Science Fiction & the Future!

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Grades 6-8

II - Introduction

A. Rationale

One of education's main goals is preparing the next generation to succeed in the future. That goals takes myriad shapes, from science instruction to life skills to even understanding advanced technology. Throughout all their years in school, students are expected to build skills and prepare for what paths they hope to take when they enter adulthood. When we talk about the future, though what does that mean? The future is not a certain point in time, one that humanity will someday reach and move on. Rather, the future is a changing set of goals and hopes that reflect our present and the challenges and crises we hope to change, achieve and solve as humanity moves forward. This unit - Science Fiction & the Future - engages and pushes students with those challenging questions while also trying to discover and examine themes and constants that run through these visions of the future.

Using popular themes and tropes of science fiction including alien invasion and advanced technology, students will examine how our present shapes and creates the future humanity expects to arrive. Students will investigate past representations of the future and what previous "presents" they reflected and their hopes and challenges. Students will come to understand that humanity's idea of the future changes as new challenges arise and threaten humanity. New goals emerge and change the course of human progress; new technology develops and humanity adapts to incorporate new ways to travel, communicate and live their everyday lives. Essentially, students will come to the understanding that the future their grandparents envisioned looks very different from the ones they think of. Students will come to the understanding that the large scale problems that we currently face - issues like climate change and global terrorism - shape our expectations for the future.

Ideally, students will use their pre-existing interests in science fiction through the course of the week, making connections between today's world and the science fiction ideas and concepts they often interact with. As we discover how the present reflects the future, students will examine their own science fiction interests and how they reflect our present. Students will examine how our future might look like, and attempt to develop the

problem solving and collaboration skills necessary to positively influence the future. Essentially, students will build the analytical skills to identify the problems that are influencing our concept of the future.

This unit prepares students to think about the future and how it is shaped and formed by present day challenges and hopes. Most importantly, it helps students develop a sense of long term thinking and responsibility. As students look at the current problems that trouble humanity, they will learn to look at these challenges through the lens of both short term and long term thinking. Students developing a sense of long term thinking helps their analytical thinking skills and gives them the ability to better evaluate the ideas and forces that influence a situation.

Problem solving is an essential part of this unit on science fiction and the future. As students analyze and research challenges, both fictional and real, they will learn to develop solutions that build on their long term thinking skills. Throughout the week's worth of lessons, students will work as a class, in small groups and on their own at developing solutions to large scale problems and analyzing how those solutions will affect their world around them and even succeed at solving the problems they are researching. Using simulation, moral dilemmas and a Socratic Seminar discussion, students will evaluate potential solutions to problems and develop an understanding of how to create successful solutions to problems that can create enduring and equitable outcomes.

Problem solving with collaboration and equity in mind will be an important skill students develop throughout this unit. Analyzing potential solutions to problems, students will learn to work together towards creating solutions that lead to more equitable outcomes. Instead of working towards solutions from a limited point of view, students will come to learn how to develop and create solutions that have positive outcomes for many more affected groups. Working through science fiction problem such as alien invasion, students will learn how potential solutions with limited points of view often fail or create even more challenges in the future.

This unit uses the parallel curriculum model to explore the concepts of problem solving and the future. Students will build core understandings of how the future is shaped and how effective solutions are built early on the unit through visual thinking and a Socratic Seminar. Examining how the future changes, students will discover and investigate connections over time; how the future is changed as new goals and new problems

emerge. Students will examine their own identity and biases while evaluating potential solutions to real and imagined problems facing humanity. Also, students will develop a stronger sense of empathy as they evaluate and create their own solutions and their impacts on the future. Finally, the unit's performance task and simulation will allow students to put their knowledge and skills into practice. Students will work together and try to strategize and collaborate.

B. Differentiation for Gifted Learners

Content wise, this unit focuses on the future through using advanced readings and imagery to engage students throughout the week. Excerpts from *The Population Bomb* will be used to push students to think about how potential future problems can be addressed by humanity. Advanced and abstract images are used to encourage students to use more complex and open ended thinking processes. Readings throughout the week will use advanced vocabulary and complex ideas that will push students to go past their original thinking and ideas. Students will be challenged throughout the week as they are pushed to engage with complicated and advanced material.

Throughout the week, strategies for higher learners will help students make the most of the advanced content. Visual thinking strategies help students engage with advanced images through abstract thinking. Costa's level of questioning pushes students to create higher level questions while participating in a Socratic Seminar on a moral dilemma focused on a hypothetical alien invasion. Throughout the week, students will develop a sense of metacognition as they build their long term thinking skills and analyze their own backgrounds and biases as they work together and even against each other representing diverse interests during an alien invasion simulation.

Students will produce advanced material while working towards understanding how the future is shaped and effective ways of problem solving. Throughout the week as they work towards deepening their understanding, students will be assessed through paragraph writing that requires extended lengths and advanced vocabulary.

The week's performance task demands that students research and produce a presentation that effectively diagnoses, explains and offers potential solutions for a problem that will threaten humanity in the near future. Students will have a rubric that will guide them to producing an effective and advanced presentation for their student audience. Though their rubric will help guide students towards producing an advanced presentation, it will allow students freedom to use their creativity and open ended thinking as they use a medium and style entirely of their choosing. Given the entire week to research a topic of their choosing, students will be able to go much more in depth into an issue they in which they already have an interest. Students will be allowed to dig deep and use their creativity on an issue they want to know more about.

Creating a learning environment dedicated to advanced learning, achievement and thinking will be one of the most important aspects to helping students enjoy success throughout the week. Making sure students feel comfortable offering honest and sincere opinions while engaging with complex material ensures students grow throughout the week.

III - Goals & Outcomes

Content Goals & Outcomes

Goal 1: Compare historical and contemporary events and issues to understand continuity and change

- Students will be able to:
    A. Analyze depictions of the future from past and present
    B. Identify what today's present was supposed to look like based on past ideas and projections
    C. Evaluate issues that influence predictions, projections and hopes for the future
    D. Identify why and how visions for the future changes over time.

(From North Carolina state social studies standards)

Goal 2: Explain how innovation and/or technology transformed civilizations, societies and regions over time.

- Students will be able to:
    A. Analyze how solutions to the world's problems affect how the world operates

B. Explain how nations of the world interact with each other as new technology emerged

C. Evaluate how technology changes how humanity interacts with each other

D. Identify how technology affects students' own individual lives.

(From North Carolina state social studies standards)

Process Goals & Outcomes

Goal 3: Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts

- Students will be able to:

A. Analyze images through open ended discussion and analysis

B. Evaluate how previous future goals shaped society

C. Identify decades of American history based on its achievements or problems.

D. Use visual thinking strategies to analyze and question images

(From Common Core literacy standards)

Goal 4: Draw evidence from informational texts to support analysis, reflection, and research.

- Students will be able to:

A. Research a complicated issue related to an issue facing the future of humanity

B. Apply research to create a potential solution for a global issue

C. Analyze and evaluate the research and conclusions of others.

(From Common Core literacy standards)

Concept Goals & Outcomes

Goal 5: Make sense of problems and persevere in solving them.

- Students will be able to:

A. Project and create potential solutions to possible future problems

B. Collaborate with other peers to weigh decisions and possible outcomes

C. Predict the outcomes of potential solutions

(From Common Core mathematics standards)

IV - Assessment Plan

Paragraph writing will be an important formative assessment tool used throughout the week. Students will work on their writing skills as they work through the unit's topics, even using Costa's levels of questioning to develop their advanced vocabulary skills and use them in their writing. The unit's first content goal, comparing historical and contemporary events to understand continuity and change will assessed through paragraph writing. Students will complete an exit ticket on the following question: How is the future that awaits us shaped by today's present? How might that future change? Student responses should incorporate how technology changes what is expected and hoped of the future and what issues they expect will challenge and shape humanity. Students should also be able to predict what past representations of the future reflected of previous times in history, including what technology was used and what goals those past societies had.

The second content goal, explain how innovation and/or technology transformed civilizations, societies and regions over time, will be assessed two ways. First, student responses during a visual thinking strategy on past representations of the future will be looked at for the ability to compare how technology changes how we believe the future looks like. Students will look at various representations of the future, from the early 1900s on, and offer their opinions and conclusions based only on details they believe are essential. Second, after completing a Socratic Seminar on a moral dilemma involving a potential solution to an alien invasion, students will be tasked as one class to first critique the original solution to the problem and its effects on the world. Students will then collaborate and create a solution that could equitably solve the problem. Student critiques should focus on issues of fairness and creating a more equitable solution to the presented problem.

Problem solving is an important concept students will come to understand throughout the week. The unit's simulation will provide a formative assessment to see how well students develop their problem solving skills, including collaboration, forward thinking and brainstorming. Students will go through the simulation twice under different guidelines: once as individual nations with competing interests and directives, second as a global organization dedicated to solving humanity's problems. Going through the simulation twice, students will be watched to see how well they use these skills throughout the simulation. Put simply, students are

expected to fail the first time through the simulation; competing country directives and resource inequalities should force them to argue while aliens invade and unable to work together. The failure will push them to evaluate what went wrong and how they can successfully work together.

After completing the simulation a second time under different criteria, students will reflect on the differences between the two simulations with the teacher and what they learned about problem solving. Students will then complete an exit ticket asking them to create a successful solution to a large problem that will affect humanity's future, incorporating new information and learning about the concept of problem solving. Student understanding will be demonstrated when students mention how collaboration is built and encouraged and the current global system fails to foster effective problem solving and collaboration.

The week's performance task will be an effective summative assessment for the unit's final three goals. Students will be act as Pentagon analysts and research one large scale problem of their choosing and evaluate how it will affect the future of humanity. Students will be required to choose a topic they want to research and learn more about. Following a rubric, they will complete both process goals as they research. Students will synthesize representations of data during their research and format their research so others can develop an understanding of their topic. Students will process informational sources during their research, learning more about the causes of the problem they are researching and its effects on the future of humanity. Finally, students will evaluate and analyze the research of other students using the performance task rubric.

Student performance task examples and the rubric are attached on the next page. Working throughout the week, students will incorporate their learning and understanding of the concept of effective problem solving as they apply their research. Student understanding of problem solving will be demonstrated in their final projects when students can successfully explain the causes of their problem, how it affects humanity's future and, most importantly, create and defend solutions that include long term thinking and effective ways to encourage the problem is addressed.

V – Final Lessons

TEACHER NAME		Lesson #
Parker		1
MODEL	**CONTENT AREA**	**GRADE LEVEL**
Visual Thinking Strategies	**Social Studies**	**6-8**

CONCEPTUAL LENS	LESSON TOPIC
The Future	How the present shapes and changes what we believe the future will be

LEARNING OBJECTIVES *(from State/Local Curriculum)*

6.E.1.2 - Explain how quality of life is impacted by economic choices of civilizations, societies and regions.
6.H.2.2 - Compare historical and contemporary events and issues to understand continuity and change.

THE ESSENTIAL UNDERSTANDING *(What is the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
Our present shapes a changing future	How does the present change how and what we see and hope for the future?

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
Students will be able to : - Analyze depictions of the future from past and present - Identify what today's present was supposed to look like	Students will be able to: - Create high level questions - Analyze images through open ended discussion and analysis - Evaluate how previous future goals shaped society - Identify decades of American history based on its achievements or problems.

GUIDING QUESTIONS
What questions will be asked to support instruction?
Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
- How do societies view the future? - Have people always viewed the future the same way? - What are your own hopes and views for the future? - Do you think most people around the world are optimistic about the future? - What might affect views of the future?	- What factors influence views of the future? - How did Americans in the 1950s think what today would look like? - What factors do you think shape your own future? - What do you think people will think the future will look in 15 years? - Why might some people in this world be pessimistic about the future?	- How do our hopes for future shape how we live today? - Why are people and groups interested in the future? - Why do our views of the future change? - How will your own present shape your future? - What would have to change to help everyone around the world be optimistic about the future?

DIFFERENTIATION ***(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.***			
Content	**Process**	**Product**	**Learning Environment**
Visually rewarding and complicated images	Visual Thinking strategies that encourage open ended discussion Costa's level of questioning to push students towards high end questions	Paragraph required to exit lesson.	

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

Students will answer the following question in written form as they sit down – What do they think the future will look like in 20 years? 50 years? 80 years?

Students will not yet share their answer.

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Students will create images that accompany their predictions. Instead of focusing on detail or precision, students will create an "abstract" depiction of their predictions for the future. Students will use the web app Padlet to make these depictions.

Students will share their abstract depictions with the rest of the class. They will not, however, explain their pictures or their own reasoning at this this time.

Student art will be displayed throughout the classroom. Students will commence on a "gallery walk" of student art. While they experience student art, students will create at least 2 questions for each depiction of the future. Students will create questions that both question what the predicted future will be and how it could be achieved.

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

Students will present their abstract depictions to the classroom. As they present their art pieces, other students will share their open ended questions about the student's artwork.

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Students will look at depictions of future societies created at various points in history – Jules Verne's ideas for the future, depictions of lunar colonies from the 50s and 60s, Mad Max style futures and others. Along with the images, students will read short texts describing crises or achievements that happened in certain decades.

Working through these images, students will try to identify what part of history these depictions come from and match each text with an image.

Students will meet back together and share their results and reasoning.

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

Students will write a paragraph answering the lesson's essential question - How is the future that awaits us shaped by today's present? How might that future change?

TEACHER NAME			Lesson #
Parker			2
MODEL	**CONTENT AREA**	**GRADE LEVEL**	
Socratic Seminar	Social Studies	6-8	

CONCEPTUAL LENS	LESSON TOPIC
Problem Solving	How the Present Shapes the Future

LEARNING OBJECTIVES *(from State/Local Curriculum)*

- **6.H.2.3 - Explain how innovation and/or technology transformed civilizations, societies and regions over time.**
- **6.E.1.1 - Explain how conflict, compromise, and negotiation over the availability of resources (natural, human and capital) impacted the economic development of various civilizations, societies and regions.**

THE ESSENTIAL UNDERSTANDING *(What is the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
Problem solving shapes the future	How does problem solving shape the future

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
- Students will learn that: o Solutions to the world's problems affect how the world operates o How nations of the world interact with each other	- Students will be able to: o Compare their own moral reasoning with their peers o Explain their reasoning and thought processes about moral issues o Defend their opinions on complex issues

GUIDING QUESTIONS

What questions will be asked to support instruction?

Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:

- What are some problems that affect the whole world? - How does the whole world try and fix larger problems? - Do solutions to problems affect everyone equally? - What world problem are you most concerned about? - What do you think effective problem solving looks like?	- What responsibilities do individual countries have to the rest of the world? - How do the world's inequalities manifest? - Who is responsible for enforcing solutions to problems? - How do you create fair solutions to world problems? - Why do you think some countries can ignore large parts of the rest of the world?	- What does effective problem solving look like? - How is it possible to make sure a problem's solution helps everyone equally? - Do you believe you have a responsibility to create solutions that are fair and equitable? - Are you willing to sacrifice to help solve world problems? - What steps could you take to make sure nations work together to create fair solutions to world problems?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
Moral dilemmas have high level vocabulary and complex sentences	Students are giving no sentence starters for debate Students share their reasoning during a Socratic Seminar. Students grade their peers during Socratic Seminar		

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

Students will be asked the following question: "What do you believe will be the biggest problem facing the world in the next 20 years? What about the next 50 years?"

Students will think pair share with their table partners then share their thoughts with the rest of the class while the teacher takes notes.

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Students will evaluate and analyze two moral dilemmas involving real world problems with future considerations in mind. Each half of the classroom will tackle a different moral dilemma.

Students will record their answers in a graphic organizer. They will also record the reasoning behind their answers and why others should agree with their positions.

Dilemma 1:

Americans throw away enough trash every day to fill 63,000 garbage trucks. All of this waste is starting to become a problem for Americans as the year 2035 approaches. Landfills are overflowing, and America continues to produce waste at record levels every year. A solution has been proposed by leading American politicians: instead of attempting to bury our trash in landfills every year, we can simply rent space in a poorer country and store our garbage there. No longer will America have to worry about waste's unpleasant sight or smells! Poorer countries will directly benefit from the immense amounts of waste Americans produce! Americans can continue to enjoy their fruits of their labor and not have to worry about trash just piling up!

Dilemma 2:

7 years ago, long range satellites for the United States of America have started to pick up several worrying objects headed for planet Earth. American scientists eventually discovered that these objects were in fact invaders from a nearby galaxy interested in colonizing Earth. Desperate, America's leaders opened secret communications with the aliens and established a diplomatic connection. Though many of America's military leaders believe the world's armies could combine and defend the planet, America's leaders believe war is too costly – billions would die. They instead negotiated with the aliens and reached an agreement – the aliens can colonize South America and Australia in return for promising not to invade the rest of the planet. The aliens will build a base in the Pacific between Australia & South America. Finally, as part of the agreement, America will not warn either Australia or South America – they will only make sure their other allies' militaries stand down when the colonization begins.

After reading through the two scenarios, students will create 2 questions using Costa levels of questioning for each scenario.

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

Students will have a Socratic Seminar around each moral dilemma. Half the students will observe the seminar and score according to a rubric.

Student observers will also record their own thoughts on the moral dilemma while they record and observe.

Students will switch roles halfway through and the second moral dilemma will be discussed.

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Students will come back together and discuss possible solutions to the two dilemmas.

Students will vote on a solution to each of the moral dilemmas.

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*
Students will write a short paragraph answering the following 2 questions about each moral dilemma:

1. How does this solution affect the world?
2. Does this solution affect everyone differently or equally?

TEACHER NAME			Lesson #
Parker			3
MODEL	**CONTENT AREA**	**GRADE LEVEL**	
Simulation	Social Studies	6-8	

CONCEPTUAL LENS	LESSON TOPIC
Problem Solving	Global Cooperation

LEARNING OBJECTIVES *(from State/Local Curriculum)*

- **6.H.2.3 - Explain how innovation and/or technology transformed civilizations, societies and regions over time.**
- **6.E.1.1 - Explain how conflict, compromise, and negotiation over the availability of resources (natural, human and capital) impacted the economic development of various civilizations, societies and regions.**

THE ESSENTIAL UNDERSTANDING *(What is the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
Inequality creates biases	How does global inequality lead to biased solutions for the world's problems?

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
- Students will learn that: o Solutions have unequal consequences for parties involved o Solutions or methods have unforeseen consequences o How global wealth is spread out around the world	- Students will be able to: o Collaborate with other peers to weigh decisions and possible outcomes o Project the outcomes of choices

GUIDING QUESTIONS

What questions will be asked to support instruction?

Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:

- What causes climate change? - What are ways we as Americans cause climate change? - Does every society view worldwide problems the same way? - How do you think climate change will affect your life? - Why would some parts of the world accept climate change? - How would you feel if you were told your country was the reason a global problem existed?	- How does the global community currently solve larger problems? - How can a nation tell others to change when they refused to do so for so long? - Why are long term solutions to large problems so difficult to reach? - How would it feel to tell a poor nation they have to stay that way? - How does the United States of America deal with climate change?	- How do global inequalities affect international cooperation? - How can the global community change to solve problems with equal outcomes? - How can you change your own behaviors to help end climate change? - How can new behaviors and rules be enforced in other regions of the world? - How might it feel to change or abandon long held behaviors or cultural practices?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
Simulation uses advanced vocabulary and complex sentence structure	**Students are given no sentence starters for writing or**	**Students required to produce exit tickets that are at least ¾ of a page and make use of advanced vocabulary**	

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

Students will be shown global statistics on climate change and where most of the world's pollution comes from and what areas of the world are most affected by climate change.

Based on prior knowledge and provided statistics, students will compare and contrast the world's biggest polluters and the most affected areas using a venn diagram.

Looking at the venn diagram, students will then be asked to respond to the following questions:

- Who is most responsible for fixing the problems solved by climate change?
- Do you believe climate change will be a solved issue within the next 30 years? 50 years? Why or why not?

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Using ActivInspire, students will play a quick "simulation" through the two moral dilemmas they encountered the previous day. Working together as a group, they will try to weigh and project the outcomes of possible decisions.

They will make their choices, then a dice roll will determine how well their decisions perform.

Students will work together in one large group during this early simulation.

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

Students will split up into groups of 2. Each group will represent a country. Using a risk board and markers, each nation will have a certain amount of resources, both natural and technical (knowledge, human capital, technology, etc). Working against each other, students will be given a specific set of needs while also being confronted with the global problem of climate change.

Students will focus on meeting their nation's needs within the simulation, using dice rolls to determine the success of choices.

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Students will come back together and discuss the differences between the two simulations – working as one large group and working as separate and unequal nations with different goals and needs.

They will work together to answer the following question – Why hasn't climate change been solved in the past 20 years?

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*
Students will complete a short exit ticket on the following question:

- What first three steps would you take that would create a solution to climate change that would have equal outcomes for every party involved?

TEACHER NAME		Lesson #
Parker		4

MODEL	CONTENT AREA	GRADE LEVEL
Taba	Social Studies	6-8

CONCEPTUAL LENS	LESSON TOPIC
Problem Solving	How the Present Shapes the Future

LEARNING OBJECTIVES *(from State/Local Curriculum)*

- **6.H.2.3 - Explain how innovation and/or technology transformed civilizations, societies and regions over time.**
- **6.E.1.1 - Explain how conflict, compromise, and negotiation over the availability of resources (natural, human and capital) impacted the economic development of various civilizations, societies and regions.**

THE ESSENTIAL UNDERSTANDING *(What is the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
Problem solving shapes the future	How could our approach to problems today shape society in the future?

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
- Students will learn that: o Projections for the future often change o Thinkers throughout history have often predicted doom for the future.	- Students will be able to: o Analyze previous projections for the future o Project and create potential solutions to possible future problems o Evaluate an argument

GUIDING QUESTIONS

What questions will be asked to support instruction?

Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
- What is overpopulation? - How has the population of the world changed over time? - What future problems are you worried about? - How do you explain future problems to different cultures? - Have you seen any effects of overpopulation?	- How would you explain Paul Erhlich's argument? - How might other countries react to being told their countries are overpopulated? - How would it feel to be told not to have any more children? - Do you think you yourself have a responsibility to future generations?	- Why hasn't overpopulation become a problem yet? - What technologies help address overpopulation? - How might overpopulation be handled 50 years from now? - Why don't we worry about overpopulation as a species?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
Advanced reading used to guide the Taba		Warm-up and exit tickets must be at least one paragraph	

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

After three days of learning about the future through the lens of science fiction and creating their own approaches to solving future problems, students will reflect on their learning by completing a quick write on the following question:

Should you be optimistic or pessimistic about the future? What evidence do you believe supports your opinion?

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Students will read one short excerpt – the prologue and foreword to *The Population Bomb*.

As they read the articles, students will select important vocabulary and concept words from the source.

The teacher will record the student's chosen words at the board.

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

Students will get into smaller groups of 3 or 4. They will group the chosen words based on attributes. They will then label those categories.

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Looking at their categories, students will now reconvene as one class and brainstorm possible solutions to the problems offered in *The Population Bomb.* The teacher will record possible solutions at the board.
Students will get back into their groups and sort proposed solutions to problems along common attributes and label the categories.

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

Class will end with a think-pair-share, where students will discuss the following:

- Why haven't the problems detailed in *The Population Bomb* affect most of the world yet?
- Has the world changed to fix these offered problems? Why or why not?
- Do you think you should be optimistic about the future?

Performance Task

All of you are futurists - thinkers and scientists who focus on the future and influencing the present in order to reach a certain possible future. You have been tasked by the Pentagon to identify one issue you believe will threaten the future of humanity within the next 100 years. Your role is to identify the problem, explain how it will affect the future of humanity, research its causes/background and create possible solutions to the problem.

The Pentagon hopes to work towards solving the world's biggest problems, and they are relying on you as futurists to help them identify that problem, its causes and potential solutions.

All of you will produce a presentation in any medium you prefer - a powerpoint, a paper, a video essay, etc - that will explain to the Pentagon what your future problem is and why it is so important to solve it in order for humanity to continue to succeed as a civilization.

Criteria	4	3	2	1
Details & Accuracy	Future problem is clearly researched and presented. There are no mistakes in research or presentation. Conclusion is clearly supported by research.	Future problem is clearly researched and presented. There are only a few small mistakes in research, i.e., no glaring errors. Conclusion is mostly clearly supported by research.	Future problem is either not clearly researched or presented. There are several mistakes present in the final product, including errors that lead to incorrect conclusions	Future problem is both not clearly researched and presented. Mistakes are everywhere throughout the final product. Conclusion and final product are factually incorrect.
Feasibility	Problem is a real one, and proposed solutions are possible within the next 100 years of humanity.	Problem is a real one, and proposed solutions are mostly possible or feasible with small details that might not happen.	Problem or proposed solutions are not real or feasible. Example - Dragons are coming!	Both problem and proposed solutions are not real. Neither solution nor problem could ever happen without accepting something that almost certainly couldn't happen. Example - Let's open a portal to another dimension and colonize Earth 2! No more climate change!
Appeal & Persuasion	Final product presents a clear and persuasive argument that convinces others	Final product presents mostly a clear and persuasive argument. Only small parts do not appeal to audience (the Pentagon)	Final product presents an unclear argument that fails to persuade others. Few are convinced of the gravity (seriousness) of the problem	Final product is so unpersuasive that others literally want to do the opposite of what you recommend.
Presentation of Final Product	Presents problem and solutions clearly and demonstrates a mastery level of understanding	Presents problem and solutions clearly and demonstrates a deep level of understanding	Presents problems or solutions confusedly and demonstrates a surface level of understanding	Has no idea whatsoever what he or she is doing.

VI: Unit Resources

A list of useful resources and scholarly articles that teachers can use to help utilize this unit.

- **Activ Inspire**
    - A presentation software that offers several customization options beyond PowerPoint or Google Slides. It takes a little time to master, but watching students go through a complex simulation impossible in other pieces of presentation software makes it worth it.
- **Random.org**
    - A site that generates random integers. Very useful during simulations for volunteers and speakers
- **Research into Formative Assessment -** Doubet, K. J. (2012). Formative Assessment Jump-Starts a Middle Grades Differentiation Initiative. Middle School Journal (J3), 43(3), 32-38.
    - A useful resource in learning more about formative assessment and using it to inform instruction.
- **Google Classroom** - https://classroom.google.com
    - Google classroom is a very useful web tool for organizing students throughout the week. Students used laptops to complete their project research and final presentation, and Google Classroom allowed them to submit their final work digitally and directly to me.
- **Google Forms** - https://www.google.com/forms/about/
    - Google Forms is an easy way for students to submit information to the teacher or even take a quiz online. I had students use it to create a source list as they researched throughout the week - they submitted the resource they used, along with when they researched the site.
- **Google Slides** - https://www.google.com/slides/about/
    - Google Slides was an effective way for students to create interesting and customizable presentations. It being web based software, it was easy for students to share their final projects with everyone else for easier feedback and presentation.

- **Gifted Learners Handbook -** http://aighowtos.weebly.com/
    - A handbook for assistance in working with gifted learners. It includes information on the many learning strategies learned throughout this unit
- **Duke's Nasher Museum and Visual Thinking -** http://nasher.duke.edu/wordsandpictures/activity/vts/
    - A simple guide that can help you learn more about how visual thinking strategies work and ideas to use them in the classroom.