Saving Power

You need ★ a calculator (optional)

Activity One

Jimmy's mum has just bought a thermal eco-wrap for their hot-water cylinder. The wrap cost her $70, which the salesperson said she'd save in power in the first year.

Jimmy read on the Internet that only 25 percent of houses in New Zealand have insulated hot-water cylinders.

1. If there are 1.58 million homes in New Zealand, how many have uninsulated cylinders?

2. If all these homes put thermal eco-wraps around their cylinders and the wrap saved each household $70 in power per year, what would be their total saving in the second year?

So next year I'll be paying $70 less!

Activity Two

Jimmy's Uncle Jack has a solar panel on his roof that helps heat his water. He and Jimmy's mum are discussing their power bills.
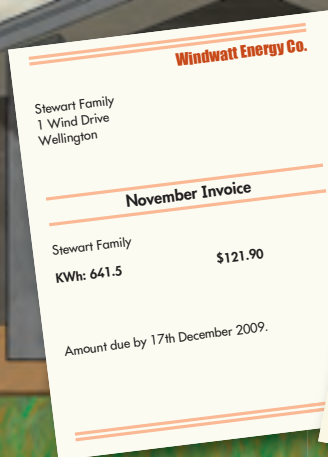
Our power bills used to be very similar, but mine has gone down quite a bit since I had the solar panel installed.

Windwatt Energy Co.

Stewart Family
1 Wind Drive
Wellington

November Invoice

Stewart Family $121.90

KWh: 641.5

Amount due by 17th December 2009.

Kiwipower

Riddle Household
23 Penny Street
Blenheim

Attn: Riddle Household

Please pay $148.20 by 20 December 2009 based on metered 780.2 KWh consumed in November 09.

Solar panels do help the environment, but they cost about $2,000 to buy and install. That'd use up our holiday savings!

1. a. Which is Jimmy's mum's power company?
   b. i. If the difference in the monthly bills above is due to Uncle Jack's solar panel, about how much might Jimmy's mum save *each year* if she had a solar panel installed?
      ii. At this rate, how many years would it take for the solar panel to pay for itself?

2.

Solar panels convert available sunshine into electricity. Blenheim gets more sunshine than Wellington, so we should be able to get more power from a solar panel!

Jimmy researches sunshine hours in the places where his relatives live.

Location	Annual sunshine hours
Blenheim	2 500
Invercargill	1 600
Palmerston North	1 700
Tauranga	2 250
Wellington	2 050

a. As a percentage, how much more solar power could Jimmy's mum expect to get in Blenheim than in each of the other locations?

b. How much more than Uncle Jack could she expect to save per year?

c. Both power bills shown are for November. Are the savings from a solar panel likely to be similar in other months?

3. Jimmy's mum thinks she might apply for a loan to buy a solar panel instead of using her savings. She checks out interest rates.

Our power bill will be about the same as Uncle Jack's soon!

a. If she borrowed $2,000 for 4 years at a flat rate of 5 percent interest per year, about how much extra would she pay?

b. How much would the solar panel cost now?

4. Jimmy's mum discovers that she can get an interest-free loan, as an environmental incentive, to pay for a solar panel.

a. How much would Jimmy's mum need to pay per month if she wants to repay $2,000 in 4 years?

b. At the end of 4 years, will the solar panel have paid for itself? If not, how much longer will it take?

Focus   Solving problems that involve rates and percentages