

Making Things That Change the World: STEAM and the Black Experience



Tyree Guyton's Heidelberg Project, Detroit, Michigan

Student Activities Packet

**Black History Month
February 2018**

Name: _____

Teacher: _____

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Overview

During this year's Black History Month, Newsela is exploring the ways that black people have contributed to the STEAM field.

If you've ever done a science experiment, solved a math problem, or built a sand castle, you've participated in STEAM. But what is STEAM exactly?



STEAM is all about making things that change the world. Now more than ever, STEAM skills are crucial to advancing our society and solving the problems of the world. Inventors, architects, scientists, web developers and many more professionals use STEAM skills every day.

Black people have made important contributions to STEAM fields that shape our world. However, their path to STEAM education and achievement has always been limited by oppression. For example, many slave owners stole the innovative ideas of enslaved black people, and got rich selling these ideas as their own.

Despite this history, black people continue to push back against and rise above these challenges. They record the lives of their families and communities through art. They work toward degrees in physics despite a lack of educational support. They continue to build things that make the world a better place.

In this Text Set, you will meet many inspiring black people who are makers, creators and innovators. You will also learn about the dark history of oppression that makes the achievements of these folks even more remarkable. At the end of the Text Set, you will complete a creative project that showcases your understanding of STEAM and the black experience.

Guiding Questions

Directions: In the space beneath the guiding questions, take notes and record details that will help you answer the questions by the end of Black History Month.

1. What are some of the important contributions black people have made to the STEAM field throughout history? How should those contributions be remembered and celebrated today?

2. What challenges have black people faced when trying to innovate, make art, contribute to science, or otherwise participate in STEAM?

3. How are black people participating in STEAM today? How can we find inspiration in their stories?

Vocabulary

Directions: Use this Cognitive Content Dictionary (CCD) to track these key vocabulary words throughout the lessons.

Word	Prediction	Definition	Draw It
Innovation			
Resistance			
Systemic Racism			
Discrimination			
Black Lives Matter			
What other key vocabulary words stand out to you throughout the lessons?			

Lesson 1: Why STEAM Matters

Objective: Students will be able to explain why STEAM is important and give examples of how STEAM skills can be used.

Overview

Everything from a vacuum cleaner to the Internet exists because someone said, "How could I make something that would fix this problem?" This is innovation, and it's been happening since the beginning of humankind.

To start innovating, all you need is a good idea. But to make your invention into reality, you need skills. Today, we call those skills STEAM skills – as you know, that refers to Science, Technology, Engineering, Art + Design, and Math. In this lesson, you'll learn how kids today are developing STEAM skills to make things that change the world.

Comprehension Questions

- How can inventions change the world?
- How do inventors use STEAM to create their inventions?

Part 1: Activate Background Knowledge

Directions:

Think about an invention that you use daily.

- What is the invention and what does it do?
- Do you think this invention has changed the world? Explain why or why not.



Part 2: Read and Respond

Directions:

Choose one of the articles in the Kid Inventors Text Set. Then, answer the following questions.

- How did the invention in this article change the world?
- Which elements of STEAM did the inventor use to make this invention?



Lesson 2: Black History and STEAM

Objective: Students will be able to explain the significance of black contributions to the STEAM field.

Overview

Black people have a long history of making things that have changed the world. Did you know that George Washington Carver discovered more than 300 uses for peanuts? That's amazing, but the history of black innovation goes far beyond that.

In this lesson, you'll read about black inventors you may or may not have heard of before who used STEAM skills to create incredible things. You'll also learn about the racism many of them faced as they worked to bring their ideas to the public.

Comprehension Questions

- What did the inventors in the article accomplish?
- How do their accomplishments affect our lives today?

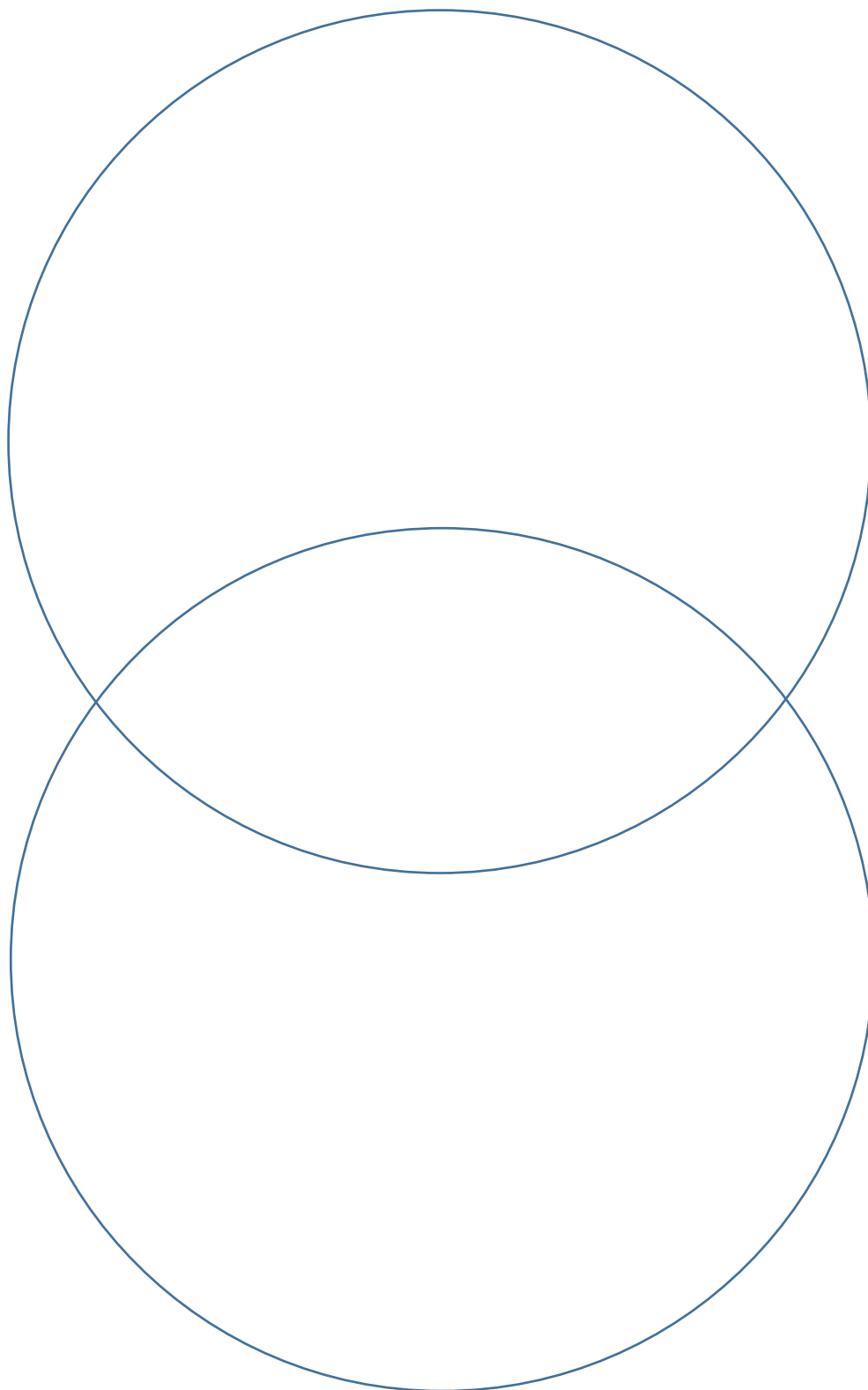
Part 1: Compare and Contrast

Directions:

- Read the article about famous African-American inventors. Then, choose two inventors that you think had something in common.
- Use the Venn diagram on the next page to compare and contrast these inventors.

Name of Inventor _____

Name of Inventor _____





Part 2: Tweet About It

Directions:

- Choose an invention that interests you from the article.
- Imagine you are alive at the time of this invention.
- Make up a Twitter handle (a nickname) for your imaginary historical character. Be creative!
 - Write a tweet that shows your reaction to the new invention.
 - Think about how people at the time would have responded to the innovation and how it would have affected their lives.
 - Make sure your tweet is short enough to fit in the space provided.
- With each of your written tweets, include a visual that helps convey your message.
- You can add a photo from the Internet, or draw your own image.
- Now, write one more tweet using the directions above. You can write it from the perspective of the same inventor, or choose a different one.

Tweet 1



_____ (Twitter handle)

Tweet 2



_____ (Twitter handle)

Lesson 3: What Is Systemic Racism?

Objective: Students will be able to explain what systemic racism is and give examples.

Overview

You probably already know what racism is: It happens when people in power discriminate against the less powerful because of the color of their skin. And you may also know that it affects the lives of people of color all over the world.

However, systemic racism is a little trickier to understand. In this lesson, you'll learn that racism doesn't just happen from person to person. Whole systems – like schools, businesses and governments – can be racist. Once you understand systemic racism, you will be able to apply it to the rest of the lessons in this Unit.

Comprehension Questions

- What is systemic racism? Why does it exist?
- How does systemic racism affect the lives of black people today?



Part 1: Video Reflection

Directions: After watching the "Systemic Racism: Employment" video, complete the 3-2-1 activity below.

Write **3** things you learned from the video.

Write **2** questions you still have about systemic racism.

Write **1** connection that you can make to the video. (The connection can be to yourself, to a text, or to the world.)



Part 2: Definitions and Examples

Directions: After reading the article about systemic racism, respond to the prompts below.

Record a definition of systemic racism in your own words.

Write two examples of systemic racism – from the article, the video, or your own experience.

1.

2.

Based on what you learned in today's lesson, how do you think black innovators and artists may have been affected by systemic racism?

Lesson 4: Overcoming Systemic Racism: Back Then

Objective: Students will be able to explain how systemic racism affected black people in STEAM in the past, and how black people were able to overcome systemic oppression.

Overview

In the last lesson, you worked on defining systemic racism and coming up with your own examples. In this lesson, you will extend your understanding of systemic racism by studying how it has affected black inventors. You'll learn how black inventors pushed back against systemic racism, and how they made things that changed the world even while being discriminated against or enslaved.

Comprehension Questions

- What is the patent system?
- What inventions did enslaved black people create?
- How were black people excluded from the patent system? How did this change over time?



- Record the cause(s) on the left and draw an arrow to the effect(s).
- The first example has been done for you.
- **Note:** There may be multiple "causes" that lead to the same "effect", or one "cause" that had multiple "effects".





How did the inventors in the article experience systemic racism?

- Cite evidence from this lesson's article about patents.
- Cite evidence from the previous lesson's article about systemic racism.

This image shows a blank sheet of white paper with ten horizontal dashed lines, typical of primary-ruled notebook paper. The lines are evenly spaced and extend across the width of the page. There is no handwriting or other markings on the paper.

Invention	African-American	Patents	Systemic Racism
Exclude	Revolutionize	Legacy	Profit
	Success	Progress	

Lesson 5: Overcoming Systemic Racism: Now

Objective: Students will be able to explain how systemic racism affects black people in STEAM in the present, as well as how black people continue to overcome systemic racism.

Overview

Although the system of American slavery has been dead since 1865, its legacy lives on. We can observe an example of this in our education system. Black people are consistently denied access to quality education. In this lesson, you'll learn about an inspirational group of black women who overcame oppressive odds to achieve great things in STEAM.

Comprehension Questions

- How do black girls in schools experience systemic racism?
- Why are the physics graduates at Dillard special? Why is it important that they are black women in the STEAM field?

Part 1: Read and Respond (Article 1 - Opinion)

Directions: After reading the opinion article about black girls in schools, respond to the questions below.

1. If black girls and women are discriminated against in schools, how might that affect their ability to achieve in STEAM?

2. If you could make one recommendation to the U.S. Department of Education that would help fix the issues in the article, what would it be?

Part 2: Interview Questions (Article 2 - Dillard)

Directions: Imagine that you could interview one of the women in the article who graduated from Dillard with a physics degree. What would you ask her? Think about how you could learn more about her life, struggles and achievements. Write at least five questions.

1.

2.

3.

4.

5.



Part 3: Create an Advertisement

Directions: Imagine you work for the recruiting department at Dillard University. Use the space below to create an advertisement that highlights your physics program, and encourages people (especially young black women) to come study physics at Dillard.

- Your ad should include:
 - A central image
 - Persuasive language
 - Details and/or quotations from the articles in this lesson

Lesson 6: Studying Visual Art

Objective: Students will be able to share reactions to works of black art and analyze the importance of these works.

Overview

If you want to learn more about a culture or time period, it's essential to study the art that goes with it. By looking at paintings, sculptures, graffiti and more, we can learn about the perspective of a particular artist. We can also learn a lot about the time when he or she lived. In this lesson, you'll consider your own reactions to works of art, then choose an artist to research more closely.

Comprehension Questions

- How do works of art reflect the time and place where they were made?
- What can we learn about the black experience by studying art?



Part 1: Reacting to Art

Directions: Skim through the article about visual art and pick an image that stands out to you, for any reason. Click the image to enlarge it on your screen. Answer the questions below about your image.

Name of artist:	
Name of artwork (look at caption):	
What stands out to you about the image?	
How does the image make you feel?	
What questions do you have about the image?	

Optional: Use the space below to experiment with recreating the image in your own style. Consider how you might adjust the image to reflect what matters to you, while also drawing inspiration from the original artist.



Part 2: Research

Directions: Read the article in the Text Set about your artist and complete the chart below.

Question	Answer	Evidence + Article Citation
What are two interesting facts about your artist?		
Based on the article, what can you learn about the time period in which the artist lived?		
What challenges did the artist face when making his or her art?		



Part 3: Jigsaw Learning

Directions: Each peer in your group (one for each artist) will present his or her findings and learnings to the rest of the group. Take notes as you listen to the presenter.

Artist	Notes	Questions

Lesson 7: Art as Resistance

Objective: Students will be able to explain the importance of art as a form of resistance and community-building in times of struggle.

Overview

Detroit, Michigan, is a city that has experienced hard times. The city government does not have much money, and many people have left the city due to a lack of opportunity. However, even in difficult conditions, people continue to innovate and make art. In this lesson, you'll learn how one remarkable artist used his imagination to find inspiration and healing for his community.

Comprehension Questions

- What are some ways that art can bring a community together?
- How have black people used art to resist systemic racism in their neighborhoods?

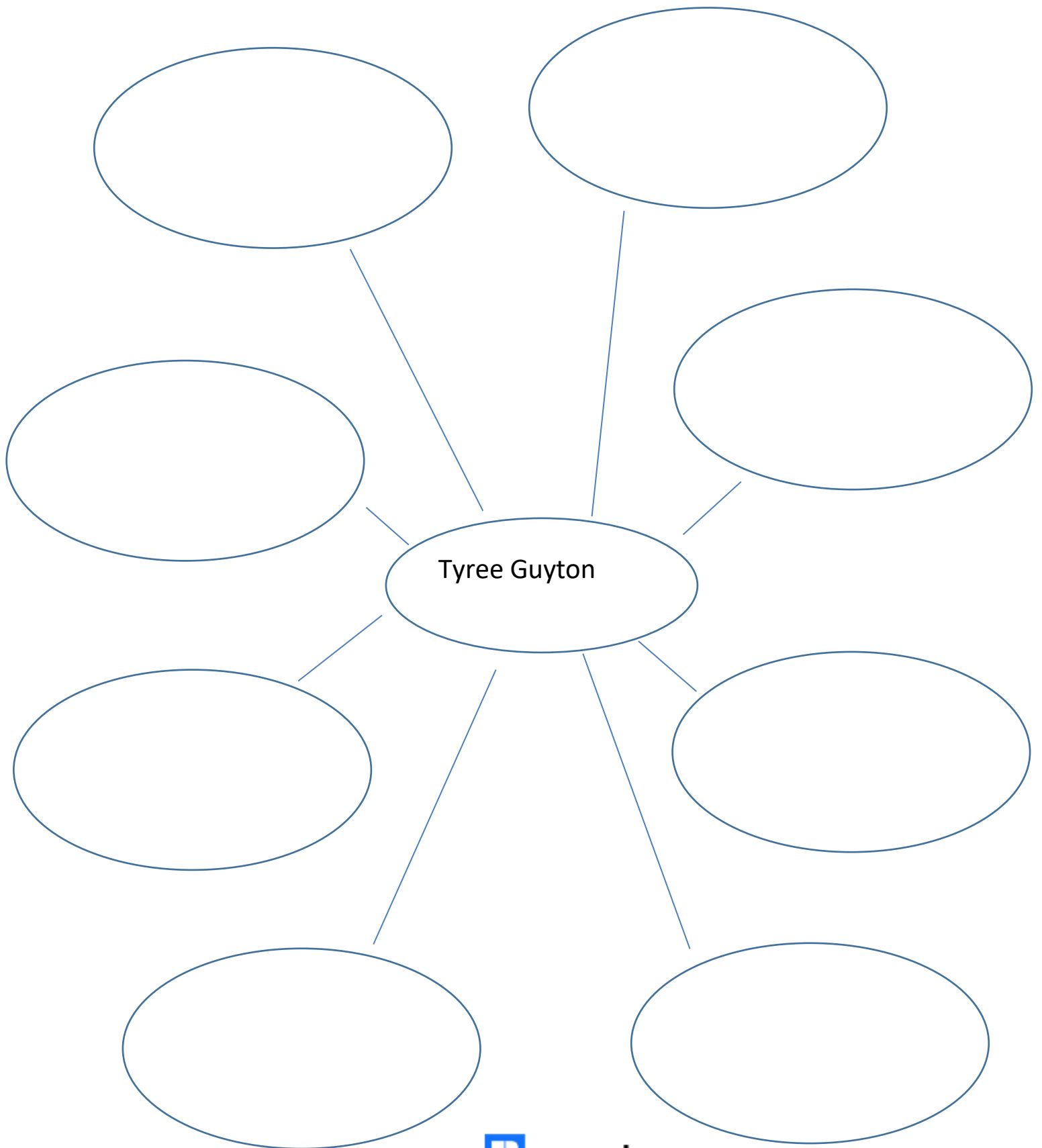


Part 1: Topic Web

Directions: Use the space on the next page to record information about artist Tyree Guyton. Make sure to include information about:

- Guyton's background
- Guyton's art
- Guyton's community
- Why Guyton's art is important

Note: If you prefer to take notes in a different format, use the blank page following the Topic Web.





- Who is Tyree Guyton and how would the people in his community describe him?
- How has his art affected his community?
- What connections can you make between Guyton and other artists or creators you have studied?

- Who is Tyree Guyton and how would the people in his community describe him?
- How has his art affected his community?
- What connections can you make between Guyton and other artists or creators you have studied?

Optional Word Bank:

Innovation

Lesson 8: STEAM in the Age of “Black Lives Matter”

Objective: Students will be able to explain how young black artists and innovators today are carrying on the legacy of STEAM achievements.

Overview

You may already know some things about the Black Lives Matter protest movement. (If not, you will learn about it in this lesson’s first article.) Like almost any protest movement, art is essential for communicating a message of resistance. In this lesson, you will learn about how artists and activists today are using visual art to make a statement about Black Lives Matter.

Comprehension Questions

- What is the Black Lives Matter movement and how did it start?
- What is the role of art in resisting systemic racism?



Part 1: Activate Previous Knowledge

What do you already know about the Black Lives Matter movement? Record your thoughts below.

Directions: After reading the article about Trayvon Martin, answer the questions below.
What is the Black Lives Matter movement?

How did the Black Lives Matter movement start?



Part 2: Reacting to Art

Directions: Look at the images in the left column, then answer the following questions for each image in the space provided.

- What details stand out to you in this image?
- How does the image reflect the ideas and goals of the Black Lives Matter movement?

Image 1: "My Afrocentric Life" by Akilah Johnson



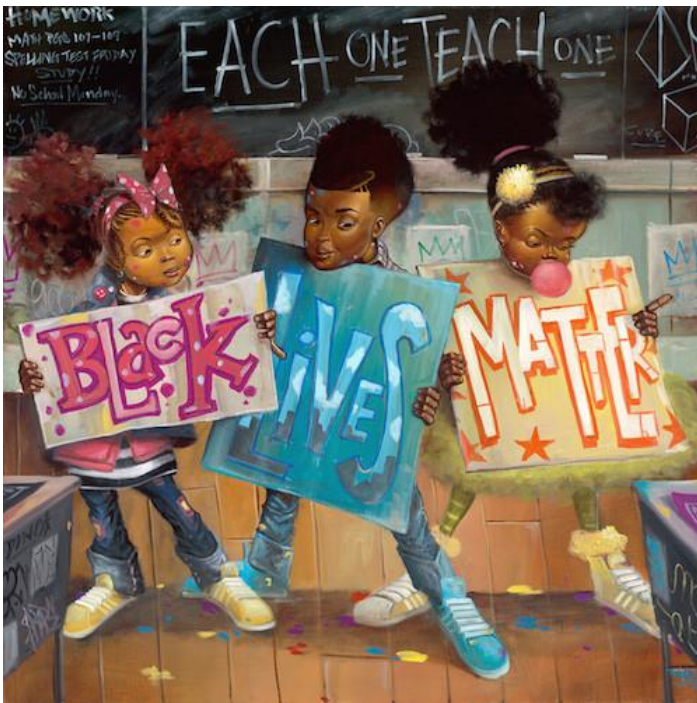
Image 2: Photo by Devin Allen



Image 3: "Black Lives Matter" by Tony B. Conscious



Image 4: "Big Words" by Frank Morrison



Culminating Project

Objective: Students will be able to become an expert on a black STEAM figure (past or present), create a piece of art or artifact in the style of this figure and present their findings to the class.

Directions: Read the information below to learn about the expectations for your Culminating Project.

Task Overview	More Details
<u>Step 1:</u> Choose an artist or innovator who you have read about during the Black History Month Unit.	<ul style="list-style-type: none">● Be sure to choose someone whose work inspires you and whom you would like to learn more about.
<u>Step 2:</u> Complete further research on your artist or innovator. Look for information about: <ul style="list-style-type: none">● Their background● Their inspiration● Their achievements and struggles● Their connection to the black community	<ul style="list-style-type: none">● Talk to your teacher about research guidelines for your class.● Note: if you cannot find enough information on your artist or innovator, you will need to pick someone else.
<u>Step 3:</u> Write a one-page essay about your artist or innovator.	<ul style="list-style-type: none">● Your essay should include:<ul style="list-style-type: none">○ Factual information about your artist or innovator (see Step 2)○ A personal reflection on why this artist or innovator matters to you
<u>Step 4:</u> Create an artifact in the style of your artist or innovator. Choose the type of artifact from the menu on the Planning Page.	<ul style="list-style-type: none">● Create an artifact in the style of this artist or innovator. The artifact should:<ul style="list-style-type: none">○ Reflect the artistic style of your innovator○ Address themes that are important to your innovator
<u>Step 5:</u> Share your essay and artifact with the class.	<ul style="list-style-type: none">● Talk to your teacher about the process for sharing your work.

Planning Page

1. Write the name of your artist or innovator here:

2. Write the research question you would like to answer here:

3. Circle the type of artifact you would like to create.

A painting

A blueprint, design or plan for an invention

A drawing

A short film

A photograph or photo series

An audio clip or podcast

A sculpture

A map

A blueprint, design or plan for a building

A short story or essay

An invention

A children's book

Something else: (fill in here, subject to teacher approval) -----

Teacher Sign-off (before starting) -----



Optional Planning Space:

Rubric

This is the rubric that you will use to self-evaluate, and that your teacher will use to evaluate your work.

Category	4	3	2	1
Information and Content (Essay)	Information is accurate, comprehensive, and incorporates knowledge learned from research. The importance and significance of the people, event or idea represented is clear.	Information is accurate and incorporates knowledge learned from research. The importance and significance of the people, event or idea represented is mostly clear.	Information is mostly accurate and incorporates knowledge learned from research. The importance and significance of the people, event or idea represented is somewhat clear.	Information may have some accuracy and incorporates knowledge learned from research. The importance and significance of the people, event or idea represented is unclear.
Effort and creativity (Artifact)	All aspects of the project were thoughtfully considered; project is original, shows creativity, and communicates pride in the completed product.	Most aspects of the project were considered; project shows creativity and communicates pride in the completed product.	Some aspects of the project were considered; project shows some creativity and communicates some pride in the completed product.	One aspect of the project is the focus and gaps may exist; project is somewhat original and some pride is reflected in the completed product.
Time and management (Overall Project)	Class time is maximized and ample time is dedicated to planning and research. The deadline is met.	Class time is mostly used efficiently and time is dedicated to planning and research. The deadline is met.	Class time is used and some time is dedicated to planning and research. The deadline is met.	Class time is somewhat used and minimal planning and research is evident. Extension may have been necessary for project.
Points: ____ / 12				

Project Notes:

