

Cat 1 Projects

Briefing for
Cat 1
3 Feb 2017

HCI Projects Day (11 categories)

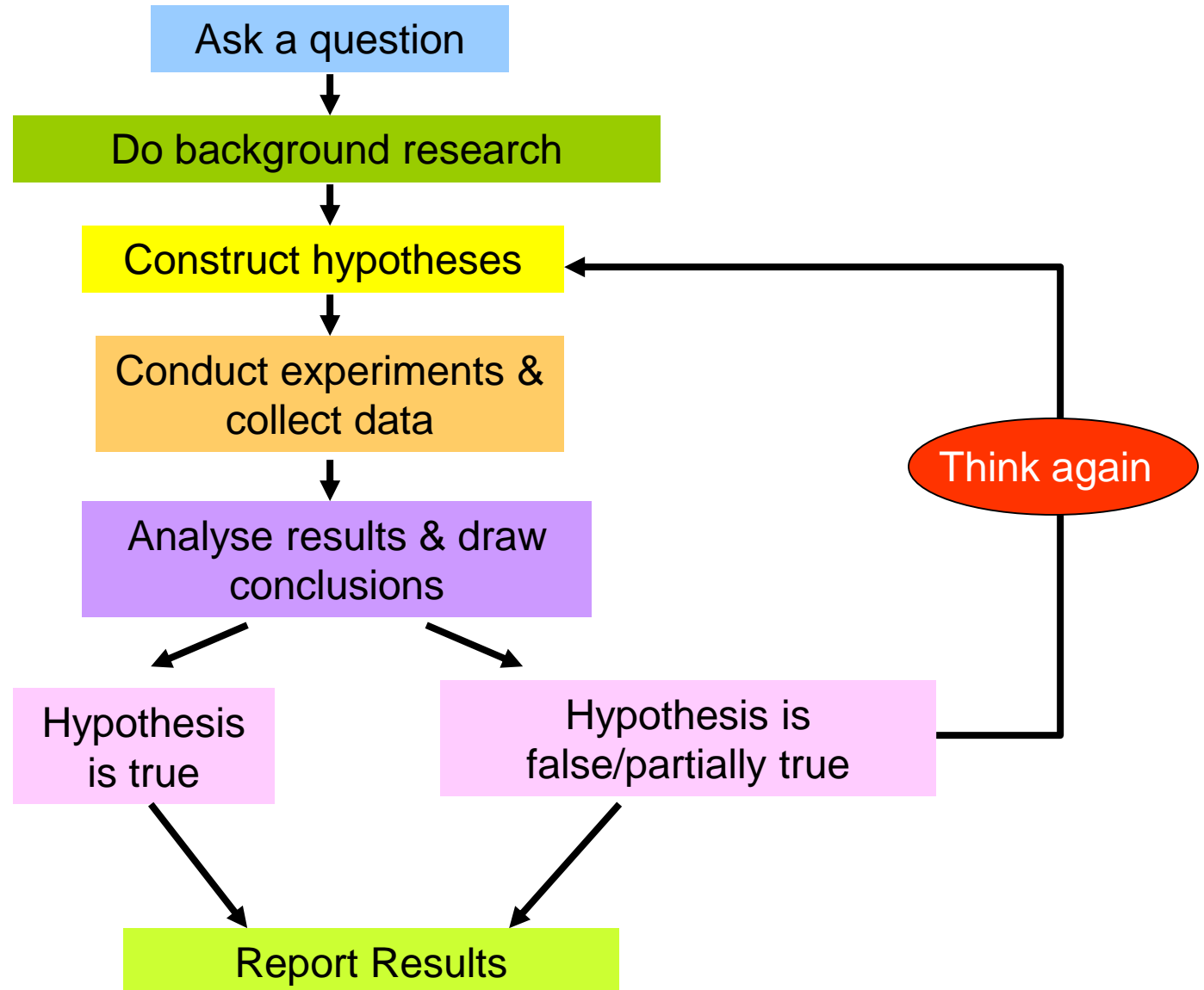
| | | |
|---|--|--|
| Category 1 (Experimental research) | Category 5 (Creative arts) | Category 9 (Infocomm studies) |
| Category 2 (Humanities & Language Arts Research) | Category 6 (Chinese Language Arts) | Category 10 (Future trends) |
| Category 3 (Inventions) | Category 7 (Service learning) | Category 11 (Engineering science) |
| Category 4 (Resource Development) | Category 8 (Mathematics) | |

What is Cat 1 project about?

- Experimental research
- Need to carry out experiments in the lab
- Data collection needed
- Must have variables



The Scientific Method



Examples of **non** Cat 1 Projects

- Causes of Tsunami
- Coconut milk extractor
- Layman guide to science experiments
- Cures to cancer
- The Green project – Resource, Educate

Examples of Cat 1 Projects

- Utilization of starch for the production of biodegradable plastic.
- Synthesis and characterisation of nanometric semiconductors
- Effect of mint on growth of bacteria
- Deriving biofuel from newspaper

How to get started?

Source for an idea which is

- Creative (if possible)
- **Feasible**
- Has good application
- Interesting



Sourcing for ideas

- There are many websites on science fair project ideas. For example:
<http://www.all-science-fair-projects.com/>
<http://www.juliantrubin.com/fairprojects.html>
<http://www.sciencebuddies.org/>
- Start early, sourcing for ideas take time. Discuss with mentor to check whether the idea is feasible.

Where to find ideas?

- Search engines
 - google
 - Google scholar
 - open access journal (<http://www.doaj.org/>)

Where to find ideas?

- HCI projects day websites
 - Web report archives. Browse through to find out what has been done. Project ideas can be obtained by **modifying** existing ideas or **extending** them.

Where to find ideas?

- Science books/magazines/newspaper

The Straits Times ASIA A10 Tuesday, June 25, 2013

Vegetables from Pearl River Delta 'contaminated'

HONG KONG – As much as one-fifth of vegetables from the Pearl River Delta contain excessive amounts of heavy metals, even as worries among residents in southern China's Guangdong province over last month's cadmium-tainted rice revelations linger.

The widespread vegetable contamination was detailed by a provincial agriculture official last week while trying to raise awareness about the worsening prob-

lem of farmland pollution in the province, the South China Morning Post reported yesterday.

Official Yu Jiame said the spread of heavy metals used in manufacturing – such as arsenic, cadmium, copper and mercury – was a “regional problem, covering a large area” following Guangdong's industrial boom.

“As a result, about 10 to 20 per cent of vegetables grown in nine vegetable production cen-

tres, including Dongguan, Conghua and Panyu, were tested (and found) to contain more heavy metals than what the country's safety levels allow,” the official was quoted as saying by Guangzhou's Nanfang Daily.

Traces of lead, chromium, zinc and nickel were found in some vegetables. Such heavy metals can accumulate in the body over years, leading to organ and nerve damage, and even cancer.

Last month, anger erupted after the Guangzhou government said nearly half of rice samples collected from local markets in the first three months had tested positive for cadmium, the Post in Hong Kong reported.

Singapore's Agri-Food and Veterinary Authority (AVA) said yesterday that “imported fresh fruits and vegetables from China have been found to meet our food safety requirements for heavy

metals so far”.

As part of its surveillance programme, imported fresh fruits and vegetables are regularly sampled and tested for heavy metal contaminants, an AVA spokesman said.

Separately, Greenpeace said yesterday traditional Chinese herbs, like *san qi* flower and honeysuckle, are being contaminated with a cocktail of pesticides, Agence France-Presse reported.

Where to find ideas?

Evaluating the ability of wastepaper in adsorbing heavy metal ions



Project ideas

- Not necessary to be 100% novel
- Possible to modify from existing ideas

Doing Background Research

- Identify gaps in knowledge.
- Research on the history of similar studies.

Grading – Preliminary evaluation

- Focus on feasibility
- Rationale/introduction
- Clear objectives & hypothesis
- Variables (controlled, independent and dependent)
- Materials, Apparatus and equipment
- Methods

Grading – Preliminary Evaluation

- Pass prelim I – 10 points
- Prelim II – 5 points

Grading – Mid term evaluation

- Everything listed in prelims
- **Detailed methods** (include photos)
- Results (organised in tables, graphs)
- Interpretation of results

Grading – Final evaluation

- Everything listed in semi-finals
- More in-depth discussion of results
- Conclusion
- Applications
- Limitations
- Future studies

Comment on the following ideas

- Effect of different organic fertilizers on plant growth
- Healthy and unhealthy food
- Investigating bacterial resistance to Dettol
- Effect of colours on emotion
- Biodegradable microspheres for use in tissue engineering

Sharing of a 2016 Sec 2 Project

Eco-friendly Synthesis of Silver Nanoparticles using Winter Melon Peel Extracts



Johnny Xiao
203 (2016)

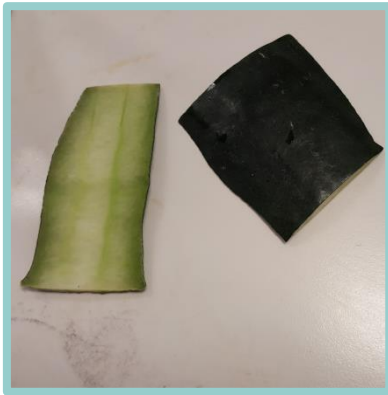


Ho Shane
203 (2016)

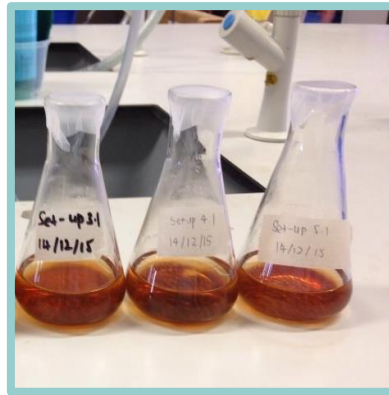
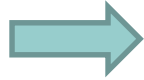


Caleb Liow
203 (2016)

What the project is about?



Winter melon peel



Colloidal silver nanoparticles



Bactericidal filter paper which can be used to remove bacteria in water

The END

*Thank
You!*

