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Head Teacher: Mrs. Ly Toom

Science and Technology Competition

Dear Parents/Carers,

We have been invited to compete against other schools within the Equals Trust at the annual Science and Technology competition. This year, the competition is to create a marble roller-coaster, which the children should plan, design and build at home. This is an optional challenge and children can choose to enter alone; with their sibling(s) or friend(s) – with a maximum group size of 6.

The children received a briefing about the challenge during assembly this morning and they were filled with excitement – so I hope we receive lots of entries! (We looked at lots of images for inspiration – I have attached the presentation together with this letter.)

To narrow down the entries and find out who will represent Abbey Road at the Equals Trust Grand Final on Tuesday 16th April, we will be holding some heats in school:

- **Key Stage 1 (Years 1 & 2) - Monday 25th March**
- **Lower Key Stage 2 (Years 3 & 4) – Tuesday 26th March**
- **Upper Key Stage 2 (Years 5 & 6) – Wednesday 27th March**

The marble coasters will need to be in school ready to compete in these heats. If coasters are created before the above dates, we would appreciate them not coming into school before Friday 22nd March to avoid the risk of accidental damage!

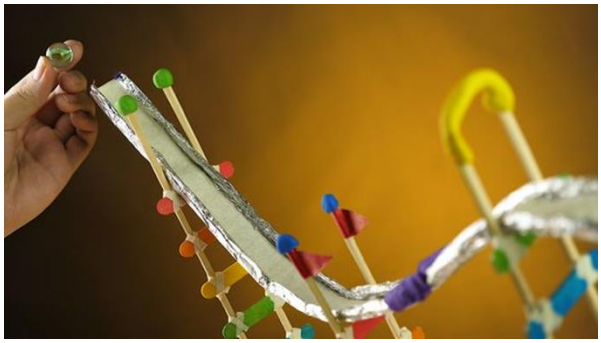
The top three entries from each phase will enter the Abbey Road finals, which will be held on Thursday 28th March. From here, one entrant per phase will qualify to represent Abbey Road at the Equals Trust Grand Final.

If your child would like to enter, please help them to understand all of the rules (see below) as there are strict regulations in place regarding the size of the rollercoaster, the minimum amount of turns that are needed for each age group and also further details of how the competition will run.

If your child needs support with any resources (paper straws, cardboard etc) to build their rollercoaster, please speak to your child's class teacher and we will do our best to help. If you have any other questions, don't hesitate to get in touch.

Many thanks and good luck,

Mr Jones



The Annual Science & Technology Competition 2023-24
Marble roller-coaster run-off challenge

Design Brief

1) The aim is to design and make a **roller-coaster for a marble (standard size),** capable of enabling the marble to run-off as it exits the roller-coaster. The focus is on:

*The number of turns within the roller-coaster (see detail below)
*Directional focus as it exits,
*Ability to enable the marble to run-off as far as possible,
*Re-usability after each 'ride'.

2) The marble roller-coaster must be self-assembled and we encourage the use of **recycled items**. Commercially made chassis will not be accepted nor will any form of remote control. Parts of construction kits i.e. Lego Technic, Knex, Meccano may be used.

3) The number of turns required are stated as a minimum, as follows:

- minimum of **4 turns for Key Stage 1**
- minimum of **5 turns for Lower Key Stage 2**
- minimum of **6 turns for Upper Key Stage 2**

Where teams are made up of children of different ages, they must follow the requirements for the oldest child in the group.

4) The marble roller-coaster should start with the marble being dropped/placed in. The marble will need to move through the turns of the coaster independently before running-off as it exits, as far as possible in a (generally) forwards projection.

5) The finished marble roller-coaster (including the base) must **not be**:

a) Longer than 50 cm.
b) Wider than 50 cm.
c) Higher than 50 cm.

We have encouraged the use of everyday, recycled materials. Some possible items your child could use to build their track are:

- Corrugated cardboard or card
- Kitchen roll/toilet roll innards, possibly cut in half
- Straws
- Egg boxes or fruit cartons
- Knex or Strawbees to form a track
- Foam insulation tubes

6) The marble roller-coasters will be placed on the starting line on one of two lanes (1m wide) laid side by side. The sides of the lanes will be higher than the marble ensuring that as the marble is released from the roller-coaster, it will run along the side of the lane so its 'run-off' distance can be measured (in a forwards direction).

Layout of the Course and Scoring

7) The layout and dimensions of the course (plan view) are shown on the attached diagram **Figure 1.** Please study this carefully. Each lane is 1m wide and separated by a central reservation. The marble roller-coaster must be reusable (no long periods of repair will be permitted before its next run.)

8) If the marble doesn't get released from the roller-coaster then it will not score points on that run.

9) The prime aim is to ensure that the marble runs-off as far as possible – with general straight line distance being measured from the start line. In the heats, each team will have one practice run and three scored runs. The most successful run of the three scored runs (i.e. the one where the marble travels furthest from the start line) will be regarded as the 'score' for that marble roller-coaster. The team can opt to make fewer runs if they wish to preserve the life of their roller-coaster. In the event of a tie, the roller-coaster with the most consistently high scores will win (i.e. the highest average).

10) The 'score' will be calculated in centimetres as the distance that the marble travels along the floor after exiting the roller-coaster. The distance will be measured in a straight line from the start line regardless of the angle that the marble exits its roller-coaster.

11) Children may work as individuals or **groups of up to six** in the design and manufacture of their roller-coasters. Only two members of the team may operate the roller-coaster for each go.

12) All children have received an initial briefing from Mrs Toom in an introductory assembly.

13) Teachers' decision on entry qualifications is final.

14) The **heats** will be held in the week beginning **Monday 25th March 2024**.

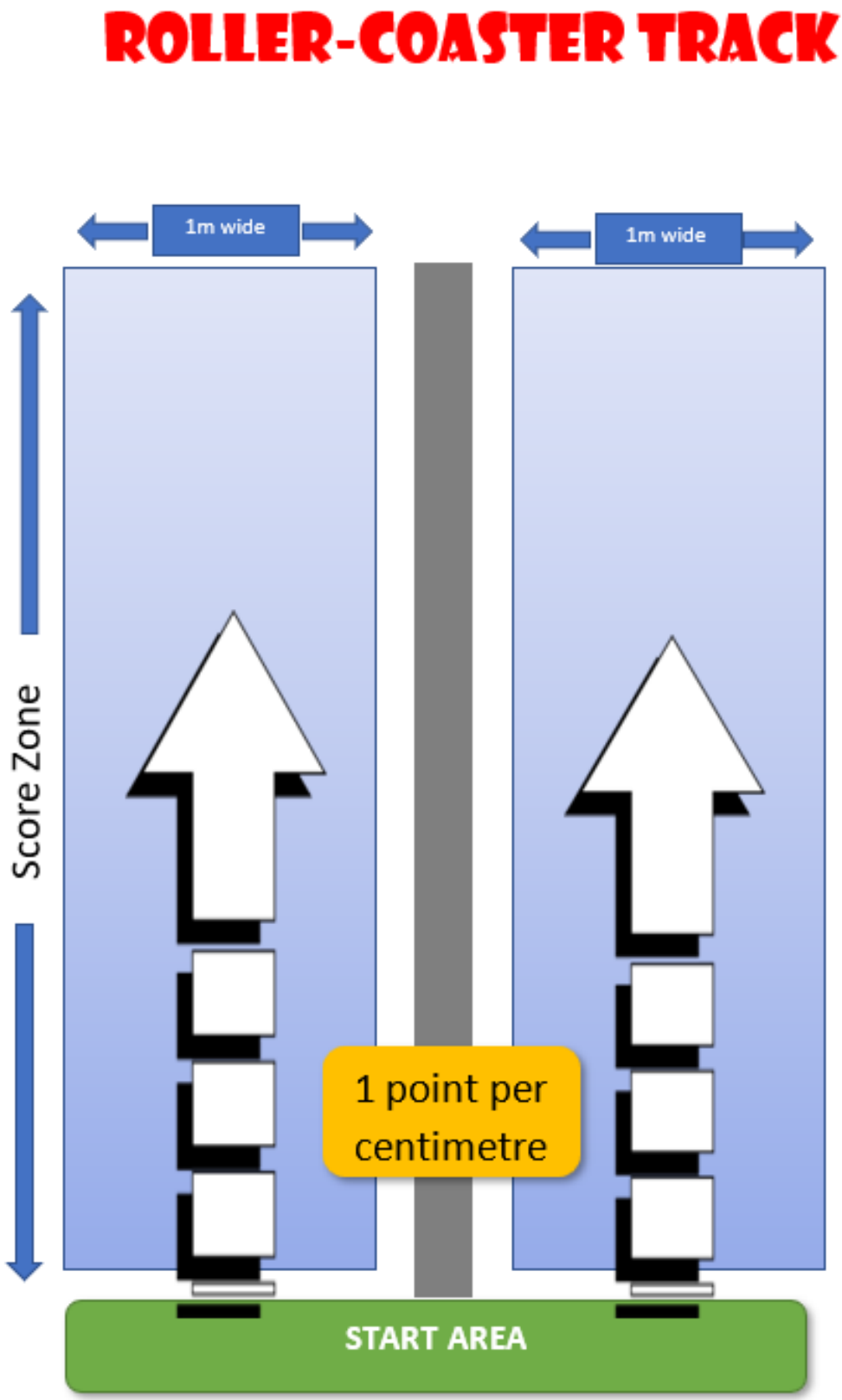
15) **The Abbey Road final** will be held on **Thursday 28th March 2024.** In the finals, each roller-coaster will again be offered one practice run and then three test runs – with the highest scoring run counting. Finalists may repair damage to their roller-coasters (2 minutes only), but re-building or major modification will not be permitted on the day. **So strength is key!**

16) Parents of the qualifying entries will be invited into school for the final. In the heats, I am sorry but there will not be room for spectators.

17) There will be a **winning roller-coaster** for UKS2, LKS2 and KS1**.** A special prize will also be awarded for the **most ingenious roller-coaster**.

May I take this opportunity to wish you every success with your entry. I look forward to seeing the roller-coasters in action. Happy designing and happy building!

Figure 1.


ROLLER-COASTER TRACK
1m wide
1m wide
Score Zone
1 point per centimetre
START AREA