



# GOLD AWARD PROJECT IDEAS



typically 70 hours of project work



## What fabric should you use to make a duvet?

**Before you start your investigation, you should carry out a risk assessment and have it checked by your teacher. For help with this, read through our health and safety information and look out for health and safety warnings in the text.**

In this project, you will investigate the thermal properties of different fabrics used in cold weather clothing or other thermal insulation applications such as sleeping bags or duvets. You will also find out about TOG values and measure the TOG values of your different fabrics.

### Getting started

You should start this project with some research. Find out about the design of fabrics with good thermal insulation properties and their use in cold weather clothing and other thermal insulation applications such as sleeping bag and duvets.

Find out what is meant by thermal resistivity and TOG value. Find out how the thermal insulation of fabrics are measured and compared. At the same time, try to obtain samples of fabrics for your own tests. You should make contact with a manufacturer or university department involved in testing the thermal properties of fabrics. You should visit their lab to observe how fabrics are tested and you should discuss with the link person some ideas about how to conduct your own tests

### Designing experiments

Design your own experiments to measure and compare the thermal properties of different fabrics.



Beware of the hazards of certain materials such as fibre glass and some mineral fibres. If you use these, think about the strategies needed to reduce the risk.

You should try to base your method on the techniques used in industry. You could start by comparing different fabrics. Make sure your tests are fair and allow a comparison of the thermal properties of your sample fabrics.

Most thermal insulation applications involve more than one layer. Often the fabric is quilted. Devise your own tests to measure the effect of having more than one layer of fabric and then investigate the effect of quilting the fabrics together. You could investigate the effect of different sizes of quilting pattern. You could then go on to use your tests to investigate other techniques used by manufacturers to improve thermal insulation.

You should find out from your link person or mentor how the TOG value of fabrics is measured. You should then discuss with your link person how you can make your own measurements of the TOG value for a variety of fabrics and products such as sleeping bags and duvets.

You will need to decide how you are going to present your results and how you are going to relate them to what you found out about the way manufacturers construct their products to give maximum thermal insulation. You should also present a summary of your research into thermal insulating fabrics and how manufacturers design products with high thermal insulation. You should explain the use of the TOG value as a means of comparing the thermal insulation properties of a particular product.

For a similar project at Silver level try 'What fabric should you use to make cold weather clothing?'

