

Curriculum Area	Science	Activity Type	Practical
Suitable for	KS 2, 3 and 4	Activity Number	BB05
Activity Name	Shake up your Brain		

Activity courtesy of Dr Eric H. Chudler - University of Washington, USA

### Learning Outcome:

To understand how the brain is protected from sudden impact, and the way in which various situations can damaged a brain.

### Materials Required:

- Eggs (at least 2)
- Markers to draw on a face (waterproof)
- Plastic container with top.
- Water (to fill the container)

### Instructions:

The cerebrospinal fluid (CSF) has several functions. One of these functions is to protect the brain from sudden impacts. To demonstrate how this works, we need to bring in "Mr. Egghead." Mr. Egghead is a **raw egg** in its shell with drawn-on face. The inside of the egg represents the brain and the egg shell represents the pia mater (the inner most layer of the meninges or coverings of the brain).

Put Mr. Egghead in a container (Tupperware works fine) that is a bit larger than the egg. The container represents the skull. Now put a tight top on the container and shake it. You should observe that shaking the "brain" (the egg) in this situation results in "damage" (a broken egg).

Now repeat this experiment with a new Mr. Egghead, except this time, fill the container with water. The water represents the cerebrospinal fluid. Note that shaking the container does not cause the "brain damage" as before because the fluid has cushioned the brain from injury.

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You could make this into a science experiment: test the hypothesis that "The cerebrospinal fluid and skull protect the brain from impact injury."

Drop Mr. Egghead from a standard height (or heights) in different conditions:

- 1) with fluid in the container
- 2) without fluid in the container
- 3) with different fluids or materials (sand, rocks)
- 4) in different shaped containers, etc.

Make sure pupils keep notes to record their observations using a chart.

Additional discussion:

1. How did the different containers etc affect the damage to the egg?
2. Does our brain wobble about in any liquid? (Link to BB03 Jelly Brain)
3. What do we have naturally to protect our own brains?
4. What can we do to stop our brains being damaged? *Being careful, helmets on bike, seat belts in cars etc* (Link to BB012 Brain Safety Brochure, BB014 Design a Helmet, BB015 Head Protection)