

Brontosaurus Learning

Making science fun!

An Experiment about

Engineering Eggstra Strength



What you will need:

- Raw egg
- A flat baking tray
- Small piece of play dough
- Heavy books

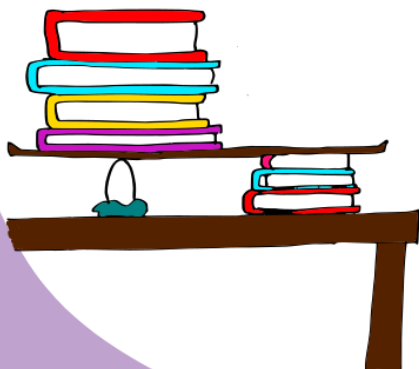
What you will do:

- 1 Place the play dough onto a table and stand the egg up in it so that the smaller end is pointing straight up.
- 2 Put a small stack of books next to it so that the top of the stack is level with the top of the egg.
- 3 Place the tray on top of the egg and stack of books so it sits flat.
- 4 Talk to your group and decide how many books you think you can stack on top of the egg before it breaks. **Write your best guess down.**
- 5 Start placing one book at a time on top of the tray nice and carefully. Keep stacking until the egg breaks. **Remember to keep count!**

What is going on?

Were you surprised by how many books the egg could hold up? Why do you think that's possible? You know how easy eggs are to break....

The answer lies in the egg's shape. Eggs have domed ends and these domes are very strong. A dome is very effective at spreading weight so that all parts of the shape share it and there's not so much pressure on any one point.



Challenges:

- Investigate where domes are used in buildings. How long have they been used?
- Try squeezing an egg sideways and then try squeezing it long ways. Can you explain the difference?



TEACHING NOTES:

Brontosaurus Learning Experiment:
Engineering EG12

Topic: Domes

Key Concepts:

- ♦ Domes are a strong shape

Resources:

- Investigation Record IR01– one copy per student
- Experiment Description Engineering EG12 – one copy per student
- Raw eggs, play dough, flat baking tray, lots of books

Lesson Notes:

Remind students to listen carefully to instructions, and to OBSERVE their experiment.

As a class discuss the experiment prior to undertaking it, and talk about what students know about eggs—perhaps make a brainstorm list. Students should then complete the sections of their Investigation Report IR01 from "Title to "Hypothesis".

Students need to be reminded to add the books carefully—they are testing the dome's ability to hold up the weight, not survive books suddenly being dropped on them!

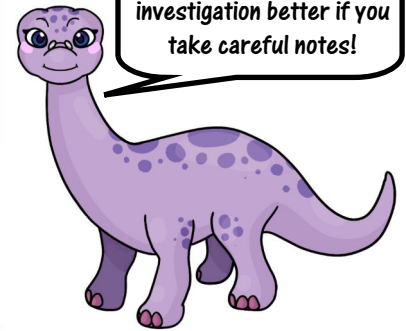
What should happen in this experiment, and why?

The strength of the egg is in its domed shape. The egg should be able to hold up lots of books (depending on the weight and size of the books of course).

Follow up discussion questions:

- What would happen if we tried this experiment on an egg lying on its side? [not as strong, will take less weight]
- Could we design an experiment using more eggs—perhaps 4 on the corners rather than just one?
- What would happen if we made a "bed of eggs" like a bed of nails? Could we lie on it? (yes) Walk on it (maybe if you were light and gentle—more pressure in one place under your foot)
- What could we build differently at our school using domes? How would that benefit us?

Investigation Record



Experiment Title:

Scientist (that's you!):

Materials: What will I need?

Investigation—what am I going to do in this experiment?

Diagrams are a great idea!

Hypothesis: What I think will happen:

Observation: What I SAW happen:

Diagrams are a great idea!

From my investigation I learnt:

Great work scientist!