Literacy Design Collaborative

Antibiotic Resistance: What You Need To Know

★ TASK ★ LADDER

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This module is to be implemented following Activity 50 in Unit C "Micro-Life". Activity 51 has been integrated into the module; choosing to implement the remaining activities is up to the teachers discretion. Prior to teaching this module ensure students have a strong background in how antibiotics work and the difference between a virus, bacteria, and protist. Activities 43, 44, and 45 provide the necessary background knowledge. Students should also understand that not all bacteria are bad and/or make you sick.

In this module students will learn about how antibiotic resistance develops via natural selection and look at three aspects of the discussion, antibiotic overuse and misuse, the use of antibacterial products, and antibiotic use on the farm.

Students will also connect what they learned in the previous unit, unit B "Body Works", and discuss the impact antibiotic resistance has on human health. Students will communicate their learning by developing a brochure to be shared with the general public.

This module addresses the following year-long Life Science Colorado Academic Standard.

"Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species."

Students are set up for successful completion of the task with strategic instructional scaffolds for 1) close reading of complex texts 2) organizing information with structured collaborative note-taking 3) structured collaborative discussion of the information resulting in a compare/contrast map and 4) application of the information in engaging role play scenarios. These strategies are repeated in a pattern with each relevant text. Furthermore, the writing process is structured with planning documents specific to the task, as well as instruction in self and peer revision processes.

For description of strategies, see the appendix @ ldc.dpsk12.org/resources

Special Note:

This module's instructional ladder uses several fields in ways not conventional to LDC for the purpose of meeting requirements of Denver Public Schools and its common module approach.

- **Skill and Mini-Task Repetition.** To provide clarity around the sequencing of the teaching of the same skill multiple times in this module, the same skill and/or mini-task sometimes appears multiple times in the Instructional Ladder's "Reading Process."

Mini-Task Prompts. To meet the local mandate of including content/language objectives (CLOs) in every lesson, these mini-task prompts include the sentence starter "students will be able to (SWBAT)." While these are not strictly "student-facing" as required by LDC, each CLO is always communicated to students in this format as a daily goal.

GRADES	DISCIPLINE	COURSE	PACING
6 - 7	Science	Life Science	18hr

Section 1: What Task?

Teaching Task

Task Template IE4 - Informational or Explanatory

After reading informational texts on antibiotics, write an informational pamphlet in which you analyze the causes of antibiotic resistance and explain the effect on human health. Support your discussion with evidence from the text/s. Include (charts, tables, illustrations, and/or stylistic devices) to help convey your message to your readers. Include a list of recommendations in your response.

Standards

Colorado Academic Standards for Science

2.1. **Focus**

Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment

2.1. **Focus**

Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species

Next Generation Science Standards

MS-LS4-4 **Focus**

Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

RST.6-8.1

Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.2

Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

RST.6-8.10

By the end of grade 8, read and comprehend science/technical texts in the grades 6—8 text complexity band independently and proficiently.

WHST.6-8.2

Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

WHST.6-8.9

Draw evidence from informational texts to support analysis, reflection, and research.

WHST.6-8.10

Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

SL.7.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

L.7.6

Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Texts

- **Task Engagement: "Man vs microbe" Bill Nye (Safari Montage)**
- **Overuse: "Resistance Maps" NPR (Interactive Maps/Data)**

- Overuse: "Why India Is A Hotbed Of Antibiotic Resistance And Sweden Is Not" NPR (Reading)
- Overuse: "Rise of Superbugs" Video (Safari Montage)
- Antibiotic Products Option 1 (at grade level)"Antibacterial Soaps Concern Experts" ABC
- Antibacterial Products Option 2 (above grade level)"Strange but True: Antibacterial Products May Do More Harm Than Good" Scientific American
- Food: "Are Antibiotics On The Farm Risky Business?" NPR (Reading)
- Activity 51 "The Full Course".pdf
- Optional Enrichment: PBS Resources
- Antibiotic Resisitance Graphic.pdf
- Optional Enrichment: "Hunting the Nightmare Bacteria" PBS (Video)
- Optional Scaffolds: E-bug Resources

Student Work Rubric - Informational or Explanatory Task - Grades 6-8

	Emerging	Approaches Expectations	Meets Expectations	Advanced
	1	2	3	4
Controlling Idea	Presents an unclear or unfocused controlling idea.	Presents a **general** controlling idea that **addresses the prompt**, with an **uneven focus**.	**Presents and maintains a clear** controlling idea that addresses **all aspects** of the prompt.	Presents and maintains a clear and **specific** controlling idea that addresses all aspects of the prompt and **takes into account the complexity of the topic**.
Selection & Citation of Evidence	Includes minimal details from sources. Sources are used without citation.	Includes details, examples, and/or quotations from sources that arerelevant to the controlling idea. Inconsistently cites sources.	Includes details, examples, and/or quotations from sources that are relevant to the controlling **and supporting ideas**. **Consistently** cites sources with **minor formatting errors**.	Includes **well-chosen** details, examples, and/or quotations from sources that **support** the controlling and supporting ideas. Consistently cites sources using appropriate format.
Development / Explanation of Sources	Explanation of ideas and source material is irrelevant, incomplete, or inaccurate.	Explanation of ideas and source material is **minimal** or **contains minor errors**.	**Accurately** explains ideas and source material and **how they support the controlling idea**.	**Thoroughly** and accurately explains ideas and source material, **using reasoning** to support **and develop** the controlling idea.
Organization	Lacks an evident structure. Makes unclear connections among ideas, concepts, and information.	**Groups ideas and uses some transitions** to connect ideas, with **some lapses in coherence or organization**.	**Groups and sequences** ideas to **develop the controlling idea**. Uses transitions **to clarify the relationships among ideas, concepts, and information**.	Groups and sequences ideas **logically** to develop the controlling idea **and create cohesion**. Uses **varied** transitions to clarify the relationships among ideas, concepts, and information.
Conventions	Major errors in standard English conventions interfere with the clarity of the writing. Language or tone is inappropriate.	**Errors** in standard English conventions sometimes interfere with the clarity of the writing. Uses language and tone that are **sometimes inappropriate** to the audience and purpose.	**Consistently applies** standard English conventions; **minor errors**, while noticeable, **do not interfere** with the clarity of the writing. Uses language and tone **appropriate to the audience and purpose**.	Consistently applies standard English conventions, **with few errors**. Demonstrates **varied syntax** and **precise word choice**. **Consistently** uses language and tone appropriate to the audience and purpose.
Content Understanding (Generic)	Attempts to include disciplinary content in explanation or argument but understanding of content is weak; content is irrelevant, inappropriate, or inaccurate.	Briefly notes disciplinary content relevant to the prompt; shows basic or uneven understanding of content; minor errors in explanation.	Accurately presents disciplinary content relevant to the prompt with sufficient explanations that demonstrate understanding.	Integrates relevant and accurate disciplinary content with thorough explanations that demonstrate in-depth understanding.

Background for Students

When Alexander Flemming discovered penicillin by accident in 1928 the world was very excited about antibiotics and their ability to cure everyday bacterial infections. Since the discovery of penicillin almost 70 years ago scientists have developed many new antibiotics to cure almost every known bacterial infection in humans and animals. In fact, antibiotics are not only in medicines they can also be found in everyday products like towels, yoga mats, sheets, household cleaners, and much more.

However, the overuse and misuse of antibiotics across the world has lead to the problem of antibiotic resistance and some scientists are concerned many antibiotics we depend on today are soon going to become ineffective.

Following the discovery of antibiotics, Alexander Flemming himself warned against the overuse and misuse of antibiotics and the development of antibiotic resistance. Following his acceptance of the Nobel Peace Prize he stated,

"The thoughtless person playing with penicillin treatment is morally responsible for the death of the man who succumbs to infection with the penicillin-resistant organism."

In this module, you will read about the causes of antibiotic resistance and the effects on human health. You will communicate your new knowledge by developing a brochure to be shared with the general public.

Extension

1. Ask students to research the specific adaptations that bacteria have developed that make them antibiotic resistant
2. Students can share their brochure digitally via the web and create an accompanying podcast.

Section 2: What Skills?

Preparing for the Task

BREAKING DOWN THE PROMPT: Ability to understand the demands of the prompt
DEVELOP BACKGROUND CONTENT KNOWLEDGE: Ability to understand the content in context of the greater topic
RUBRIC ANALYSIS: Ability to understand the performance expectations of the rubric
PRE LAB> ACTIVATE BACKGROUND KNOWLEDGE: Ability to activate background knowledge and connect to the content.
DURING LAB> SCIENTIFIC MODEL: Ability to utilize a scientific model.

Reading Process

BEFORE READING>MAKING PREDICTIONS ABOUT CONTENT: ability to predict content of a text and make connections to prior knowledge
BEFORE READING>ANALYZING GRAPHICS: Ability to analyze scientific data and determine trends
PRE- READING> ESSENTIAL VOCABULARY: Ability to define unfamiliar words
ACTIVE READING>ANNOTATING A TEXT: Ability to mark a text for key ideas
POST-READING>CLARIFYING UNDERSTANDING: Ability to clarify misconceptions or deepen understanding relative to pre-reading understanding
POST READING>GATHERING EVIDENCE AND INFERRING SOLUTIONS: Ability to cite evidence of problems upon which to draw conclusions about a solution
PRE-READING>ESSENTIAL VOCABULARY: Ability to define unfamiliar words using context clues and word analysis
ACTIVE READING>NOTETAKING: Ability to note key information
POST READING>CLARIFYING UNDERSTANDING: Ability to clarify misconceptions and deepen understanding relative to pre-module understanding
POST-READING>GATHERING EVIDENCE: Ability to cite evidence and accompany evidence with sound reasoning
PRE-READING>ESSENTIAL VOCABULARY: Ability to define key terms using context clues and word analysis
ACTIVE READING>ANNOTATING A SCIENTIFIC TEXT: Ability to close-read a scientific text using annotation strategies
ACTIVE READING>DETERMINING CENTRAL IDEAS: Ability to summarize main ideas in a text
POST-READING>CLARIFYING UNDERSTANDING: Ability to clarify misconceptions or deepen understanding relative to pre-module understanding
POST-READING>GATHERING EVIDENCE: Ability to cite text evidence in preparation for completing the final task
PRE-READING>ESSENTIAL VOCABULARY: Ability to define unfamiliar terms using context clues and word analysis
ACTIVE READING>COLLABORATIVE COMPREHENSION: Ability to comprehend non-fiction texts in a small collaborative group, using the non-fiction literature circles strategy
POST READING>CLARIFYING UNDERSTANDING: Ability to clarify misconceptions or deepen understanding relative to pre-module understanding
POST-READING>GATHERING EVIDENCE: Ability to gather text evidence in preparation for the final task
PRE LAB> ACTIVATE BACKGROUND KNOWLEDGE: Ability to activate background knowledge and connect to content.
DURING LAB> SCIENTIFIC MODELING: Ability to utilize a scientific model.
POST LAB> SCIENTIFIC MODEL: Ability to analyze data from a scientific model.
AFTER LAB> DATA ANALYSIS: Ability to analyze data from lab

Transition to Writing

FORMULATING QUESTIONS: Ability to formulate questions that align the teaching task
INTERVIEW WITH EXPERT: Ability plan questions and participate in a live discussion.

Writing Process

WRITING PROCESS> ANALYZING GRADE LEVEL PARAGRAPH EXEMPLARS: Ability to construct a well-developed paragraph which aligns with the demands of the brochure
WRITING PROCESS>CREATING A WORKS-CITED LIST: Ability to construct in-text citations statements and formatting
WRITING PROCESS>PLANNING THE WRITING: Ability to outline main ideas/reasons/details/evidence before constructing a draft
WRITING PROCESS>COMPOSING AN INITIAL DRAFT: ability to draft the brochure
WRITING PROCESS>EDITING AND REVISION: Ability to edit, revise, and improve upon an initial draft
WRITING PROCESS>COMPOSING A FINAL DRAFT: ability to incorporate feedback to composing a final draft

Section 3: What Instruction?

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
Preparing for the Task				
30 mins	**BREAKING DOWN THE PROMPT**: Ability to understand the demands of the prompt	**BREAKING DOWN THE TASK PROMPT: ANNOTATE AND SUMMARIZE** SWBAT analyze, in writing, the demands of the task on antibiotic resistance using procedural words and parts of speech (first, next, after, verb, noun).	Meets expectations: • Prompt is annotated according to instructions • **Student accurately summarizes the demands of the prompt**	The purpose of this mini-task is to introduce students to the topic, process, and final task of the module. The mini-task introduces a strategy for breaking down the requirements of a prompt, an essential skill for success with disciplinary text-based writing. Begin the mini-task by distributing the background to students and task analysis handout. Read the prompt a few times: aloud together as a class, in partners to each other, silently and independently (as necessary to meet your students' needs). Then review the directions of the handout with students. Direct students to work either independently or in partners. During student work time, facilitate by monitoring for pacing, checking for understanding, and probing for specificity. At the close of class, share exemplary student work or orally share student summaries of demands of the prompt. Meeting Students' Needs: • intentionally pair students heterogeneously by reading ability, using achievement data • create an anchor chart of an exemplar AFTER this mini-task to post and refer to throughout the module
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **RI.8.2** : Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.			
	Additional Attachments: **Task analysis abx**			
50 mins	**DEVELOP BACKGROUND CONTENT KNOWLEDGE**: Ability to understand the content in context of the greater topic	**CORNELL NOTES: ANTIBIOTICS VISUAL TEXT (BILL NYE VIDEO)** SWBAT summarize, in writing, how antibiotics work and human activity influences antibiotic resistant bacteria using content language (bacteria, evolve, mutation).	Meets expectations: • Student has noted key information • Student has developed thoughtful questions related to content • **Students has accurately summarized content by responding to essential question**	Prior to this mini-task, students should be familiar with the task and expectations for the final product (rubric). The purpose of this mini-task is to hook students into the problem of antibiotic resistance, using the Bill Nye video. Students will use the Cornell notes strategy to increase understanding of the content. Prepare for this mini-task by previewing the video for important stopping points. This video is approximately 24 minutes long. You will want to stop after each indicated section to have students compare notes. At the beginning of the mini-task, provide students with the Cornell notes handout. Explain various sections of notes (You may need to explain how they differ from 2-column notes if students are familiar with that method): • Essential question at the top • Notes (bullets, phrases) on the right hand side • Left hand side is for reflecting by developing questions AFTER taking notes • Summary on the bottom is for answering essential question after notes and question reflection Then, direct students to view the and write down important information related to the essential question on the right side. After each section of note-taking, have students compare with another student (or series of students) to add information Have students revisit their information on the right hand side by circling key terms or underlining/starring important ideas After peer reviews and annotation reviews of their initial notes, students formulate questions on the left hand side referring to the corresponding information on the right hand side. These questions may take different forms or serve different purposes: • authentic questions are questions to which students do not know the answer and would like to find out - they may be clarifying questions (which often start with "how" or "when") • probing questions dig deeper into the subject (and often start with "why") • review questions could be used as a study guide for the information that is already explicitly stated on the right hand side (these often start with "what") After reviewing notes for questions formulation, the final step is to summarize the lesson's information by answering the Essential Question from the top of the notes. An appropriate scaffold is to give a sentence starter which rephrases the essential question and place an expectation for how many details you wish to have included in the summary. (3-4 sentences). Meeting Students' Needs: • Guide the viewing/note-taking with main ideas by pre-determining main ideas on the right hand side of the notes as sub-headings • Provide question stems for various levels of questioning (ie: increasing in cognitive demand) • Extend the lesson by having students share their questions with the class and answer them, point them in a research direction, or let them know the question will be addressed in a future reading, as you see fit.
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **L.8.6** : Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to			

	comprehension or expression. **SL.8.1** : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly. **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RH.6-8.7** : Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts. **RH.6-8.1** : Cite specific textual evidence to support analysis of primary and secondary sources.			
	Additional Attachments: **student_examples_of_cornell_notes_4.pdf** **cornell notes abx 1**			
50 mins	**RUBRIC ANALYSIS**: Ability to understand the performance expectations of the rubric	**SHORT CONSTRUCTED RESPONSE: RUBRIC ANALYSIS** SWBAT paraphrase the rubric in writing using rubric words and phrases (development, organization, understanding, etc.).	**Meets Expectations** • **Student accurately paraphrases the rubric and generates a graphic that connects.** • Student effectively collaborates with group members.	Prior to this mini-task, students should be familiar with the task and background information for the topic. Prepare for this mini-task (and the rest of the module) by displaying prompt and rubric daily, reminding students of the end goal, and hand out the rubric to each student as part of the "We Do" below. Create intentional groups, setting them up for success in the process (perhaps a strong reader, a strong reader, a leader, an illustrator). Place the following posters around the room: • reading/research • development • organization • conventions • content understanding. This mini-task is set up in the gradual release model of "I Do, We Do, You Do. Begin the mini-task, with the "I Do" (Modeling) : Using one poster as an example (Focus), read the rubric and then deconstruct, using kid-friendly language. Next, involve students in the modeling with "We Do" (still as a whole class): Ask five students to come into a circle with the poster for Controlling Idea. Guide them to translate it into kid-friendly language, adding a unique graphic to help remember each element of the rubric. Finally, direct students to work in small groups in the "You Do" portion of the lesson: Hand out one poster to each table group (one poster per identified scoring element). Students paraphrase the indicators into "kid-friendly" language and generate a graphic to present their ideas to the whole class. Conclude by handing out copies of the entire rubric to students. Ask each student to individually reflect and write a goal for themselves based on the rubric. They can choose a section they feel confident with and a section they want extra support with. You may also have students share this with their parents/guardians by sending the document home to be signed. Meeting Students' Needs: • Reduce the amount of writing (and time needed) by focusing on a limited number of scoring elements and/or indicators • Extend the goal-setting by asking students to write a reflection on their writing, reading, or group work strengths and/or weaknesses • Provide sentence stems or a word bank for paraphrasing into "kid-friendly" language
	Standards: **RST.6-8.2** : Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. **SL.6.1** : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **Antibiotics Rubric**			
15 mins	**PRE LAB> ACTIVATE BACKGROUND KNOWLEDGE**: Ability to activate background knowledge and connect to the content.	**PRE LAB BRAINSTORM (ANTIBACTERIAL SOAP VS. REGULAR SOAP)** SWBAT orally summarize their thoughts and beliefs about hand washing with both antibacterial and regular hand soap, using explanatory words (because, how, why, etc.).	Meets expectations if student... • precisely details their beliefs about hand washing.	The purpose of this mini task is for students to activate their background knowledge before engaging in a lab comparing the effectiveness of antibacterial soap compared to regular soap. Prepare for this mini-task by assigning students to groups of four. Begin by asking students to answer a brainstorm question that relates to their attitudes and beliefs about hand washing with regular and antibacterial soap: *"Is washing with antibacterial soap more or less effective than regular soap? Why or why not?"* After students have time for individual reflection (silently, verbally processing in pairs, or written reflection), use the protocol *Novel Ideas Only* to share their ideas with the class, using the brainstorm question on which they reflected earlier: 1. Work collaboratively to brainstorm possible responses/answers to the brainstorm question – students are given 5 minutes to do so 2. As a new idea is asserted or stated aloud, another student from the group reiterates the contribution and then all students write it down on their individual sheet of paper

				3. After 5 minutes, the teacher directs the students to draw a line under the last item offered by the group 4. All groups are then asked to share their group's list: a. Each group stands and one "reporter" shares the group's ideas b. The "reporter" starts the process by restating the prompt/question c. The teacher reminds all other groups that they must listen to the first group very carefully because each ensuing group will only share a group's idea if it was not shared by any other group before them – this step of the protocol is key for the strategy to work and hold true to its name ("Novel Ideas Only") d. As the groups share their "Novel Ideas Only", the rest of the groups are writing the new contributions from each group to each of their individual lists. To facilitate this process, the teacher can also generate a separate running list on chart paper or Google doc, so that students that have difficulty writing and listening (simultaneously) can copy the list after they have listened attentively to the contributions of all the groups e. The end product of this activity allows for a class to generate a compilation of "Novel Ideas Only" as responses to the given prompt/question. Meeting Students' Needs: ● Provide sentence stems and/or a word bank ● "Prime" the brainstorming list with some ideas or categories ● Design groups to set students up for success with assigned roles (a leader, a writer, a time-keeper)
	Standards: **SL.7.1** : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly. **2.1.** : Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment			
	Additional Attachments: **Pre Lab Brainstorm (Wash Your Hands, Please!)**			
35 mins	**DURING LAB> SCIENTIFIC MODEL**: Ability to utilize a scientific model.	**LAB: ANTIBACTERIAL SOAP VS. REGULAR SOAP** SWBAT explain in writing their hypothesis for a lab investigating the effectiveness of washing with different soaps using content vocabulary (antibaterial, soap, more/less effective, etc.).	Meets expectations if student... ● accurately completes the following sections of their lab report: statement of the problem, hypothesis, materials and procedure.	The purpose of this mini task is for students to investigate the effectiveness of antibacterial soap and compare that to regular hand soap. Students will be collecting and analyzing data in order to answer the following question. **Is washing with antibacterial soap more or less effective than regular soap? Why or why not?** The results for this mini task will not be analyzed until the bacteria cultures have time to grow. That will take approximately 2-3 weeks. Prepare for this mini-task by assembling the following materials. ● petri dishes with agar, 1 per group of 4 students ● *check to ensure agar is less that 6 months old (this will effect your results) ● scotch tape to seal the dishes and prevent contamination ● sharpie marker to label each dish ● cotton swabs, 1 per group of 4 students ● Antibacterial soap (with Triclosan) and hand soap (without Triclosan) ● access to a sink with running water ● bio bag for disposal *contact Joni Rix for pick up at joni_rix@dpsk12.org **Important Teacher Information Regarding Disposal and Saftey** *Once the Petri dishes have been taped shut, they should not be opened again. All microorganisms grown during the experiment should be killed before discarding. The best way to dispose of bacterial cultures is to* pressure sterilize *them in a heat stable biohazard bag. If autoclaves or pressure cookers are not available or large enough to make this convenient, an alternative is to bleach the plates. Saturate the plates with a 20% or "1 in 5" household bleach solution (in other words, 1 part bleach and 4 parts water). Let them sit and soak overnight in the bleach solution before disposing of them. Please note that the bleach solution is corrosive and needs to be thoroughly removed* afterwards. *In addition, the plates can be incinerated if access to an incinerator is available.* *Additional Safety Considerations* *Once the Petri dishes have been exposed or inoculated, students should not re-open them.* For this experiment, you will have 4 independent variables with 3-4 students in each group 1. Washing hands with antibacterial soap 2. Washing hands with soap (regular) 3. Washing hands without soap (only water) 4. Do not wash hands (control) To measure results (dependent variable) students will grow bacteria cultures and examine the amount of growth on the different petri dishes. After presenting the above variables, have students fill out the statement of the problem and the hypothesis section of the attached lab report. If you have another template that your school is using feel free to use that template in place of the one provided here. Depending on their familiarity with this process you may choose to model this using the document camera. Have students generate a list of controlled variables. This may include standardizing the time washing hands and/or the amount of water used. Review this as a class and agree on a list of controlled variables everyone is going to use. Present this list to students on chart paper or on the Smart Board. You may choose to show the attached video to help students generate a list of controls. If students forget a controlled variable or decide on one that is not going to work or may present the students with errors it is ok to let students make this mistake.

				This is something that can be referenced in the conclusion section of the lab report. Here students can talk about what they would do differently and why with details from their experiment. Explain the procedure for swabbing a bacterial culture to students or show them the attached video "Growing Bacteria". Following the video or explanation, have students complete the materials and procedure section of their lab report. Check to make sure students understand the procedure before completing the lab. Instruct students on how you would like them to label their bacterial cultures. In addition to marking the dish with the independent variable, you may choose to have students indicate a group number and class period. At this point students can move into their groups, gather their supplies and complete the lab procedure. Circulate around the room ensuring students are following the procedure and address any questions students may have while they are completing the lab. Once students have completed the procedure, have students store the bacterial cultures in a dry area of the classroom where they are not likely to be disturbed and contaminated. Grow the cultures for 2-3 weeks. The data and results section of the lab report will be completed at this time. Ideas for meeting students' needs ● heterogeneous grouping based on previous lab data ● lab roles with detailed job descriptions ● sentence stems to promote collaboration
	Standards: **2.1.** : Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment			
	Additional Attachments: **All About Agar (information for teachers)** **How to Melt and Pour Agar Plates (video for teachers)** **Growing Bacteria - Sick Science! #210 (video 2)** **Growing Bacteria - Petri Dish (video 1)** **Hand Washing Technique - WHO Approved (video)** **Lab Report: Antibacterial Soap vs. Regular Soap**			
Reading Process				
20 mins	**BEFORE READING>MAKING PREDICTIONS ABOUT CONTENT**: ability to predict content of a text and make connections to prior knowledge	**ANTICIPATORY GUIDE FOR A TEXT SET - BEFORE READING ANY TEXT** SWBAT assess, in writing, their content knowledge regarding a text about about antibiotic resistance, using content language (bacteria, evolve, microbes).	Meets expectations ● student responds to all agree/disagree statements	Prior to this mini-task, students should have a general understanding of the problem of antibiotic resistance (Bill Nye video) The purpose of this mini-task is for students to examine or activate their prior knowledge about a topic and highlight any misconceptions they may have about the topic. This mini-task should be used before reading any of the texts in the text set, and then revisited after each of the reading process texts Connecting to prior knowledge helps students comprehend new content in a text, as well as self-monitor key conceptual shifts. At the beginning of the mini-task, distribute the anticipatory guide. Tell students they will soon be reading texts about antibiotics and antibacterial products, problems with their use and misuse, and the short and long-term consequences of those problems, in order to inform their informational writing. Explain how the anticipatory guide works: the "before" column of the anticipatory guide should be used to help them monitor what they know and believe *before* reading the texts, and they they will locate text evidence about each statement *after* reading. Explain that this will help them deepen their knowledge about each statement and/or correct any misconceptions. Stress that after each reading, when looking for text evidence confirming or challenging each anticipatory statement, they should seek to identify the BEST text evidence which aligns to the statement and informally cite it using this format: (author, title, and/or publication and a page or paragraph number). Explain that they are not doing formal citations in this mini-task, but rather they are noting where the information is located for their own research purposes. After the first reading, revisit the anticipatory guide statements, and model how to choose highly aligned text evidence. Plan questions to help guide student evaluation of text evidence: ● What have we learned in this text that confirms or challenges this statement? ● What text evidence can we find to demonstrate our understanding? ● What makes this evidence particularly compelling and reliable? (use of data, lack of bias, expertise of source) ● If I am choosing between two pieces of evidence, which is more compelling and why? After having modeled this thinking and recording of evidence the first time, you may use judgment as to whether this can be done independently or scaffolded with partners for subsequent post-reading uses of the anticipatory guide. Be sure to monitor progress of the multiple visitations to the anticipatory guide throughout the module, checking for use of most-aligned evidence and monitoring shifts in students' content understanding/misconceptions. Meeting Students' Needs: ● Read statements aloud as a class, or allow students to read the statements to each other (but still assess their content understanding individually) ● Pre-identify which text(s) addresses each statement

				• Allow students to contribute additional (perceived) knowledge or understanding about the topic on the back of the page
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **RH.6-8.1** : Cite specific textual evidence to support analysis of primary and secondary sources.			
	Additional Attachments: **anticipatory guide abx**			
25 mins	**BEFORE READING>ANALYZING GRAPHICS**: Ability to analyze scientific data and determine trends	**ANALYZING THE BIGGEST THREATS: WHERE IN THE WORLD ARE THE MOST RESISTANT INFECTIONS? (BEFORE READING "WHY INDIA IS HOTBED...")** SWBAT identify orally where there is the greatest rate of antibiotic resistant infections using data analysis words (increase, decrease, rate, etc.).	Meets expectations if student... • accurately cites data using the provided world resistance maps. • identifies the location of the greatest antibiotic resistant infections	This mini task should be done prior to reading the article "Why India Is A Hotbed Of Antibiotic Resistance And Sweden Is Not". Prepare for this mini-task by securing access to technology for students and previewing the website so you can facilitate its use with students. Also include the attached world map in your days' projections for students. The purpose of this mini task is for students to analyze world resistance maps for a list of antibiotic resistant infections. Using the data in the interactive world resistance maps, students will identify which countries have the highest levels of antibiotic resistance. They will not answer the why in this mini task. This question will be answered when they read the article "Why India Is A Hotbed Of Antibiotic Resistance And Sweden Is Not" in the following mini task. Begin the mini-task by directing students to the attached handout and link to website. Close the mini-task by cold calling on students to share their findings for at least one of the antibiotic-resistant infections to verbally assess their learning. Ask questions such as, • What factors might affect these rates? • Do we have any evidence that the key factor is one over the other yet? (no) • What evidence should we be on the lookout for in our reading? Chart findings on the world map to keep track of countries and create a visual for students. Meeting students' needs • Website may be used in intentional pairs • "Pre-read" the world map as a class to give students some geographical context • Pre-determine more or fewer infections • Provide pronunciation guides for technical nomenclature
	Standards: **RI.8.1** : Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.			
	Additional Attachments: **Blank World Map** **Resistance Maps** **Resistant Bacterial Infections**			
15 mins	**PRE- READING> ESSENTIAL VOCABULARY**: Ability to define unfamiliar words	**CONTEXT CLUES, WORD PARTS, AND COGNATES: DEFINE + DRAW ("WHY INDIA IS A HOTBED....")** SWBAT define, in writing, key vocabulary in the texts, using context-clue words (meaning, example, context, symbol, etc.)	Meets expectations if student: • **Completed handout with accurate definitions and relevant symbols/illustrations**	The purpose of this mini-task is to "front load" vocabulary to aid student comprehension as they read each text. Prepare for this mini-task by identifying key vocabulary in each text and determining intentional partners to set students up for success. At the beginning of the mini-task, explain to students that they will be reading a range of texts throughout this module. Some texts will be very easy to read, others will be more challenging. In order to support students with reading during this module, we will use three different ways to determine or clarify the meaning of unknown words or phrases: • Context clues • Word parts • Cognates Next, review with students the meaning of each of these strategies: • If you use *context clues*, you are reading the sentence, or sentences, around the word to help you figure out what the word means. Sometimes you will need to read a sentence or two forward or back in order to determine or clarify meaning. • If you use *word parts*, you are breaking the word up into prefixes, root words, and/or suffixes and using knowledge of the meaning of those parts to determine or clarify meaning. • If you use *cognates,* you are using your knowledge of similar words in another language. Review the Cognates handout with the class, ask students if they can think of other cognates or false cognates. To emphasize the need to beware of false cognates, show students the 30-second video (https://www.youtube.com/watch?v=3p8P3u_01No). Direct students to complete the handout with their assigned partners. Allow pairs 5 minutes to complete the handout. Note: the examples provided are relatively easy - the idea here is to familiarize the students with the strategies so that they will be able to use them moving forward. As students work, monitor pairs, addressing any misconceptions. Listen and look for student use of the terms

				roots, prefixes, suffixes, cognates, context clues, as well as for use of the resources. Close the mini-task by telling students that you expect them to continue to practice using context clues, word parts, and cognates to help them persevere as they read when meaning breaks down and that they should keep track of essential academic language in their Define + Draw log. **For the first text, a few key terms are provided with context. For the following texts, a few boxes are left blank for teacher or student identification.** **Students will return to this log as a pre-reading strategy before each text.** Meeting Student Needs: ● If there are many words in a text which you anticipate as "struggle words" for some students, provide some definitions for students and only identify one or two for them to define using the strategies ● Extend the activity by asking students to use not just definitions but provide synonyms or an additional context sentence of their own
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **L.8.6** : Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression. **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **CSR Suffix List .pdf** **CSR Root Words.pdf** **cognates (1).pdf** **False Cognates Video** **Define and Draw**			
50 mins	**ACTIVE READING>ANNOTATING A TEXT**: Ability to mark a text for key ideas	**ANNOTATING A SCIENTIFIC TEXT (WHY INDIA IS A HOTBED)** SWBAT summarize, in writing, key points in the article, "(Why India is a Hotbed of Resistance...)", using the language of inquiry (similar, different, clarify, how, why, explain*).*	**Meets expectations** ● if article is completely annotated ● annotations are focused, thoughtful, and varied ● **students are able to explain their thinking about annotations when you ask targeted questions during small group facilitation**	This annotation strategy will be used for reading each text in the module. Since this annotation strategy may be new to students, modeling is recommended. This may be done under a document camera, overhead projector, or on a Promethean board. To begin the mini-task, project the first paragraph of the text. Read the paragraph aloud with class. Direct/model annotation in the following way: ● CIRCLE words or phrases about which a student might have a question For each circled term, in the margin, students should write the specific question they have. For instance, in the first paragraph of the NPR article, if the term circled is *prevent diseases* , the question you write in the margin may be, "How well do antibiotics actually prevent diseases? How does that work?" ● UNDERLINE one sentence that represents the main idea in each paragraph. For each sentence underlined, in the margin, students should rephrase the main idea in their own words. For example, if the sentence underlined is *the more we use antibiotics, the greater the likelihood that clever bacteria will evolve in ways that resist the attack of antibiotics. So once-treatable infections become difficult or impossible to cure* you might write... *Antibiotics will not kill mutant bacteria that cause the disease and when those mutant bacteria reproduce, the antibiotic will be useless against them.* Direct students to continue reading and annotating in this way. One way to scaffold this might be partner reading/annotating with intentional partners. However, students can continue independently if you are clear on the expectation to follow the model and if they are proficient readers of scientific texts. During student work time, facilitate the annotation process with questions like... *What is the significance of what you underlined/starred/circled?* *Why will that information matter when it comes time to explain the causes and effects of antibiotic resistance?* *How does this information connect to other information we have learned about bacteria and antibiotics?* Meeting Student Needs: ● Use the NPR accompanying podcast to aid fluency for some students ● Pre-identify sentences for students to summarize ● Provide summary sentence stems and/or word banks
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **RST.6-8.10** : By the end of grade 8, read and comprehend science/technical texts in the grades 6—8 text complexity band independently and proficiently. **RST.6-8.2** : Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
10 mins	**POST-READING>CLARIFYING UNDERSTANDING**: Ability to	**REVISITING ANTICIPATORY GUIDE FOR A**	Meets expectations ● student cites appropriate textual	Prior to this mini-task, students should have completed the before reading piece of the anticipatory guide, and completed the pre-reading and active reading for the text, "India is a Hotbed of Antibiotic Resistance" (NPR). The purpose of this mini-task is for students to **revisit** their prior knowledge about the topic, clarify any

	clarify misconceptions or deepen understanding relative to pre-reading understanding	**TEXT SET (WHY INDIA IS A HOTBED)** SWBAT cite textual evidence, in writing, to clear up misconceptions and deepen knowledge about antibiotic resistance, using content language (mutation, survival, adaptation, bacteria, reproduce).	evidence • **student recognizes and clears up misconceptions about antibiotic resistance**	misconceptions they may have, and cite text evidence which led to that clarity. This mini-task should be used before reading any of the texts in the text set, and then revisited after each of the texts in the reading process skills cluster. At the beginning of the mini-task, direct students to their copy of the anticipatory guide. Review how the anticipatory guide works: the "before" column of the anticipatory guide should be used to help them monitor what they know and believe *before* reading the texts, and they they will locate text evidence about each statement *after* reading. Explain that this will help them deepen their knowledge about each statement and/or correct any misconceptions. Stress that **after** each reading, when looking for text evidence confirming or challenging each anticipatory statement, they should seek to identify the BEST text evidence which aligns to the statement and informally cite it using this format: (author, title, and/or publication and a page or paragraph number). Explain that they are not doing formal citations in this mini-task, but rather they are noting where the information is located for their own research purposes. **After the first reading**, revisit the anticipatory guide statements, and model how to choose highly aligned text evidence. Plan questions to help guide student evaluation of text evidence: • What have we learned in this text that confirms or challenges this statement? • What text evidence can we find to demonstrate our understanding? • What makes this evidence particularly compelling and reliable? (use of data, lack of bias, expertise of source) • If I am choosing between two pieces of evidence, which is more compelling and why? After having modeled this thinking and recording of evidence the first time, you may use judgment as to whether this can be done independently or scaffolded with partners for subsequent post-reading uses of the anticipatory guide. Be sure to monitor progress of the multiple visitations to the anticipatory guide throughout the module, checking for use of most-aligned evidence and monitoring shifts in students' content understanding/misconceptions. Meeting Students' Needs: • Read statements aloud as a class, or allow students to read the statements to each other (but still assess their content understanding individually) • **Pre-identify which text(s) addresses each statement** • Allow students to contribute additional (perceived) knowledge or understanding about the topic on the back of the page
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **RH.6-8.1** : Cite specific textual evidence to support analysis of primary and secondary sources.			
	Additional Attachments: **anticipatory guide abx**			
10 mins	**POST READING>GATHERING EVIDENCE AND INFERRING SOLUTIONS**: Ability to cite evidence of problems upon which to draw conclusions about a solution	**TWO COLUMNS: EVIDENCE AND REASONING ("WHY INDIA IS A HOTBED...")** SWBAT infer solutiions, orally and in writing, for problems with antibiotics and explain reasoning for each solution using the language of cause and effect (because, in order to, since, as a result of).	Meets expectations: • Student cites relevant evidence for each of the 3 problems (misuse, antibacterial products, agriculture) • **Student has scientifically sound solutions and reasoning for each problem**	Prior to this mini-task, students should have completed the vocabulary, active reading, and anticipatory guide for related reading. The purpose of this mini-task is to develop reasoning aligned to text evidence AND content knowledge, gathering evidence from each article as preparation for the final task. **This mini-task is repeated after each text.** Begin by explaining to students that reasoning is often the most difficult challenge in scientific writing. Students have a tendency to want to simply paraphrase text evidence rather than elaborating upon why the text evidence is important and how it supports the science involved. First, as a whole class, examine the non-exemplar (attached) which demonstrates a common error in reasoning. First have students locate/highlight the main idea (problem) in the paragraph, then have them locate/highlight (in another color) the text evidence. Find the associated solution as well. Finally, locate what the non-exemplar student attempted to include as reasoning. Point out how the reasoning here offers no real new explanation or scientific connections. Then, do the same process with the the exemplar paragraph, pointing out the improvements in reasoning. Finally, have students work to complete the first box in the graphic organizer using the most recently read text of the module. During student work time, monitor and check for understanding, looking for and highlighting strong exemplars, as well as conferencing with students who continue to make the mistake of paraphrasing. Close the mini-task by debriefing the process with students as a whole class. Ask something like, "What makes for strong evidence? What must be included in strong reasoning?" Meeting Students' Needs: • Scaffold whole class discussions by planning turning and talks before asking students to share observations about the exemplars and non-exemplars • Determine intentional partners for completing the graphic organizer for each text • Locate strong text evidence together as a whole class and have students only work on the associated reasoning during student work time • Provide sentence stems or frames for reasoning • Create an anchor chart of strong reasoning to post throughout the module
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.			

RST.6-8.1 : Cite specific textual evidence to support analysis of science and technical texts.

Additional Attachments:

reasoning evidence GO abx
Exemplars and non-exemplars

10 mins	**PRE-READING>ESSENTIAL VOCABULARY**: Ability to define unfamiliar words using context clues and word analysis	**CONTEXT CLUES, WORD PARTS, AND COGNATES: DEFINE + DRAW ("RISE OF SUPERBUGS")** SWBAT define, in writing, key vocabulary in the texts, using context-clue words (meaning, example, context, symbol, etc.)	Meets expectations if student: • **Completed handout with accurate definitions and relevant symbols/illustrations**	The purpose of this mini-task is to "front load" vocabulary to aid student comprehension as they read each text. Prepare for this mini-task by identifying key vocabulary in each text and determining intentional partners to set students up for success. At the beginning of the mini-task, explain to students that they will be reading a range of texts throughout this module. Some texts will be very easy to read, others will be more challenging. In order to support students with reading during this module, we will use three different ways to determine or clarify the meaning of unknown words or phrases: • Context clues • Word parts • Cognates Next, review with students the meaning of each of these strategies: • If you use *context clues*, you are reading the sentence, or sentences, around the word to help you figure out what the word means. Sometimes you will need to read a sentence or two forward or back in order to determine or clarify meaning. • If you use *word parts*, you are breaking the word up into prefixes, root words, and/or suffixes and using knowledge of the meaning of those parts to determine or clarify meaning. • If you use *cognates,* you are using your knowledge of similar words in another language. Review the Cognates handout with the class, ask students if they can think of other cognates or false cognates. To emphasize the need to beware of false cognates, show students the 30-second video (https://www.youtube.com/watch?v=3p8P3u_01No). Direct students to complete the handout with their assigned partners. Allow pairs 5 minutes to complete the handout. Note: the examples provided are relatively easy - the idea here is to familiarize the students with the strategies so that they will be able to use them moving forward. As students work, monitor pairs, addressing any misconceptions. Listen and look for student use of the terms *roots, prefixes, suffixes, cognates, context clues,* as well as for use of the resources. Close the mini-task by telling students that you expect them to continue to practice using context clues, word parts, and cognates to help them persevere as they read when meaning breaks down and that they should keep track of essential academic language in their Define + Draw log. **For the first text, a few key terms are provided with context. For the following texts, a few boxes are left blank for teacher or student identification.** **Students will return to this log as a pre-reading strategy before each text.** Meeting Student Needs: • If there are many words in a text which you anticipate as "struggle words" for some students, provide some definitions for students and only identify one or two for them to define using the strategies • Extend the activity by asking students to use not just definitions but provide synonyms or an additional context sentence of their own

Standards:

2.1. : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment

L.8.6 : Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

WHST.6-8.2 : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

RST.6-8.1 : Cite specific textual evidence to support analysis of science and technical texts.

Additional Attachments:

CSR Suffix List .pdf
CSR Root Words.pdf
cognates (1).pdf
False Cognates Video
Define and Draw

50 mins	**ACTIVE READING>NOTETAKING**: Ability to note key information	**CORNELL NOTES ON A VISUAL TEXT (RISE OF SUPERBUGS)** SWBAT explain, in writing, major causes and effects of antibiotic resistance using explanatory language (because, since,	Meets expectations: • student notes key information • student formulates thoughtful questions • **student summarizes learning in response to the essential question**	The purpose of this mini-task is to deepen students' of the problem of antibiotic resistance, using a video which explores case studies of antibiotic resistance in various countries "Rise of the Superbugs" (PBS/Safari Montage). Students will use the Cornell notes strategy to increase understanding of the content. Prepare for this mini-task by previewing the video for important stopping points. This video is approximately 57 minutes long, but you may choose to show only chapters 3,5, and 6 (called out in student handout). You will want to stop after each indicated section to have students compare notes. At the beginning of the mini-task, provide students with the Cornell notes handout. Explain various sections of notes (You may need to explain how they differ from 2-column notes if students are familiar with that method): • Essential question at the top • Notes (bullets, phrases) on the right hand side • Left hand side is for reflecting by developing questions AFTER taking notes

		after, as a result).		• Summary on the bottom is for answering essential question after notes and question reflection Then, direct students to view the and write down important information related to the essential question on the right side. After each section of note-taking, have students compare with another student (or series of students) to add information Have students revisit their information on the right hand side by circling key terms or underlining/starring important ideas After peer reviews and annotation reviews of their initial notes, students formulate questions on the left hand side referring to the corresponding information on the right hand side. These questions may take different forms or serve different purposes: • authentic questions are questions to which students do not know the answer and would like to find out - they may be clarifying questions (which often start with "how" or "when") • probing questions dig deeper into the subject (and often start with "why") • review questions could be used as a study guide for the information that is already explicitly stated on the right hand side (these often start with "what") After reviewing notes for questions formulation, the final step is to summarize the lesson's information by answering the Essential Question from the top of the notes. An appropriate scaffold is to give a sentence starter which rephrases the essential question and place an expectation for how many details you wish to have included in the summary. (3-4 sentences). Meeting Students' Needs: • Guide the viewing/note-taking with main ideas by pre-determining main ideas on the right hand side of the notes as sub-headings • Provide question stems for various levels of questioning (ie: increasing in cognitive demand) • Extend the lesson by having students share their questions with the class and answer them, point them in a research direction, or let them know the question will be addressed in a future reading, as you see fit.
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **RST.6-8.7** : Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). **RST.6-8.2** : Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **Cornell notes abx 2**			
10 mins	**POST READING>CLARIFYING UNDERSTANDING**: Ability to clarify misconceptions and deepen understanding relative to pre-module understanding	**REVISITING ANTICIPATORY GUIDE ("RISE OF SUPERBUGS")** SWBAT cite textual evidence, in writing, to clear up misconceptions about antibiotic resistance using content language (bacteria, evolve, microbes).	Meets expectations • student cites appropriate textual evidence • student recognizes and clears up misconceptions about antibiotic resistance	Prior to this mini-task, students should have completed the before-reading piece of the anticipatory guide, and completed the pre-reading and active reading for the text, "Rise of the Superbugs" (Safari Montage/PBS). The purpose of this mini-task is for students to **revisit** their prior knowledge about the topic, clarify any misconceptions they may have, and cite text evidence which led to that clarity. This mini-task should be used before reading any of the texts in the text set, and then revisited after each of the texts in the reading process skills cluster. At the beginning of the mini-task, direct students to their copy of the anticipatory guide. Review how the anticipatory guide works: the "before" column of the anticipatory guide should be used to help them monitor what they know and believe *before* reading the texts, and they they will locate text evidence about each statement *after* reading. Explain that this will help them deepen their knowledge about each statement and/or correct any misconceptions. Stress that **after** each reading, when looking for text evidence confirming or challenging each anticipatory statement, they should seek to identify the BEST text evidence which aligns to the statement and informally cite it using this format: (author, title, and/or publication and a page or paragraph number). Explain that they are not doing formal citations in this mini-task, but rather they are noting where the information is located for their own research purposes. **After the first reading**, revisit the anticipatory guide statements, and model how to choose highly aligned text evidence. Plan questions to help guide student evaluation of text evidence: • What have we learned in this text that confirms or challenges this statement? • What text evidence can we find to demonstrate our understanding? • What makes this evidence particularly compelling and reliable? (use of data, lack of bias, expertise of source) • If I am choosing between two pieces of evidence, which is more compelling and why? After having modeled this thinking and recording of evidence the first time, you may use judgment as to whether this can be done independently or scaffolded with partners for subsequent post-reading uses of the anticipatory guide. Be sure to monitor progress of the multiple visitations to the anticipatory guide throughout the module, checking for use of most-aligned evidence and monitoring shifts in students' content understanding/misconceptions. Meeting Students' Needs: • Read statements aloud as a class, or allow students to read the statements to each other (but still assess their content understanding individually) • **Pre-identify which text(s) addresses each statement** • Allow students to contribute additional (perceived) knowledge or understanding about the topic on the back of the page

	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **RH.6-8.1** : Cite specific textual evidence to support analysis of primary and secondary sources.			
	Additional Attachments: **anticipatory guide abx**			
10 mins	**POST-READING>GATHERING EVIDENCE**: Ability to cite evidence and accompany evidence with sound reasoning	**2 COLUMNS: EVIDENCE AND CONCLUSIONS (RISE OF SUPERBUGS)** SWBAT devise solutions, orally and in writing, for problems with antibiotics and explain reasoning for each solution using the language of cause and effect (because, in order to, since, as a result of).	Meets expectations: • Student cites relevant evidence for each of the 3 problems (misuse, antibacterial products, agriculture) • **Student has scientifically sound solutions and reasoning for each problem**	Prior to this mini-task, students should have completed the vocabulary, active reading, and anticipatory guide for related reading. The purpose of this mini-task is to develop reasoning aligned to text evidence AND content knowledge, gathering evidence from each article as preparation for the final task. **This mini-task is repeated after each text.** Begin by explaining to students that reasoning is often the most difficult challenge in scientific writing. Students have a tendency to want to simply paraphrase text evidence rather than elaborating upon why the text evidence is important and how it supports the science involved. First, as a whole class, examine the non-exemplar (attached) which demonstrates a common error in reasoning. First have students locate/highlight the main idea (problem) in the paragraph, then have them locate/highlight (in another color) the text evidence. Find the associated solution as well. Finally, locate what the non-exemplar student attempted to include as reasoning. Point out how the reasoning here offers no real new explanation or scientific connections. Then, do the same process with the the exemplar paragraph, pointing out the improvements in reasoning. Finally, have students work to complete the first box in the graphic organizer using the most recently read text of the module. During student work time, monitor and check for understanding, looking for and highlighting strong exemplars, as well as conferencing with students who continue to make the mistake of paraphrasing. Close the mini-task by debriefing the process with students as a whole class. Ask something like, "What makes for strong evidence? What must be included in strong reasoning?" Meeting Students' Needs: • Scaffold whole class discussions by planning turning and talks before asking students to share observations about the exemplars and non-exemplars • Determine intentional partners for completing the graphic organizer for each text • Locate strong text evidence together as a whole class and have students only work on the associated reasoning during student work time • Provide sentence stems or frames for reasoning • Create an anchor chart of strong reasoning to post throughout the module
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **reasoning evidence GO abx** **Exemplars and non-exemplars**			
10 mins	**PRE-READING>ESSENTIAL VOCABULARY**: Ability to define key terms using context clues and word analysis	**CONTEXT CLUES, WORD PARTS, AND COGNATES: DEFINE + DRAW (ANTIBACTERIAL PRODUCTS TEXT)** SWBAT define, in writing, key vocabulary in the texts, using context-clue words (meaning, example, context, symbol, etc.)	Meets expectations if student: • **Completed handout with accurate definitions and relevant symbols/illustrations**	The purpose of this mini-task is to "front load" vocabulary to aid student comprehension as they read each text. Prepare for this mini-task by identifying key vocabulary in each text and determining intentional partners to set students up for success. At the beginning of the mini-task, explain to students that they will be reading a range of texts throughout this module. Some texts will be very easy to read, others will be more challenging. In order to support students with reading during this module, we will use three different ways to determine or clarify the meaning of unknown words or phrases: • Context clues • Word parts • Cognates Next, review with students the meaning of each of these strategies: • If you use *context clues*, you are reading the sentence, or sentences, around the word to help you figure out what the word means. Sometimes you will need to read a sentence or two forward or back in order to determine or clarify meaning. • If you use *word parts*, you are breaking the word up into prefixes, root words, and/or suffixes and using knowledge of the meaning of those parts to determine or clarify meaning. • If you use *cognates,* you are using your knowledge of similar words in another language. Review the Cognates handout with the class, ask students if they can think of other cognates or false cognates. To emphasize the need to beware of false cognates, show students the 30-second video (https://www.youtube.com/watch?v=3p8P3u_01No). Direct students to complete the handout with their assigned partners. Allow pairs 5 minutes to complete the handout. Note: the examples provided are relatively easy - the idea here is to familiarize the students with the strategies so that they will be able to use them moving forward.

				As students work, monitor pairs, addressing any misconceptions. Listen and look for student use of the terms *roots, prefixes, suffixes, cognates, context clues,* as well as for use of the resources. Close the mini-task by telling students that you expect them to continue to practice using context clues, word parts, and cognates to help them persevere as they read when meaning breaks down and that they should keep track of essential academic language in their Define + Draw log. **For the first text, a few key terms are provided with context. For the following texts, a few boxes are left blank for teacher or student identification.** **Students will return to this log as a pre-reading strategy before each text.** Meeting Student Needs: ● If there are many words in a text which you anticipate as "struggle words" for some students, provide some definitions for students and only identify one or two for them to define using the strategies ● Extend the activity by asking students to use not just definitions but provide synonyms or an additional context sentence of their own
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **L.8.6** : Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression. **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **CSR Suffix List .pdf** **CSR Root Words.pdf** **cognates (1).pdf** **False Cognates Video** **Define and Draw**			
20 mins	**ACTIVE READING>ANNOTATING A SCIENTIFIC TEXT**: Ability to close-read a scientific text using annotation strategies	**ANNOTATING A SCIENTIFIC TEXT (ANTIBACTERIAL PRODUCTS TEXT)** SWBAT summarize, in writing, key points in the article, " (Why India is a Hotbed of Resistance...)", using the language of inquiry (similar, different, clarify, how, why, explain*).*	**Meets expectations** ● if article is completely annotated ● annotations are focused, thoughtful, and varied ● **students are able to explain their thinking about annotations when you ask targeted questions during small group facilitation**	This annotation strategy will be used for reading each text in the module. Since this annotation strategy may be new to students, modeling is recommended. This may be done under a document camera, overhead projector, or on a Promethean board. To begin the mini-task, project the first paragraph of the text. Read the paragraph aloud with class. Direct/model annotation in the following way: ● CIRCLE words or phrases about which a student might have a question For each circled term, in the margin, students should write the specific question they have. For instance, in the first paragraph of the NPR article, if the term circled is *prevent diseases* , the question you write in the margin may be, "How well do antibiotics actually prevent diseases? How does that work?" ● UNDERLINE one sentence that represents the main idea in each paragraph. For each sentence underlined, in the margin, students should rephrase the main idea in their own words. For example, if the sentence underlined is *the more we use antibiotics, the greater the likelihood that clever bacteria will evolve in ways that resist the attack of antibiotics. So once-treatable infections become difficult or impossible to cure* you might write... *Antibiotics will not kill mutant bacteria that cause the disease and when those mutant bacteria reproduce, the antibiotic will be useless against them.* Direct students to continue reading and annotating in this way. One way to scaffold this might be partner reading/annotating with intentional partners. However, students can continue independently if you are clear on the expectation to follow the model and if they are proficient readers of scientific texts. During student work time, facilitate the annotation process with questions like... *What is the significance of what you underlined/starred/circled?* *Why will that information matter when it comes time to explain the causes and effects of antibiotic resistance?* *How does this information connect to other information we have learned about bacteria and antibiotics?* Meeting Student Needs: ● Use the NPR accompanying podcast to aid fluency for some students ● Pre-identify sentences for students to summarize ● Provide summary sentence stems and/or word banks
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **RST.6-8.10** : By the end of grade 8, read and comprehend science/technical texts in the grades 6—8 text complexity band independently and proficiently. **RST.6-8.2** : Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
40 mins	**ACTIVE READING>DETERMINING**	**EVALUATING A CRITICAL QUOTE**	Meets expections: ● student accurately	This minitask is for use with the text ABC News article (grade level) or Scientific American article (above grade level) on antibacterial products. The purpose of this mini-task is help students to evaluate how information may

	CENTRAL IDEAS: Ability to summarize main ideas in a text	**(ANTIBACTERIAL PRODUCTS TEXT)** SWBAT evaluate, verbally and in writing, a critical quote from text about antibacterial products and its connection to antibiotic resistance using comparing and contrasting words (in contrast, similarly, however, although).	paraphrases meaning of critical quote in a gist statement • student is able to find a challenging quote and accurately compare the two statements	vary from one text to another, depending on the point of view or purpose of an author. Therefore, it is important to read critically and compare information from multiple sources. First, direct/facilitate students to read and annotate, using the "annotating a scientific text" strategy (see mini-task) After reading, direct students to locate the pre-identified critical quote in the text and copy it into the opening box on the attached worksheet. Share with students the purpose of analyzing a critical quote. ABC News: *"Antibacterial products do not cause bacterial resistance," Ed Kavanaugh, president of the cosmetics group, said in the statement. "They kill germs, thus breaking the circle of infection."* Scientific American: *"Hygiene—keeping both home and body clean—is one of the best ways to curb the spread of bacterial infections, but lately consumers are getting the message that washing with regular soap is insufficient."* Direct students to think/pair/write through each reflection question regarding the critical quote (work in partners) During student work time, be sure to monitor understanding by checking on students' gisting and their selection/understanding of the challenging quote they select. Probe for reasoning and specificity. At the end of the mini-task, facilitate a debrief discussion with the class around the content knowledge/clarification of misconception derived from evaluating the critical quote and its connection to answering the task prompt. Meeting Students' Needs • Provide sentence stems for gists and explanations • Pre-identify "challenging quotes" for students to choose from (in addition to the pre-identified critical quotes)
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **RST.6-8.9** : Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. **RST.6-8.6** : Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **analysis of a critical quote**			
10 mins	**POST-READING>CLARIFYING UNDERSTANDING**: Ability to clarify misconceptions or deepen understanding relative to pre-module understanding	**REVISITING ANTICIPATORY GUIDE (ANTIBACTERIAL PRODUCTS TEXT)** SWBAT cite textual evidence, in writing, to clear up misconceptions about antibiotic resistance using content language (bacteria, evolve, microbes).	Meets expectations • student cites appropriate textual evidence • student recognizes and clears up misconceptions about antibiotic resistance	Prior to this mini-task, students should have completed the before reading piece of the anticipatory guide, and completed the pre-reading and active reading for the text, Antibacterial Products Text (ABC or Scientific American). The purpose of this mini-task is for students to **revisit** their prior knowledge about the topic, clarify any misconceptions they may have, and cite text evidence which led to that clarity. This mini-task should be used before reading any of the texts in the text set, and then revisited after each of the texts in the reading process skills cluster. At the beginning of the mini-task, direct students to their copy of the anticipatory guide. Review how the anticipatory guide works: the "before" column of the anticipatory guide should be used to help them monitor what they know and believe *before* reading the texts, and they they will locate text evidence about each statement *after* reading. Explain that this will help them deepen their knowledge about each statement and/or correct any misconceptions. Stress that **after** each reading, when looking for text evidence confirming or challenging each anticipatory statement, they should seek to identify the BEST text evidence which aligns to the statement and informally cite it using this format: (author, title, and/or publication and a page or paragraph number). Explain that they are not doing formal citations in this mini-task, but rather they are noting where the information is located for their own research purposes. **After the first reading**, revisit the anticipatory guide statements, and model how to choose highly aligned text evidence. Plan questions to help guide student evaluation of text evidence: • What have we learned in this text that confirms or challenges this statement? • What text evidence can we find to demonstrate our understanding? • What makes this evidence particularly compelling and reliable? (use of data, lack of bias, expertise of source) • If I am choosing between two pieces of evidence, which is more compelling and why? After having modeled this thinking and recording of evidence the first time, you may use judgment as to whether this can be done independently or scaffolded with partners for subsequent post-reading uses of the anticipatory guide. Be sure to monitor progress of the multiple visitations to the anticipatory guide throughout the module, checking for use of most-aligned evidence and monitoring shifts in students' content understanding/misconceptions. Meeting Students' Needs: • Read statements aloud as a class, or allow students to read the statements to each other (but still assess their content understanding individually) • **Pre-identify which text(s) addresses each statement** • Allow students to contribute additional (perceived) knowledge or understanding about the topic on the back of the page
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment			

	RH.6-8.1 : Cite specific textual evidence to support analysis of primary and secondary sources.			
	Additional Attachments: **anticipatory guide abx**			
10 mins	**POST-READING>GATHERING EVIDENCE**: Ability to cite text evidence in preparation for completing the final task	**2 COLUMNS: EVIDENCE AND CONCLUSIONS (ANTIBACTERIAL PRODUCTS TEXT)** SWBAT devise solutions, orally and in writing, for problems with antibiotics and explain reasoning for each solution using the language of cause and effect (because, in order to, since, as a result of).	Meets expectations: • Student cites relevant evidence for each of the 3 problems (misuse, antibacterial products, agriculture) • **Student has scientifically sound solutions and reasoning for each problem**	Prior to this mini-task, students should have completed the vocabulary, active reading, and anticipatory guide for related reading. The purpose of this mini-task is to develop reasoning aligned to text evidence AND content knowledge, gathering evidence from each article as preparation for the final task. **This mini-task is repeated after each text.** Begin by explaining to students that reasoning is often the most difficult challenge in scientific writing. Students have a tendency to want to simply paraphrase text evidence rather than elaborating upon why the text evidence is important and how it supports the science involved. First, as a whole class, examine the non-exemplar (attached) which demonstrates a common error in reasoning. First have students locate/highlight the main idea (problem) in the paragraph, then have them locate/highlight (in another color) the text evidence. Find the associated solution as well. Finally, locate what the non-exemplar student attempted to include as reasoning. Point out how the reasoning here offers no real new explanation or scientific connections. Then, do the same process with the the exemplar paragraph, pointing out the improvements in reasoning. Finally, have students work to complete the first box in the graphic organizer using the most recently read text of the module. During student work time, monitor and check for understanding, looking for and highlighting strong exemplars, as well as conferencing with students who continue to make the mistake of paraphrasing. Close the mini-task by debriefing the process with students as a whole class. Ask something like, "What makes for strong evidence? What must be included in strong reasoning?" Meeting Students' Needs: • Scaffold whole class discussions by planning turning and talks before asking students to share observations about the exemplars and non-exemplars • Determine intentional partners for completing the graphic organizer for each text • Locate strong text evidence together as a whole class and have students only work on the associated reasoning during student work time • Provide sentence stems or frames for reasoning • Create an anchor chart of strong reasoning to post throughout the module
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **reasoning evidence GO abx** **Exemplars and non-exemplars**			
10 mins	**PRE-READING>ESSENTIAL VOCABULARY**: Ability to define unfamiliar terms using context clues and word analysis	**CONTEXT CLUES, WORD PARTS, AND COGNATES: DEFINE + DRAW (ARE ANTIBIOTICS ON THE FARM RISKY BUSINESS?)** SWBAT define, in writing, key vocabulary in the texts, using context-clue words (meaning, example, context, symbol, etc.)	Meets expectations if student: • **Completed handout with accurate definitions and relevant symbols/illustrations**	The purpose of this mini-task is to "front load" vocabulary to aid student comprehension as they read each text. Prepare for this mini-task by identifying key vocabulary in each text and determining intentional partners to set students up for success. At the beginning of the mini-task, explain to students that they will be reading a range of texts throughout this module. Some texts will be very easy to read, others will be more challenging. In order to support students with reading during this module, we will use three different ways to determine or clarify the meaning of unknown words or phrases: • Context clues • Word parts • Cognates Next, review with students the meaning of each of these strategies: • If you use *context clues*, you are reading the sentence, or sentences, around the word to help you figure out what the word means. Sometimes you will need to read a sentence or two forward or back in order to determine or clarify meaning. • If you use *word parts*, you are breaking the word up into prefixes, root words, and/or suffixes and using knowledge of the meaning of those parts to determine or clarify meaning. • If you use *cognates,* you are using your knowledge of similar words in another language. Review the Cognates handout with the class, ask students if they can think of other cognates or false cognates. To emphasize the need to beware of false cognates, show students the 30-second video (https://www.youtube.com/watch?v=3p8P3u_01No). Direct students to complete the handout with their assigned partners. Allow pairs 5 minutes to complete the handout. Note: the examples provided are relatively easy - the idea here is to familiarize the students with the strategies so that they will be able to use them moving forward. As students work, monitor pairs, addressing any misconceptions. Listen and look for student use of the terms *roots, prefixes, suffixes, cognates, context clues,* as well as for use of the resources. Close the mini-task by telling students that you expect them to continue to practice using context clues, word

				parts, and cognates to help them persevere as they read when meaning breaks down and that they should keep track of essential academic language in their Define + Draw log. **For the first text, a few key terms are provided with context. For the following texts, a few boxes are left blank for teacher or student identification.** **Students will return to this log as a pre-reading strategy before each text.** Meeting Student Needs: • If there are many words in a text which you anticipate as "struggle words" for some students, provide some definitions for students and only identify one or two for them to define using the strategies • Extend the activity by asking students to use not just definitions but provide synonyms or an additional context sentence of their own
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **L.8.6** : Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression. **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **CSR Suffix List .pdf** **CSR Root Words.pdf** **cognates (1).pdf** **False Cognates Video** **Define and Draw**			
50 mins	**ACTIVE READING>COLLABORATIVE COMPREHENSION**: Ability to comprehend non-fiction texts in a small collaborative group, using the non-fiction literature circles strategy	**NON-FICTION TEXT-LIT CIRCLES (ARE ANTIBIOTICS ON THE FARM RISKY BUSINESS?)** SWBAT analyze, orally and in writing, a non-fiction text about how agriculture practices contribute to antibiotic resistance using content language (preventative, agriculture, livestock, resistant, mutation)	Meets expectations: • each student has completed the obligations of their role in the lit circle • the group has reached a complete and accurate understanding of the text as exhibited by their questions and gist statement	Prior to this mini-task, students should have read and learned about the development of antibiotic resistance due to overuse and misuse. The purpose of this mini-task is to provide students a collaborative close reading strategy to use with the NPR text on use of antibiotics in farming. This strategy is an example of true collaborative learning, in which the each group's participants are clearly defined, each student is responsible for adding to the collective understanding the group, and the group produces a collective product. Prepare for this mini-task by assigning students to heterogeneous groups, balancing strong reading achievement with the needs of struggling readers, based upon reading achievement data. Consider student strengths and learning styles as well. At the beginning of the mini-task, post an essential question for this reading: *Why is the use of antibiotics for farm animals problematic for humans? (and/or: How does the use of antibiotics in farm animals contribute to antibiotic resistance?)* Then, distribute the role descriptions to each group (described on student handout) and inform students of their job within the group. There are a few ways in which the reading can be accomplished, depending upon the needs of your students: • students read independently, each attending to their assigned job and then share understanding (most fluent readers) • students read aloud in a group, each attending to their job during read-aloud and then share understanding (moderately fluent readers) • students read aloud in a group, stopping and starting in sections with each sharing their understanding after each "chunk" (least fluent readers) After reading and accomplishing each role, students individually develop a summary which answers this essential question. Then, students share their summary statements with their group and reach consensus on a collective summary statement. During student work, as students develop their content understanding from the reading, monitor for the misconception that the problem is that humans are exposed to antibiotics by what they eat and for the accurate conception that bacteria resistance develops due to overuse and that when humans contract infections from resistant bacteria, antibiotics will not be useful to them. Facilitate to make sure all students are contributing by attending to their roles, as well as for pacing. Close the mini-task by collecting student work to review for content understanding. Meeting Students' Needs • Pre-film a model group in action (or "fishbowl" a model group live) to show students an exemplar of the process • Follow-up with a reflection on the process to encourage growth mindset • Provide sentence stems or reference materials for each role (ie: lists of roots/prefixes/suffixes for vocab expert)
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **L.8.6** : Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression. **SL.8.1** : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly. **RST.6-8.10** : By the end of grade 8, read and comprehend science/technical texts in the grades 6—8 text complexity band independently and proficiently.			

	RST.6-8.4 : Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6—8 texts and topics. **RST.6-8.2** : Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.			
	Additional Attachments: **non-fiction lit circles**			
10 mins	**POST READING>CLARIFYING UNDERSTANDING**: Ability to clarify misconceptions or deepen understanding relative to pre-module understanding	**REVISITING ANTICIPATORY GUIDE (ARE ANTIBIOTICS ON THE FARM RISKY BUSINESS?)** SWBAT cite textual evidence, in writing, to clear up misconceptions about antibiotic resistance using content language (bacteria, evolve, microbes).	Meets expectations • student cites appropriate textual evidence • student recognizes and clears up misconceptions about antibiotic resistance	Prior to this mini-task, students should have completed the before reading piece of the anticipatory guide, and completed the pre-reading and active reading for the text," Are Antibiotics on the Farm Risky Business?"(NPR). The purpose of this mini-task is for students to **revisit** their prior knowledge about the topic, clarify any misconceptions they may have, and cite text evidence which led to that clarity. This mini-task should be used before reading any of the texts in the text set, and then revisited after each of the texts in the reading process skills cluster. At the beginning of the mini-task, direct students to their copy of the anticipatory guide. Review how the anticipatory guide works: the "before" column of the anticipatory guide should be used to help them monitor what they know and believe *before* reading the texts, and they they will locate text evidence about each statement *after* reading. Explain that this will help them deepen their knowledge about each statement and/or correct any misconceptions. Stress that **after** each reading, when looking for text evidence confirming or challenging each anticipatory statement, they should seek to identify the BEST text evidence which aligns to the statement and informally cite it using this format: (author, title, and/or publication and a page or paragraph number). Explain that they are not doing formal citations in this mini-task, but rather they are noting where the information is located for their own research purposes. **After the first reading**, revisit the anticipatory guide statements, and model how to choose highly aligned text evidence. Plan questions to help guide student evaluation of text evidence: • What have we learned in this text that confirms or challenges this statement? • What text evidence can we find to demonstrate our understanding? • What makes this evidence particularly compelling and reliable? (use of data, lack of bias, expertise of source) • If I am choosing between two pieces of evidence, which is more compelling and why? After having modeled this thinking and recording of evidence the first time, you may use judgment as to whether this can be done independently or scaffolded with partners for subsequent post-reading uses of the anticipatory guide. Be sure to monitor progress of the multiple visitations to the anticipatory guide throughout the module, checking for use of most-aligned evidence and monitoring shifts in students' content understanding/misconceptions. Meeting Students' Needs: • Read statements aloud as a class, or allow students to read the statements to each other (but still assess their content understanding individually) • **Pre-identify which text(s) addresses each statement** • Allow students to contribute additional (perceived) knowledge or understanding about the topic on the back of the page
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **RH.6-8.1** : Cite specific textual evidence to support analysis of primary and secondary sources.			
	Additional Attachments: **anticipatory guide abx**			
10 mins	**POST-READING>GATHERING EVIDENCE**: Ability to gather text evidence in preparation for the final task	**2 COLUMNS: EVIDENCE AND CONCLUSIONS (ARE ANTIBIOTICS ON THE FARM RISKY BUSINESS?)** SWBAT devise solutions, orally and in writing, for problems with antibiotics and explain reasoning for each solution using the language of cause and effect (because, in order to, since, as a result of).	Meets expectations: • Student cites relevant evidence for each of the 3 problems (misuse, antibacterial products, agriculture) • **Student has scientifically sound solutions and reasoning for each problem**	Prior to this mini-task, students should have completed the vocabulary, active reading, and anticipatory guide for related reading. The purpose of this mini-task is to develop reasoning aligned to text evidence AND content knowledge, gathering evidence from each article as preparation for the final task. **This mini-task is repeated after each text.** Begin by explaining to students that reasoning is often the most difficult challenge in scientific writing. Students have a tendency to want to simply paraphrase text evidence rather than elaborating upon why the text evidence is important and how it supports the science involved. First, as a whole class, examine the non-exemplar (attached) which demonstrates a common error in reasoning. First have students locate/highlight the main idea (problem) in the paragraph, then have them locate/highlight (in another color) the text evidence. Find the associated solution as well. Finally, locate what the non-exemplar student attempted to include as reasoning. Point out how the reasoning here offers no real new explanation or scientific connections. Then, do the same process with the the exemplar paragraph, pointing out the improvements in reasoning. Finally, have students work to complete the first box in the graphic organizer using the most recently read text of the module. During student work time, monitor and check for understanding, looking for and highlighting strong exemplars, as well as conferencing with students who continue to make the mistake of paraphrasing. Close the mini-task by debriefing the process with students as a whole class. Ask something like, "What makes for strong evidence? What must be included in strong reasoning?"

				Meeting Students' Needs: • Scaffold whole class discussions by planning turning and talks before asking students to share observations about the exemplars and non-exemplars • Determine intentional partners for completing the graphic organizer for each text • Locate strong text evidence together as a whole class and have students only work on the associated reasoning during student work time • Provide sentence stems or frames for reasoning • Create an anchor chart of strong reasoning to post throughout the module
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **reasoning evidence GO abx** **Exemplars and non-exemplars**			
15 mins	**PRE LAB> ACTIVATE BACKGROUND KNOWLEDGE**: Ability to activate background knowledge and connect to content.	**PRE LAB BRAINSTORM (THE FULL COURSE)** SWBAT describe orally and in writing their experience with antibiotics using content vocabulary (illness, treatment, antibiotic, etc.).	Meets expectations is student... • thoroughly and thoughtfully describes their experience with antibiotics	The purpose of this mini task is to activate students background knowledge around the use of antibiotics to treat infection. Following this mini task students will complete a lab modeling how antibiotics effect the population of a disease causing bacteria. See the attached student handout titled "Pre Lab Brainstorm (The Full Course"). Ask students to think about their experiences with antibiotics and use their background knowledge to answer the questions on their handout. Explain to students that there are no right or wrong answers to these questions and to just do their best to answer them fully. Some student may be familiar with what it means to take a "full course" of antibiotics. For these students we have included an optional question at the bottom of the handout. Following the Brainstorm, ask students to share their answers with their group and identify similarities and differences. In addition to the discussion ask student to annotate their responses by underlining what was similar and circling what was different. Wrap up with a class discussion asking groups to share out their experience identifying what was similar and different. Ideas for meeting students' needs • provide students will an illustrated dictionary of vocabulary words • heterogeneous pairs based on familiarity of the topic (this could be done using a line up) • optional enrichment question
	Standards: **SL.7.1** : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.			
	Additional Attachments: **Pre Lab Brainstorm (The Full Course)**			
45 mins	**DURING LAB> SCIENTIFIC MODELING**: Ability to utilize a scientific model.	**LAB: THE FULL COURSE** SWBAT summarize data, in writing, using data summary words and phrases (increase, decrease, over time, number of bacteria, etc.).	Meets expectations if... • accurately summarizes data	The purpose of this mini task is for students to model the effects of antibiotics on a population of disease-causing bacteria. The results will demonstrate that it is critical to remember to take each dose on time and to complete the entire prescribed course of antibiotics. 1. The class reads the Scenario and the teacher models the Procedure. Ask students to read the Scenario titled “A Bacterial Infection” on page C-100 in the attached Student Materials. While they are doing this, distribute the materials, including Student Sheet 51.1, “Population Data.” You can also provide Student Sheet 51.2, “Bacteria Graph,” at this time, or wait until students have completed collecting their data. These documents are found in the attached Teacher Materials. Review what each disk color represents and then review the procedure. Depending upon the makeup of your class, you may want to lead the class step-by-step through the procedure. Make sure that students understand that at the start, their body is infected with only 20 bacteria (of the same species), not all 50 they were given. You might want to suggest that they draw a circle representing the body on the bottom of Student Sheet 51.1 and place the initial 20 disks inside the circle. It is also recommended that you explain the Number Cube Key on page C-101 in the Student Materials so that all student pairs understand what to do after each toss of their cube. Note* It is important that students understand bacteria will "reproduce" following each toss. 2. Student pairs work together to collect data. Encourage student pairs to begin working on their own. Circulate among the groups to make sure each pair is doing the simulation correctly. Once students have proceeded to the last step, you may have to provide assistance with the graphing. Again, depending upon the makeup of your class, you may want to work through this step with the entire class. 3. Student pairs review and summarize data. Ask students to discuss and summarize their data by answering the Post Lab Questions. The purpose of these questions is for students to begin to notice and discuss trends in their data. Students will be synthesizing and discussing the implications of their data in a later mini task. Ideas for meeting students' needs

				• provide students with a picture human cut out to use with the colored disks to help them visualize the model • heterogeneous groups based on previous lab data • lab roles

Standards:

2.1. : Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species

2.1. : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment

SL.7.1 : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

WHST.6-8.9 : Draw evidence from informational texts to support analysis, reflection, and research.

RST.6-8.2 : Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

RST.6-8.1 : Cite specific textual evidence to support analysis of science and technical texts.

Additional Attachments:

Post Lab Questions (The Full Course)
Teacher Materials (The Full Course)
Student Materials (The Full Course)

35 mins	**POST LAB> SCIENTIFIC MODEL**: Ability to analyze data from a scientific model.	**POST LAB ANALYSIS QUESTIONS** SWBAT analyze, orally and in writing, the results from a lab using data analysis words (according to the data, the data shows, this means that, etc.).	Student meets expectations if... • accurately analyzes data	The purpose of this mini task is for students to analyze data and draw conclusions. For this mini task use the following protocol to have students analyze the results from the lab. First, assign specific questions to specific students depending on the students needs. The first question is the least complex and the last question is the most complex. Question 3 and 4 are intermediate in their complexity. Students will need to use their data table and graph to answer the questions. Encourage students to use evidence from their experiment in their response. Depending on your students you may want to model what this looks like. Once students have answered their assigned question they will actively listen to their classmates and record answers to the remaining questions. Notice that in addition to question numbers each question is also assigned a symbol. You may choose to use question numbers or symbols with students when explaining the protocol. The protocol is as follows: Students should have their question handout and their data table and graph with them during this portion. First, students meet with one person with a different question than their own. 1's meet with 2's and 3's meet with 4's. Student share their question and answer with their partner and record their answers on their handout. Second, student pairs combine with another student pair. 1's and 2's combine with 3's and 4's. Students again share their question and answer with their group members and record their answers on their handout. Some students will be listening twice to a classmates explanation. This is ok because it will reinforce the content for students. Finally, students will answer the exit ticket questions explaining their understanding of the content. Ideas for meeting students needs • differentiate questioning • homogeneous pairs based on math data/heterogeneous quads based on math data • sentence stems or word bank for exit ticket

Standards:

2.1. : Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species

2.1. : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment

SL.7.1 : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

RST.6-8.2 : Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

RST.6-8.1 : Cite specific textual evidence to support analysis of science and technical texts.

Additional Attachments:

Post Lab Analysis Questions

35 mins	**AFTER LAB> DATA ANALYSIS**: Ability to analyze data from lab	**BACTERIA CULTURES OBSERVATIONS AND DATA ANALYSIS** SWBAT summarize data in writing and address the lab question about antibacterial soap, using the vocabulary of data analysis (more than, less than, equal to, etc.).	Meets expectations if student... • accurately completes results and conclusions section of the lab report.	The purpose of this mini task is to analyze results from bacterial cultures and draw conclusions. Prepare for this mini-task by creating the bacteria cultures (previous mini-task) and allowing 2-3 weeks to grow. Also, create student groups so that each group can have one of each independent variable. This may mean sharing cultures across classes. Begin the mini-task by sending students to groups and directing them to draw what they see and record observations for all 4 cultures and note observations on their lab report under the section results (data). Students will answer Part 1 of the Data Analysis Discussion Guiding Questions with their group to help them analyze the results and draw conclusions. During the small group discussion, the teacher can monitor groups and provide any necessary feedback. To identify any differences among groups, use the following 'stay and stray' protocol: Choose one student from each group to explain the results to visiting groups, this person will 'stay". The rest of the group will 'stray' to the other groups to get a look at their data and compare it to their own. Each group member will visit a different group.

				Next, students will return to their original group and share their findings with each other. Students will then continue to further analyze their results by answering Part 2 of the Data Analysis Discussion Guiding Questions. Once this is complete, ask students to complete the conclusions section of their lab report. You may use the attached video "Why Antibacterial Soap Is Dangerous" to help discuss the results. Ideas for meeting students' needs • sentence stems/word bank for answering data analysis questions • provide additional visuals of bacterial cultures for comparison • heterogeneous grouping, with a strong reader, writer, leader, time-keeper, etc.
	Standards: **2.1.** : Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment			
	Additional Attachments: **How Much Good Is Antibacterial Soap Doing You? (video option 2)** **Why Antibacterial Soap Is Dangerous (Video option 1)** **Data Analysis Guiding Questions (Antibacterial Soap vs. Regular Soap Lab)** **Lab Report: Antibacterial Soap vs. Regular Soap**			
Transition to Writing				
50 mins	**FORMULATING QUESTIONS**: Ability to formulate questions that align the teaching task	**QUESTIONS TO ASK THE FIELD EXPERT: CAROUSEL BRAINSTORM** SWBAT write text based questions to ask an field expert regarding antibacterial resistance using content vocabulary (antibacterial products, antibacterial overuse, antibiotic use in agriculture, etc.).	Meets expectations if student... • activity participates with group members to write questions • writes questions that are text based and connect to the teaching task	The purpose of this mini task is for students to prepare for a field interview with an expert by writing questions. Students will be working in groups of 3-4 and each group will have a different color marker. This will help the teacher to see each groups thinking and monitor participation. Students will be generating questions around the following topics, **antibiotic overuse, antibiotic products and antibiotics in agriculture**. Please see the attached graphic from the CDC. This additional text, along with the complete text set, can be used to support students in generating questions. Because there are only 3 topics you should make 2 posters of each topic to keep the groups small and avoid overcrowding around a poster. Assign each student group a different poster to generate questions. Students will have ~20 minutes at their poster to write questions to ask an expert. The questions that students write should be based in the text and connect to the teaching task. To support students with writing text-based questions you may choose to model and provide students with the attached question stems. Once students are finished writing the questions at their assigned poster have students do a gallery walk where they will vote on the top 2 questions at each poster. Instruct students read all of the questions at each poster and to either tally or star the 2 questions they would like to ask the expert the following day. Give students ~3 minutes at each poster to do this. Following the activity, compile the top 5 questions under the 3 topics into a handout for students to use in the next mini task where they will ask their questions to the expert speaker. We also recommend you share these questions with the expert speaker before the interview takes place. In the following mini task, students will be using Today's Meet to submit follow-up questions to the expert. You may choose to have students submit their questions for this mini task using the same program in order to familiarize them with the process. Ask each group to have one student submit their questions and use the "show speaker colors" function so that students can easily see the different questions from different groups. Ideas for meeting students' needs • heterogeneous grouping based on writing data • question stems • provide a bank of quotes from the text for students to include in their questions • provide attached graphic to support understanding
	Standards: **2.1.** : Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **SL.7.1** : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **Sample Student Questions 3/3/16 Hamilton Middle School** **Question Stems** **Antibiotic Resisitance Graphic.pdf**			
1 hr	**INTERVIEW WITH EXPERT**: Ability plan questions and participate in a live discussion.	**VIRTUAL INTERVIEW WITH AN FIELD EXPERT AND BACKCHANNEL CHAT - OPTION 1 (PROFESSIONAL**	Meets expectations if student... • actively participates in a class discussion by paraphrasing the experts response and generating follow-up	The purpose of this mini task is for students to use the questions they generated from the previous mini task to interview an expert in the field of antibiotics and antibiotic resistance. This can be a doctor, nurse, college professor, etc. You will likely only have time to answer 4-5 of the questions from the previous mini task. You will be virtually interviewing the expert using Skype, Facetime, or Google Hangouts. You may also choose to record a video transcript of the expert using screencast app like MediaCore Capture. You will need to do this from the same computer you are calling the expert from. This video can be downloaded and then uploaded and shared with

	GUEST) SWBAT analyze, orally and in writing, the causes and effects of antibiotic resistance using content vocabulary (antibiotic resistance, overuse, agriculture, products, etc.).	questions.	students on the web for later viewing. This is great for students who may be absent and for students who would like to review the material presented. Please see the attached video resources to learn more about how to use these tools. You will be virtually interviewing the expert using Skype, Facetime, and/or Google Hangouts. You may also choose to record a video transcript of the expert using screencast app like MediaCore Capture. You will need to do this from the same computer you are calling the expert from. This video can be downloaded and then uploaded and shared with students on the web for later viewing. This is great for students who may be absent and for students who would like to review the material presented. Please see the attached video resources to learn more about how to use these tools. You will likely only have time to answer 4-5 of the questions from the previous mini task so when choosing questions you may want to prioritize the question order. *Before the Interview Day, you will want to set high classroom expectations around an air of formal climate for when a guest visits your school, whether virtually or in person. You may want to designate a student host for the day to welcome the guest, thank them, and explain the process to the guest. The goal should be student leadership and ownership of success with the guest. The student leaders can also facilitate the turn and talks and moderate follow-up questions.* Students should be divided up into pairs. Because time is limited, not every student pair will be able to ask a question of the expert. As mentioned in the previous mini task, you should share the questions students generated with the expert prior to the interview. This will help the expert prepare and limit their response time in order to answer as many questions as possible. In addition to sharing the questions with the expert, you should also share the text set with the expert. This will give the expert an idea of what the students already know and help them to make connections to what is discussed in the text. Below is a description of the question/answer process. Have student leaders facilitate a conversation following this pattern: 1. Student pairs ask the expert a question. 2. Expert answers the question using their own expertise and the text set. 3. Students stop and process the answer with their partner by paraphrasing and taking notes on their note catcher. 4. Students generate a follow-up question which they will type into TodaysMeet. (To set up a backchannel chat see the attached teacher resources for TodaysMeet. There is a video tutorial as well as an FAQ. Below you will find additional tips and tricks for using TodaysMeet in your classroom) The teacher should chart any unfamiliar vocab and address that with students so they can use that vocabulary in their question. 5. Expert reads the follow-up questions and chooses 1/2 question(s) to answer. This process repeats with the remaining questions for the duration of class time. When switching groups/questions, take a minute to give students feedback on their follow-up questions. Pull the screen up and highlight specific student questions stating what about their question was effective. Again, be sure to provide students with the transcript of the backchannel chat and the video transcript of the expert interview so that they may use it as a resource when they begin to plan their writing. **TodaysMeet Tips and Tricks** Once you have set up your backchannel chat, TodaysMeet provides a shortened url to share with students. This will make it easy for students to navigate to the backchannel chat. Make sure explain to students once you say something in TodaysMeet you cannot edit or undo it. You may want to take some time to discuss expectations around appropriate content and language used in the backchannel chat. TodaysMeet has a feature that will show speaker colors. We recommend using this feature because this will help students follow along better on the discussion thread as it is happening in real time. Also, when changing topics or questions assign a student type in a line. See the example below. --- This will help students keep track of the discussion and when a new question is asked. TodaysMeet also offers the option to save and print a transcript of the discussion. Along with the video of the expert this is a great resource to provide to students as they prepare to write. In terms of the content entered into the backchannel, provide students with the attached Follow-up Question Stems. Ideas for meeting students' needs • provide attached follow-up question stems and example questions • heterogeneous pairs based on writing data • substitute a "paper pass" between partners as an alternative to technology use

Standards:

2.1. : Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species

2.1. : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment

SL.7.5 : Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

SL.7.2 : Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

SL.7.1 : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

RST.6-8.1 : Cite specific textual evidence to support analysis of science and technical texts.

	Additional Attachments: **Interview with Sarah** **Interview with an expert packet** **Google Hangouts** **Follow Up Question Stems Expert Day** **Expert Day Note Catcher** **New to Skype - A Full Tutorial** **How to use TodaysMeet** **Today's Meet FAQ**			
5 mins	**INTERVIEW WITH EXPERT**: Ability plan questions and participate in a live discussion.	**VIRTUAL INTERVIEW WITH AN EXPERT AND BACKCHANNEL CHAT - OPTION 2 (STUDENT EXPERT PANEL)** SWBAT research, in writing, specific questions related to antibiotic resistance for participation in a panel discussion (antibiotic resistance, overuse, agriculture, products, etc.).	Meets expectations if student... ● actively participates in a class discussion using discussion strategies ● accurately and appropriately uses discussion strategies based on the research and preparation	In this mini task students will use the questions they generated from the previous mini task to interview an expert student panel on antibiotics and antibiotic resistance. You may also choose to record a video transcript of the expert using screen cast app like Screencastify. The video can be used for a debrief of the process afterwards. Prepare for this mini-task by dividing students into groups with 3-4 students each and each group should be given 2 questions to research the answers to in order to be ready to answer as experts. These questions should be synthesized from the previous mini-task on question formulation. Additionally, students will be pointed to resources to bring in additional knowledge. A note-catcher in which to place questions and answers, along with the links to the additional online resources, is linked in the student resources. Once all students are prepared to be experts, the teacher or the group will choose which student will be the representative on the panel and which students will play the role of asking questions and participating in the backchannel chat. To ensure that each group has the opportunity to ask a question, have students choose which question they would like to ask the expert first just in case you run out of time to ask all of the questions. In addition to asking the expert questions, students will be participating in a live backchannel chat on computers. Depending on the technology that his available in your school you may want to have students working in pairs or individually. To set up a backchannel chat see the attached teacher resources for TodaysMeet. There is a video tutorial as well as an FAQ. Once you have set up your backchannel chat, TodaysMeet provides a shortened url to share with students. This will make it easy for students to navigate to the backchannel chat. Make sure explain to students once you say something in TodaysMeet you cannot edit or undo it. You may want to take some time to discuss expectations around appropriate content and language used in the backchannel chat. TodaysMeet has a feature that will show speaker colors. We recommend using this feature because this will help students follow along better on the discussion thread as it is happening in real time. Also, when changing topics or questions assign a student to mark the change of question by submitting a "break" comment. This will help students keep track of the discussion and when a new question is asked. TodaysMeet also offers the option to save and print a transcript of the discussion. Along with the video of the expert this is a great resource to provide to students as they prepare to write. In terms of the content entered into the backchannel, students will be utilizing the 3 discussion strategies below. ● Question ● Use Evidence ● Connect Please see the attached student resource. Students will need access to the text set in order to accurately cite evidence. You may choose to require students to use a certain number of these discussion strategies over the span of the class period. When switching groups/questions, take a minute to highlight discussion strategies being used on the backchannel. Pull the screen up and highlight specific student responses stating what about their response was effective. You can also take this time to address any additional questions that come up on the backchannel. For example, several students maybe asking the same question and you can take this time to provide them with the answer. Continue to ask new student groups to come up and ask their question to the expert and the rest of the class to participate in the backchannel chat until you are out of class time. Again, be sure to provide students with the transcript of the backchannel chat and the video transcript of the expert interview so that they may use it as a resource when they begin to plan their writing. Meeting Students' Needs: ● Scaffold the conversation by taking breaks for students to turn and talk, paraphrasing the experts' answer and/or generating follow-up questions ● Provide a visual dictionary of academic vocabulary for students to refer to ● Provide sentence stems to help students generate follow up questions ● Build in rewards/awards recognizing exemplary participation during the process
	Additional Attachments: **Discussion Strategies for Backchannel Chat** **New to Skype - A Full Tutorial** **How to Use Screencastify** **How to use TodaysMeet**			

	Today's Meet FAQ **Preparing students as experts**			
Writing Process				
20 mins	**WRITING PROCESS> ANALYZING GRADE LEVEL PARAGRAPH EXEMPLARS**: Ability to construct a well-developed paragraph which aligns with the demands of the brochure	**EXEMPLAR PARAGRAPHS** swbat to compare and contrast, orally, the critical elements of well-developed paragraphs using the language of composition (hook, topic sentence, transition, reasoning)	Meets expectations if: student explains the improvements in key paragraph writing elements found in the exemplar paragraph	Prior to this mini-task, students should have completed all readings and labs, as well as discussed what good written reasoning looks like. The purpose of this mini-task is to provide a mini-lesson on the elements of a grade-level exemplar paragraph. This is important because as students progress in grade levels, what was once considered appropriate writing must go through continuous improvement. It is beneficial to students to see and analyze concrete examples of grade appropriate writing expectations. Begin the mini-task by explaining to students that within their informational brochure, they will be expected to include complete paragraphs for some of the components. Next, show students the exemplars and non-exemplars from the teacher resources. These are written about a previous science topic. The attached handout is highlighted, as the most scaffolded version of implementing this lesson, however there are many options or reducing the scaffold or making the mini-task more complex (see Ideas for Meeting Students' needs) Close the mini-task by explaining that the next step is to plan your writing. When planning paragraphs, students should keep the elements of the exemplar paragraph in mind (and available for reference). Meeting Students' Needs: • Remove the highlighting and ask students to identify the different elements. Make sure to point out the notes about tone, text evidence, and development. • Show only the non-exemplar and ask students to improve upon each element. • Implement any combination of the above approaches. For instance, you could identify some elements with highlighting and ask students to identify others. You could show some improvements upon the non-exemplar and ask students to generate improvements on others.
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **WHST.6-8.5** : With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. **WHST.6-8.4** : Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.			
	Additional Attachments: **Examplar pghs**			
15 mins	**WRITING PROCESS>CREATING A WORKS-CITED LIST**: Ability to construct in-text citations statements and formatting	**WORKS CITED PAGE FOR PAMPHLET** SWBAT cite sources, in writing, about antibiotic resistance in MLA format using citation terms (date, title, author, publisher, copyright date, etc).	Meets expectations: • student accurately completes a works cited page for the text set	For this particular writing product, in-text citations are not necessary, but it is important to emphasize to students the importance of citing their information sources in informational writing. Prior to this mini-task, students should have planned the sections of their pamphlet and noted where the work-cited page is included in the layout. Prepare for this mini-task by familiarizing yourself with the website http://www.easybib.com/ and securing technology for students. Begin the mini-task by directing students to the website http://www.easybib.com/ and modeling how to find the related info in the text set and enter it into the citation creator. Eventually, gradually release students to complete this process for each text in the text set. Close the mini-task by having students place their works-cited list into their pamphlet. Meeting Students' Needs: • Scaffold by presenting a completed works-cited page for students and highlight the citation format and elements cited (publisher, author, etc) and where those things are found in each text. • Do this process in an inquiry-based manner by having students find and locate the citation elements themselves in partners and then present them with the completed page for insertion into their pamphlet (rather than using easybib).
	Additional Attachments: **Link to online citing tool**			
50 mins	**WRITING PROCESS>PLANNING THE WRITING**: Ability to outline main ideas/reasons/details/evidence before constructing a draft	**PLANNING THE WRITING: PAMPHLET LAYOUT** swbat organize, in writing, relevant content for each section of the health brochure on antibiotic resistance using the language of composition (hook,	Meets expections: • student is able to plan organization of relevant facts, evidence, and reasoning for each section of the brochure layout	Prior to this mini-task, students should have completed all the reading and writing and examined exemplar paragraphs. In this mini-task, students will use a graphic organizer to organize content in their brochure. This will help students plan for success: laying out information in an organized manner and making sure to include all requirements of the prompt. Begin by showing the planning page to students. Model how to make notes of what will go on each page by doing the first column (front page) of the brochure and perhaps one of the inside pages together as a class. (Be careful not to over-scaffold and do every step for students!) Show how you can use your notes and annotated texts to include content information. Discuss the importance of putting the information in your own words. When instructing/modeling, make sure to model using only notes/phrases and/or bullets, rather than writing complete sentences. This will demonstrate the difference between planning and first draft and help students make the mistake of spending too much of allotted assessment time for planning in a timed assessment.

		introduction, transition, example, evidence, conclusion)		Note the "make it fun/personalize it" page. Brainstorm possible content for this section including, but not limited to, FAQs, drawings, comics, songs, slogans, etc. Then, direct students to begin working on their plan, individually, though they may consult with each other as they plan. During student work time, monitor for pacing and completion of all parts of the planning document. You may ask students to defend why they have included some information and left out others. Close the mini-task by either introducing the technology tool for creating the brochure (link in teacher resources) OR demonstrate how they prepare/fold construction paper for their final draft, and discussing next steps in the writing process. Meeting Students' Needs: ● Plan (but not draft) the brochure in intentional partners, assigning one student to key pages and others to other pages (being careful not to make one partner do "easy" and the other "hard") ● Provide a bank of illustrations, graphs, etc. ● Provide models of informational pamphlets from the "real world", collected from pharmacies, doctors' offices, etc.
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **WHST.6-8.5** : With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. **WHST.6-8.4** : Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **Antibiotics Brochure Template**			
1 hr	**WRITING PROCESS>COMPOSING AN INITIAL DRAFT**: ability to draft the brochure	**DRAFTING INDIVIDUAL PARAGRAPHS FOR THE PAMPHLET** SWBAT analyze, in writing, the causes and effects of antibiotic resistance , using content vocabulary (full course, mutation, resistant, reproduction).	Meets expectations: ● student completes a first draft of all paragraphs laid out in the brochure plan.	Point out to students that the full writing process for a writing assignment in science includes: 1) Understanding expectations 2) Research 3) Analysis of the research 4) Planning the format/organizing your ideas 5) Drafting 6) Revising and editing based upon feedback 7) Publishing a final draft (construction paper/colors or via technology tool) Point out that in the pamphlet plan that some full paragraphs are required and therefore they must compose an initial draft, incorporating skills learned from the paragraph writing mini-task and the problem/solution/reasoning graphic organizer mini-task. If students do the first drafts in class, you will have the opportunity to monitor and correct their progress "in real time" and use intentional pairing to help students help each other, as well as pointing out strong examples to the class. Meeting Students' Needs: ● Work with a small group of students with most intense needs ● Provide students with intense writing needs paragraph frames ● As students finish early, assign them to circulate as peer helpers or to work with a small group
	Standards: **WHST.6-8.10** : Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. **WHST.6-8.9** : Draw evidence from informational texts to support analysis, reflection, and research. **WHST.6-8.5** : With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. **WHST.6-8.4** : Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
50 mins	**WRITING PROCESS>EDITING AND REVISION**: Ability to edit, revise, and improve upon an initial draft	**PAPER PASS FOR PEER REVISION** SWBAT evaluate, in writing, key elements of a peers' first draft of a brochure on antibiotic resistance using language from the rubric.	Meets expectations (if each student reviewer...) ● provides thoughtful feedback on each section of the brochure ● uses scientific knowledge/reasoning in feedback	The purpose of this mini-task is to help students improve upon their first draft and create a climate in which they value feedback from peers and teachers. This protocol is silent, with optional intermittent turn and talks. Silent protocols ensure concentrated time with text and discourage students simply "explaining what I meant" and require students to convey their thinking precisely in writing. Prepare for this mini-task by assigning students to groups with at least two relatively strong writers in each. Begin the mini-task by distributing the feedback sheet and refer students to a copy of the rubric. Have students highlight for their peer reviewers their writing goal so that feedback can be focused towards their goal. Assign students to do one page for each paragraph, with each person in the group reviewing a different paragraph, so that by the time a student receives back her own paper, they have had 3 paragraphs reviewed in detail. The

				paragraphs which match the feedback sheet are the 3 interior brochure paragraphs, focusing on the problems (3 causes of antibiotic resistance) and suggestions for solutions. It will be beneficial to first model quality feedback. You may do this using the non-exemplar paragraph from the previous mini-task. **Helpful feedback is specific and constructive.** Appropriate examples of quality feedback would be..... *I noticed your second sentence is incomplete. I suggest you rewrite the second sentence as...* *I noticed your evidence is not specific. I suggest you check the NPR article paragraph 2 for additional, more specific evidence.* **Feedback that is judgmental or not specific is not helpful.** Non-examples would be... *I noticed your writing makes no sense. Your handwriting is messy. You can't spell. etc.* *I suggest you use a dictionary....get neater...find better evidence....etc.* Once modeling is completed, start the protocol, using a timer and setting the expectation that students not pass papers until they are directed to do so. Emphasize that the protocol remains silent. Intermittently, you may provide brief periods of time for authors to clarify feedback given to them. The beauty of a silent protocol is that it does allow for you to sit with a small group that may need more intensive guidance and feedback from you as the teacher! Meeting Students' Needs: ● Provide accountable talk sentence stems for helpful feedback ● Provide exemplar paragraphs ● Ask students to highlight elements of paragraph in different colors (as they did with the exemplars)
	Standards: **2.1.** : Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment **L.8.6** : Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression. **L.8.3** : Use knowledge of language and its conventions when writing, speaking, reading, or listening. **L.8.2** : Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. **L.8.1** : Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. **WHST.6-8.5** : With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. **WHST.6-8.4** : Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **RST.6-8.2** : Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. **RST.6-8.1** : Cite specific textual evidence to support analysis of science and technical texts.			
	Additional Attachments: **paper pass feedback sheet abx**			
40 mins	**WRITING PROCESS>COMPOSING A FINAL DRAFT**: ability to incorporate feedback to composing a final draft	**FINAL DRAFT OF PAMPHLET** SWBAT analyze, in writing, the causes and effects of antibiotic resistance , using content vocabulary (full course, mutation, resistant, reproduction).	Meets expectations: ● Student publishes high quality final draft of pamphlet, following organizational plan and incorporating peer feedback.	Prior to this mini-task students should have planned and drafted their pamphlet, as well as received peer/teacher feedback on their first draft. Direct students to the rubric, and remind them to follow their plan and incorporate feedback as they complete their final draft. This may be done by hand or using technology, depending on resources available at your school. Close the mini-task by highlighting student working behaviors, including perseverance, resourcefulness, and cooperation. Meeting Students' Needs ● Draft, revise, and finalize one paragraph at a time ● Implement "accountability partners" to keep students on-pace and make sure all students complete a final draft
	Standards: **WHST.6-8.2** : Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.			

Instructional Resources

No resources specified

Section 4: What Results?

Student Work Samples

Advanced

Antibiotics High .pdf

Meets Expectations

Antibiotics Medium.pdf

Not Yet

Antibiotics Low.pdf

Teacher Reflection

Not provided

All Attachments

- Task Engagement: "Man vs microbe" Bill Nye (Safari Montage) : https://s.ldc.org/u/vypx3l1gj0fb2orq3hokipmd
- Overuse: "Resistance Maps" NPR (Interactive Maps/Data) : https://s.ldc.org/u/2qsnvjvog015i8uy5l58cg4m3
- Overuse: "Why India Is A Hotbed Of Antibiotic Resistance And Sweden Is Not" NPR (Reading) : https://s.ldc.org/u/6f7intd5hfucjju6s8ks3nuy0
- Overuse: "Rise of Superbugs" Video (Safari Montage) : https://s.ldc.org/u/4cczc8de1dtjxie9ky86rn859
- Antibiotic Products Option 1 (at grade level)"Antibacterial Soaps Concern Experts" ABC : https://s.ldc.org/u/56d8c3r3p1oczz3rt71nkgetn
- Antibacterial Products Option 2 (above grade level)"Strange but True: Antibacterial Products May Do More Harm Than Good" Scientific American : https://s.ldc.org/u/bpu18g8d8mwv7f9zxqr7vhfwo
- Food: "Are Antibiotics On The Farm Risky Business?" NPR (Reading) : https://s.ldc.org/u/7joc4zweffinu63j2ua94z0an
- Activity 51 "The Full Course".pdf : https://s.ldc.org/u/5i9z7av4t8pjwtn74273b15te
- Optional Enrichment: PBS Resources : https://s.ldc.org/u/8100xkkk1nuhxh06xui5ia2ze
- Antibiotic Resisitance Graphic.pdf : https://s.ldc.org/u/1mhqtqknfwr55oq7yqdc3gh5l
- Optional Enrichment: "Hunting the Nightmare Bacteria" PBS (Video) : https://s.ldc.org/u/7hpauxxggatj0lldkwgvfkkt7
- Optional Scaffolds: E-bug Resources : https://s.ldc.org/u/728uuvqfxmb87q3ti5bf4qjqx
- Antibiotics High .pdf : https://s.ldc.org/u/681nst8ymy1x7geq0xdlo46ey
- Antibiotics Medium.pdf : https://s.ldc.org/u/1py3fy9821t0pviqwnleyw9jz
- Antibiotics Low.pdf : https://s.ldc.org/u/hq11f0bi3bp6jqoh196iwpt5