

Hitting the target

12. Your teacher will give you a copy of a target. Place the target on your table as shown.
13. In this part of the activity, do **not** mark the path of the ball.
Take it in turns to try to launch the ball so that it hits the target. You can choose the direction of the launching track, but keep the block in the same position and keep the release height of the ball the same.
Once you hit the target, move it to the top left corner, and try again. You will need to launch directly up the table.
14. Try more target positions. Are there positions on the table where it is impossible to hit the target? Discuss with your class.



What does the path of the ball look like?

15. Your teacher will pick one of your traced paths. Mark the highest point of the path of the ball. Mark or crease the butcher's paper along the bottom of the table.
If you have used two sheets of butcher's paper, use some masking tape to carefully join the two pieces.
Cut out the trace of the ball's path, starting with the launching track and ending where the ball left the table. Cut along the mark or crease at the bottom of the table.
Find where you marked the highest point of the ball, and fold your paper in two. Unfold your paper and place it on the board ready for a class discussion.
16. Write down what you have learned in this activity about how the ball moves when it rolls on a sloping table and why.

Lesson 7: Complex Motion

Name: _____

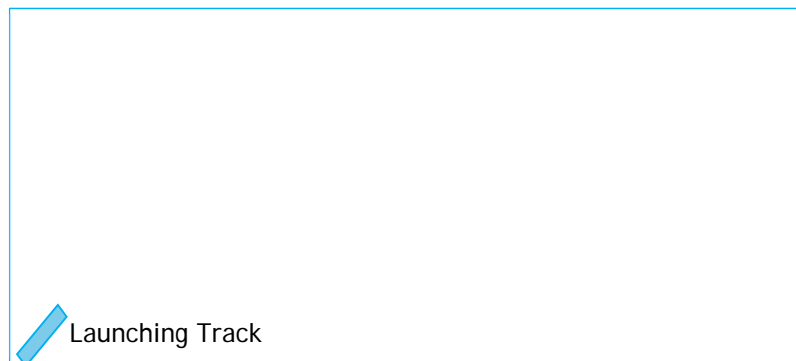


What happens when you roll a ball on a sloping table?

Predicting the motion of the ball

1. Your teacher has set up a sloping table with a launching track to release a ball.

Use the space below to draw your prediction of the path of the ball on the table.



2. Use the space below to write why you think the ball will move as you predicted. You could use ideas from earlier lessons.

3. Discuss your prediction with the rest of the class.
4. Watch carefully to see what happens when the ball rolls on the table after being released on the launching track.
5. Is this what you expected to happen?

Yes ☐ No ☐

Discuss it with the rest of the class.

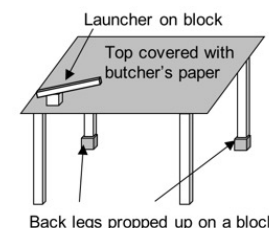
Setting up your own table

6. Your group will need a table, two objects of equal thickness to prop up the 'back legs' of your table, a launching track, objects to prop up the launching track, Blu Tack®, one or two sheets of butcher's paper, masking tape, a cup of water, pencils, some different coloured markers, a ball for rolling, scissors.

7. Set up your table as shown in the diagram.

If your table needs two sheets of butcher's paper, overlap the left-hand piece over the right-hand piece.

Make sure your launching track is at the bottom left-hand corner of your table.



8. Experiment to make the ball roll so that its path covers as much of the table as possible. Find and mark:
 - A good place to put the front of the launching track (direction).
 - A good release height for the ball on the launching track (speed).

Tracing the path of the ball

9. Choose a person to be the Launcher. The other members of your group will be the Markers.

Markers need to line up at the side and the back of the table with pencils ready to mark the ball's path with a line of dots.
10. The Launcher wets the ball, dries it slightly so that it is not too wet, and releases it from the mark on the launching track.

Markers use their pencils to quickly make a few marks each along the trace left by the water, making sure the dots are drawn lightly to avoid ripping the paper.

The Launcher then draws the path of the ball with a coloured marker.

11. Repeat this activity 4 or 5 times, each time using a different person to be the Launcher; a different direction (but keep the back of the launching track in the same place); the same height as marked in Step 8; and a different coloured marker.