ORANGE HIGH SCHOOL

ASSESSMENT TASK NOTIFICATION

Subject	Science: Water For the World
Year	7
Weighting	50%
Teachers	Miss Constant, Mr Routh, Ms Townsend, Mrs Boardman, Mr Schenkel, Miss Huggett, Mrs Mansur
Head Teacher	Mr Shea
Date and school week	Term 2, Week 2 – 4th to 8th May 2020 (classroom teacher will confirm submission day)

Assessment Outline

1. Use the project scaffold as a guide to design and build a working filtration device that can purify dirty water in a location of your choosing from around the world. The purpose is to allow the water to become drinkable.
2. This will be a scaffolded project for Year 7 with links to separation techniques and deepening your understanding of the Particle Theory section in The Chemical World Topic.
3. Students will be guided by information on purifying water as a design thinking task. They will make decisions on why it is important to purify water for all individuals and communities, and how this process can be accomplished.
4. 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 or OneNote), 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 Rubric: Water Filtration Device (Due Term 2, Week 2B) Student Name:_____ Class:_____

Course Outcomes		A 5	B 4	C 3	D 2	E 1	0	WS 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 1: Empathy SC4-7WS Process and analyse data from secondary sources	Empathy profile	5 Deep and thoughtful understanding of individuals/communities and their requirements for clean water	4 Detailed understanding of individuals/communities and their requirements for clean water	3 Good understanding of individuals/communities and their requirements for clean water	2 Simple understanding of individuals/communities and their requirements for clean water	1 Basic understanding of individuals/communities and their requirements for clean water	0	
Stage 2: Define SC4-7WS Process and analyse data from secondary sources EN4-4B Makes effective language choices to creatively shape meaning with accuracy, clarity and coherence	Identifying affected parties	3 Extensive understanding of who the problem affects and how they are affected	X	2 Good understanding of who the problem affects and how they are affected	X	1 Basic understanding of who the problem affects and how they are affected	0	
	Problem statement	X	X	2 Clearly articulated problem statement in relation to identified water issues of a particular individual/community	X	1 Individual/community problems listed	0	
	Language use	5 Extensive use of scientific terminology when communicating problem and defining problem statement	4 Detailed use of scientific terminology when communicating problem and defining problem statement	3 Good use of scientific terminology when communicating problem and defining problem statement	2 Some use of scientific terminology when communicating problem and defining problem statement	1 Limited use of scientific terminology when communicating problem and defining problem statement		**/15** **WS7**
Stage 3: Ideate SC4-8WS Produce plausible solutions to identifiable problems SC4-CW3	Research	X	4 Detailed explanation of the science behind the device, including only relevant information + Minimum three sources of information used for each device design	3 Good explanation of the science behind the device, including mostly relevant information + Minimum two sources of information used for each device design	2 Simple explanation of the science behind the device, including some relevant information + At least two sources of information provided for any device designs	1 Basic explanation of the science behind the device, including little relevant information + One source of information listed for at least one device design	0	**/4** **CW3**

Explains how scientific understanding of, and discoveries about, the properties of elements, compounds, and mixtures relate to their uses in everyday life	Ideation: Product ideas	5 Three extensive device designs produced + All required materials for each device provided + All designs are creative and original + All designs are relevant to the selected individual/community + Each diagram is clearly constructed and labelled	4 Three detailed device designs produced + Most required materials for each device provided + At least two designs are creative and original + Most designs are relevant to the selected individual/community + Each diagram is clearly constructed and most components are labelled	3 Three good device designs produced + Some required materials for each device provided + At least one design is creative and original + One design is relevant to the selected individual/community + Diagram for each device present with some labels	2 Two-Three simple device designs produced + A few required materials for at least two devices provided + Designs are modified from existing devices + Diagram for at least one device contains some labels	1 One basic device design produced + A few required materials for one device + Design may be very similar to pre-existing devices + Diagram for device is present (may not be labelled)	0	
Stage 4: Prototype SC4-6WS Follows a sequence of instructions to safely conduct an investigation SC4-8WS Produce plausible solutions to identified problems	Filtration device	5 Extensive justification of chosen device + Demonstrates deep knowledge of separation techniques in device + 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	4 Detailed justification of chosen device + Demonstrates deep knowledge of separation techniques in device + Most chosen materials are appropriate for task + Device could be cheaply constructed in chosen community + Water sample is significantly improved after passing through filtration device	3 Good justification of chosen device + Demonstrates good knowledge of separation techniques in device + Most chosen materials are appropriate for task + Device could be easily constructed in chosen community + Water sample is improved after passing through filtration device	2 Simple justification of chosen device + Demonstrates some knowledge of separation techniques in device + A few chosen materials are appropriate for task + Device could be constructed in chosen community without major issues + Water sample is somewhat improved after passing through filtration device	1 Simple justification of chosen device + Demonstrates little knowledge of separation techniques in device + A few chosen materials are appropriate for task + Device could be constructed in chosen community, may face difficulty with sourcing or purchasing materials + Water sample is slightly improved after passing through filtration device	0	**/10** **WS8**
	Safety Assessment	X	4 Detailed list of three potential risks with appropriate risk minimisation strategies for each risk	3 Good list of three potential risks with a logical risk minimisation strategy for each	2 Simple list of two to three potential risks with at least two appropriate risk minimisation strategies	1 A single basic risk minimisation strategy with a somewhat relevant minimisation strategy	0	**/4** **WS6**

Stage 5: Test SC4-9WS Presents science ideas using appropriate text types and representations	Testing device	5 Extensive explanation of how device worked + Two or more detailed reasons on why the device was or was not successful at filtering the water sample + Three or more detailed explanations on suitable tests that could be conducted to ensure the water is safe to drink + Extensive explanation of the impacts each hazard may have on humans	4 Detailed explanation of how device worked + Two detailed reasons on why the device was or was not successful at filtering the water sample + Three detailed explanations on suitable tests that could be conducted to ensure the water is safe to drink + Detailed explanation of the impacts each hazard may have on humans	3 Good explanation of how device worked + Two appropriate reasons on why the device was or was not successful at filtering the water sample + Three explanations on suitable tests that could be conducted to ensure the water is safe to drink + Suitable explanation of the impacts that each hazard may have on humans	2 Simple explanation of how device worked + One to two appropriate reasons on why the device was or was not successful at filtering the water sample + At least one explanations on suitable tests that could be conducted to ensure the water is safe to drink + Some explanation of the impacts that each hazard tested may have on humans	1 Basic explanation of how device worked + One somewhat relevant reason on why the device was or was not successful at filtering the water sample + A test that could be conducted to ensure the water is safe to drink is listed + Little to no explanation on the hazards posed to humans from the water sample given	0	
	Reflection and Evaluation	7 Extensive description of three problems encountered during investigation and their solutions + Detailed impact with 2 highly appropriate examples + Self-reflection tool filled out online	6 – 5 Detailed description of three problems encountered during investigation and their solutions + Detailed impact with 2 appropriate examples + Self-reflection tool filled out online	4 – 3 Good description of two - three problems encountered during investigation and their solutions + Relevant impact with 2 examples + Self-reflection tool filled out online	2 Simple description of one-two problems encountered during investigation and a solution to at least one provided + Impact stated with an example + Self-reflection tool filled out online	1 Basic description of one problem encountered during investigation with no solution provided + Impact stated with an example + Self-reflection tool filled out online	0	**/12** **WS9**

Working scientifically break down:

WS7 Total	/15		**WS8** Total	/10		**WS9** Total	/12
CW3 Total	/4		**WS6** Total	/4			

Overall Result:

Grade	A	B	C	D	E	Total
Result	45-40	39-28	27-12	12-6	5-0	/45

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.

Empathy:

You will be taken through a PowerPoint presentation, as a class, to help you to develop an understanding of a community where drinking water quality is quite low.

1. Brainstorm feelings that someone or yourself might feel as a teenager

2. What would you prefer to drink?

	1	2	3	4
What might be in this water sample that might stop you from drinking it?				

3. Watch the water.org video and complete the two tables below

What water costs	**How that impacts people and communities**
Missing school	
Mum walking all day to get water	
Families getting sick	
People losing their lives	

4.

Who is affected?	How would you feel if you were affected?	Why it is important to find a way to get clean water?

Define:

1. What were the main things you felt during the empathy stage?

_____

_____

_____

_____

2. **Who is experiencing the problem?** In other words, who are your targeted people and will be the focus of your problem statement?

_____

_____

_____

3. **What is the problem?** Based on the observations you made during the empathise phase, what are the issues and main points that frequently came up? What do you think is the cause of this problem?

_____

_____

_____

4. **Where does the problem present itself?** In what location (name the city and country), situation or context are the people who face this problem? Are there any other people involved? If so, who are they?

_____

_____

_____

5. **Why does it matter?** Why is it important that this problem be solved? What value would a solution bring to the people that face this problem?

_____

_____

_____

6. 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):

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.		

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.		

Idea 3: _____

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.		

Optional 4th idea: _____

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:

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

_____

_____

_____

2. Why have you chosen to create this idea? (You must relate this back to the science – separation techniques)

_____

_____

_____

_____

_____

_____

3. 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.	

<u>Construct your device now from the equipment you collected.</u>

Do not drink your water samples!

Test:

1. Describe how your device worked.

_____

_____

_____

_____

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

	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

3. Explain reasons (at least 2) why the filtration process completed by your device **did** or **did not** work.

_____

_____

_____

_____

4. 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:

1. 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.	
3.	

2. 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?

Impact that your device would have on the community:

_____

_____

_____

Example of how the impact you affect the community:

_____

_____

_____

Explain how your example links to the impact:

_____

_____

_____

Link to how the community would be better now with your device:

_____

_____

_____

3. Self-reflection tool

Please complete the ONLINE self-reflection tool supplied to you Week 1 Term 2 in regards to this project