

Margaret Hamilton

Lesson Plans

Discovering a computer programming
pioneer who helped us land on the moon

Common Core Aligned Lesson Plans By Grade

Grades 3–5

Pg 3–6

Grades 6–8

Pg 7–10

Grades 9–12

Pg 11–14

Margaret Hamilton

Lesson Grades 3–5

STANDARDS:

CCSS.ELA-Literacy.CCRA.K-5.R.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

CCSS.ELA-Literacy.CCRA.K-5.R.9: Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

CCSS.ELA-Literacy.CCRA.K-5.SL.4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

CCSS.ELA-Literacy.CCRA.K-5.SL.5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

OBJECTIVE:

Students will be able to prove with evidence the big idea, “perseverance is important for problem solving” by reading/viewing multiple resources about Margaret Hamilton and her work on the Apollo 11 moon landing to then in pairs create an infographic that presents how perseverance is crucial to problem solving.

MATERIALS:

- Notebook
- Pencil
- Apollo 11 video clip:
https://images.nasa.gov/details-Apollo_11_Intro_720p.html
- Margaret Hamilton Resources
 - Image of Margaret Hamilton
 - Moon Mirror Image of Margaret Hamilton
 - Margaret Hamilton Bio Elementary:
<https://www.kidscodecs.com/margaret-hamilton/>
 - Margaret and the Moon or YouTube reading of Margaret and the Moon (<https://www.youtube.com/watch?v=telH4l3f92Q>)
- Chromebook/iPad/Laptop
- Poster making materials (if not making digital infographic)
 - Poster paper (1 per pair)
 - Markers
 - Glue
 - Construction paper

MOTIVATION:

To engage the students and pique their interest, show them NASA's clip of the Apollo 11 mission (linked in materials section). After watching the clip ask students to think-pair-share the following question: How was the Apollo 11 mission made possible?

Once students have had enough time to share with a partner, field a few student responses to share with the class. Then, show an image of Margaret Hamilton and her moon mirror image. Briefly introduce that Margaret had an important role in making the Apollo 11 mission a success and that today the students would be investigating her more.

Note: If students are unfamiliar with the Apollo 11 mission, after watching the video is the proper time to provide the necessary background information they will need to be successful in the lesson.

INTRODUCE THE BIG IDEA:

Introduce the big idea, "perseverance is important for problem solving". Write the big idea on the board and have students write it in their notebook. Go over the vocabulary word "perseverance" by having students come up with a working definition and write it in their notebook as well.

PRACTICE THE BIG IDEA:

To practice with the big idea, “perseverance is important for problem solving”, choose a person from history that has persevered to solve a problem, or reach their goal that the students are familiar with/studied recently (such as Martin Luther King Jr., Hellen Keller, or Jackie Robinson). Project a picture of that person and ask the students, “How did _____ persevere to solve a problem?” Have the students discuss this question in pairs or small groups, and then ask a few volunteers to share what they discussed.

APPLY THE BIG IDEA:

To apply the big idea, “perseverance is important for problem solving”, re-show the image(s) of Margaret Hamilton and inform the students that they will now be doing a case study of Margaret Hamilton. In pairs, students will prove the big idea, “perseverance is important for problem solving” by researching how Margaret’s perseverance allowed her to problem solve and reach her goal of successfully getting Apollo 11 to the moon. For the first resource on Margaret Hamilton, either read the picture book *Margaret and the Moon* aloud to the class, or show the YouTube read aloud video of *Margaret and the Moon*. Afterwards, have students read/watch at least one more resource on Margaret Hamilton from the materials list.

After analyzing at least two resources on Margaret Hamilton and taking notes, students will make a digital infographic or paper poster that shows how Margaret’s perseverance allowed her to successfully problem solve and reach her goal of getting Apollo 11 to the moon. The digital infographic or poster should include Margaret’s name, a picture of Margaret, specific examples from the text/resources of her persevering and how this perseverance allowed her to reach her goal of getting Apollo 11 to the moon.

SHARE & SUMMARIZE THE BIG IDEA:

Once students have finished creating their Margaret Hamilton infographic/poster with their partner that proves the big idea, “perseverance is important for problem solving”, have as many students as possible present their project to the class.

Note: You may also conduct a gallery walk to allow students the opportunity to see all the infographics/posters in a short period of time.

INTEGRATION:

After students have presented their Margaret Hamilton projects to the class, circle back to the original Apollo 11 video from the beginning of the lesson and have students complete an exit ticket in which they answer the following question: How is perseverance important for problem solving?

Note: This exit ticket can also be done as digitally, such as on Google Classroom.

This lesson is based on model of teaching called the "Advance Organizer" from: Joyce, Bruce; Weil, Marsha; and Calhoun, Emily, "Models of Teaching" (2003). Centers for Teaching and Technology - Book Library. 96.

Margaret Hamilton

Lesson Grades 6–8

STANDARDS:

CCSS.ELA-Literacy.CCRA.6-12.R.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

CCSS.ELA-Literacy.CCRA.6-12.R.9: Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

CCSS.ELA-Literacy.CCRA.6-12.SL.4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

CCSS.ELA-Literacy.CCRA.6-12.SL.5: Make strategic use of digital media and visual displays to express information and enhance understanding of presentations.

OBJECTIVE:

Students will be able to prove with evidence the big idea, “perseverance is crucial for problem solving” by reading/viewing multiple resources about Margaret Hamilton and her work on the Apollo 11 moon landing to then in pairs create an infographic that presents how perseverance is crucial to problem solving.

MATERIALS:

- Notebook
- Pencil
- Apollo 11 Engagement Clip (Show minutes 9:15-13:20 only)
<https://www.youtube.com/watch?v=qUe5lpDBcsM&list=PLiuUQ9asub3TUTO658F3BCfxuK4CGpFF5&index=17>
- Margaret Hamilton Resources
 - Image of Margaret Hamilton
 - Moon Mirror Image of Margaret Hamilton
 - Apollo Program Informational Article:
<https://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-was-apollo-program-58.html>
 - Margaret Hamilton Biographical Article:
<https://www.smithsonianmag.com/smithsonian-institution/margaret-hamilton-led-nasa-software-team-landed-astronauts-moon-180971575/>
 - Margaret Hamilton NASA Article:
<https://www.nasa.gov/feature/margaret-hamilton-apollo-software-engineer-awarded-presidential-medal-of-freedom>
 - Margaret Hamilton Interview:
<https://futurism.com/margaret-hamilton-the-untold-story-of-the-woman-who-took-us-to-the-moon>
 - Margaret Hamilton Biographical Video:
<https://www.makers.com/profiles/596e0f42bea17725160a95c1>
 - Margaret Hamilton Today Show video:
<https://www.today.com/video/apollo-11-50th-anniversary-meet-the-woman-who-put-men-on-the-moon-63582277862>
- Chromebook/iPad/Laptop
- Poster making materials (if not making digital infographic)
 - Poster paper (1 per pair)
 - Markers
 - Glue
 - Construction paper

MOTIVATION:

To engage the students and pique their interest, show them NASA's clip of the Apollo 11 landing and moonwalk (minutes 9:15-13:20 only). After watching the clip ask students to think-pair-share the following question: How was the Apollo 11 mission and moon landing made possible?

Once students have had enough time to share with a partner, field a few student responses to share with the class. Then, show an image of Margaret Hamilton and her moon mirror image. Briefly introduce that Margaret had an important role in making the Apollo 11 mission a success and that today the students would be investigating her more.

Note: If students are unfamiliar with the Apollo 11 mission, after watching the video is the proper time to provide the necessary background information they will need to be successful in the lesson.

INTRODUCE THE BIG IDEA:

Introduce the big idea, “perseverance is crucial for problem solving”. Write the big idea on the board and have students write it in their notebook. Go over the vocabulary words “perseverance” and “crucial” by calling on students to come up with a working definition. Once the class has agreed on the definitions, have them write the definitions in their notebook as well.

PRACTICE THE BIG IDEA:

To practice with the big idea, “perseverance is crucial for problem solving”, choose a person from history that has persevered to solve a problem, or reach their goal that the students are familiar with/studied recently (such as Amelia Earhardt, Hellen Keller, or Jackie Robinson). Project a picture of that person and ask the students, “How did _____ persevere to solve a problem?” Have the students discuss this question in pairs or small groups, and then ask a few volunteers to share what they discussed.

APPLY THE BIG IDEA:

To apply the big idea, “perseverance is crucial for problem solving”, reshew the image(s) of Margaret Hamilton and inform the students that they will now be doing a case study of Margaret Hamilton. In pairs, students will prove the big idea, “perseverance is crucial for problem solving” by researching how Margaret’s perseverance allowed her to problem solve and reach her goal of successfully getting Apollo 11 to the moon.

Put students in partner pairs and provide them the links to the Margaret Hamilton resources from the materials section of the lesson. Of the 6 resources, they should examine a minimum of two resources, more if they have time. I recommend that at least one of those should be a written resource (not 2 videos). Provide the students approximately 20 minutes to read/watch the resources with their partner, taking notes as they go of examples of how Margaret persevered to solve problems for the Apollo 11 mission.

After analyzing at least two resources on Margaret Hamilton and taking notes, students will make a digital infographic or paper poster that shows how Margaret’s perseverance allowed her to successfully problem solve

and reach her goal of getting Apollo 11 to the moon. If infographic design is new to the students, they may also create a digital slides presentation instead of the physical poster if technology allows. The digital infographic, poster or slideshow should include Margaret's name, a picture of Margaret, specific examples from the text/resources of her persevering and how this perseverance allowed her to reach her goal of getting Apollo 11 to the moon.

SHARE & SUMMARIZE THE BIG IDEA:

Once students have finished creating their Margaret Hamilton infographic, poster or slideshow with their partner that proves the big idea, “perseverance is crucial for problem solving”, have as many students as possible present their project to the class.

Note: You may also conduct a gallery walk to allow students the opportunity to see all the infographics/posters in a short period of time.

INTEGRATION:

After students have presented their Margaret Hamilton projects to the class, circle back to the original Apollo 11 video from the beginning of the lesson and have students complete an exit ticket in which they answer the following question: How is perseverance crucial for problem solving?

Note: This exit ticket can also be done as digitally, such as on Google Classroom.

[This lesson is based on model of teaching called the “Advance Organizer” from: Joyce, Bruce; Weil, Marsha; and Calhoun, Emily, “Models of Teaching” \(2003\). Centers for Teaching and Technology - Book Library. 96.](#)

Margaret Hamilton

Lesson Grades 9–12

STANDARDS:

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CCSS.ELA-Literacy.CCRA.6-12.SL.4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

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OBJECTIVE:

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MATERIALS:

- Notebook
- Pencil
- Apollo 11 Engagement Clip (Show minutes 9:15-13:20 only)
<https://www.youtube.com/watch?v=qUe5lpDBcsM&list=PLiuUQ9asub3TUT0658F3BCfxuK4CGpFF5&index=17>
- Margaret Hamilton Resources
 - Image of Margaret Hamilton
 - Moon Mirror Image of Margaret Hamilton
 - Apollo Program Informational Article:
<https://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-was-apollo-program-58.html>
 - Margaret Hamilton Biographical Article:
<https://www.smithsonianmag.com/smithsonian-institution/margaret-hamilton-led-nasa-software-team-landed-astronauts-moon-180971575/>
 - Margaret Hamilton NASA Article:
<https://www.nasa.gov/feature/margaret-hamilton-apollo-software-engineer-awarded-presidential-medal-of-freedom>
 - Margaret Hamilton Interview:
<https://futurism.com/margaret-hamilton-the-untold-story-of-the-woman-who-took-us-to-the-moon>
 - Margaret Hamilton Biographical Video:
<https://www.makers.com/profiles/596e0f42bea17725160a95c1>
 - Margaret Hamilton Today Show video:
<https://www.today.com/video/apollo-11-50th-anniversary-meet-the-woman-who-put-men-on-the-moon-63582277862>
 - Apollo 11 Code (Great for Computer Science Students):
<https://github.com/chrislgarry/Apollo-11/>
- Chromebook/iPad/Laptop
- Poster making materials (if not making digital infographic)
 - Poster paper (1 per pair)
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MOTIVATION:

To engage the students and pique their interest, show them NASA's clip of the Apollo 11 landing and moonwalk (minutes 9:15-13:20 only). After watching the clip ask students to think-pair-share the following question: How was the Apollo 11 mission and moon landing made possible?

Once students have had enough time to share with a partner, field a few student responses to share with the class. Then, show an image of Margaret Hamilton and her moon mirror image. Briefly introduce that Margaret had an

important role in making the Apollo 11 mission a success and that today the students would be investigating her more.

Note: If students are unfamiliar with the Apollo 11 mission, after watching the video is the proper time to provide the necessary background information they will need to be successful in the lesson.

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Introduce the big idea, “perseverance is crucial for problem solving”. Write the big idea on the board and have students write it in their notebook. Go over the vocabulary words “perseverance” and “crucial” by calling on students to come up with a working definition. Once the class has agreed on the definitions, have them write the definitions in their notebook as well.

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APPLY THE BIG IDEA:

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Put students in partner pairs and provide them the links to the Margaret Hamilton resources from the materials section. Of the 7 resources, they should examine a minimum of 3 resources, more if they have time. I recommend that at least two of those should be a written resource so students are able to identify direct quotes. Provide the students approximately 25 minutes to read/watch the resources with their partner, taking notes as they go about specific examples of how Margaret persevered to solve problems for the Apollo 11 mission to be successful.

After analyzing at least three resources on Margaret Hamilton and taking notes, students will make a digital infographic or paper poster that shows how Margaret's perseverance allowed her to successfully problem solve and reach her goal of getting Apollo 11 to the moon. If infographic design is new to the students, they may also create a digital slides presentation instead of a physical poster if technology permits. The digital infographic, poster or slideshow should include Margaret's name, a picture of Margaret, specific examples from the text/resources of her persevering and how this perseverance allowed her to reach her goal of getting Apollo 11 to the moon.

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INTEGRATION:

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Note: This exit ticket can also be done as digitally, such as on Google Classroom.

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