Subject: Science

Level: Standard 4

Strand: Form and Function

Topic: Examining the area of the base and height, to improve stability of simple structures.

Key Points:

- Stability is the ability of an object to maintain its balance after being disturbed
- Stability of an object can be judged by how well it resists tipping over.
- The more stable an object the less likely it will tip or topple over.
- The stability of an object is affected by
    - The area of its base. Increasing the area of the base will also increase the stability of an object. The bigger the area of its base the more stable the object.
    - The height of the object from surface it is supported on. Usually a shorter object is more stable.

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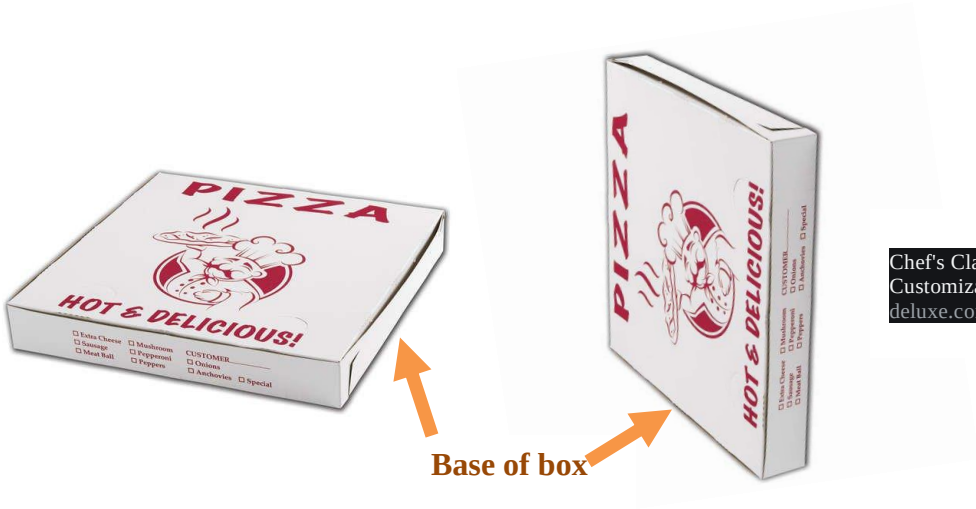
Activity

1. Effect of the area of the base of an object on its stability.

The picture below shows pizza boxes stored in different ways on a cupboard.



Chef's Classic Pizza Boxes, 16 x 16 x 2", Customization Options ...
deluxe.com ·

BOX A BOX B

(i) Which box will topple over more easily? _____

(ii) Which box is therefore more stable? _____

(iii) Compare the base of Box A and Box B. Which base is larger?

_____

(iv) Complete the following sentence by choosing the correct term.

The **smaller/ larger** the base of an object, the greater is its stability.

Stability can therefore be increased by **decreasing/ increasing** the base.

2. .Effect of the height of an object on its stability.

Leslie and Javid are building towers from Lego blocks.

Leslie's 

Javid's 

Alphabet Letter Pin K, Pin transparent background PNG clipart ... hiclipart.com

(i) Leslie is building a tower from Lego blocks. What would most likely happen to the tower as it becomes taller?

_____

(ii) Stability of an object therefore **decreases/ increases**as an object becomes taller.

_____

(iii) Javid was able to build a taller tower. How does the design of his tower allow for this?

_____

Assessment

3. The pictures below show different household items. Identify which item from each group is least stable and how its stability can be improved.

Item	Least stable item	How to improve its stability
 Group of Ceramic Vases: Amazon.com	(i)	
 Realistic detailed 3d wooden bar stool Royalty Free Vector vectorstock.com	(ii).	

4. Jim and his sister, Daisy, got gifts from their Grand pa. These gifts are shown below.

Jim's

Bicycle And Tricycle Clipart

clipart.email

Daisy's

China Europe Style Strong Kids Tricycle ...

cube-bicycle.en.made-in-china.com ·

Which bicycle will be more stable? Give two reasons why it is more stable.

_____

_____

Answer Key

1. (i) **Box B** will topple over more easily.

(ii) **Box A** is therefore more stable.

(iii) The base of **Box A is larger** that and Box B

(iv) Complete the following sentence by choosing the correct term.

The **larger** the base of an object, the greater is its stability.

Stability can therefore be increased by **increasing the area of the base**.

2. (i) **Leslie tower would most likely topple as it becomes taller**.

(ii) Stability of an object therefore **decreases** as an object becomes taller.

(iii) **Javid was able to build a taller tower. The design of his tower allows for this because he placed a block (red) at the bottom to increase the size of the base. This made his tower more stable.**

3.

Least stable item	**How to improve its stability**
(i) Jar B as it is the tallest jar	**Decrease the height of the jar or increase the area of the base.**
(ii) Stool A as its base is less than stool B.	**Increase the area of the base as shown in stool B..**

4. Daisy's bicycle is more stable because

- **it has a larger area for the base**
- **it is shorter than Jim's**