# GCSE-6-3 The effect of particle size on reaction rate

Apparatus (per group)

- 100ml conical flask
- 25ml measuring cylinder
- Delivery tube and bung
- Gas syringe
- Timer
- Dropping pipettes
- Weighing boat
- Waste buckets and sieves

Chemicals (per group)

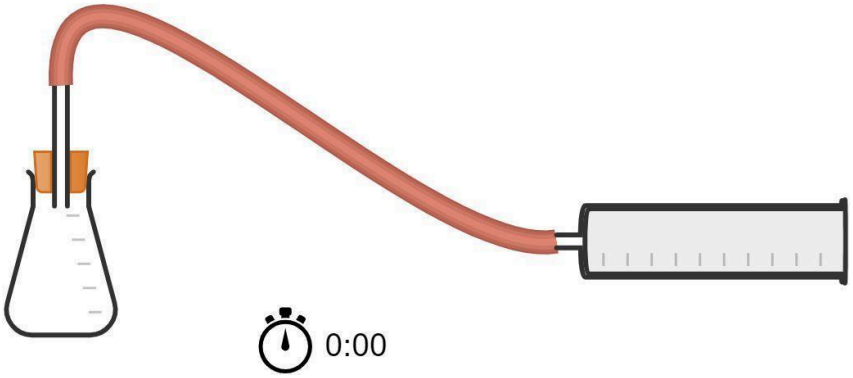
- Small, medium and large marble chips
- Hydrochloric acid (2 M)

Waste disposal

- Marble chips: wash, dry and re-use
- Acid solution: waste water

# The effect of particle size on reaction rate

1. Set up the apparatus as shown in the diagram below.




2. Weigh out 2.5g of large marble chips into a weighing boat.
   (You may not be able to weigh out 2.5g exactly. A mass between 2.4 and 2.6g will be OK)
3. Place the marble chips into the conical flask.
4. Using a measuring cylinder, place 25cm$^3$ of hydrochloric acid into the conical flask. Immediately insert the bung and start the timer.
5. Record the time taken to collect 100cm$^3$ of gas in the gas syringe.
6. Pour the reaction mixture into the sieve and waste bucket. Rinse out the conical flask with a little tap water.
7. Pour the reaction mixture into the waste flask, and rinse out the reaction flask with tap water.
8. Repeat the experiment using medium and small marble chips.

| Marble chip size | Time taken / s |
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# Experiment Hazard Assessment

## Experiment: The effect of particle size on reaction rate
## Reference: GCSE-6-3

Chemical hazards

| | | |
|---|---|---|
| Hydrochloric acid (2M) | Currently not classified as hazardous | CLEAPSS Hazcard 47A<br>Recipe Book 43 |

| | | |
|---|---|---|
| Marble chips (calcium carbonate) | Currently not classified as hazardous | CLEAPSS Hazcard 19B |

Other hazards / precautions for teachers and technicians

None