



Insects and spiders: An avenue for 'If-then' thinking

<http://topdrawer.aamt.edu.au/Reasoning/Big-ideas/If-then/If-then-statements>

A typical problem that stimulates 'If-then' reasoning is:

There are some insects and spiders. Altogether, they have 7 heads and 48 legs.
How many insects and how many spiders are there?

Students need to think through the possibilities, given that a spider has 8 legs and 1 head and an insect has 6 legs and 1 head. This is 'If-then' thinking.

The above problem is probably suitable for years 4–10, depending on the approach taken. For example, primary students could draw or make the heads then use matchsticks as 'legs' to experiment, while older students might design a table, spreadsheet or graph.

You can find similar problems about insects and spiders arranged into problem cards on the Mathwire website at <http://mathwire.com/problemsolving/insectspider.pdf>.

Here are some other suggestions for years F–10.

- In the first year of schooling, start with models of (say) two cats and one bird; then add more, recording the number of legs. This could prepare children for making various materials for (say) 14 legs.
- A problem that could be attempted at year 2 might involve the number of wheels on a small number of tricycles and bicycles.
- A similar problem at year 3 or 4 might involve goannas and emus.
- Year 6 or 7 could use 18-wheel and 22-wheel trucks.
- Year 8 or 9 students might use the cost of cartons of milk and containers of yoghurt.
- A Year 10 or 11 problem could involve two or more different types of machines that make various numbers of microchips per hour.

Once students can solve such problems easily, they enjoy writing their own. They could make a set of problem cards for use by peers or lower year levels.

