

Teacher's background information

Calculate

Calculate is about understanding how energy is used in the home and discovering ways to reduce its use. This unit can be studied as a stand-alone unit or as the precursor to either **Conserve** or **Communicate** activities.

In Calculate, students will:

- review their knowledge of where energy comes from, including renewable and non-renewable energy sources
- calculate the running costs of appliances and understand how they contribute to total household energy costs
- identify possible energy savings and calculate their value in terms of household bills and greenhouse gas emissions.

Activities and assignments

Calculate consists of five sections, each with a unique class-length activity and take-home assignment, all of which have strong connections to the curriculum framework (see pages 6–11). Each activity and assignment is numbered to correspond to the relevant section. For example, Assignment 2 can be found in Section 2.

Section	Objective
Section 1 Energy: The global picture	To learn where energy comes from.
Section 2 Energy @ Home: Your total energy bill	To learn how to read and analyse energy bills.
Section 3 Energy @ Home: How energy is used	To understand the amount of energy that is used by appliances and enable comparisons.
Section 4 Everyday savings @ Home	To analyse household energy use and develop energy saving ideas.
Section 5 Everybody's energy savings	To pool the class results and calculate the overall savings.

Some activities and assignments may require additional information, which is located in the Support materials section (see page 67 onwards). If so, these will be marked under the heading 'Students need' in the activity or assignment.

Introducing Calculate to students

The success of this project for students may depend on the way Section 1 is introduced. Making it fun will encourage students to approach the project with a positive attitude. It is also an important introduction tool that assists in investigating students' prior knowledge on energy and associated topics.

It is recommended that teachers give students the Activity 1, *Energy quiz* with no additional discussion, explaining that it is not a test but, rather, an activity designed to stimulate thinking about the way energy is used. Afterwards take students through each question, discuss the answer(s) and explore in detail the relevant topics. This resource provides example topics and additional information that will assist you in these discussions (see pages 21–23).

Energy journal

Some of the activities and assignments in Calculate require students to utilise an energy journal. This will need to be organised before Activity 2 commences.

It's important to remind students to paste or stick all loose sheets of paper, including the completed activities and assignments, into their energy journal. This will ensure that information won't get lost and that it will be available at all times.

The Origin Energy efficiency website and energy efficiency calculator

The Origin Energy efficiency website and energy efficiency calculator will need to be accessed by students so they can complete certain activities and assignments.

It is recommended that the students are provided with the additional information on these tools (see page 17) as an introductory explanation.

If students can't access a computer there is an energy summary template they can use (see Support materials, page 89). Students should complete their individual or combined energy team use on the template and, when computers are available, transfer the information to calculate the costs and CO₂ emissions.

Students could also take the template home to discuss the energy team's combined use.

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Further discussions with students

Some concepts that could be discussed during Calculate are outlined below.

- Factors that affect home energy consumption, for example, seasonal variations, extreme weather, social events or special occasions.
- Are particular times of the year better for saving energy? If time permits, ask students to develop a hypothesis about seasonal variations.
- Examine the range of motivations for saving energy. Is saving money or saving the environment their most important motivation? What do they believe motivates different people?
- Use the graphic information contained on the energy bills and on the energy efficiency calculator as a basis for developing further activities, such as converting information from one style of graph to another. Discuss the advantages and disadvantages of the various presentation styles.

Introducing the Home Energy Project to the household

To maximise household involvement and encourage support, introductory information about the project can be provided to parents.

A sample letter (see page 73) is included in this resource and it is recommended that this, together with the introduction by Tim Flannery, be distributed before the commencement of Calculate.

An electronic version of this letter has been provided for your convenience on the Home Energy Project CD. It can be modified to suit your needs.

The energy team

Not every student will be able to involve their household or all members of their family in this project. But that doesn't need to be a barrier to participation.

Those able to participate from each household (including the student) will form the 'energy team'.

The energy team will discuss and analyse the household's energy consumption (include the consumption of other members of the household who are not in the energy team).

The activities could also be completed by an individual student recording that student's own energy usage, thus forming an energy team of one. The student could then team up with a friend to share their results.