal has directly contributed to increased flooding and erosion, habitat degradation, disruption of the water supply, the release of carbon into the atmosphere, and rising sea levels.

**Design a superhero to save our shores and protect biodiversity in and around mangrove forests.**

TRIM



## Coral Reefs

**Threat:** Ocean Acidification

**The ocean is warming and becoming more acidic.** Coral reefs are made from living organisms that need calcium carbonate to build their skeletons.

These changes in the ocean cause coral skeletons to become weak and brittle, making them more vulnerable to breakage and disease. This causes a ripple affecting all the plants and animals, including humans, who rely on the reefs.

**Design a superhero to restore our ocean and protect the coral reefs.**



## LONG-EARED JERBOA

*Euchoreutes naso*

TRIM

### A D A P T A T I O N S

- Powerful legs for jumping
- Makes minimal contact with surface to avoid sinking
- Moves using very little energy in extreme conditions



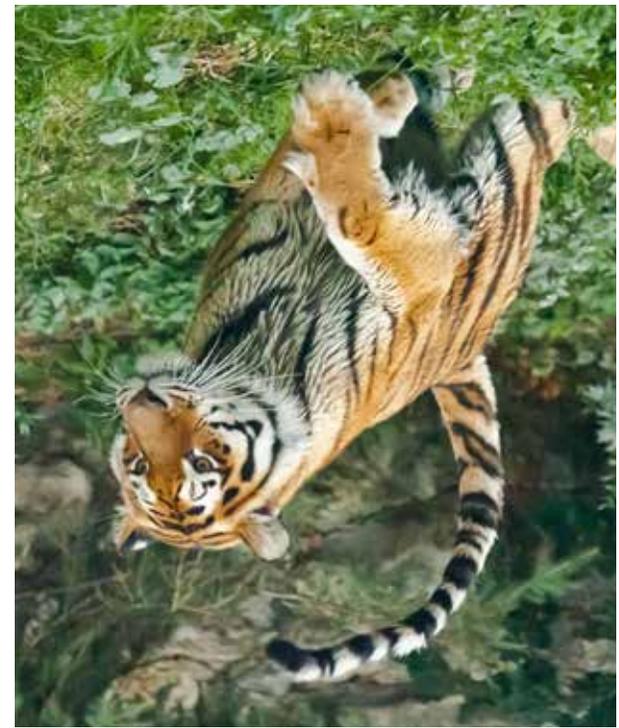
## LONG-TAILED TIT

*Aegithalos caudatus*

TRIM

### A D A P T A T I O N S

- Lightweight to rest on thin branches
- Can balance on unstable surfaces
- Cooperative group behavior



## BENGAL TIGER

*Panthera tigris tigris*

### A D A P T A T I O N S

- Powerful burst of speed
- Able to move stealthily through dense vegetation
- Combines strength with precise controlled movement



## RED PANDA

*Ailurus fulgens*

TRIM



## SNOW LEOPARD

*Panthera uncia*

TRIM



## TIBETAN FOX

*Vulpes ferrilata*

### A D A P T A T I O N S

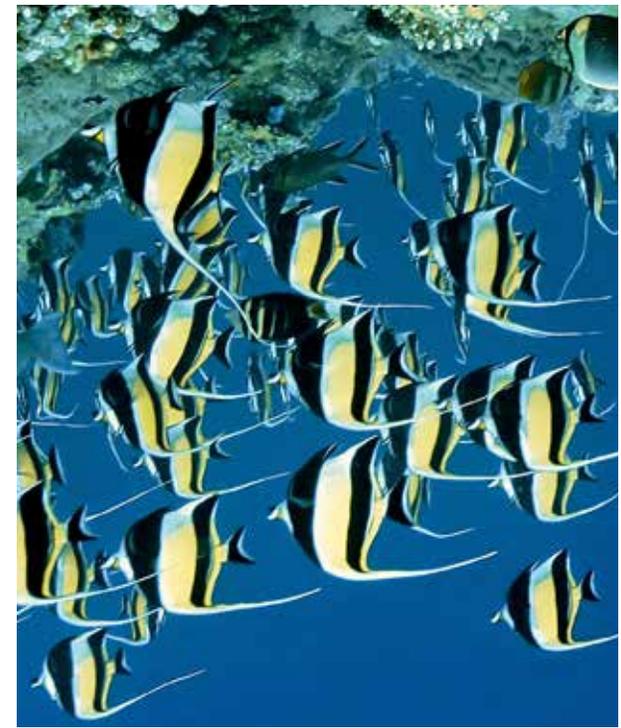
- Strong grip for climbing trees and maneuvering branches
- Good sense of balance for narrow ledges and unstable surfaces
- Moves easily through the forest canopy avoiding the ground

### A D A P T A T I O N S

- Able to leap long distances
- Front and back legs act as shock absorbers for safe landings
- Moves well on steep cliffs or icy ground

### A D A P T A T I O N S

- Wide-area awareness across open landscapes
- Able to move over long distances using little energy
- Patient hunter



# MUDSKIPPER

*Periophthalmus spp.*

TRIM

## A D A P T A T I O N S

- Moves well on land and in the water
- Good grip on wet slippery surfaces
- Stable on soft, muddy ground

# PLATEAU PIKA

*Ochotona curzoniae*

TRIM

## A D A P T A T I O N S

- Able to tolerate extreme cold
- Moves quickly from shelter to shelter
- Very efficient at conserving heat

# MOORISH IDOL

*Zanclus cornutus*

## A D A P T A T I O N S

- Able to swim around complex structures with precise movements
- Can navigate tight spaces
- Very aware of surroundings



# GREY REEF SHARK

*Carcharhinus amblyrhynchos*

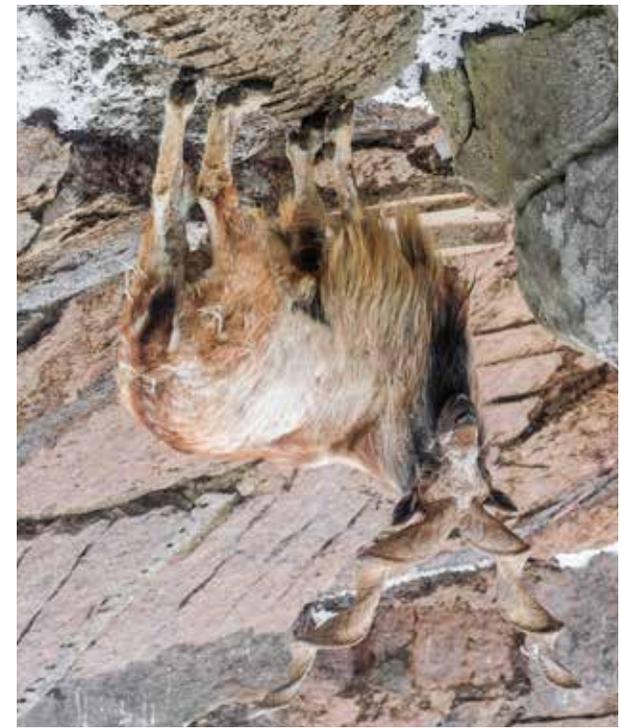
TRIM



# SEA BUNNY

*Jorunna parva*

TRIM



# MARKHOR GOAT

*Capra falconeri*

## A D A P T A T I O N S

- Body is streamlined for efficient movement through water
- Good directional control when swimming at high speed
- Wide-ranging sensors detect subtle changes in environment

## A D A P T A T I O N S

- Protective coating of slime
- Releases a toxic chemical defense to avoid predation
- Flexible body able to fit into small tight spaces

## A D A P T A T I O N S

- High-grip hooves for steep rocky surfaces
- Exceptional balance on narrow ledges and cliffs
- Strong powerful legs to climb sheer vertical terrain

# Superhero Design Guide

Designer name:

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My habitat is:

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Common animal adaptations here are:

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My habitat's threats are:

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My Research Notes:

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My Superhero's name is:

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The habitat my Superhero lives in is:

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The threats and dangers my Superhero face are:

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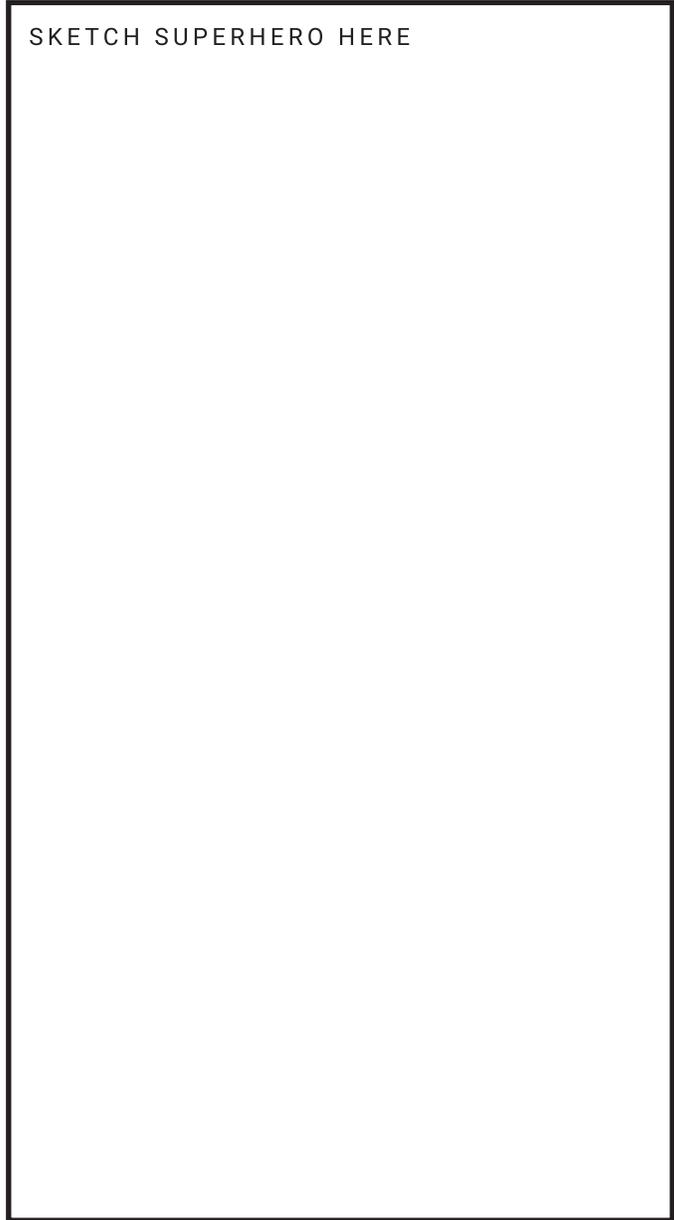
The adaptations my Superhero has developed to handle those threats are:

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SKETCH SUPERHERO HERE





**BBC EARTH**

# WILD ASIA

LIFE AT EXTREMES

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