

Egg-citing science!

How strong is an eggshell?

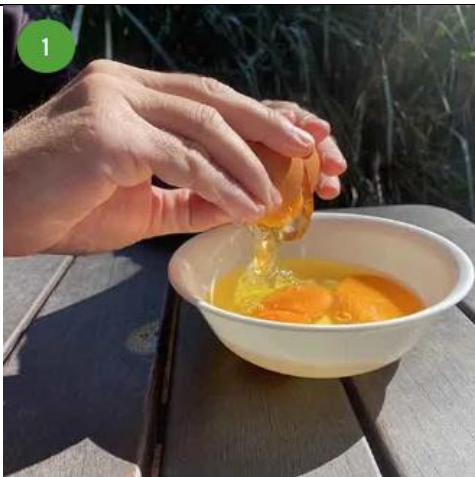
You will need

At least 2 eggs (we used 4 to be on the safe side)

A bowl to save the egg yolks and whites (maybe use this for the [Baked Alaska science cooking activity!](#))

Books

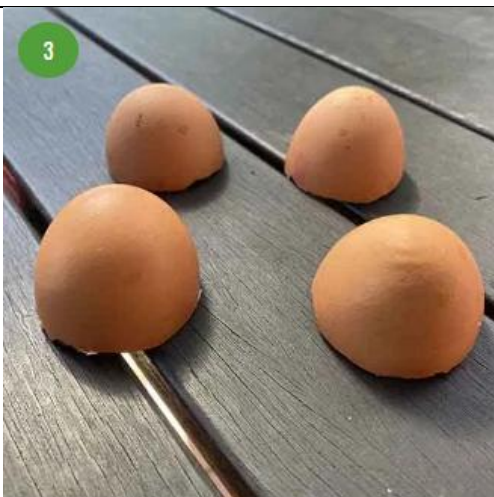
Optional: paints, paintbrushes and paper



Carefully crack the eggs into a bowl. Don't waste the egg contents, they are perfect for the [Baked Alaska activity](#) or simply for an extra yummy breakfast.



Wash the eggshells under running water and leave them to dry. You may want to trim the edges of the eggshells with scissors too.



Arrange your eggshells so that they can support your stack of books.

Weigh each book before you do the next step.



Optional – paint your eggs before testing their strength!



Gently place your first book onto the eggshells.

Extension: If you have access to some scales, this is a good chance to measure the mass of each book prior to adding them onto the stack.



Keep carefully adding books onto the eggshells... how many can they hold?



Keep going until the books crush the eggshells!

How many books did your eggshells hold up?
What was the weight of the books?

Variables to test

- What happens if you add more eggshell halves to your experiment?
- Compare having 3 vs. 4 eggshell halves... does this hold a significantly greater weight?
- Try different types of eggs

What is going on?

Eggshells are very strong if they are compressed. The curved shape of the eggshell allows the force to be spread horizontally and vertically throughout the shell.

You can think of an eggshell as being like a 360-degree arched bridge. Engineers have known about the strength of arches for thousands of years. Arches are very stable and allow building structures to support a lot of weight. Some structures built by the ancient Romans have survived thousands of years due to arches built into their design.