## 9 Reaction timer

## EQUIPMENT

- Reaction timer template
- Sellotape
- Scissors
- Pritt-Stik type glue
- 2 p coin


## RISKS

Paper cuts.
Scissor cuts.

## SESSION

1). Discuss what goes on in side the body when your finger touches a very hot object.

Discuss nerves and how the message signals travel.
Discuss the sequence of events:nerve in finger stimulated, signal travels to brain, brain interprets signal, brain sends message to muscles to move finger, etc
2). Discuss ways of measuring small times.

Demonstrate online reaction timer.
3). Discuss objects falling - all fall at same rate without air resistance.

Show hammer and feather video. e.g.
https://nssdc.gsfc.nasa.gov/planetary/lunar/apollo_15_feather_drop.html http://nssdc.gsfc.nasa.gov/planetary/image/featherdrop_sound.mov
4). Show Felix Baumgartner video - October 2012-39km - 1400km/hr e.g.
https://www.youtube.com/watch? v=FHtvDA0W34I
5). Demonstrate principle of reaction with a ruler.
6). Discuss how to make reaction timer.
7). Students measure each others reaction times.

Either best of three tries or average(?).
At the end of the last Apollo 15 moon walk, Commander David Scott held out a geologic hammer and a feather and dropped them at the same time. Because they were essentially in a vacuum, there was no air resistance and the feather fell at the same rate as the hammer, as Galileo had concluded hundreds of years before - all objects released together fall at the same rate regardless of mass. The hammer had a mass of 1.32 kg and the Falcon feather a mass of 0.03 kg . They were dropped from a height of 1.6 m and within the accuracy of the simultaneous release, the objects were observed to undergo the same acceleration and strike the lunar surface simultaneously.



METHOD
1). Cut out the template opposite to the ends of the page.
2). Fold in half vertically, so that the scale is on the outside
3). Glue together.
4). Secure the $2 p$ coin to the bottom with Sellotape.

## To use the reaction timer:-

1). Hold the reaction timer vertically at the top.
2). Arrange for your subject to hold their first finger and thumb opposite the 0 mark on the reaction timer, but not touching it.
3). Release the reaction timer. The subject should try to stop the reaction timer by closing their first finger and thumb.
4). The time indicated on the reaction timer where their finger and thumb are, represents their reaction time in seconds.


NAME:
Measure the reaction times of three friends and record the results below.
Each person should have three tries.

| Name | Time 1 (s) | Time 2 (s) | Time 3 (s) | MEAN TIME (s) |
| :--- | :--- | :--- | :--- | :--- |
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