

# Generations of STEM:

# Garrett Morgan

## Inventor of the Traffic Signal

With only an elementary education, Garrett Morgan began working at a sewing machine factory. Fascinated by the machine, he learned to fix them and earned a patent for an improved sewing machine design.

In an unlikely twist, the sewing machine would lead to his next patent for a hair product. Noting that fabric would often be marred when the needles moved too fast while sewing, he came up with a solution to reduce that friction. The cloth material seemed straighter, and when trying it on himself, he created the G.A. Morgan Hair Refining Company cream!

Next, he developed a breathing device that became the prototype for the gas masks used in World War I. Despite using the mask to save lives in a tunnel explosion, many would not purchase the product as he was an African American.

His inventions earned Morgan enough money to be the first black man in Cleveland to own a car. In 1923, Morgan developed a new traffic signal. This one had three lights, adding the now familiar yellow warning light. He eventually sold his patents for the traffic signal to General Electric.



[Image Source: Wikipedia, United States Marine Corps](#)

# Generations of STEM: Garrett Morgan

Read about Garrett Morgan and his contributions to STEM!  
Then complete the following questions.



1. What are some of Garrett Morgan's inventions? Improved sewing machine design,  
hair straightening product, breathing machine, improved traffic signal

2. Why were Garrett Morgan's inventions so important? They help keep us safe, they improved  
the quality of life at the time and now, etc.

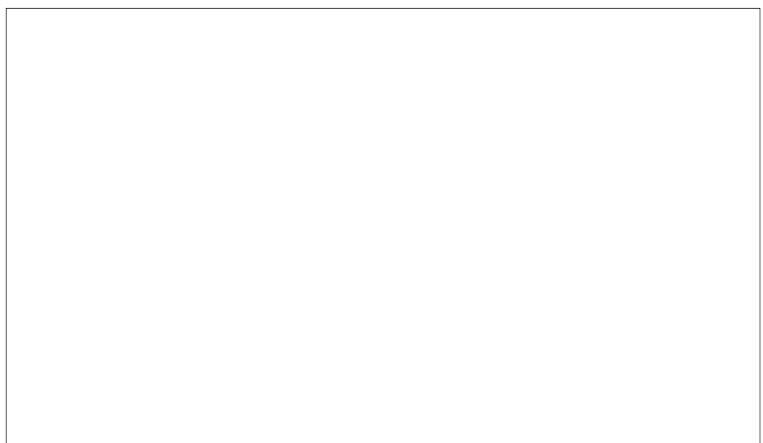
3. If you could ask Garrett Morgan one question, what would it be? Answers will vary -- try to get  
students thinking like inventors!

4. Garrett Morgan was good at finding solutions to make things better. Think of something you use everyday.

What can you do to improve it? Draw and describe your redesigned object.

Answers will vary here, too! Get ready for

some fun inventions!



# Code Improvements



Did you know code can be improved, too?

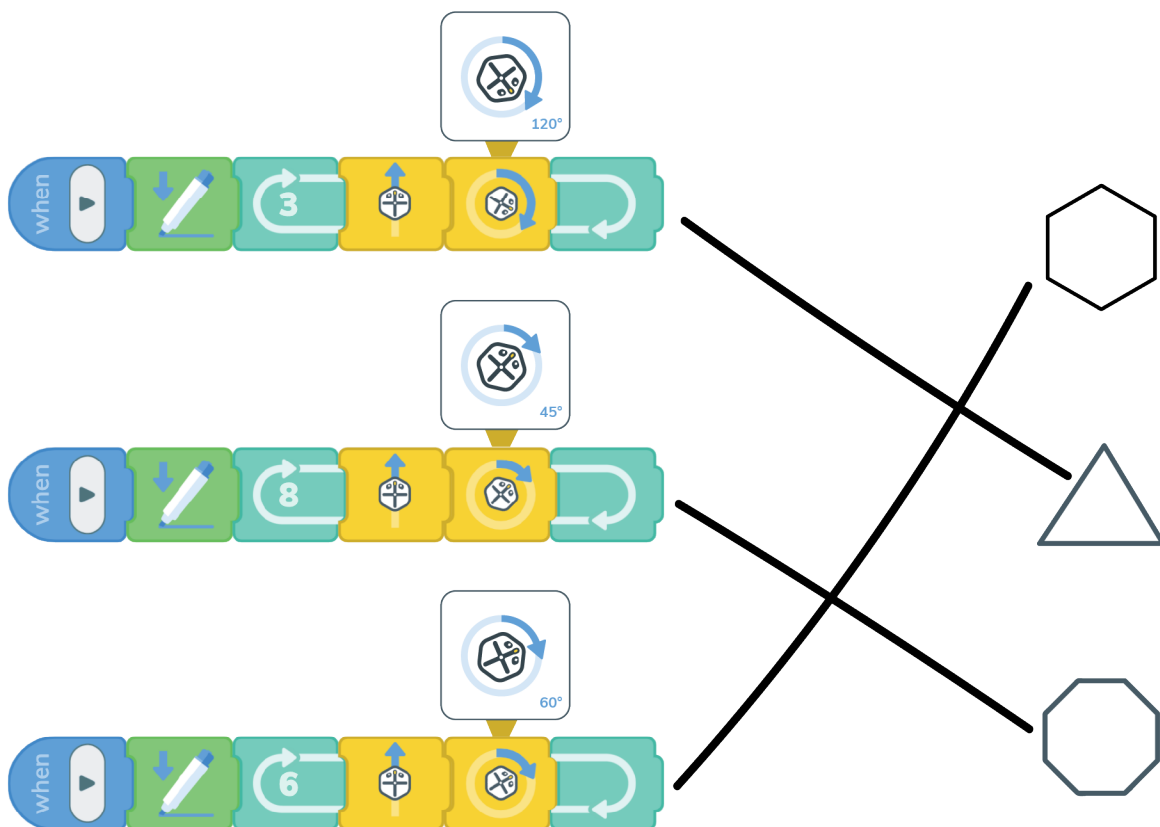
Look at this code. It tells Root to draw a square.



You might notice some patterns. The **Move Block** and **Turn Block** repeat four times. This code can be improved and simplified! When we use a **Repeat Block**, we improve the efficiency of the code!



Look at the code below. Draw a line to connect the code to the correct shape.



## Check your answers!

Copy the code into a new project on [code.irobot.com](https://code.irobot.com) or in the iRobot™ Coding App.