

ORANGE HIGH SCHOOL

ASSESSMENT TASK NOTIFICATION

| Subject | Science: Water For the World |
|---------------------|--|
| Year | 7 |
| Weighting | 50% |
| Teachers | Miss Huggett, Miss Townsend, Mr Shea, Mrs Boardman, Mr Warne, Miss Wright, Mrs |
| | Mansur |
| Head Teacher | Mr Shea |
| Date and | Term 2, Week 2 –26 th to 30 th April 2021 (exact submission date and method to be negotiated |
| school week | with teacher) |
| Class Due | |
| Date | |
| | |

<u>Assessment Outline</u> <u>Context: Part of a Chemistry Unit focusing on separating mixtures.</u>

- 1. You will be designing and building a working filtration device that can purify water for drinking.
- 2. This will be a scaffolded project for Year 7.
- 3. Students will choose a community to design a water purification define for.

Final submission:

Students will hand in their water filtration device (or submit footage of their device working - the student must be clearly seen in the footage via Google classroom), the completed design thinking task scaffold, (completed in class) and an evaluation of their final design.

Non-completion of Task:

If you know you are going to be away on the day that the task is due, you must make alternative arrangements with your classroom teacher. If you are away on the day of the examination, you must catch up with your classroom teacher on the first day you return to make alternate arrangements to catch up on this task.

Failure to follow the above procedures may result in a zero award.

Outcomes Assessed

WS4 Identifies questions and problems that can be tested or researched and makes predictions based on scientific knowledge **WS5** Collaboratively and individually produces a plan to investigate questions and problems

WS6 Follows a sequence of instructions to safely undertake a range of investigation types, collaboratively and individually

WS7 Processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions

- **WS8** Selects and uses appropriate strategies, understanding and skills to produce creative and plausible solutions to identified problems
- **WS9** Presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations

CW3 Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques. **EN4-4B** Makes effective language choices to creatively shape meaning with accuracy, clarity and coherence

| Marking Rul | bric: Water | Filtration Device (| Due Term 2, Week | 2B) Stud | ent Name: | Cl | lass: | |
|---|--|---|--|---|---|---|------------------|-----------|
| Course | | A | В | С | D | Е | 0 | WS |
| Outcomes | | 5 | 4 | 3 | 2 | 1 | | Total |
| | Sections from assessment task | Has achieved a very high level of competence in the processes and skills and can apply these skills to new situations (EXTENSIVE) | A high level of competence in the processes and skills. In addition, the student is able to apply these skills to most situations (THOROUGH) | An adequate level of competence in the processes and skills (SOUND) | A limited level of competence in the processes and skills (BASIC) | Very limited competence in some of the processes and skills (ELEMENTARY) | Not attempted | |
| Stage 2: Define SC4-7WS Process and analyse data from secondary sources EN4-4B Makes effective language | Problem statement Question 1. | X | X | 3 Clearly articulated problem statement in relation to identified water issues of a particular individual/community All Community | 2 Attempt to articulate problem statement in relation to identified water issues of a particular individual/community. | 1 Individual/community problems listed ANY 1 | 0 | |
| choices to creatively shape meaning with accuracy, clarity and coherence | | | | community identified Problems with the water in identified community listed. Impact device will have on the community identified. | Community identified Problems with the water in identified community listed. Impact device will have on the community identified. | Community identified Problems with the water in identified community listed. Impact device will have on the community identified. | | /3 WS7 |
| Stage 3: Ideate SC4-8WS Produce plausible | Research/ Science behind | 5 Extensive explanation of the science behind the 3 device designs. including | 4 Detailed explanation of the science behind the device, including only | 3 Good explanation of the science behind the device, including mostly relevant | 2 Simple explanation of the science behind the device, including some relevant | 1 Basic explanation of the science behind the device, including little relevant | 0 | |
| solutions to identifiable problems SC4-CW3 Explains how | Question 2. | only relevant information. Describe the purpose of each material used in the | relevant information + Minimum three sources of information used for each device design | information + Minimum two sources of information used for each device design | information + At least two sources of information provided for any device designs | information + One source of information listed for at least one device design | | |
| understanding of, and | | της αενίζε | | | | | | /5 CW3 |

| - | 1 | | | | 1 | | | |
|------------------|-------------|-----------------------------|---------------------------|--------------------------------|---------------------------|----------------------------|---|-----|
| discoveries | | Identify | | | | | | |
| about, the | | expected | | | | | | |
| properties of | | components | | | | | | |
| elements, | | that will be | | | | | | |
| compounds, | | removed by | | | | | | |
| and mixtures | | each material of | | | | | | |
| relate to their | | device | | | | | | |
| uses in everyday | | | | | | | | |
| life | | | | | | | | |
| | | Identify what | | | | | | |
| | | will remain in | | | | | | |
| | | the filtrate | | | | | | |
| | | (water) after | | | | | | |
| | | being filtered | | | | | | |
| | | through device. | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | + | | | | | | |
| | | Minimum three sources of | | | | | | |
| | | information used for each | | | | | | |
| | | device design. | | | | | | |
| | | | | | | | | |
| | | 3 sources of | | | | | | |
| | | information | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Ideation: | 5 | 4 | 3 | 2 | 1 | 0 | |
| | Product | All required materials for | Most required materials | Some required materials | TA few required materials | A few required materials | | |
| | ideas | each device provided | for each device provided | for each device provided | for at least two devices | for one device | | |
| | Question 2. | + | + | + | provided | + | | |
| | | All designs are relevant to | Most designs are relevant | At least one design is | + | Design may be very similar | | |
| | | the selected | to the selected | creative and original | Designs are modified from | to pre-existing devices | | |
| | | individual/community | individual/community | + One design is relevant to | existing devices | + Diagram for dovice is | | |
| | | Fach diagram is clearly | Fach diagram is clearly | the selected | Diagram for at least one | procent (may not be | | |
| | | constructed and labelled | constructed and most | individual/community | device contains some | labelled) | | |
| | | | components are labelled | + | labels | labelleag | | |
| | | Drawing is | | Diagram for each device | | | | |
| | | scientific – 2D | | present with some labels | | | | |
| | | with a ruler and | | , | | | | |
| | | nencil | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | /10 |
| | | | | | | | | /10 |
| | | required listed | | | | | | WS8 |

| | | Clearly states relevance to the community. le why materials are suitable and design. | | | | | | |
|---|-------------------------------------|---|--|--|---|---|---|-----------|
| Stage 4: Prototype SC4-6WS Follows a sequence of instructions to safely conduct an investigation SC4-8WS Produce | Filtration device Question 3. | 5 Extensive justification of chosen device Written statement about why you chose the design. | 4 Detailed justification of chosen device | 3 Good justification of chosen device | 2 Simple justification of chosen device | 1 Simple justification of chosen device | 0 | |
| plausible solutions to identified problems | Safety Assessment Question 4. | 4 Detailed list of three potential risks with appropriate risk minimisation strategies for each risk Identify 3 x risk and link to minimisation strategy | 3 Good list of three potential risks with a logical risk minimisation strategy for two risks. | 2 Simple list of two to three potential risks with at least one appropriate risk minimisation strategies | 1 A single basic risk minimisation strategy with a somewhat relevant minimisation strategy Or Multiple risks identified with no relevant strategy | 0 Nothing relevant | 0 | /4 WS6 |
| Stage 5: Test SC4-9WS Presents science ideas using appropriate text types and representations | Testing device Question 5 | 6 All chosen materials are appropriate for task + Device could be cheaply and easily constructed in chosen community + Water sample is significantly improved after passing through filtration device + Extensive explanation of how device worked + Two or more detailed | 5-4 Most chosen materials are appropriate for task + Device could be cheaply and easily constructed in chosen community + Water sample is improved after passing through filtration device + Detailed explanation of how device worked + Two or more reasons on | 3 Many of chosen materials are appropriate for task + Device could be cheaply and/or easily constructed in chosen community. + Water sample is improved after passing through filtration device. + Simple explanation of how device worked. + One simple reasons on | 2 Some of chosen materials are appropriate for task + Device could be cheaply and/or easily constructed in chosen community + Water sample is somewhat improved after passing through filtration device + Basic explanation of how device worked + | 1 Some of chosen materials are appropriate for task + Device could be cheaply and/or easily constructed in chosen community + Water sample is somewhat improved after passing through filtration device + Limited explanation of how device worked + | 0 | /18 |

| 1 | | | | | | | 1 | |
|---|------------|---------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|---|--|
| | | was or was not successful | not successful at filtering | not successful at filtering | One basic reasons on why | Limted relevance on why | | |
| | | at filtering the water | the water sample | the water sample. | the device was or was not | the device was or was not | | |
| | | sample | + | + | successful at filtering the | successful at filtering the | | |
| | | + | Three detailed | Two detailed explanations | water sample | water sample | | |
| | | Three or more detailed | explanations on suitable | on suitable tests that | + | + | | |
| | | explanations on suitable | tests that could be | could be conducted to | One detailed explanations | Limited explaination on | | |
| | | tests that could be | conducted to ensure the | ensure the water is safe to | on suitable tests that | suitable tests that could | | |
| | | conducted to ensure the | water is safe to drink | drink. | could be conducted to | be conducted to ensure | | |
| | | water is safe to drink | | | ensure the water is safe to | the water is safe to drink | | |
| | | | | | drink | | | |
| | | Determines | | | | | | |
| | | success of | | | | | | |
| | | design. Provides | | | | | | |
| | | 2 reasons to | | | | | | |
| | | support this. | | | | | | |
| | | Describes the | | | | | | |
| | | | | | | | | |
| | | the device | | | | | | |
| | | | | | | | | |
| | | ldentifies 3 tests | | | | | | |
| | | that could be | | | | | | |
| | | used to test the | | | | | | |
| | | safety of water. | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Evaluation | 10-9 | 8-7 | 6-5 | 4-3 | 2-1 | 0 | |
| | Question 6 | Extensive description of | Detailed description of | Good description of two - | Simple description of one- | Basic description of one | | |
| | | three problems | three problems | three problems | two problems | problem encountered | | |
| | | encountered during | encountered during | encountered during | encountered during | during investigation with | | |
| | | investigation and their | investigation and their | investigation and their | investigation and a | no solution provided | | |
| | | solutions | solutions | solutions | solution to at least one | + | | |
| | | Identify three | + | + | provided | Impact stated with an | | |
| | | problems | Detailed impact with 2 | Relevant impact with 2 | + | example | | |
| | | Describe how | appropriate examples | examples | Impact stated with an | | | |
| | | the problems | + | | example | | | |
| | | were overcome. | | | | | | |
| | | | | | | | | |
| | | + | | | | | | |
| | | Detailed impact with 2 | | | | | | |
| | | highly appropriate | | | | | | |
| | | examples | | | | | | |
| | | Describes | | | | | | |
| | | impact on | | | | | | |
| | | community. | | | | | | |
| | | | | | | | | |
| | | format | | | | | | |
| | | iormat | | | | | | |

| Language use2x1xxUseExtensive use of scientific terminology throughout investigationExtensive use of scientific terminology (a least 10 used) whenLimited use of scientific terminology (a small amount tier 2 and 3 words used) whenImage: DescriptionImage: Description investigationImage: Description tier 2 and 3 tier 3 words used) whenamount tier 2 and 3 words used) when communicating problem and defining problem and defining problem statementamount tier 2 and 3 words used) whenImage: DescriptionImage: Description tier 3 words)Image: Description tier 3 words)Image: Description tier 3 words)Image: Description tier 3 words)Image: DescriptionImage: Description tier 3 words)Image: Description tier 3 words)Image: Description tier 3 words)Image: Description tier 3 words)Image: DescriptionImage: Description tier 3 words)Image: Description t | | Uses two named examples to support the impact. | | | | | |
|---|-----------|---|---|-----------------------------|---|---------------------------|--|
| use Extensive use of scientific terminology throughout investigation Good use of scientific terminology (at least 10 tier 2 and 5 tier 3 words used) when Limited use of scientific terminology (a small amount tier 2 and 3 words used) when 0 (20 or more tier 2, 10 or more tier 3 words) communicating problem and defining problem tier 3 words) communicating problem and defining problem statement communicating problem and defining problem statement + + + + (Grammatically correct, with correct punctuation and spelling correct punctuation and spelling (minimal errors 6- 7) Limited use of scientific terminology (a small amount tier 2 and 3 words used) when | Language | 2 | x | 1 | x | x | |
| Entire document. terminology throughout investigation terminology (a teast 10 tier 2 and 5 tier 3 words used) when amount tier 2 and 3 words used) when | use | Extensive use of scientific | | Good use of scientific | | Limited use of scientific | |
| Entire document. investigation tier 2 and 5 tier 3 words used) when amount tier 2 and 3 words used) when Image: Communicating problem 2, 10 or more tier 2, 10 or more tier 3 words) communicating problem and defining problem and defining problem statement communicating problem and defining problem and defining problem statement + + Mostly Grammatically correct, with mostly correct punctuation and spelling and spelling timited grammar correct punctuation and spelling (minimal errors 6-7) Image: Communication problem 2 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <td< td=""><td></td><td>terminology throughout</td><td></td><td>terminology (at least 10</td><td></td><td>terminology (a small</td><td></td></td<> | | terminology throughout | | terminology (at least 10 | | terminology (a small | |
| document. used) when used) when used) when used) when used) when communicating problem and defining problem and defining problem and defining problem and defining problem and defining problem statement + + + Mostly Grammatically timited grammar correct, with correct punctuation and spelling correct punctuation and spelling (minimal errors 6- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - | Entire | investigation | | tier 2 and 5 tier 3 words | | amount tier 2 and 3 words | |
| Image: Component control of the con | document. | | | used) when | | used) when | |
| 2, 10 or more and defining problem and defining problem tier 3 words) statement statement + Mostly Grammatically + Grammatically correct, correct, with mostly bit mits ome correct, with correct punctuation and spelling punctuation and and spelling spelling (minimal errors 6- 7) | | (20 or more tier | | communicating problem | | communicating problem | |
| tier 3 words) statement statement + + + + Mostly Grammatically Limited grammar correct, Grammatically correct, correct, with mostly with some correct with correct punctuation and spelling spelling (minimal errors 6- | | 2, 10 or more | | and defining problem | | and defining problem | |
| + Grammatically correct, with correct punctuation and spelling - - - - - - - - - - - - - - - - - - - | | tier 3 words) | | statement | | statement | |
| + Mostly Grammatically Grammatically correct, with correct punctuation and spelling - (minimal errors - 1-2) | | | | + | | + | |
| Grammatically correct, with correct punctuation and spelling (minimal errors 1-2) | | + | | Mostly Grammatically | | Limited grammar correct, | |
| with correct punctuation and spelling (minimal errors 6- 7) (many errors) 1-2) | | Grammatically correct, | | correct, with mostly | | with some correct | |
| and spelling spelling (minimal errors 6- 7) (many errors) 1-2) | | with correct punctuation | | correct punctuation and | | punctuation and spelling | |
| (minimal errors 1-2) 7) | | and spelling | | spelling (minimal errors 6- | | (many errors) | |
| Image: matrix interval Image: matrix interval 1-2) Image: matrix interval | | | | 7) | | | |
| 1-2) | | (minimal errors | | | | | |
| | | 1-2) | | | | | |

Working scientifically break down:

| WS7 Total | /3 | , | WS8 Total | /10 | WS9 Total | /18 |
|--------------|----|---|---------------------|-----|--------------|-----|
| CW3 Total | /5 | , | WS6 Total | /4 | | |

Overall Result:

| Grade | A | В | С | D | Е | Total |
|--------|-------|-------|-------|------|-----|-------|
| Result | 40-35 | 34-28 | 27-12 | 12-6 | 5-0 | /40 |

Feedback:

Task 1: Filtration Device Project (Due Week 2 Term 2)

In this task, you will go through the design-thinking model to research, understand, create and test a working water filtration device designed by you.

Follow the scaffold to begin your journey.

Define (what is the problem and how might it be solved)

Question 1. Using the sentence to create a problem statement (must linked to a chosen community):

The ______(the people affected by the issue) need to

_____ (what is the issue)

because ______ (how could it help the people)

___ 、

Ideate (the first idea is not necessarily the best idea):

Question 2. Idea 1:

| Labelled diagram of the device: | Equipment needed: | The science of my device: |
|------------------------------------|-------------------|---------------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| List of websites used: | | |
| | | |
| 1. | | |
| 2. | | |
| 3. | | |
| How is this design relevant to the | | |
| chosen community? Explain. | | |
| chosen community? Explain. | | |

Idea 2: _____

| Labelled diagram of the device: | Equipment needed: | The science of my device: |
|------------------------------------|-------------------|---------------------------|
| | | |
| | | |
| | | |
| | | |
| List of websites used: | | |
| 1. | | |
| 2. | | |
| 3. | | |
| How is this design relevant to the | | |
| chosen community? Explain. | | |
| | | |
| | | |
| | | |

Prototype:

Question 3.

A). Which idea from the ideate section are you going to construct?

B). Why have you chosen to create this idea?

C). How could you modify your chosen idea to make it better (more efficient)?

4. Complete the below safety table about your device.

| Potential risk | How would you reduce the chance of this risk occurring? |
|----------------|---|
| 1. | |
| 2. | |
| | |
| 3. | |

Construct your device now from the equipment you collected.

Do not drink your water samples!

Test: Question 5.

A). Place a picture or insert a video below of your device and describe the water before and after the filtration process.

Photo/Video

| Water before | Water afte | | | |
|---|------------|--|--|--|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| B). Explain reasons (at least 2) why the filtration process completed by your device did or did not work. | | | | |

(Refer to the science behind your device)

C). The water coming out of your filter needs to be tested to determine if it is safe to drink. **Do not drink your water samples.** What things (at least 3) would you need to test for to determine if the water is safe to drink? Explain the effect each of these things could have on a human.

Evaluation:

Question 6

A). In the construction or creation of your model you may have had some problems occur. Identify the problems / potential problems you had (or may of had) and how you reduced or solved the issue.

| Possible problems | How did I reduce or solve this problem? | |
|-------------------|---|--|
| 1. | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| 2. | | |
| | | |
| | | |
| | | |
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| | | |
| 3. | | |
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| | | |

B). What kind of impact could your device have on the communities where water quality is poor? What are some things that people and communities can achieve once given access to clean water?

| | Your Paragraph Should Include: | | | | |
|---|--------------------------------|---|---|--|--|
| | P | F | F | | |
| N | Point | Evidence | Explanation | 1 Link | |
| | Make your point | Back it up: Support your point with | Explain how the evidence supports | Link this point to the next point in | |
| | 1 | évidence & examples | yoùr point | the following pahaghaph Or back to | |
| | www.virtuallibrary.info | | Or back to main point | | |

Impact that your device would have on the community: