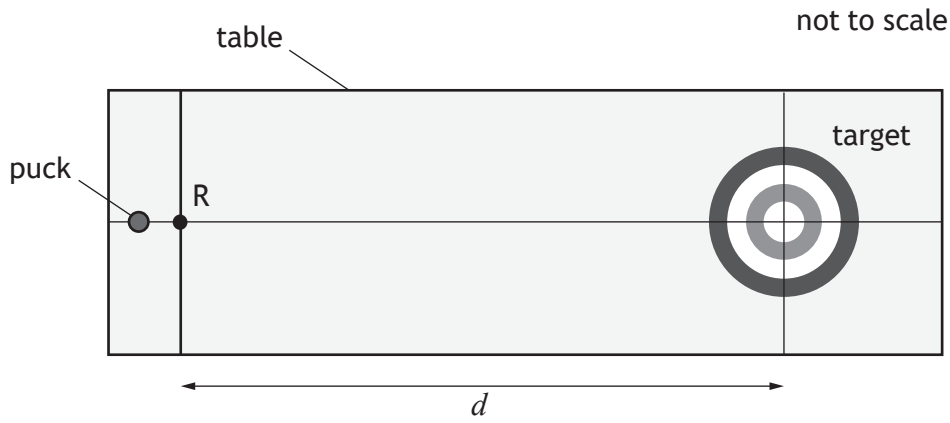
**2.** A student carries out an experiment to investigate friction between a puck and the surface of a table.




The student measures the mass $m$ of the puck.

The student pushes the puck and releases it at point R. The student measures the initial speed $u$ of the puck as it is released at R.

The puck travels distance $d$ before coming to rest in the centre of the target.

The student records the following measurements:

mass of puck, $m = 0.350$ kg

initial speed of puck, $u = 0.78$ m s$^{-1}$

distance travelled by puck, $d = 2.160$ m.

(a) (i) Calculate the average acceleration of the puck between point R and the centre of the target. **3**

*Space for working and answer*

**2. (a) (continued)**

(ii) Calculate the magnitude of the average force of friction between the puck and the table. **3**

*Space for working and answer*

(b) The student determines the absolute and percentage scale reading uncertainties for each measurement.

| | Measurement | Absolute uncertainty | Percentage uncertainty |
|---|---|---|---|
| Mass of puck, $m$ | 0.350 kg | $\pm$0.001 kg | 0.3% |
| Initial speed of puck, $u$ | 0.78 m s$^{-1}$ | $\pm$0.01 m s$^{-1}$ | 1.3% |
| Distance travelled by puck, $d$ | 2.160 m | $\pm$0.001 m | 0.05% |

The student makes the following statement:

'The best way to reduce the uncertainty in the value calculated for the average force is to use a balance that measures to the nearest 0.0001 kg to measure the mass of the puck.'

Explain why the student's statement is incorrect. **1**

**[Turn over**