



INVESTIGATING AND EVALUATING IDEAS

INVESTIGATING STABILITY

Photographs: Music stand, Deck chair, Sun lounger, Privacy screen, Cube, Pyramid



Photocopiable page: Investigating stability

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By looking at photographs of familiar structures, children learn why stability can be an important consideration in the design. Key examples of structures to include in discussion are those with wide or heavy bases, or those which have triangular bases for stability. Most of the photographs from the gallery of resources show frame structures, but also included are two images of 3D shapes to show that shell structures are stable too. This will help the children to be more creative when designing their own photograph frames. They will learn that there are other ways of making a frame stand up besides using a simple A-frame design.

Discussing the photographs: materials

- ▶ Make a slideshow of the music stand, deck chair, sun lounger and privacy screen. Looking at each photograph in turn, discuss with the children where they might find each of the objects. Ask the children if they can recognise the materials the object is made from and explain to them that they are all structures made from frames.
- ▶ Some materials in the frames are solid like the wood on the deck chair; others are hollow tubes as in the music stand. Look at the item made from tubular metal and ask questions to focus attention on how the material has been altered or processed to make it more useful. Can the children explain why the music stand is made of tubular material (so it is lighter to carry and durable)?

Discussing the photographs: structures

- ▶ Discuss with the children what each structure is designed to hold and how each structure holds it.
- ▶ Some of the items in the photographs, such as the deck chair and music stand, have been designed to fold away. Ask the children to point out the parts of the structures that might be hinged to allow them to fold. Talk about why these structures need to be folded away (they are structures which are not needed all the time; because of their wide base they take up a lot of room in storage). Folding items flat makes it easier to pack them into boxes to be sold in shops.
- ▶ Look at the photographs of the cube and pyramid shapes which have been included in this collection of stable objects and discuss why they have been included. Ask the children to think about what makes a 3D shape stable (its wide base). They should consider the shape of the base of the 3D structure and whether it would make any difference to the stability of the shape if it was standing up on a different shaped side. Ask the children to think of other 3D shapes that could have been included in the collection.

Activities

- ▶ Ask the children to work in groups and brainstorm structures. What things can they see around them that are made to stand up? Ask them to think about whether the structure holds something up or in place. They should consider how the structure is made stable, what kind of base it has and what materials it is made from.
- ▶ Give the children the 'Investigating stability' photocopiable on page 46 showing pictures of other stable objects that they may be familiar with. Ask them to label the part of the object that is stable and explain in the space provided on the sheet why the object needs to be stable and what could happen if the structure was not stable.
- ▶ Using components from a construction kit, ask the children to work in pairs to make a stable structure. The task could be open, giving the children an opportunity to make any kind of structure they choose, or it could be more specific such as asking the children to make a piece of playground equipment or a book stand. Ask the children to sort their structures into those with a wide base and those with triangular bases.
- ▶ Ask the children to test stability by timing how long they can stand on one foot without