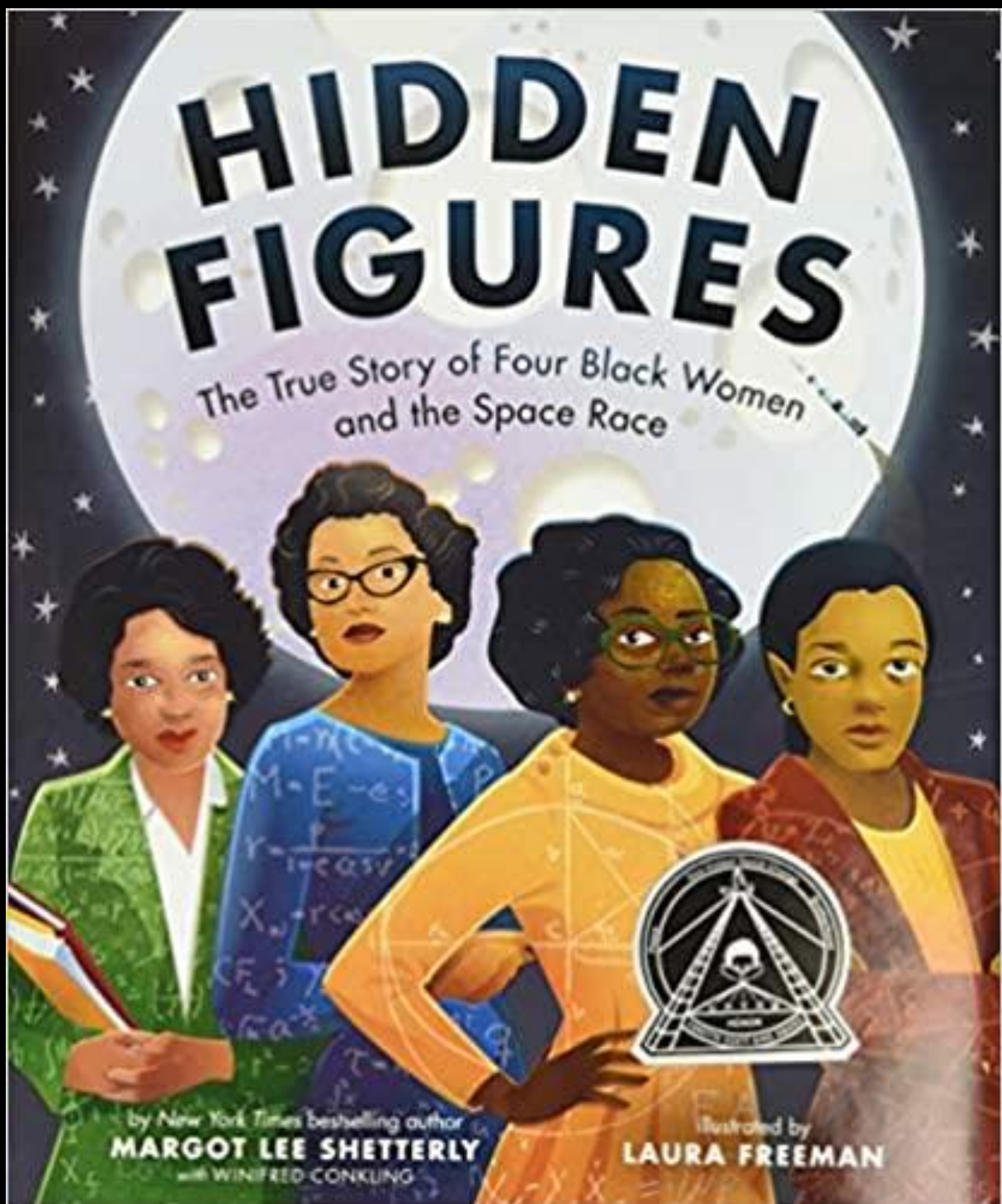


Hidden Figures STEM: Race to the Moon



READ ALOUD OF THE BOOK



Computer: a person who solves difficult math problems in the 1940s.
Today computers are pieces of technology used to solve things.

Code: a set of step-by-step instructions that tells a computer what to do.

Programmer: a person who writes code for computers.

HIDDEN FIGURES

The True Story of Four Black Women and the Space Race

Race to the Moon

Directions: Code a path for the astronaut to get to the moon.

	OBSTACLE			
			OBSTACLE	FINISH

Name: Coely

WRITE THE CODE

Directions: Write the code that shows the steps needed to get the astronaut to the river. Then move the rocket ships to come up with a different coding path.

UP

DOWN

RIGHT

LEFT

1.

↓	↓	↓	→	→	↑	→	→	↓

2.

Race to the Moon

Directions: Code a path for the astronaut to get to the moon.

FINISH				OBSTACLE	
		OBSTACLE			
					START

MATERIALS



- COPY OF *HIDDEN FIGURES*
 - [HTTPS://WWW.AMAZON.COM/HIDDEN-FIGURES-STORY-BLACK-WOMEN/DP/0062742469](https://www.amazon.com/Hidden-Figures-Story-Black-Women/dp/0062742469)
 - RACE TO THE MOON CODING GRID
- RACE TO THE MOON CODING PIECES
- WRITE THE CODE RECORDING SHEET
- SCISSORS
- PENCIL
- PLASTIC SHEET PROTECTORS (OPTIONAL)
- DRY ERASE MARKERS (OPTIONAL)
- VELCRO DOTS (OPTIONAL)
- BINDER CLIPS (OPTIONAL)

HIDDEN FIGURES CODING

Teacher Instructions

Materials:

- Race to the Moon Coding Grid, Coding Pieces, and Write the Code Recording Sheet
- scissors
- pencils
- Hidden Figures by Margot Lee Shetterly (optional)
- plastic page protectors (optional)
- dry erase markers (optional)
- velcro dots (optional)
- binder clips (optional)

Instructions:

- This challenge is a great activity to complete after reading Hidden Figures by Margot Lee Shetterly. The activity can stand alone, but it is best if students are familiar with the book.
- Review the vocabulary cards with students.
- Have students read the included article to build background knowledge and set up the challenge.
- Before letting students begin coding, model the activity for students to set them up for success.

HIDDEN FIGURES CODING

Instructions (continued):

- The activity can be set up as no prep. Just print the coding mat, coding pieces, and write the code recording sheet for each pair. Students can cut out their own coding pieces.
- If you are planning to use the activity multiple times laminate the coding mat and coding pieces. You can also stick velcro dots on the back of each coding piece and in each square of the coding mat. Place the recording sheet in a page protector and have students write the code with a dry erase marker.
- To begin the activity divide students into pairs.
- Follow the instructions on the student instructions page (example images are included).
- For each round challenge students to come up with at least two different paths to get the astronaut to the moon.

To Decrease Difficulty:

- To decrease difficulty have students use the astronaut cutouts. Students can move the astronaut on the grid beginning at start and following the code they wrote to check their work.
- Do not add any obstacles to the coding grid.

HIDDEN FIGURES CODING

Instructions (continued):

To Increase Difficulty:

- As an added challenge have students figure out a way to get the astronaut to the moon using the least amount of moves and/or the most amount of moves.
- Have students come up with more than two ways to get the astronaut to the moon by keeping the rest of the board the same and only moving the rocket ships. Challenge students to come up with as many different solutions as possible.

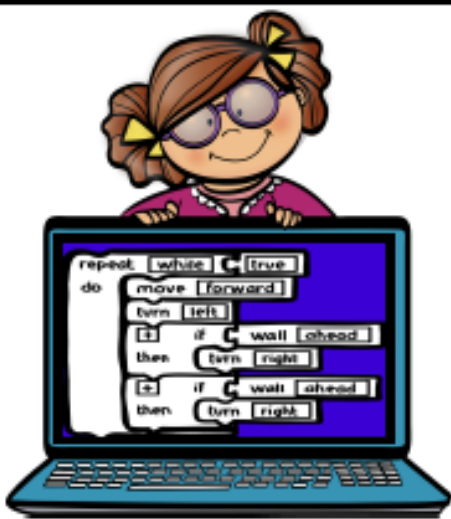
Vocabulary

Directions: Use the vocabulary cards to pre-teach the science vocabulary words before completing the activities.

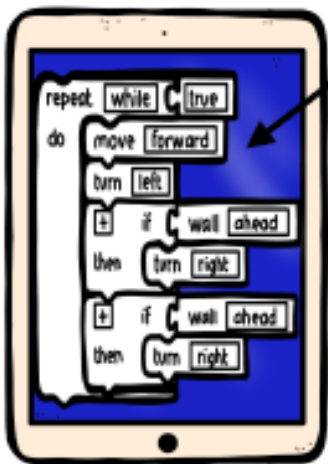


Computer: a person who solved difficult math problems in the 1940s

-Today computers are pieces of technology used to store data.



Programmer: a person who writes code for computers.



Code: a set of step-by-step instructions that tells a computer what to do.

Name: _____

Race to the Moon



Dorothy Vaughan



Mary Jackson



Katherine Johnson

In the 1940s Dorothy Vaughan, Mary Jackson, and Katherine Johnson worked at NASA. At that time, African Americans were treated differently than white Americans, and it was very difficult for them to get a job. Nevertheless, they were very good at math and were able to get jobs working as computers.

Through their hard work and accomplishments, NASA was able to put the first astronauts on the moon in 1969.

Can you and your partner
code a path to put an
astronaut on the moon?

INSTRUCTIONS

Can your team get the astronaut to the moon? Work in groups of 2 to complete the challenge.

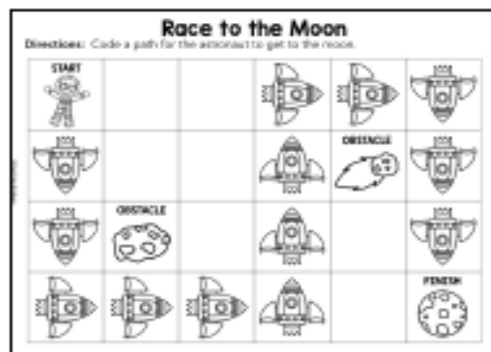
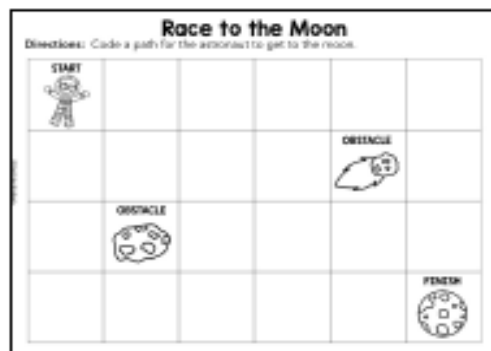
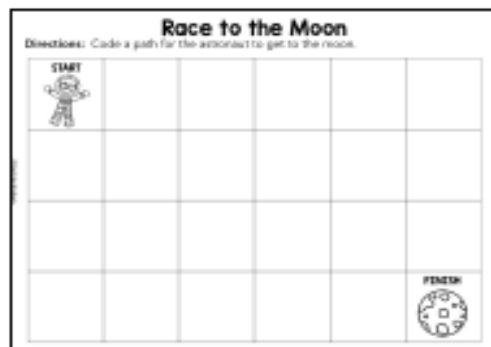
Step 1: Partner 1 will place the astronaut in one corner of the Race to the Moon mat and the moon in the opposite corner.

Step 2: Partner 1 will place the two obstacles on the mat.

Step 3: Partner 1 will make a path from the astronaut to the moon using the rockets. Be sure that the rockets are facing the correct direction. The rockets must go around the obstacles.

Step 4: Partner 2 will write the code, then partner 1 will check the code.

Step 5: Partner 2 will move the rockets to create a different path. Partner 1 will write the code, and Partner 2 will check it.



Name: _____

WRITE THE CODE

Directions: Write the code that shows the steps needed to get the astronaut to the moon. Then move the rocket ships to come up with a different coding path.

↑ ↓ → ←
UP DOWN RIGHT LEFT

1. ↓ ↓ ↓ → → → ↑ ↑ ↑ →
→ ↓ ↓ ↓

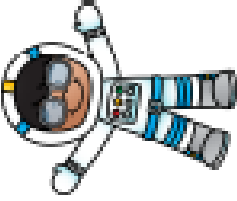
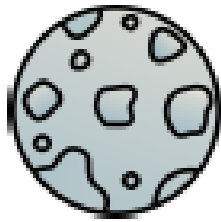


2. _____

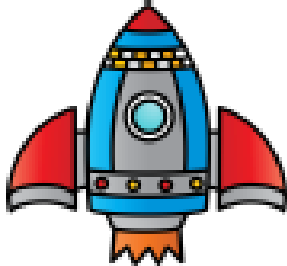
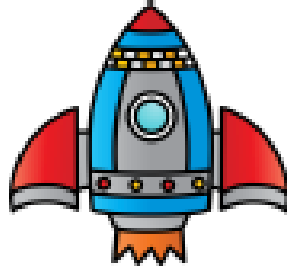
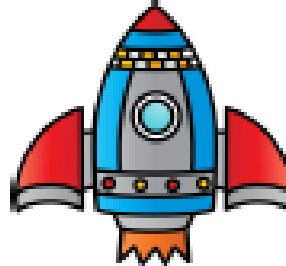
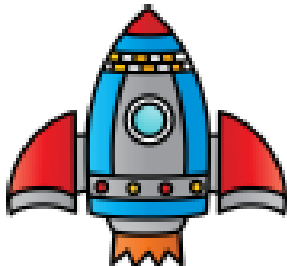
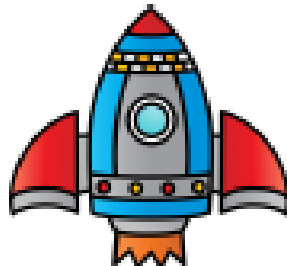
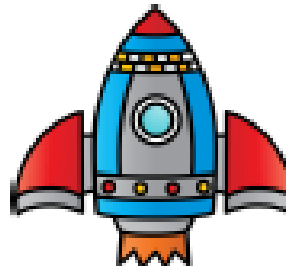
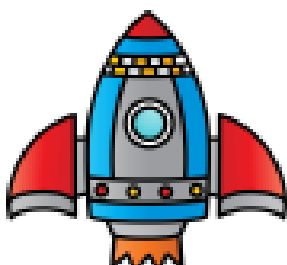
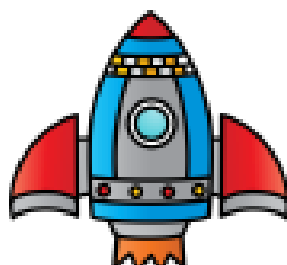
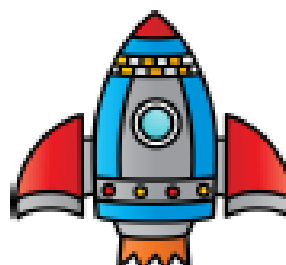
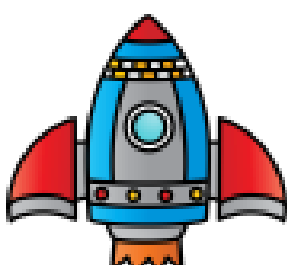
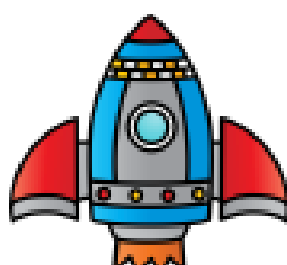
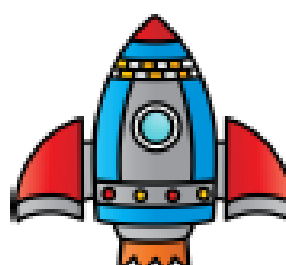
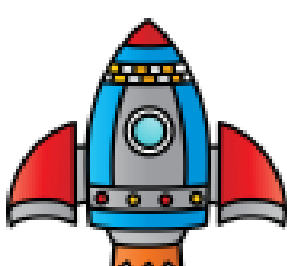
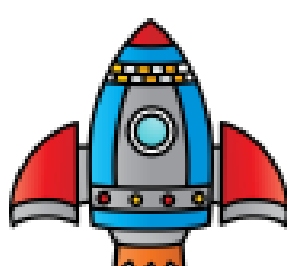
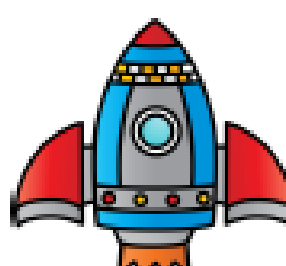
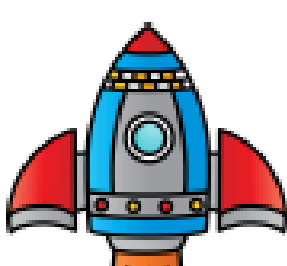
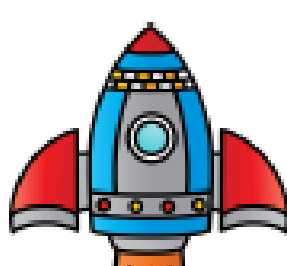
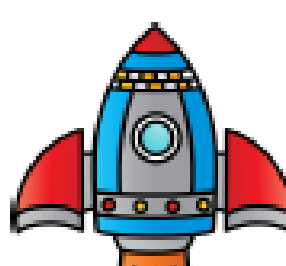
Astronaut Cutouts

Directions: Print and cut out the astronauts. Attach a binder clip to the bottom of the astronaut so that it stands up. Students can move the astronaut on the grid beginning at start and following the code they wrote to check their work.



Coding Pieces

START	
FINISH	
OBSTACLE	
OBSTACLE	

Name: _____

CODING REFLECTION

Directions: Answer the questions to reflect on your coding.

Describe a challenge you had today. If someone else had a similar challenge what advice would you give them?

How can coding skills help you in other subjects as well?

What about your work today are you most proud of?





CINSAM

NKU Center for Integrative Natural Science and Mathematics

Created by:

Ella Bowling, faculty/lecturer, CINSAM

Submit completed codes & photos to:

connect@nku.edu

Post photos of your students completing
the activity and/or completed codes on
social media using
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