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:

SCN 3-13a Using a microscope, I have developed my understanding of the structure and variety of cells and their functions

SCN 3-13b I have contributed to investigations into the different types of microorganisms and can explain how their growth can be controlled.

SCN 3-13c I have explored how the body defends itself against disease and can describe how vaccines can provide protection.

Inquiry and investigative skills

- Plan and design scientific investigations and enquiries
- Carry out practical activities
- Analyse, interpret and evaluate scientific findings
- Presents scientific findings

Learning Intentions:

- Discover the structure, function and variety of cells.
- Investigate microorganisms and their growth.
- Explore how we can defend ourselves against disease.

Success Criteria **(S.C.):**

S.C. 1: Identify the structure and function of plant and animal cells.

S.C. 2: Select and present information, about how the structure of specialised cells helps them to carry out their specialised functions.

S.C. 3: Investigate the conditions and chemicals that can promote and restrict the growth of micro-organisms.

S.C. 4: Research and present information about disease, infection, the immune system and how vaccinations work to protect us from diseases and infections.

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

Task 1 for S.C. 1 This task follows a series of lessons looking at the structure of plant and animal cells, and the functions of cell organelles. Pupils were tasked with making a model cell from any materials found at home. Differentiated success criteria were given for the model, as seen from 'Evidence for S.C. 1.'

Task 2 for S.C. 2 Pupils took part in an active learning task 'Cells Careers Fair' where they were to select relevant information about the structure and function of specialised cells and write the correct facts on their record sheet.

Task 3 for S.C. 3 Pupils planned and carried out scientific inquiry into the effect of toothpaste on growth of microbes. Pupils identified variables, with prompts, and planned a valid test. Pupils then carried out the investigation, following a method and collected their results. Results were displayed in a graph and analysed, forming conclusions. The investigation was evaluated together in the form of a discussion, and pupils recorded the key ideas.

Task 4 for S.C. 4 Pupils firstly carried out a structured research task, as detailed in 'Task information for S.C. 4' and then presented their information, one to one, at a Cells Conference. Pupils engaged in a self-assessment task of their research product and then evaluated each other's work following their presentation carousel. Pupils were encouraged to ask each other questions when assessing each other.

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

Task 1 for S.C. 1 - Make a model cell and describe the structure and function of cell organelles - verbally or written. A creative task to incorporate application of knowledge.

Task 2 for S.C. 2 - Select appropriate information and write down, and draw, the structure and function of specialised cells. Literacy skills used to find out new information, adding depth and building on basic knowledge of cell structure and function.

Task 3 for S.C. 3 - A full scientific inquiry = say, make, write and do. Scientific literacy skills developed, putting new terms into context of a scientific investigation. Skills based task adding depth and breadth to knowledge of microbes.

Task 4 for S.C. 4 - Write down key facts and make an appropriate visual tool to present to peers. Pupils were challenged to meet the success criteria of the task and demonstrate their own knowledge and understanding by assessing their peers.

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

The pupil was encouraged to describe the function of the cell organelles they had correctly identified on the model cell. The pupil required few prompts and could confidently make the comparison between plant and animal cells following the task feedback.

The pupil had correctly selected appropriate information to describe and explain the structure and function of specialised cells. It was discussed why specialised cells were different, and not all the same.

The pupil engaged well with the scientific inquiry task, with support and prompts. Drawing conclusions from the results was a basic description of the results. Following discussion the pupil could give reasons why the toothpaste prevented the growth of bacteria. The evaluation of the investigation was appreciated by the pupil, allowing discussions with a peer. Further depth was added to show an appreciation of the health and safety aspects of working with microbes.

Following supported research into vaccinations, the pupil produced a visual tool that met most of the success criteria and helped support her presentation of facts to her peers. Through self-evaluation the pupil realised what was needed to fully achieve the success criteria, which was supported by the peer and teacher assessment.

Pupil Voice:
What have you learned? How did you learn? What skills have you developed?

From the pupil voice evidence, it can be seen that the pupil has an appreciation for the breadth and depth of knowledge that has been developed, having highlighted their understanding of the learning intentions without prompts or discussion.

The pupil has given some examples of skills that they believe to have developed, but may need support in identifying a wider range of new skills.

Did the learner successfully attain the outcomes? YES

[Practitioner Moderation Template]

[Learner Evidence]

Cells Careers Fair

1. Visit each stand to find out about the different jobs specialised cells have.
2. Note down their special features that help them do their job

Cells Careers Fair

Stand 1:

Name of specialised cell:

Job description:

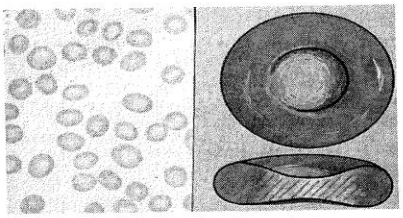
Special features:

Diagram:

You are the careers expert for: **Transport**

Specialist area: Transport of oxygen around the body

WANTED: Red Blood Cells

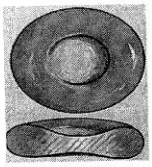


Job Description

- Red blood cells make up part of the blood
- Their main role is to carry OXYGEN to all parts of the body
- Oxygen is needed by all cells to carry out an important chemical reaction called respiration which releases energy.

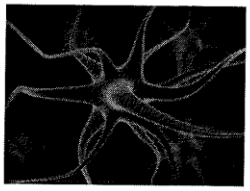
Special Features

- Red blood cells are shaped like a donut & don't have a nucleus
- This increases the area of the surface
- Bigger surface area allows the cell to carry more oxygen



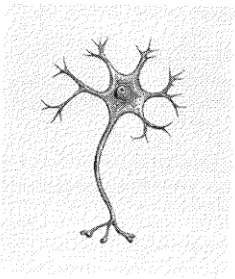
Practitioner Moderation Template Learner Evidence

You are the careers expert for: **Communication**



Specialist area: Carrying messages around the body

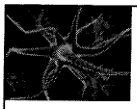
WANTED: Nerve Cells



Job Description

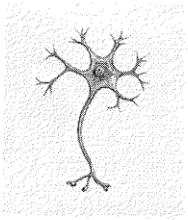
- Nerve cells carry signals to and from the brain around the body
- Nerve cells receive signals from the body and send the message to the brain
- The brain decides on what needs to happen and sends a message back to tell the body what to do

E.g. If you sit on a pin: pain receptors send a message to the brain & the brain sends a message back to tell your muscles to move so you jump up off the pin!

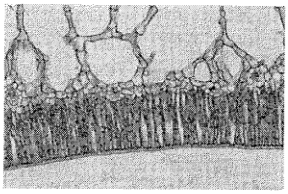


Special features

- Nerve cells are long & thin
- They can carry signals very quickly
- They are spread all about the body

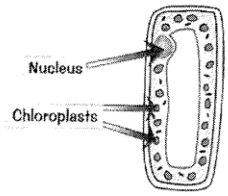


You are the careers expert for: **Manufacturing**



Specialist area: Making food

WANTED: Plant leaf cell

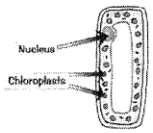


Job Description

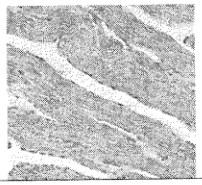
- These cells make the food for the plant
- The cells make food from carbon dioxide and water using sunlight a green chemical called chlorophyll
- This special chemical reaction is called photosynthesis
- ('photo' = light 'synthesis' = making)

Special Features

- The chloroplasts use sunlight energy to make food for the plant
- The cells line up on the surface of the leaf to catch as much sunlight as possible
- The tough cell wall helps keep the shape of the cell



You are the careers expert for: **Health & Fitness**



Specialist area: Movement

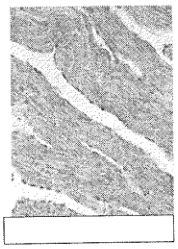
WANTED: Muscle Cell

Job Description

- These cells move the body
- The muscle cells get short and fat = contract
- The muscle cells go long and thin = extend
- This movement pushes and pulls our bones with the help of tendons and ligaments

Special Features

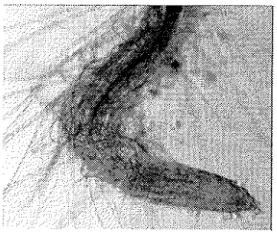
- The muscle cells change shape to help move the bones
- There are different kinds of muscle cells e.g. cardiac muscle cells make up the heart (which never stops moving!)



Practitioner Moderation Template

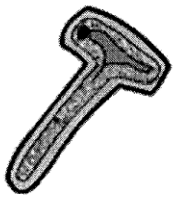
Learner Evidence

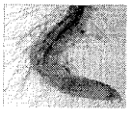
You are the careers expert for: **Scottish Water**



Specialist area: Obtaining water

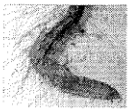
WANTED: Root Hair Cells





Job Description

- Root hair cells line the outside of a plants roots which are underground
- These cells soak up the water in the soil
- The plant needs water to help make it's own food



Special Features

- These cells have special extensions (hairs) that stick out into the soil
- The many 'hairs' increase the surface area of the roots
- The bigger surface areas means the roots can soak up more water

HERK Evidence for S.C. 2
Appropriate information has been selected from the materials provided by peers. The special features show good explanations & the relationship between structure and function

Cells Careers Fair

STAND 1: Transport

Name of specialised Cell: Red blood Cells.

Job description: Make up part of the blood. Main role is to carry oxygen. Oxygen is needed by all cells to carry out respiration which releases energy.

Special features:
- Shaped like a donut, no nucleus.
- Increases surface area, which allows the cell to carry more oxygen. ✓ Structure + function explained

Diagram:

STAND 2: Communication

Name of specialised Cell: Nerve Cells

Job description: Nerve cells carry signals to and from the brain and the body. They receive signals from the body and send them to the brain. The brain decides on what needs to happen and sends a message to tell the body what to do.

Special features:
- Long and thin
- It carries signals quickly
- Spread all over the body.

Structure + function

Diagram:

STAND 3: Manufacturing

Name of specialised Cell: Leaf Cell

Job description: Makes food for the plant by using CO^2 + water, using chlorophyll and that reaction is called photosynthesis.

Special features:
- The chloroplasts attract sunlight to make food for the plant.
- Cells line up on the surface of the leaf to catch lots of sunlight.
- Cell wall keeps shape of cell. ✓ Structure + function

Diagram:

STAND 4: Health & fitness

Name of specialised Cell: Muscle Cell

Job description: They move muscles.
If they go short and fat they contract. / Structure.
If they go long and thin they extend.

Special features:
They change shape to move the bones. There are different shapes of cells.
E.G cardiac cells make up the heart.

Diagram: 

function is described well.

STAND 5: Scottish Water

Name of specialised Cell: Root hair cells

Job description: Soak up water for food.

Special features: They have extensions called hair which can stretch out. Can increase surface area of hair.

Diagram: 

good relationship between Structure and function.

[Practitioner Moderation Template]

[Learner Evidence]

Peer Assessment of Model Cells

Name of Assessor	1. Cell is modelled with some or all labels	2a. If animal cell: all 3 structures are shown OR	2b. If plant cell: all 6 structures are shown	3. Cell structures are described	4. Creativity is shown	Overall grade score /4
Owen	Yes	Yes		NO	Yes	3
Alex	Yes	Yes		Yes	Yes	4
Jay	Yes			Yes	Yes	4
Robbie	✓	✓		✓	✓	4
Rebecca	Yes	Yes	✓	Yes	Yes	4
Michael	✓	✓	✓	X	✓	3/4
Mitchell	✓	✓		X	✓	3/4
Aimee.W.	✓	✓		✓	✓	4/4

Peer Assessment of Model Cells

Name of Assessor	Two Stars and a Wish Comments
Robbie	very colourful, creative, no wish
Rebecca	Very creative, colouful and smart.
Michael	* great creativity * nice drawing * Paint better
Aimee.W.	* - great idea * - great, colourfull
Sara	* good explanations * Very Creative

Title:
Aim:

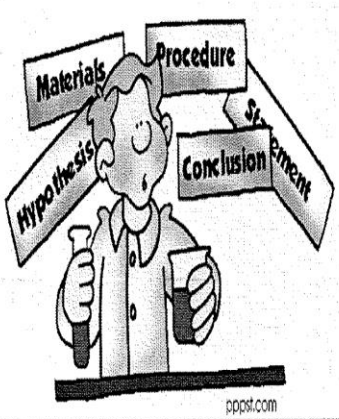
Prediction: *what you think will happen, which toothpaste will be the most effective at preventing bacteria growth?*

Independent variable: *What is the thing changed in the investigation?*
Dependent variable: *What are you measuring in this investigation, what results will you record?*
Control variables: *what things do you need to keep the same to make it a fair and* ***valid*** *test?*

Method:

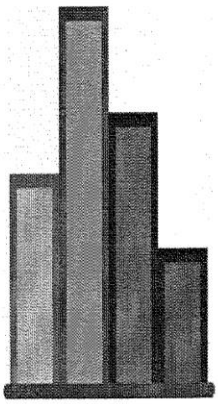
Write a step by step method of how you carried out the experiment, with enough detail to allow someone else to carry out the experiment.

Draw a labelled diagram to show how the experiment was set up



Results:
Make a copy of your results table.

Stick on your graph, make a smaller version or trim your graph to fit in the space.



Conclusion:
Write a conclusion that explains which toothpastes were most and least effective against bacterial growth, use data (numbers) from your results to back up what you are saying. Compare to ***the control****: the disk that had no toothpaste. Which toothpaste brand would you chose to buy? Why?*

Evaluation:
What was good about your experiment?
How ***accurate*** *were your measurements? (mm is more accurate than cm)*
How did you make it a fair test?
How did you limit contamination?
What could be improved about your experiment? You could repeat your experiment and calculate an average, to check how ***reliable*** *your results are.*

[Practitioner Moderation Template]

[Learner Evidence]

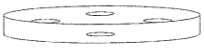
Toothpaste Investigation

Aim:

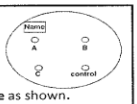
To find out which brand of toothpaste is most effective against bacteria.

Equipment:

- bacterial plate
- 3 brands of toothpaste
- tweezers
- 4 small discs
- incubator oven
- sticky tape



Day 1



Method:

- Collect a **bacterial plate** and 4 small discs.
- **Label** the bottom of the plate with your **name** as shown.
- Turn the plate the right way up. Coat one disc with toothpaste A and place it on the plate just below the label using **tweezers**.
- **Repeat** this for each brand of toothpaste as shown above.
- Add a disc with no toothpaste to the dish. This is a **control**.
- Use tape to **seal** the lid of the bacterial plate.
- Place your plate in the **incubator** overnight.
- **Wash** your hands using soap and warm water.
- **Draw** a diagram in your jotter that shows the position of the discs and a key showing the **brand** of toothpaste used.

Introduction – Day 2

- The bacterial colonies on each of the plates will have **multiplied** in the warm oven environment. Now it is time to see which brand of toothpaste was **most effective** against the bacteria.
- How will you measure this?

Toothpaste Investigation

Method:

- **Observe** the plate and **measure** the distance (in mm) between each toothpaste sample and the bacteria.
- **Wash your hands** and write your measurements in a table.

Results:

Disc	Toothpaste Brand	Distance from bacteria (mm)
A	Tesco Value	
B	Aquafresh	
C	Tesco freshmint	
D	None	

Conclusion

- Write a **conclusion** that explains which toothpastes were most and least effective against bacterial growth.
- Which toothpaste brand would you chose to buy? Why? Include your answers to these questions in your conclusion.

[Practitioner Moderation Template]

[Learner Evidence]

T paste Investig
find the
from grow

Predictio : I think best
Aquafresh. (hypothesis test)
Indep var
D

P bacterial growth
no g with around the

ng tile, Petri

st you put a bit of ea
spotting tile.
1 bit of toothpaste per circle

step get
nto othpaste.

var
Size of disc
Species of bacteria
Volume of toothpaste
Size of Petri dish
Incubation tempreature
Room temperature
Time left to incubate

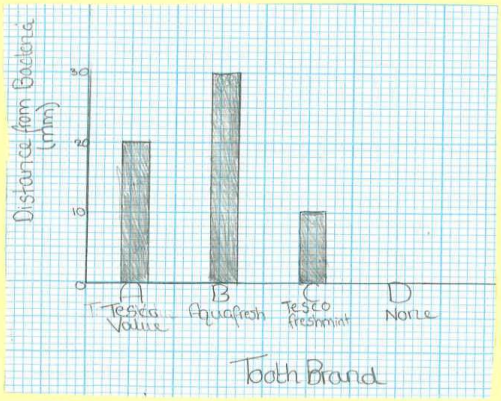
Variables identified

Scientific enquiry investigative skill
Planned investigation

Step 3: Put labels
petri dish. lid.
Step 4: Take the dis
them inside the p

Natural activity

D	Toothpaste Brand	bacteria (mm)
A	Tesco Value	20mm
B	Aquafresh	30mm
C	Tesco freshmint	10mm
D	None	0mm



Correct finding

Conclusio
Analysis interpretation of results.
It turns out that the best toothpaste is aquafresh because the distance from the bacteria is 30mm. And the toothpaste that was least effective was none which had a distance of 0mm.
I would buy the Aquafresh.
Verbal discussion: good understanding that Aquafresh toothpaste has chemicals that stop the growth of bacteria. No bacteria could heat from the oven, incubator, affected the bacteria to grow.
Evaluation: Our experiment was good because it was a fair experiment and we always made sure we washed the spactula before we put it into another tub of toothpaste
Controls
(Health & Safety working with Microbes).

Practitioner Moderation Template

Learner Evidence

Research Task Success Criteria

Poster Presentation: Thursday 8 December

Your task...

For your chosen topic you will need to:

Research:

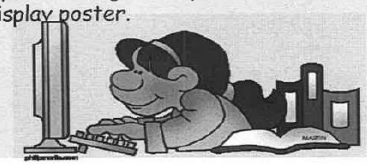
What? Why? Who? When?

Produce:

An A3 poster to display your information.

Present:

Share your findings with your classmates, using your display poster.



Research topics:

1. Body defences against diseases
2. Vaccinations
3. Microbes that can cause disease
4. Immune system
5. Uses of microbes

Success Criteria

You must include...

- ❑ Background information about your topic
- ❑ The science behind your topic

You should include...

- ❑ Interesting facts
- ❑ Reference your sources of information

You could include...

- ❑ Any future developments relating to your topic
- ❑ Any relevant news articles

Evidence for S.C.4

Self Assessment : A3 Poster

Name: Jodie Robb

Title of presentation: Vaccinations

Self

You must have included...

☑ 1. Background information about your topic

☑ 2. The science behind your topic

You should have included...

☑ 3. Interesting facts

☑ 4. Reference your sources of information

You could have included...

☑ 5. Any future developments relating to your topic

☐ 6. Any relevant news articles

understanding of:
- disease
- infection
- Immune System

by...

Peer Assessment Poster Presentation

Peer

You must include...	Total
1. Background information about your topic *Tally Mark:* ||||	5
2. The science behind your topic *Tally Mark:* ||||	5
You should include...	
3. Interesting facts *Tally Mark:* ||||	5
4. Reference your sources of information *Tally Mark:* ||||	5
You could included...	
5. Any future developments relating to your topic *Tally Mark:* ||||	5
6. Any relevant news articles *Tally Mark:*	
Overall Score: 25	

- listening to peer presentations one on one.

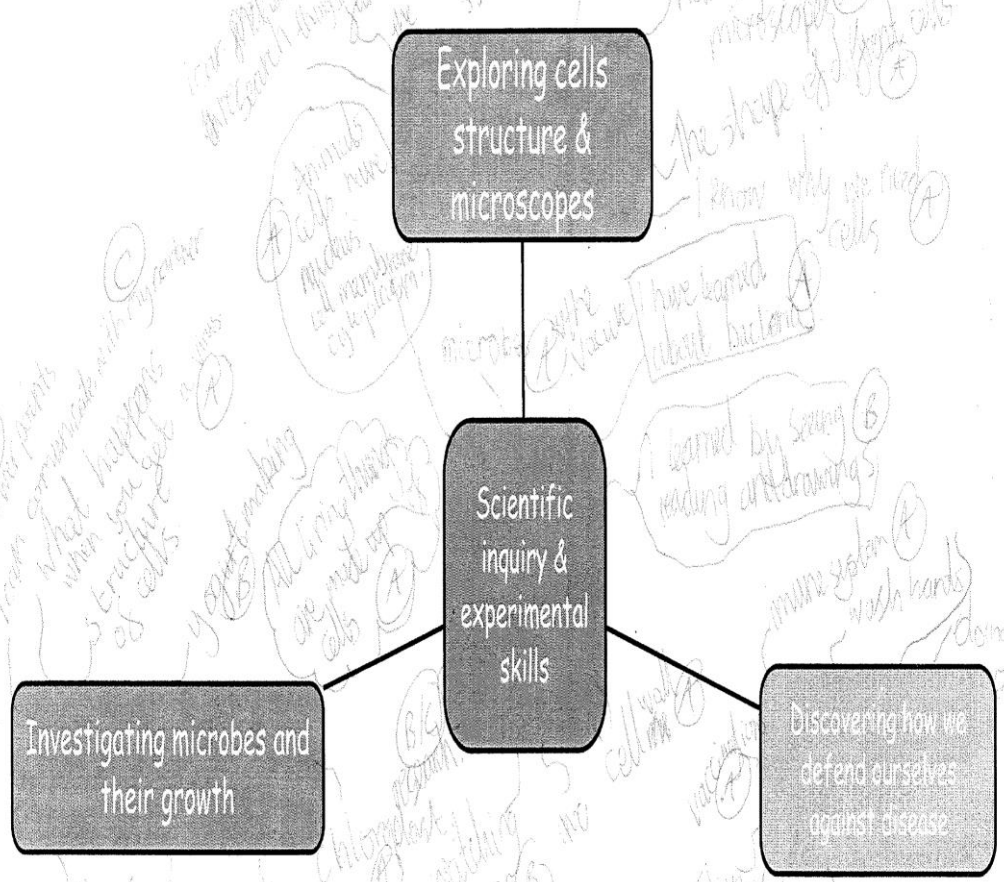
Next steps...

Can you tell me what you learned from others?

PEER REVIEWED

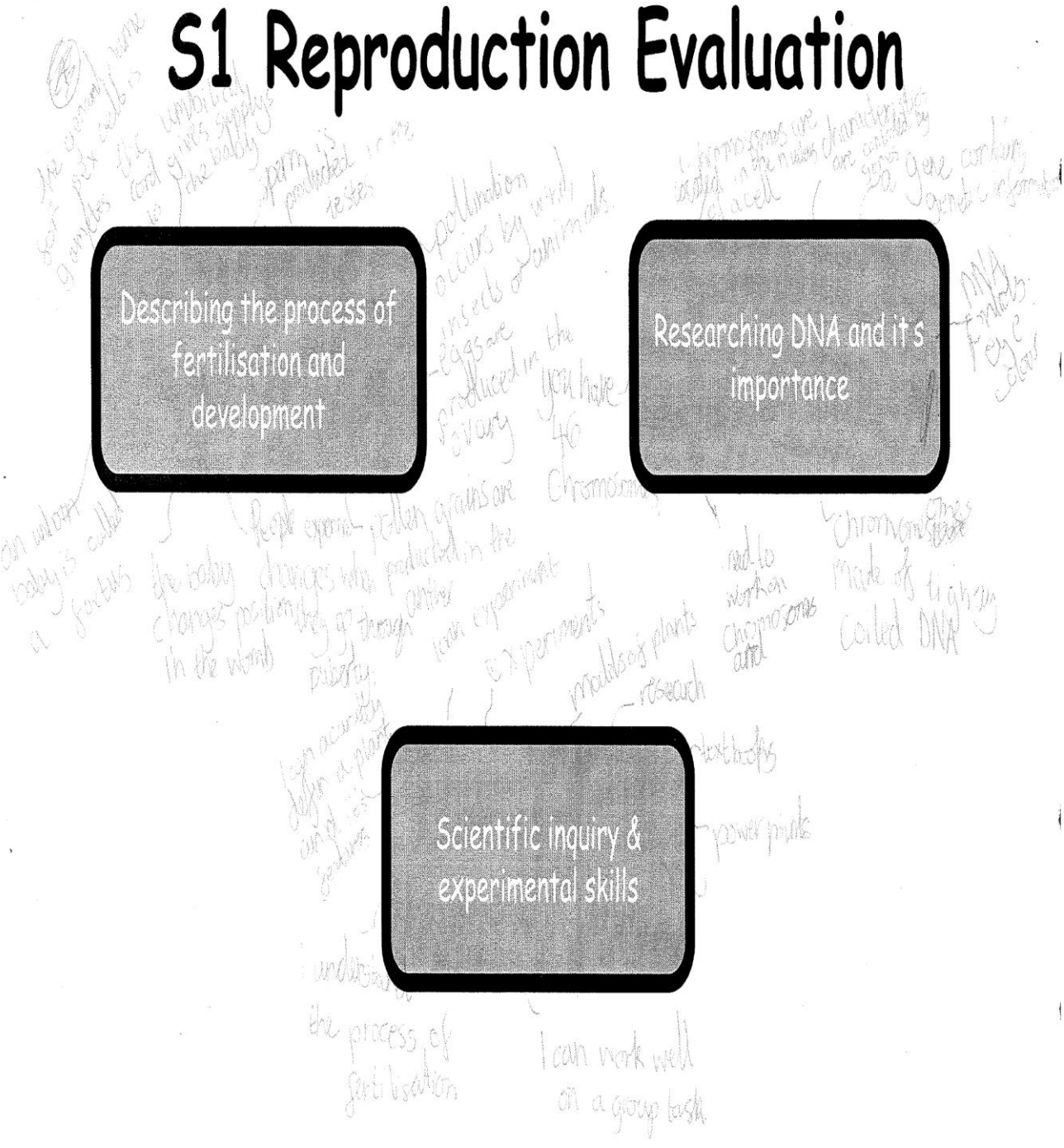
Practitioner Moderation Template Learner Evidence

S1 Cells Evaluation



Practitioner Moderation Template

Learner Evidence

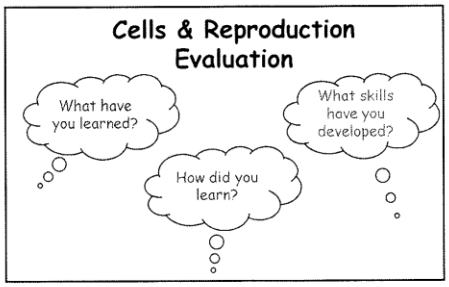


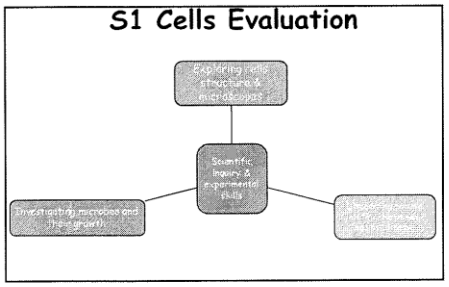
Practitioner Moderation Template

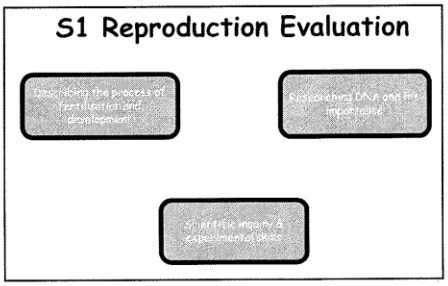
Learner Evidence

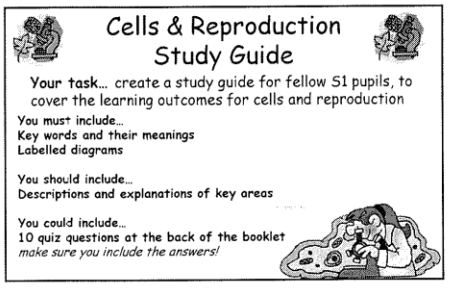
Pupil voice evidence

01/02/2017









[Practitioner Moderation Template](#) [Learner Evidence](#)

Teacher Assessment : A3 Poster Presentation

Teacher

You must have included...

☑ 1. Background information about your topic

☑ 2. The science behind your topic A good explanation about how vaccinations work.

You should have included...

☑ 3. Interesting facts A good range of facts, clearly well researched.

☑ 4. Reference your sources of information Well done! You have written the full URL, a good habit to start!

You could have included...

☑ 5. Any future developments relating to your topic Very interesting, Single dose vaccinations would save a lot of people missing their booster dose.

? ☐ 6. Any relevant news articles Can you find anything on BBC News?

Presentation comments: You spoke with confidence during the Conference, and it was clear what you were explaining. Well done!! MM 12/12/16.