

### Visible Elements in Photo



- Weathered wooden surface (appears to be driftwood or aged board) with deep grain texture
- Scattered dried seed pods or mushroom caps (round, textured discs in various sizes and colors: tan, rust, cream, white)
- Thin twigs and branches (various lengths, some curved)
- Small nails or metal fasteners (rusted and shiny)
- Natural layering suggesting outdoor, possibly beach or forest environment

### Reasonable Inferences

- From seed pods/mushroom caps + twigs: Small organisms or structures once attached to or grew from this wood; the round objects may have dispersed or detached naturally.
- From weathered wood texture + metal fasteners: This surface has experienced long-term exposure to elements and possibly human use (e.g., dock, fence, signage).
- From scattered arrangement + size variety: Objects of different weights and shapes need to be secured or organized to prevent them from rolling or shifting with movement or wind.

### Engineering Task

#### K-2 Challenge:

"Make a Nature Board That Holds Everything in Place"

Collect small twigs, seed pods, and pebbles like the ones in the photo. Your job: design a way to arrange and attach them to a piece of wood so they don't fall off or roll around when you move it. You can use string, clay, or tape. What works best?

#### 3-5 Challenge:

"Design a Display Frame for Collected Natural Objects"

You have found various natural materials (seed pods, twigs, small stones, dried mushrooms) that you want to display permanently on a wooden board. Your design must:

- Secure at least 8 objects in place so they remain stable when the board is tilted at 45°
- Use only 3 types of fastening methods (e.g., string, hot glue, clips, small nails)
- Keep the board lightweight enough for one person to carry
- Leave at least 20% of the board surface visible

Test your design by tilting and shaking the board. Which fastening method worked best for which object types?

### EDP Phase Targeted

Ask / Define Problem — This real-world photo shows an actual collection challenge: how to organize and stabilize natural objects on a weathered surface. Students can observe the problem (objects scattered, at risk of loss or damage) and define what "staying in place" means before jumping to solutions.

## Suggested Materials

- Scrap wood or cardboard base
- String, twine, or yarn
- Hot glue gun or wood glue
- Small nails, tacks, or pushpins
- Clay or poster putty (reusable adhesive)
- Collected natural objects: twigs, seed pods, pebbles, dried leaves

## Estimated Time

45–60 minutes (one session for K-2; one or two sessions for 3-5 depending on whether testing and iteration are included)

## Why This Works for Teachers

This task directly addresses 3-5-ETS1-2: Generate and compare multiple solutions to a design problem by requiring students to evaluate which fastening method works best for different material types and weights.