

A-ISPC 2026

PROJECT IDEAS & AI IN SCIENCE

A Preparation Booklet

AI-Assisted International Science Project Competition

Emerald Horizon Ventures · aispc2026.org

Welcome

This booklet is here to help you get started on your A-ISPC project. It's split into three parts: a list of project ideas across five scientific fields to spark your own thinking, a collection of real facts about how AI is changing science today, and a short set of tips for putting together a strong submission.

Remember: you don't have to use one of the ideas in this booklet exactly as written. They're starting points — feel free to adapt, combine, or take them in a completely different direction based on what genuinely interests you.

A Quick Recap of the Format

A-ISPC has no fixed tracks or categories. You choose your own research question and build a science project around it, using AI as a documented tool along the way — not a black box. You can compete individually, or as a team of 2–3 students from the same school.

What you submit: a project report, plus a 3-minute video presenting your work. Deadline: October 15, 2026.

How you're judged: Scientific Rigour (40%), Originality (30%), and AI Integration (30%) — meaning judges specifically want to see how you used AI, not just that you used it.

Part One — Project Ideas

Five fields, several starting questions each — with a note on how AI could realistically be woven in as a documented tool.

Biology & Health

1. Can AI predict plant disease from leaf photos taken on a phone?

AI angle: Train or use an existing image-classification model to identify disease patterns in leaf images, comparing accuracy across plant species.

2. How accurately can AI estimate sleep quality from simple wearable or phone sensor data?

AI angle: Use AI to analyze movement/heart-rate patterns and compare predictions against a self-reported sleep diary.

3. Can a chatbot-style AI model give reliable answers to common first-aid questions?

AI angle: Test an AI model's responses against verified medical guidelines, documenting where it's accurate and where it fails.

4. Does AI-assisted diet tracking improve accuracy compared to manual food logging?

AI angle: Use an AI food-recognition tool to log meals for two weeks and compare results to a manually tracked control group.

5. Can AI detect early signs of stress from voice recordings?

AI angle: Use AI audio analysis tools to look for patterns in tone, pitch, or speech rate correlated with self-reported stress levels.

Environmental Science

1. Can AI image recognition track local biodiversity from camera trap or phone photos?

AI angle: Use an AI image classifier to identify and count species from a set of local wildlife photos, checking accuracy against manual identification.

2. How well can AI predict next-week weather patterns using local historical data?

AI angle: Use a simple AI/machine-learning model to forecast temperature or rainfall, comparing its predictions to actual outcomes and official forecasts.

3. Can AI help identify areas of a neighborhood most affected by urban heat?

AI angle: Use AI to analyze satellite or thermal image data, mapping heat patterns and proposing possible causes.

4. Does an AI model improve recycling sorting accuracy compared to manual sorting?

AI angle: Train or use an image-classification tool to sort recyclable materials, testing accuracy against manual sorting by students.

5. Can AI estimate air quality trends using publicly available sensor data?

AI angle: Use AI to analyze historical air-quality datasets and identify patterns tied to traffic, weather, or time of day.

Physics & Engineering

1. Can AI improve the accuracy of predicting a pendulum's motion compared to standard physics formulas?

AI angle: Use a machine-learning model trained on pendulum motion data and compare its predictions to the classical physics equations.

2. How well can AI predict the strength of different bridge/tower designs from simple simulations?

AI angle: Use AI-assisted simulation tools to test multiple structural designs and compare predicted vs. actual load tolerance in a physical model.

3. Can AI optimize the most fuel-efficient route for a small electric vehicle or drone?

AI angle: Use an AI route-optimization tool and compare its suggested paths to manually chosen routes for efficiency.

4. Does AI-based image analysis improve measurement accuracy in physics experiments (e.g., measuring free-fall time)?

AI angle: Use AI-powered video analysis tools to measure motion and compare to manual stopwatch/ruler measurements.

Chemistry & Materials

1. Can AI predict which household materials will be the best insulators before testing them?

AI angle: Use AI to analyze material properties data and predict insulation performance, then test the prediction experimentally.

2. How accurately can AI identify unknown substances from simple color-change chemical reactions?

AI angle: Use AI image classification on reaction photos to predict substance identity, validating against known chemistry results.

3. Can AI help design a more effective natural water filter using common materials?

AI angle: Use AI to help analyze combinations of filtering materials (sand, charcoal, cloth) and predict effectiveness, then test physically.

Data Science & Computer Science

1. Can AI detect fake or manipulated images better than the average student?

AI angle: Compare human accuracy vs. an AI deepfake-detection tool on a set of real and edited images.

2. How well can AI predict exam performance based on study habits data?

AI angle: Collect anonymized study-habit survey data and use a simple AI model to predict outcomes, testing its accuracy.

3. Can AI-generated study schedules improve learning efficiency compared to self-made schedules?

AI angle: Compare test results between students using an AI-generated study plan vs. a self-made one over a set period.

4. Does AI translation accuracy differ significantly between formal and informal language?

AI angle: Test an AI translation tool on formal text vs. slang/informal text and measure accuracy differences.

Part Two — How AI Is Changing Science

Real examples of AI accelerating scientific discovery — useful context for your report's introduction, or just genuinely interesting.

1. Protein Folding Solved (Mostly)

For decades, predicting how a protein folds into its 3D shape was one of biology's hardest problems. In 2020, DeepMind's AlphaFold predicted protein structures with accuracy rivaling years of lab experiments — accelerating drug discovery and disease research worldwide.

2. AI Discovers New Antibiotics

In 2020, MIT researchers used AI to screen over 100 million chemical compounds and discovered a completely new antibiotic (later named Halicin) capable of killing bacteria resistant to existing drugs — a process that would have taken years using traditional lab methods.

3. AI Reads Ancient Texts

Researchers have used AI to help decipher damaged or unreadable ancient manuscripts and scrolls — including using machine learning to virtually 'unroll' and read the Herculaneum scrolls, carbonized by the eruption of Mount Vesuvius in 79 AD, without physically opening them.

4. AI Finds New Planets

Space agencies use AI to sift through massive amounts of telescope data to detect the subtle patterns of distant exoplanets — patterns far too faint and numerous for humans to check manually. AI has helped identify thousands of candidate planets from NASA's Kepler mission data alone.

5. AI Predicts Earthquake Aftershocks

Scientists have trained AI models on historical earthquake data to better predict the location of aftershocks following a major earthquake, potentially helping emergency response teams act faster and save lives.

6. AI Helps Design New Materials

Materials scientists use AI to predict the properties of new materials — like battery components or super-strong alloys — before they're physically created, dramatically speeding up the trial-and-error process of materials discovery.

7. AI Monitors Coral Reefs

Marine biologists use AI-powered underwater cameras and audio sensors to track coral reef health and fish populations automatically, processing far more data than researchers could review manually.

8. AI Assists Cancer Detection

AI image-analysis tools can now detect certain patterns in medical scans (like mammograms) that are sometimes missed by the human eye, and are increasingly used as a second check alongside radiologists — not a replacement for them.

9. AI Models the Climate

Climate scientists use AI to improve the accuracy of long-term climate models, helping predict extreme weather events and identify regions at greatest risk from climate change.

10. AI Helps Track Endangered Species

Conservationists use AI to automatically identify individual animals (like tigers or whales) from photos based on unique markings, making it possible to track population health across huge geographic areas.

11. AI Speeds Up Vaccine Research

During the COVID-19 pandemic, AI tools helped researchers rapidly analyze the virus's structure and predict how it might mutate, contributing to faster vaccine development timelines.

12. AI Can Now 'Smell'

Researchers have trained AI models to predict how a chemical compound will smell to humans based on its molecular structure — a task previously thought to require a trained human nose.

Part Three — Understanding the Judging Criteria

Scientific Rigour — 40%

This is the largest single component, and it's about whether your project follows genuine scientific method: a clear question, a testable hypothesis, a sound experimental or research design, and honest analysis of your results — including results that didn't go as expected.

A project that gets a "messy" or partially-inconclusive result, but explains why and what it means, generally scores better than one that only reports a clean-looking result without explaining the process behind it.

Originality — 30%

Originality doesn't require inventing something nobody has ever thought of. It's about your own angle: a personal spin on a common topic, an unusual combination of fields, or applying a method to a context it isn't normally used in.

A strong way to build originality is to start from something specific to your own life or community — a local environmental issue, a habit among your classmates, a question that came from your own curiosity — rather than a generic textbook topic.

AI Integration — 30%

This is scored on transparency, not just usage. Judges want to see exactly which AI tool you used, how you used it, what it got right, and — just as importantly — where it fell short or needed correction by you.

A project that says "I used AI to help analyze my data, but it initially misread outliers in my dataset, so I manually corrected X" demonstrates far stronger AI Integration than one that only says "I used ChatGPT to help write this."

Part Four — A Worked Example

To make the process concrete, here's how one idea from Part One could actually be developed from a starting question into a full project.

Starting Question

"Can AI image recognition track local biodiversity from camera trap or phone photos?"

Step 1 — Narrow It Down

The original question is broad. A student narrows it to something testable in their own context: "Can a free AI image-recognition tool correctly identify bird species from photos taken in my school garden, and how does its accuracy compare to my own identification using a field guide?"

Step 2 — Design the Method

The student takes 40 photos of birds visiting the garden over two weeks, identifies each manually using a field guide, then runs the same photos through an AI image-recognition tool and records its identification for each.

Step 3 — Analyze Honestly

The AI correctly identifies 31 of 40 birds (77.5%). The student examines the 9 mistakes and notices the AI struggled specifically with juvenile birds and photos taken from a distance — a genuine, specific finding, not just a pass/fail score.

Step 4 — Document the AI Use

In the report, the student names the specific tool used, explains exactly how photos were submitted to it, and includes a table comparing AI vs. manual identification for all 40 photos — with the 9 mismatches clearly noted and discussed.

Step 5 — The 3-Minute Video

Rather than reading the report aloud, the video shows a handful of the actual photos, the AI's identification attempt on screen, and a brief, direct explanation of what the student learned — including the limitation they discovered.

Notice that this project didn't require expensive equipment, a lab, or a completely novel scientific discovery. It required a specific, testable question and an honest account of what happened — which is exactly what strong Scientific Rigour and AI Integration scores are built on.

Part Five — Tips for a Strong Submission

1. Choose a question you're genuinely curious about — projects driven by real curiosity are usually stronger than ones chosen just because they seem easy.
2. Keep your research question specific and testable. "How does AI affect the world?" is too broad; "Can AI predict X better than method Y?" is testable.
3. Document exactly how you used AI throughout your project — which tools, what prompts or settings, and what the AI got right or wrong. Judges score AI Integration (30%) specifically on this transparency.
4. Don't let AI replace your own thinking — the strongest projects use AI as a tool alongside genuine scientific method: forming a hypothesis, testing it, and analyzing real results.
5. Start your 3-minute video script early. Practice explaining your project in plain language — a clear, confident explanation often matters as much as the project itself.
6. If working in a team of 2-3, divide responsibilities clearly early on (research, experiments, video/report writing) so nothing gets rushed at the deadline.

Good Luck

Whether you build on one of these ideas or come up with something entirely your own, the most important thing is genuine curiosity backed by real scientific method. Judges can tell the difference between a project that was explored honestly and one that was rushed.

Questions about your project, the submission process, or the Global Finals in Hong Kong? Reach out any time.

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