

Trend Task: Muffin Drop

Approach: One to one

Year: 4 & 8

Focus: Gravity and air resistance

Resources: 2 small muffin cases, 4 large muffin cases, orange and green A4 sheets of paper

Questions / instructions:

This first activity is done at the table.

In this activity you'll be thinking about how things fall through the air. We're going to use two sheets of paper.

Give student sheet of orange and green A4 paper.

Hold the orange one vertically, like this [demonstrate]. Hold the green one horizontally, like this [demonstrate]. Drop them from the same height at the same time.

Drop from height of student's head.



1. Which one hit the table first — the orange one or the green one?

orange 90 (78) 91 (100)

2. Why do you think that one hit the table first?

less air resistance 22 (28) 48 (67)

Now we're going to use paper muffin cases.

Give student paper muffin cases.

You need to stand in front of the camera to do this experiment.

Assist student to find a clear space to stand and drop objects.

Take a small paper case and a large paper case. Hold the paper cases upright at the same height. Then let them go at the same time. Do this 3 times.

Allow time.

3. Which one hit the floor first — the small case or the large case?

small case 58 (94) 54 (82)

4. Why do you think that one hit the floor first?

less air resistance 7 (23) 23 (32)
because it's smaller 19 (34) 19 (28)

Now take two large paper cases. Flatten one out. Hold both paper cases at the same height. Let them go at the same time. Do this 3 times.

If necessary assist student to flatten the cup.

5. Which one hit the floor first — the flat one or the other one?

normal one (not flattened) 98 (94) 98 (100)

6. Why do you think that one hit the floor first?

less air resistance 19 (26) 46 (49)

Take a **small** paper case and a **large** paper case. Screw them both up into tight balls. Hold them at the **same** height and let them go at the same time. Do this 3 times.

7. Which hits the ground first — the small one or the large one?

same time 25 (39) 29 (33)

8. Why did that one hit the floor first?

not marked • •

9. Why do you think that you were asked to do each of these activities three times before I asked you what happened?

to check consistency, reliability [replication] 28 (28) 64 (64)

Total score: 5-6 6 (16) 22 (32)

3-4 35 (58) 34 (41)

2 36 (22) 25 (21)

0-1 23 (4) 19 (6)

Commentary:

The results for this task are intriguing. Some of the results for the 1999 year 4 group are very high, particularly for question 3 and the associated question 4. At both year levels, there was a decline in performance between 1999 and 2003. The very large change in response to question 3 suggests that, despite the considerable care taken, the muffin cases used in 2003 were not sufficiently well matched to the cases used in 1999. This component was excluded from trend analyses.