

Questacon at HOME

Activity sheet – Ball Run

The Innovation Process

Background

This activity focuses on the Make, Try and Refine segments of the Innovation Process. Ball Runs are best described as continual “works-in-progress” or prototypes. They require precision and refinement, and places for changes are best discovered through frequent testing. Real-world examples include bubble gum dispensers or coin donation boxes. Others can be found by searching YouTube for “Marble Runs,” “Ball Runs,” or “Biisuke Ball's Big Adventure.”

Safety

This activity uses sharp tools and has plenty of small parts. Please supervise children at all times.

The Challenge

Create a maze of tunnels, ramps and traps using simple materials and tools. All to control the descent of a marble – Can you make a marble travel top to bottom in 10 seconds?

Materials and Tools

Whatever is cheap, recycled and accessible!

- A Ball Run frame or structure to build from. Might be;
 - The fridge
 - An upside-down chair
 - Roof rafters or couch
 - Build your own!
- Marbles or small balls
- Consumable materials. Whatever you can find which may include;
 - Card, paper, string, toothpicks, toilet rolls, paddle-pop sticks, twisty-ties, paper cups, plastics (including bottles), wood, rubber bands.
- Tools. Which may include;
 - Scissors, safety knives, hot glue guns, masking tape, safety glasses and/or saw, drill.
- Timer. Like a stopwatch.



Activity sheet – Ball Run

Making a Ball Run

Make sure you have space to make and assemble your Ball Run. It can be as big or as small as you like! Work within the materials and space limitations you have to create something unique and fun.

Cardboard or paper ramps can be easily adjusted and repositioned to reduce material use and allow for simple refinements. Start by prototyping two tracks that slow and control a marble's descent before making frames (10 minutes).

Now use the rest of the materials to stick, tie and position your ramps, so the ball flows from one to the other. Make sure to test early and test often. Never assume something will work until you have tried it! You could even film your Ball Run on your phone and tag Questacon!



What do you think?

- What did you find the most challenging throughout the process?
- Was testing important during the design phase?
- What would you do differently next time?
- If you were to build this full scale what materials could you use?

What's next?

Ready to keep building? How about you try some of these challenges;

- Can you make a mechanism that returns the balls back to top?
- How long can you make the ball travel for? Non-stop.
- Make another run from across the room and join them together!

For guidance in building 3D Ball Run frames, check out Teacher DIY at the Teacher Resources section of our website www.questacon.edu.au. For inspiration using only paper, scissors and tape for this lesson, please visit our friends at www.paperrollercoasters.com.

