

**East Renfrewshire Council: Education Department
Practitioner Moderation Template**



Prior to the moderation exercise, please complete the following information and submit it to your facilitator with assessment evidence from one learner that you judge to have successfully attained the Es' and Os'.

Experiences and Outcomes:

By investigating renewable energy sources and taking part in practical activities to harness them, I can discuss their benefits and potential problems. SCN 3-04b

Through investigation, I can explain the formation and use of fossil fuels and contribute to discussions on the responsible use and conservation of finite resources. SCN 4-04b

I can independently select ideas and relevant information for different purposes, organise essential information or ideas and any supporting detail in a logical order, and use suitable vocabulary to communicate effectively with my audience. LIT 3-06a / LIT 4-06a

Learning Intentions:

1. I can state the meaning of the term fuel and give some examples
2. I can classify fuels as renewable or non-renewable
3. I can describe how fossil fuels were formed
4. I can state some uses of fossil fuels
5. I can state the advantages and disadvantages of using fossil fuels as our main source of energy.
6. I can give examples of renewable energy sources and describe how they generate energy.
7. I can give advantages and disadvantages of each of the renewable energy sources identified.

Success Criteria:

1. Pupils should be able to state that a fuel is a substance which burns (combusts) to produce energy. Pupils should be able to state that combustion is the scientific term for burning, which is the reaction of a substance with oxygen.
2. Pupils should be able to state that fossil fuels are finite resources and will run out (non-renewable).
3. Pupils will be able to create a comic strip detailing the formation of either coal or oil to demonstrate their understanding of the process involved.
4. They will be able to give examples and uses of these fuels and some of their fractions.
5. Pupils will take part in a practical activity to show the devastating effects that irresponsible or careless use of crude oil, can have on wildlife.
6. Pupils will be able to teach the class about an alternative source of energy by researching and producing a powerpoint on the renewable source of their choice.

Briefly outline the context and range of quality learning experiences that have been provided making reference to the chosen design principles.

During this series of lessons, pupils were focusing on the sub-topic of fuels. Pupils were led through a series of slides and video clips detailing the definitions of the key terms, formation of fossil fuels and the impact these fuels have on society. Lessons were as follows:

- Lesson 1: Introduction of fuels by the teacher. Discussion of already known renewable and non-renewable energy sources by pupils in groups.
- Lesson 2: Introduction of the formation of fossil fuels and pupils use this to create a cartoon strip of the formation of coal or oil.
- Lesson 3: Introduction to fractional distillation of crude oil and why that is useful. Pupils then complete an "Oil Spill" experiment to highlight one of the many environmental issues associated with oil.
- Lesson 4: Pupils research an alternative energy source which may help stop these environmental issues. The pupils then teach each other about their energy source by means of a powerpoint presentation that they create.

Record the range of assessment evidence that was gathered to meet the success criteria (Say, Write, Make, and Do) considering breadth, challenge and application.

SAY

- Oral questioning is routine in the class with higher order questions used frequently.
- Pupils also get many opportunities for peer discussion while the teacher walks around and listens to the discussions.
- Pupils use key vocabulary accurately in class.
- Pupils present their research in a group presentation where they have to discuss the renewable energy that they have chosen, addressing the use and advantages/disadvantages.

MAKE

7. Pupils make a cartoon strip showing the formation of either coal or oil (pupil choice) demonstrating their understanding of the lesson points.
8. Pupils make (in groups) a powerpoint presentation highlighting their research on a renewable energy source

DO

9. Pupils to peer assess each other's presentations. This feedback is spoken in the class so that each pupil can write their own self-evaluation on what they did well and could improve upon in their presentations.

Briefly outline the oral/written feedback given to the pupil on progress and next steps, referring to the learning intention and success criteria.

Written feedback is given on formal homework and some class work. Oral feedback is used continuously through lessons. Lessons were matched to specific learning outcomes shown during lessons and feedback was given orally as to next steps in consolidating the points.

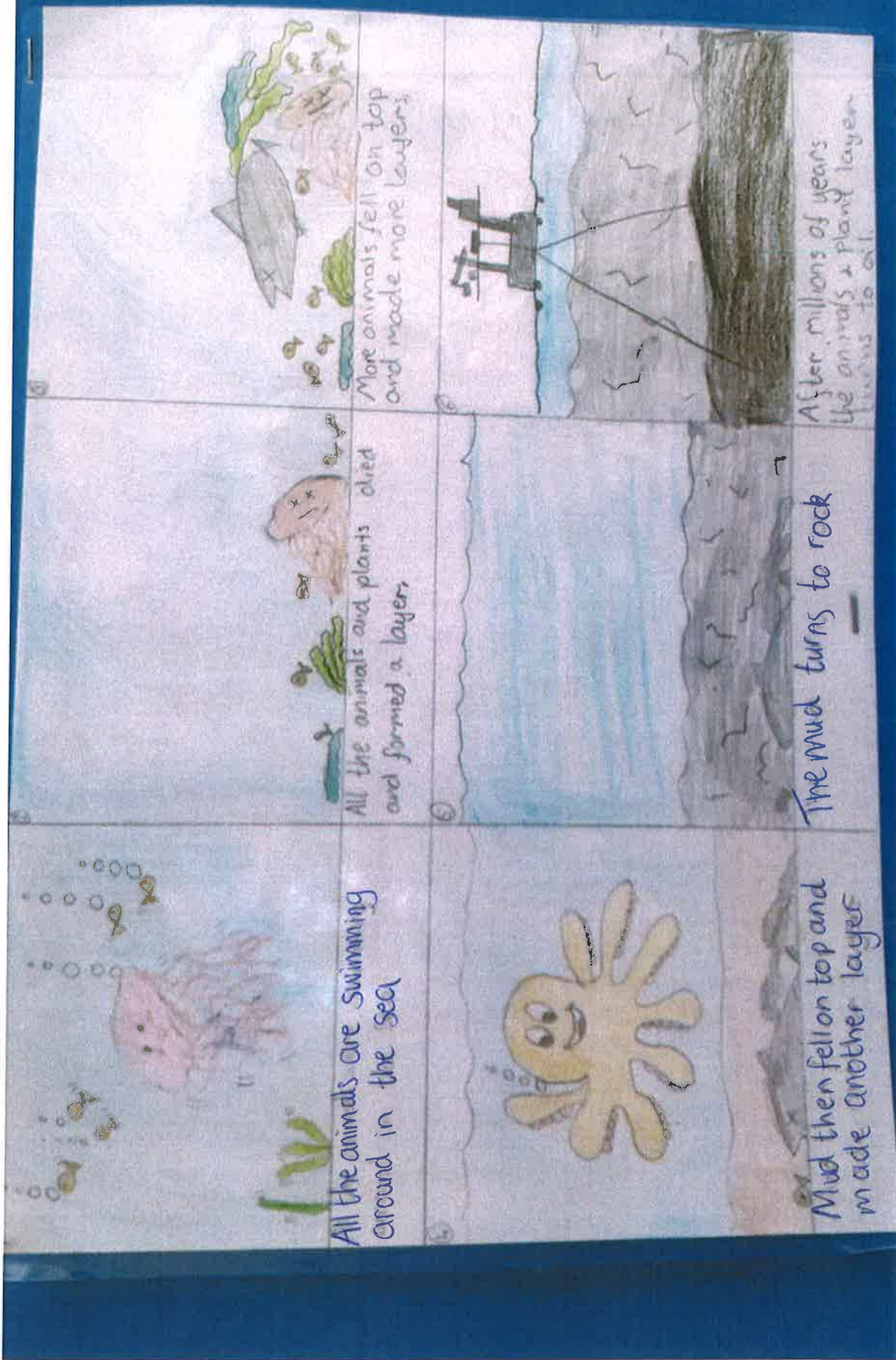
Pupil Voice:

What have you learned? How did you learn? What skills have you developed?

See Pupil Feedback Sheets

Did the learner successfully attain the outcomes? **YES**

LI: ③
SC: ③



All the animals are swimming around in the sea

All the animals and plants died and formed a layer.

The mud turns to rock

Mud then fell on top and made another layer

More animals fell on top and made more layers

After millions of years the animals & plant layer turns to oil

SCN
4-04b



Oil Spill Experiment:

SCN 3.04b/4.04b (LI/SC 5)

Pupils take part in experiment to see effect of oil on a feather. Verbal responses taken by teacher as to what effect this could have on wildlife. Pupils responded with "would make them heavy" "might not be able to fly" "might not be able to swim".

Energy For Scotland

I can state the meaning of the term fuel and give some examples	
I can classify fuels as renewable or non-renewable	
I can describe how fossil fuels were formed	
I can state some uses of fossil fuels	
I can state the advantages and disadvantages of using fossil fuels as our main source of energy.	
I can give examples of renewable energy sources and describe how they generate energy.	
I can give advantages and disadvantages of each of the renewable energy sources identified.	

Fuels

A fuel is a substance which can burn to release energy.

Combustion is the scientific word for burning, and means reacting a substance with Oxygen.

Fuels can be classified as renewable or non-renewable.

Renewable	Non - Renewable
• Wind • Hydroelectric • Solar • Biofuel • Nuclear • Tidal	• Oil • Coal • Gas } fossil fuels

Fossil Fuels

Coal, Oil and Gas are known as fossil fuels. They are made from the remains of dead plants and animals over millions of years. They will eventually run out; they are known as finite resources.

1. Coal

300 million years ago, most of the earth was a swamp. As trees and plants died, they sunk to the bottom of this swamp, where they built up. Over many years, the heat and pressure resulted in the formation of coal.

2. Oil and Gas

Oil and gas is formed from dead animals and plants which sunk to the bottom of the sea. Their remains were covered by mud, which eventually turned into rock. This put pressure on the remains, and the heat resulted in the formation of oil. To get to the oil, we must drill through the rocks.

Crude oil is a mixture of compounds, which is useless. To make use of this resource, we have to separate the mixture. The compounds have different boiling points, so can be separated by a process known as fractional distillation.

The first stage in the refining process involves separating the oil into groups of compounds with similar boiling points. These groups of compounds are called fractions.

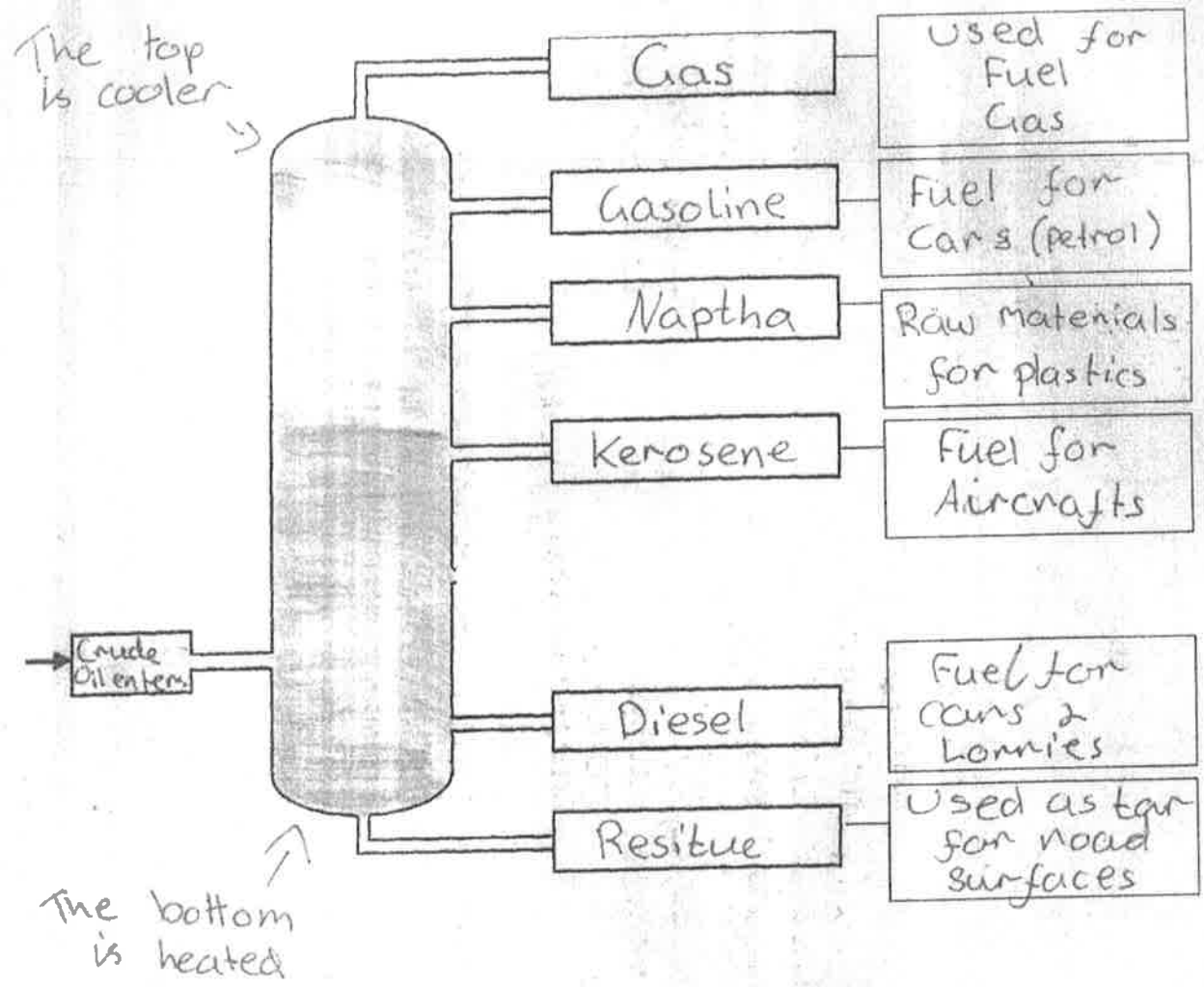
The process by which oil is separated into fractions is called fractional distillation. The fractions come off according to their boiling points.

The hottest part of the tower is the bottom; it is coolest at the top.

SCN: ④
SCN: 4-04b

Pupil notes

Fractional Distillation: Uses



Advantages of Fossil Fuels	Disadvantages of Fossil Fuels
Produce a lot of energy	finite resource
Stable	Global warming
Easily available	

SCN
3-04b

SCN 3-04b

Renewable Energy

Renewable Energy	How it works	Advantages	Disadvantages
Solar		Silent Renewable no pollution	decreases home value non continuous expensive space
Wind		Free don't cover a lot of land	don't always work noisy harm animals
Tidal		Cheap Environmentally friendly efficient	close to land expensive could fail
Biofuels		Less greenhouse gasses alternative	the cost destroys habitats
Wind again		None	None

SC (5)

SCN-4-046

10-1-17 oil spill test

We put vegetable oil in a tank
half full of water and put
a feather in and out then
we tried to wash it with
sairy liquid and mixing it
with a mixing rod then
cleaned it out and put the
stuff away. also when a bird
goes in the oil its feathers
get heavier and is hard
to clean with water and fairy
liquide

Lit 3-06a/
4-06a

24/11/2017

LI: 6 & 7
SC: 6
M

Geothermal

By Katie, Menaal and Emma

What does Geothermal mean?

- Geo means its from the earth and thermal means heat therefore geothermal means heat from the earth.

What is the source of Geothermal Energy?

- Geothermal energy comes from underground heat from volcanoes. The lava comes from underground and it is hot so we use that heat when we use geothermal energy.

How it works

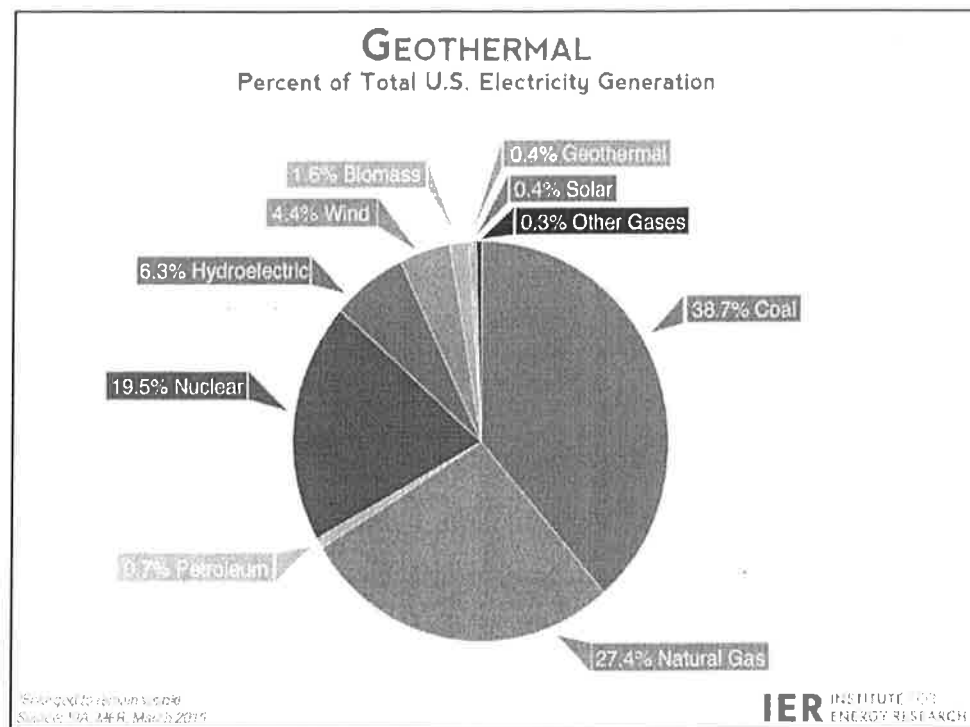
- The ground – four feet under – all year round is the same temperature, 55°. So what the workers for geothermal energy do is put the pipes four feet in the ground and collect the heat to heat our houses and schools.

Pros of Geothermal Energy

- It is energy efficient – it uses less energy to do the same things that it would if it was powered by fossil fuels.
- Low maintenance – you don't need to tend to it a lot.
- It is environmentally friendly compared to gas or oil furnaces (meaning no combustion.)
- It does not give off a lot of pollution.
- Geothermal energy is a renewable resource as long as the earth exists.

Cons of Geothermal Energy

- The cost of drilling in the geothermal reservoir (it is basically an artificial lake) is very expensive.
- Electricity is still needed to operate heat pumps.
- Sometimes it damages underground homes for rodents and damages tree roots.



Conclusion

There are more positives than negatives there for geothermal energy is a good renewable source that we should be using more.

THANK YOU FOR LISTENING!!!

Pupil Voice

Forms survey on
Science so far.

Responder 13

03:22

Time to complete

4 - Anonymous

1. Do you enjoy Science? *

- ☒ Yes
- ☐ No
- ☐ Sometimes

2. Do you get the opportunity to work in groups? *

- ☐ Yes, all the time.
- ☒ Yes, but only every so often.
- ☐ We have once or twice but not really.
- ☐ No, we never work in groups.

3. Do you think that there are enough experiments to do that are relevant to the topic? *

- ☒ Yes
- ☐ No

4. If you said no to question 3, why not?

5. Do you find the resources (booklet/powerpoint/instruction cards) easy to follow? *

☒ Yes

☐ No

☐ Other

6. Do you feel that you have enough resources and information to prepare you for the test on this topic? Please give details. *

yes

7. What has been your favourite part of S1 Science so far and why? *

the experiments because they are fun and help you understand

8. Is there anything that you think would improve your experience in S1 Science? *

no its great!!!!

9. Finally, please tell us your class number and the name of the topic you are doing. *

1.8 scotland the great Emma Vallance

Pupil Voice

Energy For Scotland

Pupil traffic-lights to show areas of understanding/ needing help.

I can state the meaning of the term fuel and give some examples	●
I can classify fuels as renewable or non-renewable	●
I can describe how fossil fuels were formed	●
I can state some uses of fossil fuels	●
I can state the advantages and disadvantages of using fossil fuels as our main source of energy.	●
I can give examples of renewable energy sources and describe how they generate energy.	●●
I can give advantages and disadvantages of each of the renewable energy sources identified.	●

What have you learned in this topic?

• fossil fuels
• advantages and disadvantages of energy
Oral questioning to clarify 2nd point. She meant advantages/dis of different ^{sources} ~~types~~ of energy.

How did you learn?

• a power point
• booklets
• partner work
• experiments
• videos

Think about all of the tasks and activities in this topic. What skills have you developed?

• Research skills
• listening skills
• talking skills
• pitfall trap skills

Pupil Voice (And presentation evidence).

To DO:

Peer assessment

As you listen to the other presentations, use the table on the previous page to give each team a score for each category.

Pupil assessed different groups.

Group→ Category	1	2	3	4	5	6	7	8	9	10
Presentation	2	2	2	1	3	2	1			
Workload	1	1	1	1	2	1	1			
Attractive	3	2	1	1	3	1	1			
Grammar /spelling	1	1	1	2	2	2	1			
Organisation	1	1	1	1	3	1	1			
Content	2	2	1	1	2	1	2			

Self assessment

Consider the feedback from your classmates.

Strengths What did you do well?

- A lot of good information
- layed out well
- eye contact



Targets What will you aim to improve upon next time?

- Understand the diagrams.



Pupil used class feedback to self-evaluate

Presenting to the class

→ DON'T FORGET!

Good scientists have to be able to work with others, complete research, and communicate their findings to others.

Category	1	2	3	
Presentation	Well rehearsed with smooth delivery that holds audience attention	Rehearsed with fairly smooth delivery that holds audience attention most of the time	Delivery not smooth, but able to maintain interest of the audience most of the time	Delivery not smooth and audience attention often lost
Workload	The workload is divided and shared equally by all team members	The workload is divided and shared fairly by all team members, though workloads may vary from person to person	The workload was divided, but one person in the group is viewed as not doing his/her fair share of the work	The workload was not divided OR several people in the group are viewed as not doing their fair share of the work
Attractiveness	Makes excellent use of font, colour, graphics, effects, etc, to enhance presentation	Makes good use of font, colour, graphics, effects, etc, to enhance presentation	Makes use of font, colour, graphics, effects, etc, but occasionally these distract the audience from the presentation content	Use of font, colour, graphics, effects, etc, but these distract the audience from the presentation content
Grammar and spelling	No spelling mistakes or grammatical errors	Three or fewer spelling mistakes and/or grammatical errors	Four spelling mistakes and/or grammatical errors	More than four errors in spelling and/or grammar
Organisation	Content is well organised using headings or bullet points to group related material	Uses headings or bullet points to organise, but the overall organisation of topics appears flawed	Content is organised mostly in the presentation	There is no clear organisation or structure only many facts
Content	Covers topic in-depth with details and examples. Subject knowledge is excellent	Includes essential knowledge about the topic. Subject knowledge appears to be good	Includes essential information about the topic but there are one/two factual errors	Content is minimal OR there are several factual errors



These were used as a reference for peer-evaluation.