

**Trend task**

**Truck Track**

**Approach:** Team

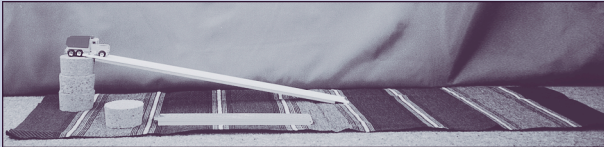
**Level:** Year 4

**Focus:** Plan, carry out and report results for an experiment involving a toy truck launched down a ramp with varying slope. Extrapolate results, check and interpret.

**Resources:** Toy truck, track, cloth, 5 corks (1 hidden), 1 metre folding ruler, instruction card.

**Questions/instructions:**

Set up the cloth and track on a level surface, with the far end of the track raised on three corks. Place the 4th cork nearby, and the ruler (folded) alongside the cloth. Keep the 5th cork out of sight.



In this activity you are going to find out how the slope of this ramp affects how far the truck will travel on the cloth after it rolls down the ramp. You will need to use the ruler to measure how far the truck goes. You will use one, two, three or four corks under the end of the track, to make the slope more steep or less steep. At the moment there are three corks under the track, so it is quite steep. For each slope, you should make measurements with the truck going forward and other measurements with the truck going backward. Perhaps it will make a difference whether it is going forward or backward. Let me show you once how the truck goes.

Show the truck going down the ramp once, forwards. Then pick up the truck and hold it while you give the next instructions, and while the team does its planning.

You are to work as a team, and try to make sure that everyone helps. First, you should plan how you will do the experiment. Think about what things you will need to keep the same. Think about how you will do the measurements. Sort out who is going to do the measurements and who will do the other jobs. Everyone should have a job. You may want to change jobs half way through, so you each try two jobs.

Plan your experiment now, and tell me when you have finished your planning.

**Planning to achieve:**

	<i>% responses</i> 1999 ('95) <b>year 4</b>
consistent set-up and release of truck	11 (0)
accurate measurement of travel	29 (27)
check on consistency by replicating	0 (0)
requested member participation	96 (90)

**Instruction card**

- Your task is to find out:
  - how the slope of the ramp affects how far the truck travels
  - whether the truck goes further forwards or backwards.
- Think about how you will do the experiment.
  - What will you keep the same?
  - How will you do the measurements?
- You are to work as a team and make sure that everyone helps.
- Record your measurements on the results sheet.

**Results**

Number of corks	Distance going forwards	Distance going backwards
1		
2		
3		
4		
5		

After they have finished planning, give the group the truck and results sheet.

Here is the truck, and a sheet to record your results on. You can do your experiment now. Tell me when you have finished and recorded all your results.

After they have finished experimenting:

What did you find out in your experiment?

*Prompts:* How does the slope affect how far the truck goes? Does it make any difference whether the truck travels backwards or forwards? [If they think it does, ask "Can you figure out why?"]

Could you have done anything to make your results more accurate? What?

**Experimentation:**

good consistency in release of truck	72 (73)
good accuracy in measurement	54 (43)
included replication consistently	6 (3)
completed all combinations of slope and truck orientations	81 (73)
recorded results accurately	35 (30)

**Reporting:**

clear and accurate	42 (43)
rather "fuzzy"	48 (47)
very unclear or inaccurate	10 (10)

What do you think would happen with five corks? Make a prediction and tell me why you think that.

After discussion, give them the 5th cork:

Test with this fifth cork, and see if you were right.

<b>Predictions &amp; discussions:</b> very good	32 (28)
moderate	55 (62)
poor	13 (10)

**Commentary:**

Teams of students in both 1995 and 1999 showed quite limited ability to anticipate issues during planning. Replication was almost non-existent — a serious fault in scientific investigations. Measurement and recording of results were other weaknesses. Overall, there is evidence of some improvement between 1995 and 1999.