**Science: Marvellous Microorganisms Year 5/6 OC 2015**

**Program of work by Mrs Julie Condie**

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| **Year 5/6 OC****Science**Some ideas taken from:<http://www.leadingpbl.org/w/file/fetch/30524305/>KKits%20Bacteria%20PBL%20Lesson%20Planning%20Form.pdf | **Inquiry focus:** Why do people get sick? How can we prevent it?You are a member of a team of experts. You can be a scientist, a doctor, a patient or a community information officer.  Your community faces the possibility of being infected with a contagious illness - a Mystery Pathogen.  It can be a well known illness, like influenza, but can be one never before classified..... !What will you do to prevent it?Your team is to address a public meeting to educate and reassure people. You also need to provide information about how the spread of the pathogen can be prevented.  |
| **Goals – Assessment Indicators** **Student:*** Gathers information about different microorganisms and how they work.
* Explains how microorganisms can provide both positive and negative effects.
* Explains the ways in which different microorganisms interact to create changes in the body and environment.
* Describes ways to prevent the spread of unwanted microorganisms.
* Demonstrates the capacity to transfer their knowledge of microorganisms into simple language.
* Creates a community announcement demonstrating their understanding about microorganisms, how they spread and how the spread of unwanted microorganisms can be prevented.
* Create a website of information about their chosen microorganism.
 | **Learning Outcomes:**ST3 – 1VAShows interest in and enthusiasm for Science and technology, responding to their curiosity, questions and perceived needs, wants and opportunities.ST3 – 2VADemonstrates a willingness to engage responsibly with local, national and global issues relevant to their lives, and to shaping sustainable futures.ST3 – 3VADevelops informed attitudes about the current and future use and influence of Science and technology based on reason.ST3 – 4WSInvestigates by posing questions, including testable questions, making predictions and gathering data to draw evidence-based conclusions and develop explanations.ST3 – 5WTPlans and implement a design process, selecting a range of tools, equipment, materials and techniques to produce solutions that address the design criteria and identified constraints.ST3 – 11LWDescribes some physical conditions of the environment and how these affect the growth and survival of living things. |
| **Assessment:**Pre-test in order to determine knowledge levels of about microorganisms . Teacher observation during question building and research collection (Guided Inquiry) - Feedback given at point of need throughout scaffoldsCompletion of Public Service Announcement (PSA) and website about their mystery pathogen. |
| **Key dates: Term 4 20145**A Guided Inquiry Unit integrating English with Science and running throughout the term.Final presentation (to parents) of students’ community service announcements. Date to be determined later in the term. |
| **Differentiation**All students (including higher ability students) will be individually conferenced to be encouraged to create and research challenging questions during the GI process. Higher ability students will be paired with lower ability. |
| **Integration and Links to other KLA’s**This unit has significant links to English. A community service announcement has to be carefully written and presented. In addition, students read, summarise and rewrite points in their own words. |
| **ICT integration and skill focus*** The students will use a range of ICT devices and internet programs to research their organisation or agency
* The Wiki will help students organise information they discover.
* Students will add data to a google doc about their decomposition lab at home.
* Students will use digital recording technologies to create a community service announcement.
* Students will use WIX, PBworks to create a website and add it to the class wiki.
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| **Phase of Guided Inquiry** | **What teachers are doing** | **What students are doing** |
| **C:\Users\rtodd\Desktop\gi_open.jpg****Week 1** | **Assessment For Learning:** * Students write down anything they know about microorganisms.
* Students complete the SLIM toolkit questions.

**OPEN Activities:*** Tell students a story about my holidays – tummy bug sickness of the first week. Describe the park situation and daughter becoming sick and then a few days later, me getting sick.
* Pose the question, why do we get sick?
* Discuss the overall inquiry focus for the term and the idea of the guided inquiry phases briefly. Tell them we are on the open phase this week.
* Show students the rubric demonstrating how they will be assessed this term. Help them see that part of their mark will be based on their ability to work in a group.
* Watch the sneeze video.

<https://www.youtube.com/watch?v=qKiQA5e-fPg>* Show students some gross images: person kissing their dog, eating food off the floor, picking nose. Ask students what is clean and what is dirty? Come up with a definition.
* Play a short game, “What would you do for money?” lick the floor, trade gum, lick a shoe, doorknob etc.
* Watch a short news story video about bacteria on cell phones:

<https://www.youtube.com/watch?v=4lmwbBzClAc>* Begin reading the novel “The Smallpox Slayer” by Alan Brown.
 | Complete pre-test to determine knowledge levels about microorganisms.* Participate in activities as organised by the teacher.
* Have a pair discussion about:
	+ What are microorganisms?
	+ What causes the spread of microorganisms?
	+ Can microorganisms be good?
	+ Share a story about a time you were sick. What happened?
* Microorganism web quest

<http://www.childrensuniversity.manchester.ac.uk/interactives/science/microorganisms/micro-organisms/>Students write some of the information into their Science books.More detailed web quests:<http://commtechlab.msu.edu/sites/dlc-me/zoo/zdmain.html>http://mrscolleysmicroorganisms.weebly.com* Students complete the KWL chart based on the knowledge gained from this weeks investigations.
* Students complete a title page in the Science books about “Micro-organisms”.
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| **Phase of Guided Inquiry** | **What teachers are doing** | **What students are doing** |
| **C:\Users\rtodd\Desktop\gi_immerse.jpg****Week 2** | **Immerse Activities:*** Show students the research river powerpoint and explain the feelings that go with each stage of research.
* Review the overall inquiry focus for the term. Tell them we are on the immerse phase this week.
* Show students the rubric demonstrating how they will be assessed this term. Help them see that part of their mark will be based on their ability to work in a group.
* Watch the video about how CDC deal with an epidemic.

<https://www.youtube.com/watch?v=8q8xv6wilQs>* Show students website and books so they can immerse themselves in the content.

http://glencoe.mheducation.com/sites/0078665809/student\_view0/unit6/webquest\_projects.html* Continue reading the novel “The Smallpox Slayer” by Alan Brown.
* Watch time lapse video about decomposing fruit.

https://www.youtube.com/watch?v=c0En-\_BVbGc * Discuss “see, think, wonder” about the time-lapse video. Write down their thoughts.
 | * Complete a simple web quest about a mystery illness.

Mystery microorganism X (Teachers illness):<http://zunal.com/webquest.php?w=1829>* Observing their grown microorganisms in petri dishes and looking at them through a microscope.
* Students are provided with “Inquiry Journal Prompts” page from “Guided inquiry design”. During this week’s sessions students are required to complete the journal including:
	+ Write 3 things you learned in this weeks session
	+ Write about something that surprised you or was new to you.
	+ Write something that you already knew about. Tell how you know.
	+ List some ideas that seem interesting to you.
	+ List ideas that you want to know more about.
* Conver-stations – Using their journal pages, students form small groups and discuss some of their responses. They also discuss why they are interested in their particular choices.
* Students begin a decomposition lab at home. They are asked to choose a vegetable or fruit, cut it in half and collect data about it for 3 weeks and take a photo each day. They enter their data into a google doc:

<http://marvelousmicroorganisms.pbworks.com/w/page/101449297/FrontPage> |
| **C:\Users\rtodd\Desktop\gi_explore.jpg****Week 3** | **Explore Activities:*** Show students the guided inquiry phases and tell them we are up to the explore phase.
* Mini lesson about how to do ‘Stop and Jot’ to accurately take notes from their reading and record the sources. They are shown how to record page number and name of book as well as writing down why they are interested in that section. They are also shown how to write down the URL for websites and videos and record the date.
* Conduct a mini-lesson about authentic sources:
	+ Currency – Is information recent or revised?
	+ Authority – Can author be trusted?
	+ Purpose – Selling something, educational, entertaining or hoax?
	+ Objectivity – Is information biased, one point of view?
	+ Writing – Is it well-written and well-formatted?
* Students are asked to record things that interest them throughout their reading.
* Remind students of the rubric demonstrating how they will be assessed this term.
* Continue reading the novel “The Smallpox Slayer” by Alan Brown.
 | * Students read some basic information about microorganisms

<http://www.bbc.co.uk/bitesize/ks2/science/living_things/microorganisms/read/1/>* <http://www.childrensuniversity.manchester.ac.uk/interactives/science/microorganisms/micro-organisms/>
* Students complete ‘stop and jot’ notes as they are reading through information from books and Internet.
* Students complete ‘Pair share protocol’. It includes:
	+ Write down what is interesting as you read.
	+ Why is it interesting?
	+ Read over your notes and write the things you would like to tell someone else.
* Inquiry circles:
	+ Share what you found interesting. Listen to your partner share their interests. Think about what possible pathogen would interest you for your project.
* Students have another look at their petri dishes and the bacteria grown in them. They are provided with a chart and asked to try and identify which types of bacteria they can see in their dishes.
* Demonstrate the size of the bacteria by showing the following:

https://www.google.com.au/search?q=human+skin+cell+bacteria&safe=active&client=safari&hl=en-gb&source=lnms&tbm=isch&sa=X&ved=0CAgQ\_AUoAWoVChMI5b2YjObAyAIVQZiUCh1GuA3P&biw=1024&bih=672#safe=active&hl=en-gb&tbm=isch&q=human+skin+cell+bacteria+size+comparison&imgrc=R-TGqgkYvVA0BM%3A |
| **C:\Users\rtodd\Desktop\gi_identify.jpg****Week 4** | **Identify Activities:*** Show students the guided inquiry phases and tell them we are up to the Identify phase.
* Mini lesson about how to take notes accurately from sources. Discuss how to do the following:
	+ Recall
	+ Summarise
	+ Paraphrase
	+ Extend
* Students are asked to continue recording things that interest them but to narrow it down to a disease they are interested in.
* Conduct interview – Call doctor of pathology from RPA and conduct a facetime interview. Students listen to what she is researching and then have a question time at the end.
* Continue reading the novel “The Smallpox Slayer” by Alan Brown.
 | * Students brainstorm their top 3 choices of pathogen for their website and PSA. They are asked to discuss and mindmap:
	+ What am I trying to accomplish?
	+ How interested am I in this idea?
	+ How much time do I have?
	+ What information and resources do I have?
* They discuss these with a partner. They then narrow down their favourite pathogen.
* Students record information about one particular pathogen.
* Students complete ‘stop and jot’ notes as they are reading through information from books and Internet on their particular pathogen.
* Students write interview questions for the expert interview this week.
* Students complete SLIM toolkit number 2.
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| **C:\Users\rtodd\Desktop\gi_gather.jpg****Week 5** | **Gather Activities:*** Show students the guided inquiry phases and tell them we are up to the Gather phase.
* Students are asked to continue recording ‘stop and jot’ notes about their pathogen.
* PSA lesson – Students are taught about Public Service Announcements (PSAs). Some are watched and then together the class record:
	+ What are the elements of a successful PSA? (See first website for ideas)
	+ How can you make a good PSA?
	+ What makes a bad PSA?
	+ What persuasive techniques were used?

**PSA’s**<http://rock-your-world.org/how-to-study-public-service-announcements-psas><http://www.scholastic.com/browse/lessonplan.jsp?id=1504><https://sites.google.com/site/teacherquality/psa><https://www.youtube.com/watch?v=DB6d70tnSEA&index=6&list=PLAE2FB201E19BB82E><http://www.readwritethink.org/parent-afterschool-resources/activities-projects/mytube-make-video-public-30157.html?main-tab=2#activity1> <http://www.readwritethink.org/files/resources/30157_activity_sheet.pdf><http://www.readwritethink.org/files/resources/script_outline.pdf>* Continue reading the novel “The Smallpox Slayer” by Alan Brown.
 | * In small groups, students watch some PSA’s and discuss which ones they found most effective and why.
* Students continue to gather information about their chosen pathogen. They may work in pairs.
* Students fill in a story map of screen shots and accompanying text for their PSAs.

<http://rock-your-world.org/how-to-study-public-service-announcements-psas>* Students read a little more information on microorganisms in general:

<https://www.studyladder.com.au/games/activity/microorganisms-27969> |
| **C:\Users\rtodd\Desktop\gi_create.jpg****Week 6** | **Create Activities:*** Show students the guided inquiry phases and tell them we are up to the Create phase.
* Students are shown imovie and how it works. They are shown some more PSAs as motivation for making their own.
* Students are shown WIX and PBworks sites for creating free websites. They are also provided with the marvellous microorganism wiki address to add their completed PSAs and website links to. They are shown a few things for creating the website.
* Continue reading the novel “The Smallpox Slayer” by Alan Brown.
 | * Students create a public information website about their pathogen using PBworks or WIX. They add their link for their website to the marvelous microorganism wiki.

http://marvelousmicroorganisms.pbworks.com/w/page/101449297/FrontPage* Students create a PSA in imovie about their pathogen. They include the link to the website at the end of their PSA.
* Students complete some comprehension activities and reading about the discovery of penicillin:

**Flemming & Florey**http://www.abc.net.au/science/slab/florey/story.htm[http://www.educa.madrid.org/web/colegio1/aicole/sos6P/contenidos/04\_Healh/9%20Reading%20Comprehension%20Health%20&%20Healthy%20Living.pdf](http://www.educa.madrid.org/web/colegio1/aicole/sos6P/contenidos/04_Healh/9%20Reading%20Comprehension%20Health%20%26%20Healthy%20Living.pdf)<http://www.abpischools.org.uk/page/modules/infectiousdiseases_timeline/timeline6.cfm?coSiteNavigation_allTopic=1><https://www.studyladder.com.au/games/activity/penicillin-20746><http://www.australia.gov.au/about-australia/australian-story/howard-florey>  |
| **C:\Users\rtodd\Desktop\gi_share.jpgWeek 7** | **Share Activities:*** Show students the guided inquiry phases and tell them we are up to the Share phase.
* Students are shown WIX and PBworks sites and provided with the marvellous microorganism wiki address to add their completed PSAs and website links to.
* Continue reading the novel “The Smallpox Slayer” by Alan Brown.
 | * Students create a public information website about their pathogen using PBworks or WIX. They add their link for their website to the marvelous microorganism wiki.

http://marvelousmicroorganisms.pbworks.com/w/page/101449297/FrontPage* Students create a PSA in imovie about their pathogen. They include the link to the website at the end of their PSA.
* Parents are invited into the classroom and stations set up for students to show parents their PSA, website and decomposition time-lapse video. They can explain how they worked through their assignment.
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| **Week 8** | **Evaluate Activities:*** Show students the guided inquiry phases and tell them we are up to the Evaluate phase.
* Students are provided with the rubric. They are asked to assess the people in their inquiry circle.
* “Student to student evaluation of share presentations” can be used for students to give feedback to each other. (Guided inquiry design).
* Finish reading the novel “The Smallpox Slayer” by Alan Brown.
 | * In small groups, students assess each other based on the term’s work.
* Students evaluate their own learning and the process they went through to research this term.
* Students complete the SLIM toolkit final survey questions.
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| **Week 8****C:\Users\rtodd\Desktop\gi_evaluate.jpg** | Use Thinking Hats to evaluate unit of work: | Students use DeBono’s Thinking Hats to evaluate the organisation/agency of a peer and write their responses in their HSIE journals. Eg Yellow Hat – What is the positive impact of the organisation? Black Hat – What issues does that organisation create/have to face?White Hat – List some factual information about the organisation/agencyGreen Hat - If this were your organisation, would you do anything differently?**Overall Evaluation**: Students rotate in groups to sheets of Coloured cardboard and write ideas and comments on each. | Coloured Cardboard |
| **Teachers’ Evaluation and Reflection** |
| Was the timing/sequencing appropriate for this topicYES/NOPlease specifyWas there sufficient resources/support material for this topic?YES/NOPlease specifyDid you find/make any new resources?YES/NOPlease specify**Making Connections:**What links were you able to make to other strands? |
| **Student Achievement: See marvelous microorganism wiki (above)**What aspects of the topic did the students do particularly well?What activities or tasks did the students particularly enjoy or find helpful?Were there any aspects of the topic that the students found particularly difficult? Why?What measures did you take to try and address these difficulties?Were there activities that needed to be modified to optimise student learning potential? |