



Organisation details for the New Zealand Young Physicists' Tournament (NZYPT) 2022

The successful tournament format for NZYPT trialled in 2021 continues for 2022.

This format separates the **New Zealand inter-school** team competition (**NZYPT**) from the selection of individual students to represent New Zealand in the **International tournament (IYPT)**.

In 2021 more schools were able to participate in the regional tournaments. This was due to the additional time available for research into finding solutions to the 7 problems in NZYPT after the start of the school year. This was a welcome addition which allowed increased participation in the competition.

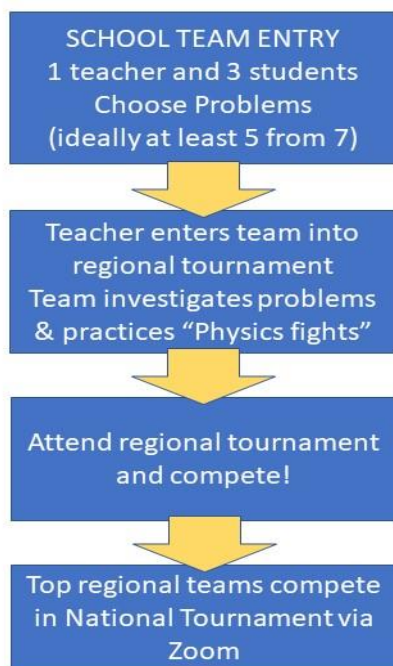
Students keen to participate on the international stage in IYPT

Individual students from anywhere in NZ can compete to be a New Zealand representative in IYPT. This may be in a face to face tournament overseas or it may be online. All students who are NZ residents are eligible regardless of whether they compete in NZYPT or not.

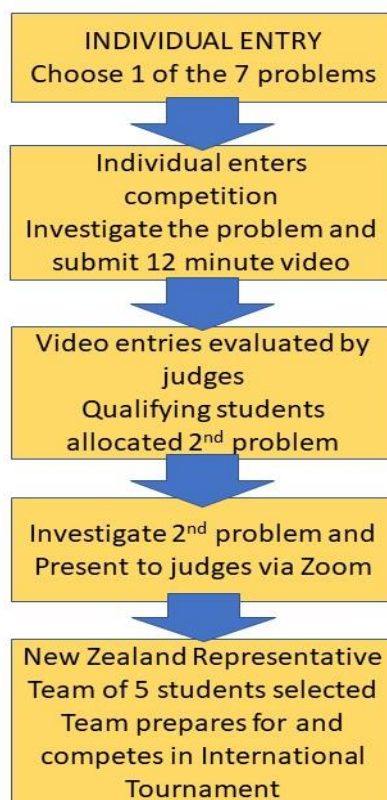
Students keen to participate in the NZYPT inter-schools' competition

Face to face NZYPT regional tournaments for school teams will take place in Auckland, Christchurch and Wellington. These will be followed by an Online National final for the top school teams from the regions.

NZYPT Inter-School team



NZ Team selection for IYPT



New Zealand IYPT team selection process for IYPT 2022

1. Entry is open to all students attending NZ secondary school full time. If they also want to compete in the NZYPT inter-schools team competition they must enter this separately.
2. There will be an [IYPT information 2022 Zoom meeting](#) for all interested students on **Thursday 18th November** at 5.00 pm to further explain the process and answer any questions. Click on the Zoom link to join the meeting.
3. Entrants must research one or more of the 7 NZYPT 2021 problems and select their **best solution** to present via a **12 minute video report**. The video should show the apparatus used and the experiment taking place with a PowerPoint (or equivalent) set of slides and an oral explanation of the Physics of their solution. The video needs to be saved on **YouTube**.
4. Individuals must register their intention to enter the New Zealand team selection process using the link [IYPT individual entry link](#) and **have paid the \$20 entrance fee by Friday 14th January 2022**.
5. Each student and their supporting teacher will be sent an email explaining how to submit their video presentation **after they have registered and paid** the entrance fee.
6. The **final date for video submissions is Monday 31st January 2022**. No videos will be accepted after 10 pm (NZ time) on this date.
7. All participants will receive feedback by Wednesday 9th February 2022 including those students selected for first round "Zoom" interview as potential members of the New Zealand representative team. **These interviews will take place online on Saturday 12th February 2022**. Please keep this date free as alternative dates will not be possible. Students will be questioned by a jury panel consisting of physics teachers about their video and solution to the problem they have submitted.
8. A squad of students will be selected for the second-round interviews. Each will be allocated an IYPT 2022 problem (**not used in NZYPT**) for them to individually investigate.
9. The New Zealand team of 5 students will be selected from the New Zealand squad by a second online interview on **Saturday 19th March 2022**. Second round interviewees will present the results of their individual research in a live 12-minute online presentation followed by discussion with jurors. The successful team of 5 will be announced after all squad members receive feedback on **Sunday 20th March 2022**.

NZYPT inter-school regional tournaments and the National school team tournament 2022

1. **Auckland, Christchurch and Wellington venues** will host a regional tournament on **Saturday 7th May 2022**. Schools may enter up to two teams, each consisting of three students. Each team must provide a teacher/juror for their regional event.
2. All school teams must be **fully registered with names of participating students provided and the entry fee of \$135 paid by Friday 15th April 2022**. Use the online form link that follows to start your entry process. (Student names can be changed up until Friday 22nd April 2022). Schools are eligible for an early bird discount (team entry reduced to \$105 per team) if they are all paid up before **Friday 18th March 2022**.
3. Entry link for NZYPT regional tournaments 2022 is via this link [NZYPT inter-school team entry form](#).
4. Invoices and further details of the competition will be sent to schools on completion of the online registration form.
5. The **top team from each region will compete** in the **Online National Tournament** on **Sat 14th May 2022** for the title of NZYPT National Schools Champions and the national trophy.

The 7 Problems for NZYPT 2022

1. Ball on Membrane

When dropping a metal ball on a rubber membrane stretched over a plastic cup, a sound can be heard. Explain the origin of this sound and explore how its characteristics depend on relevant parameters.

2. Strange Motion

Sprinkle small floating particles on the surface of water in a bowl. Bring a strong magnet above and near to the water surface. Explain any observed motion of the particles.

3. Tennis Ball Tower

Build a tower by stacking tennis balls using three balls per layer and a single ball on top. Investigate the structural limits and the stability of such a tower. How does the situation change when more than three balls per each layer and a suitable number of balls on the top layer are used?

4. Balls on an Elastic Band

Connect two metal balls with an elastic band, then twist the elastic band and put the balls on a table. The balls will begin to spin in one direction, then in the other. Explain this phenomenon and investigate how the behaviour of such a "pendulum" depends on the relevant parameters.

5. Three-Sided Dice

To land a coin on its side is often associated with the idea of a rare occurrence. What should be the physical and geometrical characteristics of a cylindrical dice so that it has the same probability to land on its side and one of its faces?

6. Candle Powered Turbine

A paper spiral suspended above a candle starts to rotate. Optimise the setup for maximum torque.

7. Boycott Effect

If particles are suspended in a liquid that has a lower density than the particles, the particles will settle to the bottom of the container. The rate of settling can be affected by tilting the container that holds the liquid. Explain this phenomenon and investigate the effect of relevant parameters.

End.

