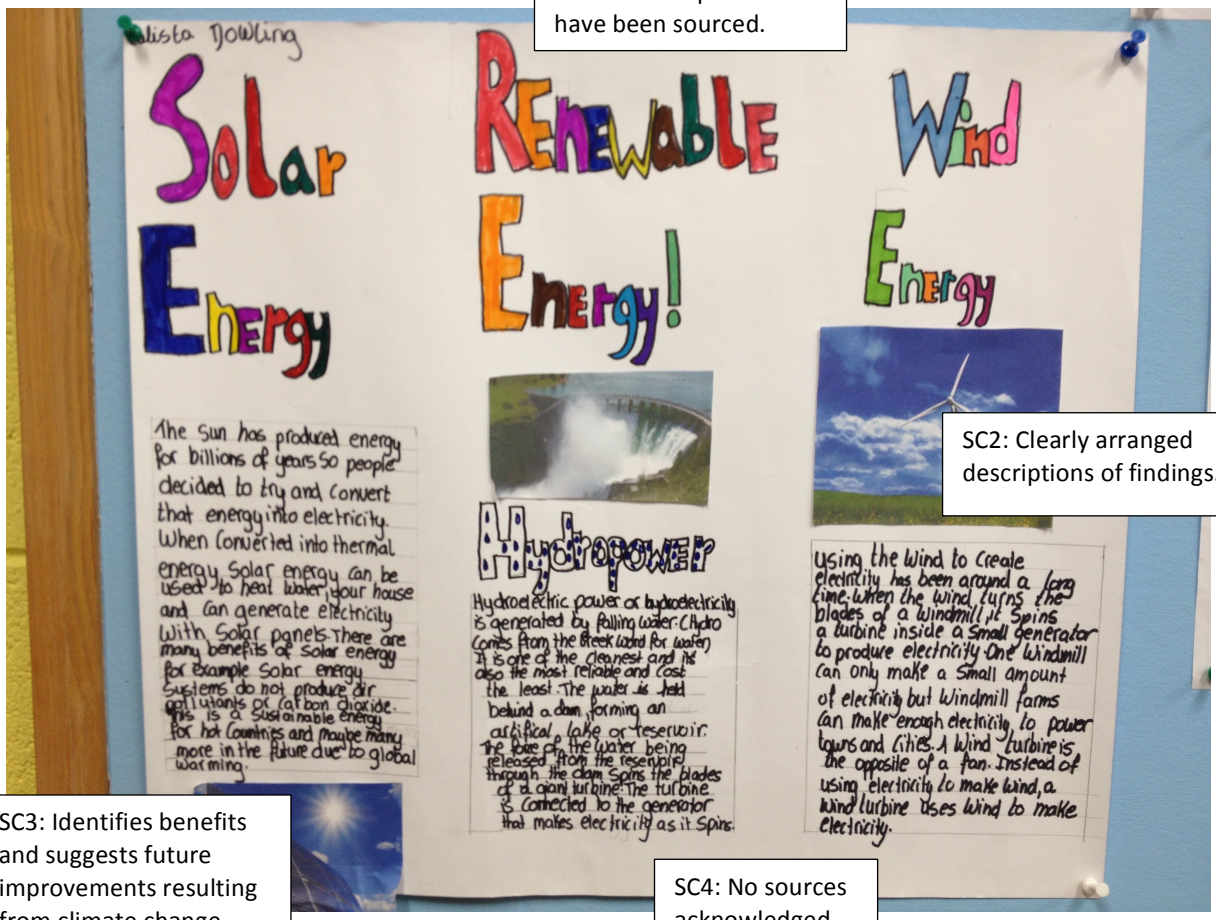
Meeting Current and Future Energy Needs

Marked Examples of Students' Work for Guidance

Sample 1

SC1: All information is relevant and pictures have been sourced.



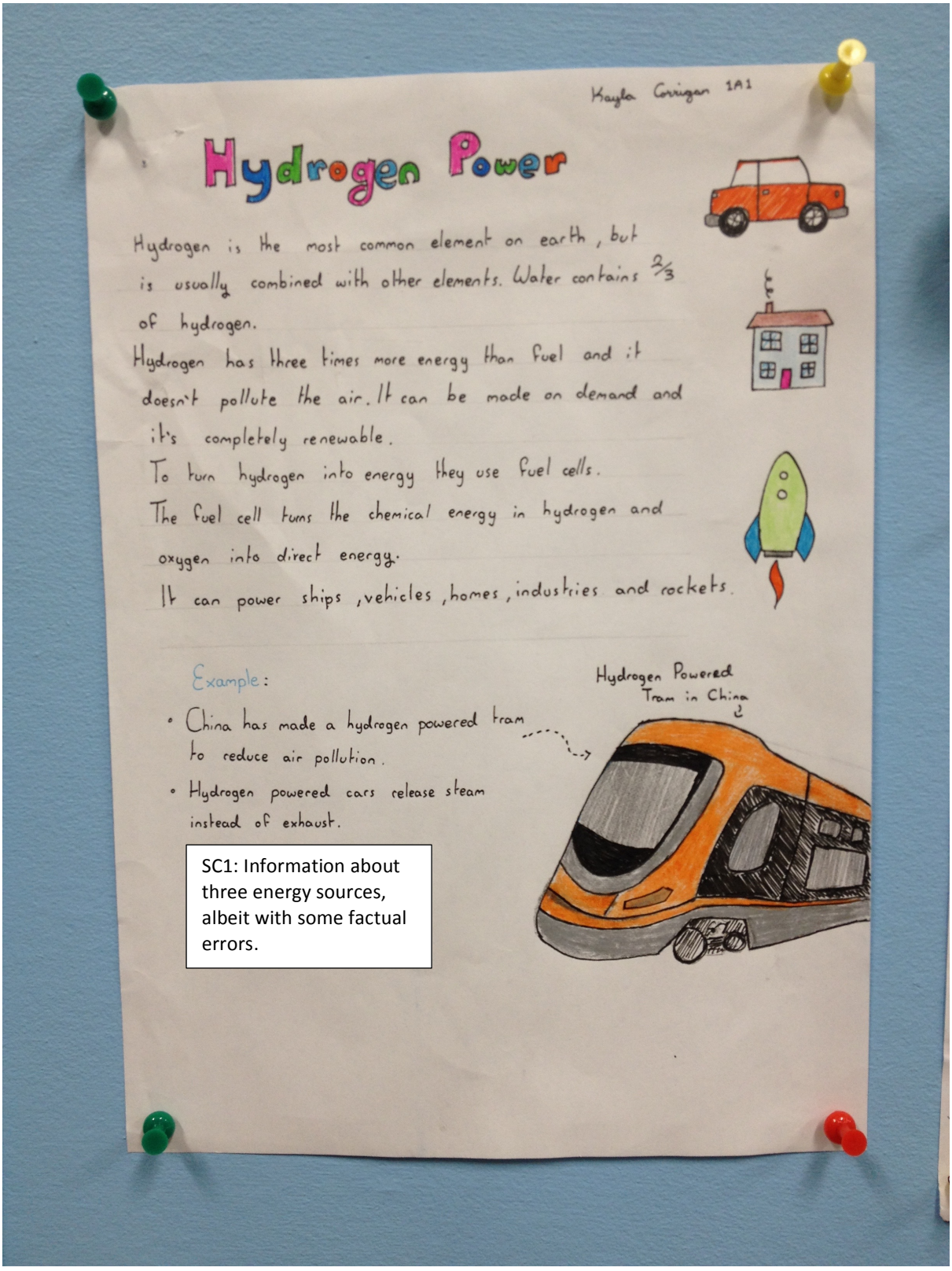
SC2: Clearly arranged descriptions of findings.

SC3: Identifies benefits and suggests future improvements resulting from climate change.

SC4: No sources acknowledged.

Overall judgement: In line with expectations

Sample 2



Kayla Corrigan 1A1

Hydrogen Power

Hydrogen is the most common element on earth, but is usually combined with other elements. Water contains 2/3 of hydrogen.

Hydrogen has three times more energy than fuel and it doesn't pollute the air. It can be made on demand and it's completely renewable.

To turn hydrogen into energy they use fuel cells.

The fuel cell turns the chemical energy in hydrogen and oxygen into direct energy.

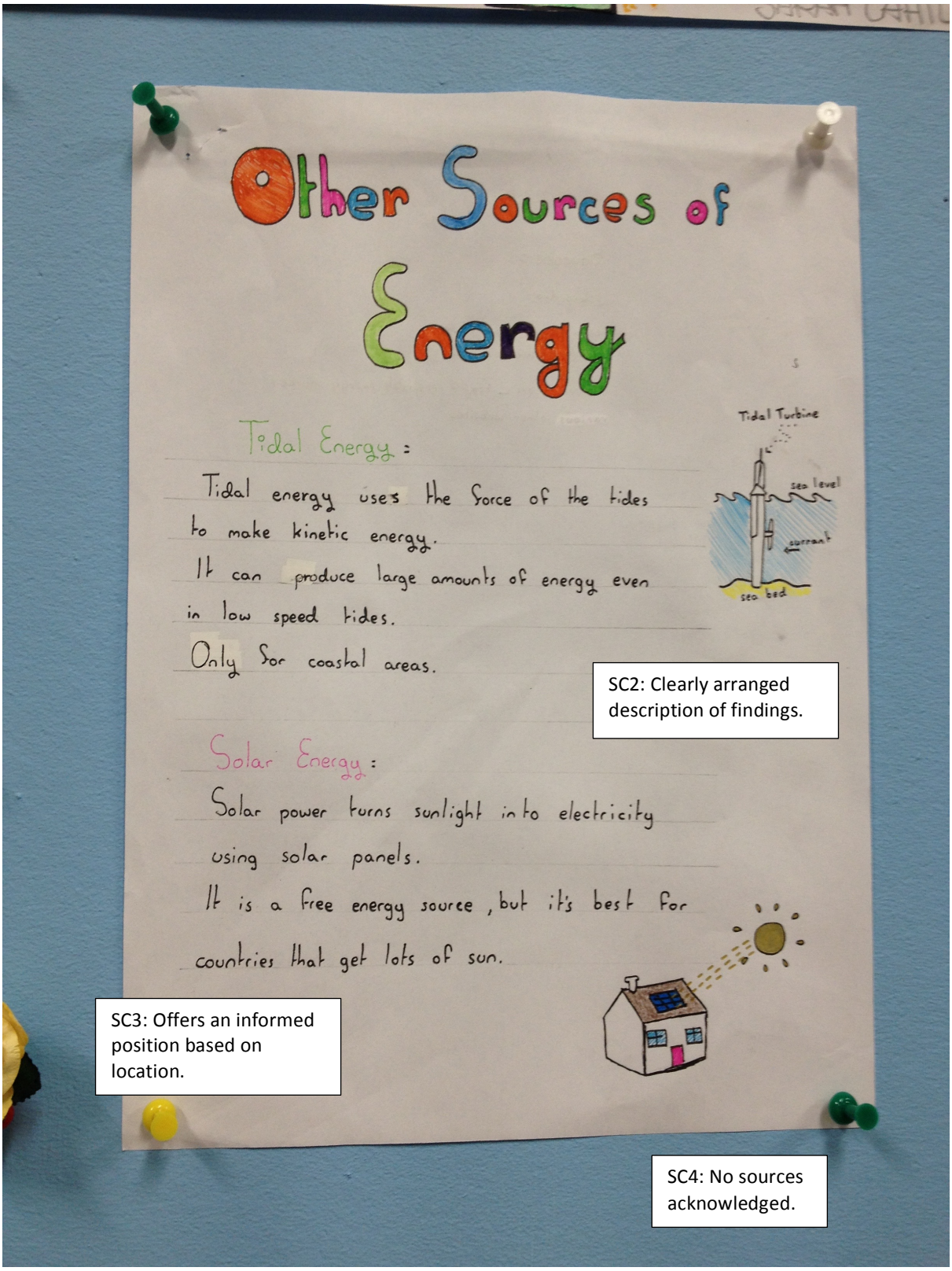
It can power ships, vehicles, homes, industries and rockets.

Example:

- China has made a hydrogen powered tram to reduce air pollution.
- Hydrogen powered cars release steam instead of exhaust.

Hydrogen Powered Tram in China

SC1: Information about three energy sources, albeit with some factual errors.



SC2: Clearly arranged description of findings.

SC3: Offers an informed position based on location.

SC4: No sources acknowledged.

Overall judgement: In line with expectations

Sample 3

What is geothermal energy?

Geothermal energy is the heat from the Earth. it's clean and sustainable. Resources of geothermal energy range from the shallow ground to hot water and hot rock found a few miles beneath the Earth's surface, and down even deeper to the extremely high temperatures of molten rock called magma.

SC2: Clear description of findings.

Geothermal energy has been around for as long as the earth has existed Geo means earth, and thermal means heat. So, geothermal basically means earth-heat.

Geothermal heating is a method of heating and cooling buildings. causing hot springs and also generating electricity through indirect use.

The future of geothermal energy.

The reason that geothermal is expected to play an important role in the future is because, we're getting better and better at doing this: we're now drilling geothermal wells with increasing effciency, allowing more energy to be captured.

Geothermal energy is a energy provided by earth heat and other resources as long as the earth has heat this energy will continue to be sustainable

SC3: Three arguments raised to support the choice of resource.

By using geothermal sources of energy, present generations of humans will not endanger the capability of future generations to use their own resources to the same amount that those energy sources are presently used.

Technology!

This technology has been tested since 2002 in Soultz-sous-Forêts, eastern France. In 1997, after ten years of testing and test boring, water circulation was achieved at low pump power for four months between the two deep wells. This 2008 a power plant with capacity of 1.5 MW was commissioned, providing enough energy to supply a small city.

SC1: Well researched to provide extensive information about the topic.

In the last few years, technology has been developed that creates energy by injecting water into "dry" low permeability rocks, such as fractured granite. Terms used to refer to this include enhanced geothermal systems, hot fractured rock and hot dry rock.

Geothermal electricity generation is currently used in 24 countries, while geothermal heating is in use in 70 countries.

Capability of geothermal energy

Clearly, geothermal holds some pretty serious potential. In trying to predict what a clean energy future looks like, some, like the Cleantech wiz Saul Griffith, figure geothermal will eventually account for around 1/6th of the world's power supply. Others, like the IPCC, think it will clock in at 4%. Either way, it will be an integral part of the renewable energy mix powering the world, as fossil fuels recede from view.

Geothermal energy has the potential to play a significant role in moving the U.S (and other regions of the world towards a cleaner, more sustainable energy system. It is one of the few renewable energy technologies that can supply continuous, baseload power. Additionally, unlike coal and nuclear plant, binary geothermal plants can be used a flexible source of energy to balance the variable supply of renewable resources such as wind + solar.

Overall judgement: Above expectations

Sample 4

Hydroelectric Power

By Emma Hudson
1A1

Contents

- Introduction (2)
- What is hydroelectric power? (3)
- How is it generated? (4), (5), (6)
- How much electricity does it create? (7)
- What is this electricity used for? (8), (9)
- Where is hydroelectric power used? (10)
- How will it help us in the future? (11), (12)
- Conclusion (13)
- Credits/sources of information (14)

SC1: Excellent use of Table of contents to arrange findings.

(1)

Introduction

This project is about a certain source of energy that is used to create electricity. Flowing water creates energy that can be captured and turned into electricity. This is called hydroelectric power.

SC3: Clearly sets out position, would have been useful to mention more than one source for comparative purposes when arguing position.

(2)

What is Hydroelectric Power?

Hydroelectric power is a source of energy used to create electricity. It is very helpful because there will always be water which is used to create hydroelectric power, making it very convenient for now and in the future. However, hydroelectric power is not absolutely mandatory in our lives because it is only one of the many sources of energy used to create electricity, and there are other very efficient and convenient ways to generate electricity.

(3)

How is Hydroelectric Power Generated?

The most common type of hydroelectric power plant uses a dam (the main focus of this project). A dam is built in a river to store water in a reservoir. The water that is then released from the reservoir flows through a turbine, spinning it. This activates a generator to produce electricity. There are dams all over Ireland and in many other countries as well.

Building a dam on a river (damming a river) has its benefits, but it can also cause problems. Some benefits are…

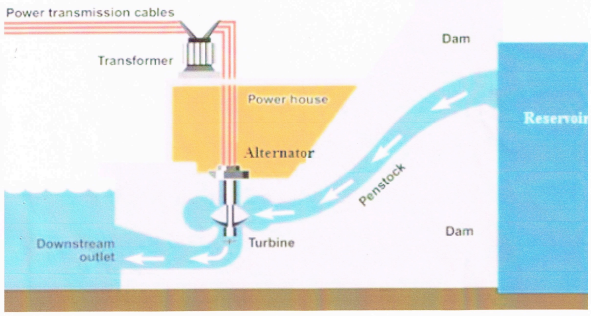
- they generate power for our homes
- dams create artificial lakes (water trapped behind dams) which can be used as reservoirs to store water
- artificial lakes are good places for fishing and other water sports

Some problems are…

- artificial lakes can flood valuable farmland
- river creatures (eg. salmon) can be harmed because of the change to their natural habitat
- it is expensive and quite difficult to dam a river

SC1: All information is relevant and pictures have been sourced. Mentions both benefits and drawbacks in the technology.

Hydroelectric power generation



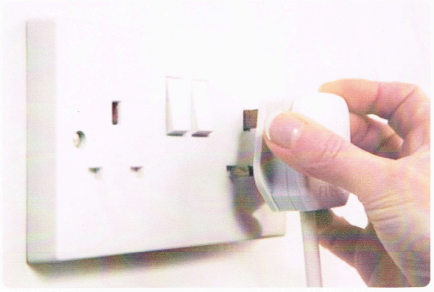
How Much Electricity does Hydroelectric Power provide?

Hydroelectric power generate 20% (1/5) of the world's electricity. This may not seem like a lot, but it really does make a difference, as well as being very convenient. We have become very dependant on electricity over the last 50 years, so we need a lot.

SC3: Figure is generous, but emphasises the capacity of hydroelectric power to meet global electricity consumption; 'almost 20%' would be more accurate.

What is this electricity used for?

After the energy from the rushing water goes through the dam and it turned into electricity, the electricity is sent to our homes, schools, work etc. We use electricity all the time, even more than we know. We use it for heat, light, cooking, different types of entertainment (eg. television, radio etc.) and many other things. A huge amount of money is wasted on electricity bills as we leave lights and other electrical devices on when we don't need to and other things like that. We are so dependant on electricity that we would barely be able to survive without it. This includes things like food (oven, microwave, refrigerator to keep the food safe to eat etc.), cleaning (washing machine, dishwasher etc.) travelling long distances (car, ~~aeroplane~~, train etc.) and so much more.



Where is Hydroelectric Power used?

Hydroelectric power isn't just used in Ireland - lots of other countries use it too. For example...

- 99% of Norway's electricity comes from hydroelectric power.
- America produces the most hydroelectric power in the world (due to good technology and many rivers) but only 13% of America's electricity comes from hydroelectric power. This shows that America uses a lot of electricity.
- 18% of Italy's electricity comes from hydroelectric power. Italy is the 14th largest producer of Hydroelectric power in the world.

How will Hydroelectric Power Help Us in the Future?

Hydroelectric power will help us in the future because unlike things like solar power, which only works when the sun is shining, the water that generates hydroelectric power will always be found on Earth through the rain cycle. There are reasons it could become a struggle, like if a river were to dry up and also there are disadvantages of dams (see page 5), but it is still a very convenient source of electricity. It

SC1: Extensive research on hydroelectric power, but lacks comparison to other sources.

also does not create pollution, as some other sources of electricity do, which will make a huge difference for our society in the future.

SC3: Focuses on the low pollution impact to argue in favour of hydroelectric.

Conclusion

In conclusion, hydroelectric power is useful in many ways, but does have flaws. The world is very dependant on electricity and hydroelectric power does not cause pollution. However, it is expensive to create and harms the local river creatures by building over their natural habitat. There are many other pros and cons to hydroelectric power.

Thanks for reading!

CREDITS AND SOURCES

- renewableenergy.com
- water.usgs.gov
- New Complete Geography, Gill & Macmillan eBooks
- Wikipedia

SC4: Sources are acknowledged.

By Emma Hudson
1A1

Overall judgement: Above expectations