

# Sand Dunes Exploration

Building Resilient Coastal Ecosystems

## Keywords:

Coastal Dunes, Ecosystem Resilience, Biodiversity, Environmental Conservation, STEM Education

## Target group:

Children aged 8-10, Educators

## Objectives:

This hands-on activity teaches participants why coastal dunes matter—shielding land from erosion, sheltering wildlife, and offering recreation. Through exploration, they'll learn how dunes boost ecosystem resilience and how humans can protect these fragile habitats.



## General Guideline on Time Allocation:

The duration needed to carry out this activity may vary depending on the specific group of children. Teachers are encouraged to adapt the implementation according to the needs, interests, and dynamics of the group.

In the preparatory phase, teachers may use a variety of activities to introduce and contextualize the chosen topic. These can include discussions, videos, drawings, storytelling, or even a field trip, depending on the age and background knowledge of the children.

The main construction phase, during which children plan and build their urban element using LEGO bricks, should typically not exceed 45 to 60 minutes. However, this phase often stimulates further curiosity and questions among the children, potentially leading to extended engagement or follow-up activities. For more detailed instructions and pedagogical support on how to implement activities of INNO-kids project, please download the Teacher's Methodological Guide.



## Materials and Resources Needed:

- High-resolution images/videos of coastal dunes (landscapes, flora/fauna, erosion effects).
- LEGO bricks: Assorted colors (tan for sand, green/blue for vegetation, plants, animal figurines (birds, turtles), tiles for boardwalks).
- LEGO Baseplates: Blue (water edge) and tan (sand) to define zones.

## Introduction:

Coastal dunes are dynamic ecosystems found along coastlines worldwide, playing a crucial role in protecting inland areas from erosion, providing habitat for diverse plant and animal species, and offering recreational opportunities. In this activity, participants will explore the importance of coastal dunes and their role in maintaining ecosystem resilience through hands-on learning experiences and creative engagement.

## Procedure:

### Preparation

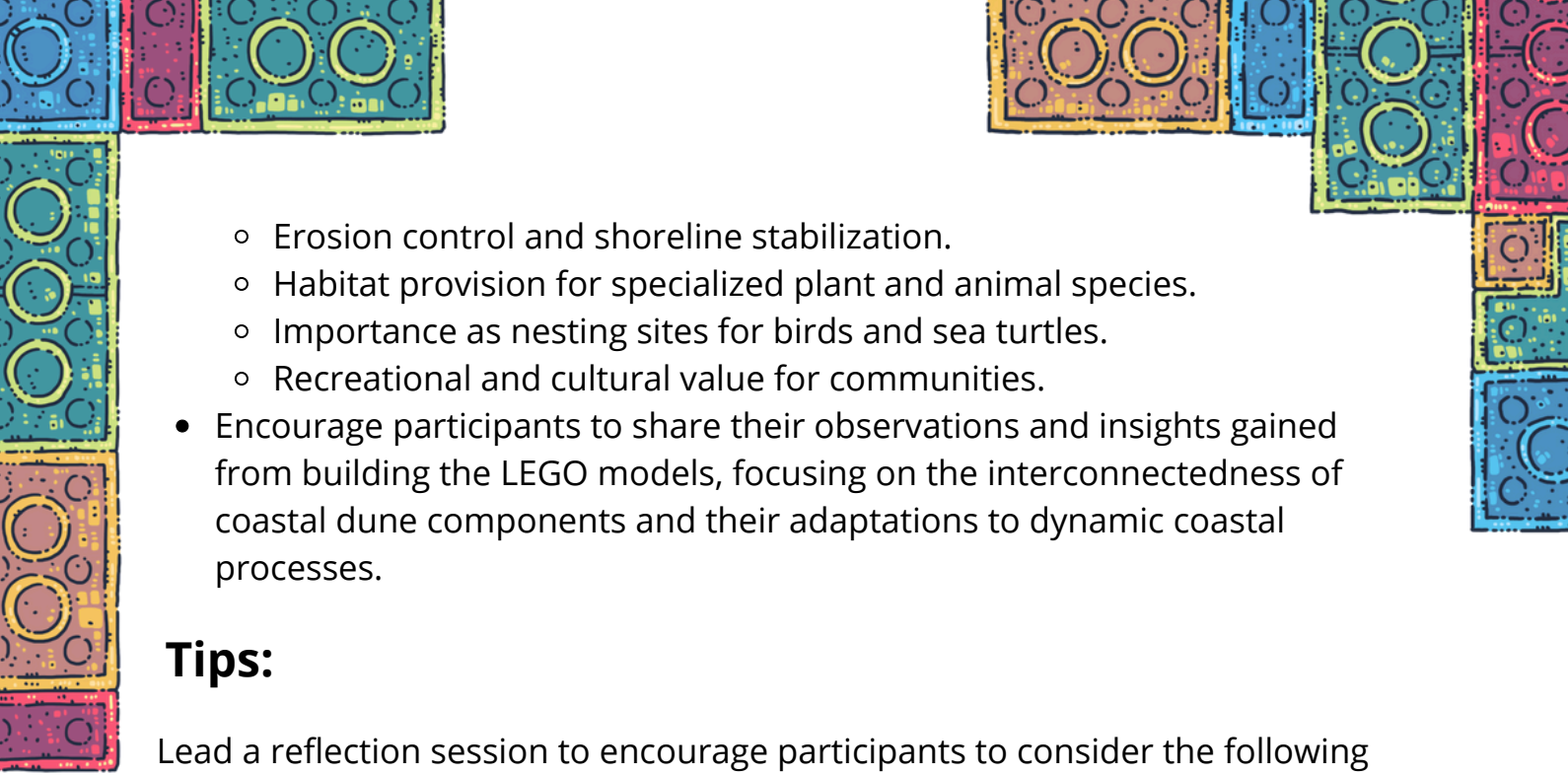
- Begin with an interactive discussion about coastal dunes, highlighting their characteristics, functions, and significance in coastal ecosystems.
- Show images or videos of coastal dune landscapes and the diverse flora and fauna that inhabit these environments to provide context and stimulate curiosity.

### Construction

- Provide participants with LEGO bricks and challenge them to build models representing coastal dune ecosystems.
- Encourage creativity and attention to detail as participants construct sand dunes, beach vegetation, coastal animals, and human-made structures like boardwalks or beach access points.
- Emphasize the importance of incorporating elements such as vegetation roots, sand stabilization techniques, and wildlife habitats into their LEGO models to illustrate the resilience and biodiversity of coastal dune ecosystems.

### Discussion

Facilitate a group discussion to explore the ecological functions and services provided by coastal dunes, including:

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- Erosion control and shoreline stabilization.
  - Habitat provision for specialized plant and animal species.
  - Importance as nesting sites for birds and sea turtles.
  - Recreational and cultural value for communities.
  - Encourage participants to share their observations and insights gained from building the LEGO models, focusing on the interconnectedness of coastal dune components and their adaptations to dynamic coastal processes.

## **Tips:**

Lead a reflection session to encourage participants to consider the following questions:

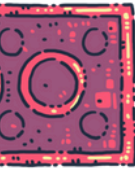
- What did you learn about coastal dunes from building and exploring the LEGO models?
- How do coastal dunes contribute to the resilience of coastal ecosystems and the well-being of coastal communities?
- What are some ways we can protect and conserve coastal dunes in our local area or globally?
- How can individuals and communities contribute to the preservation of coastal dune habitats and biodiversity?

## **Additional Considerations:**

### **Differentiation:**

Provide additional support or simplified instructions for pupils who may require extra assistance. For advanced pupils, offer extension tasks such as researching further sustainable practices or designing more complex models.

### **Assessment:**



Assess pupils based on their participation and engagement during discussions and hands-on activities. Evaluate the creativity, effort, collaboration, depth of understanding demonstrated in their models, critical thinking, ability to provide constructive feedback and presentation skills.



## Curriculum Connections:

This activity integrates:

**Environmental Studies** (*coastal ecosystems, the role of dunes in erosion control, biodiversity conservation, and the human impact on natural habitats*)

**Science** (*ecosystem dynamics, habitat resilience, plant and animal adaptations in sandy environments, and the physical processes shaping coastal landscapes*)

**Geography** (*coastal formations, natural defences, and the interaction between land and sea*)

**Citizenship Education** (*the importance of protecting fragile environments, environmental responsibility and sustainable tourism*)

**Art** (*creative expression, construction*)

## References to Sustainability Goals:

- **SDG 14: Life Below Water** – Pupils explore the importance of coastal dunes in supporting marine biodiversity and protecting coastal habitats, contributing to the conservation of marine ecosystems and species.
- **SDG 15: Life on Land** – Pupils emphasize the role of coastal dunes in maintaining terrestrial biodiversity, soil stabilization, and ecosystem resilience, aligning with efforts to halt biodiversity loss and restore degraded land.