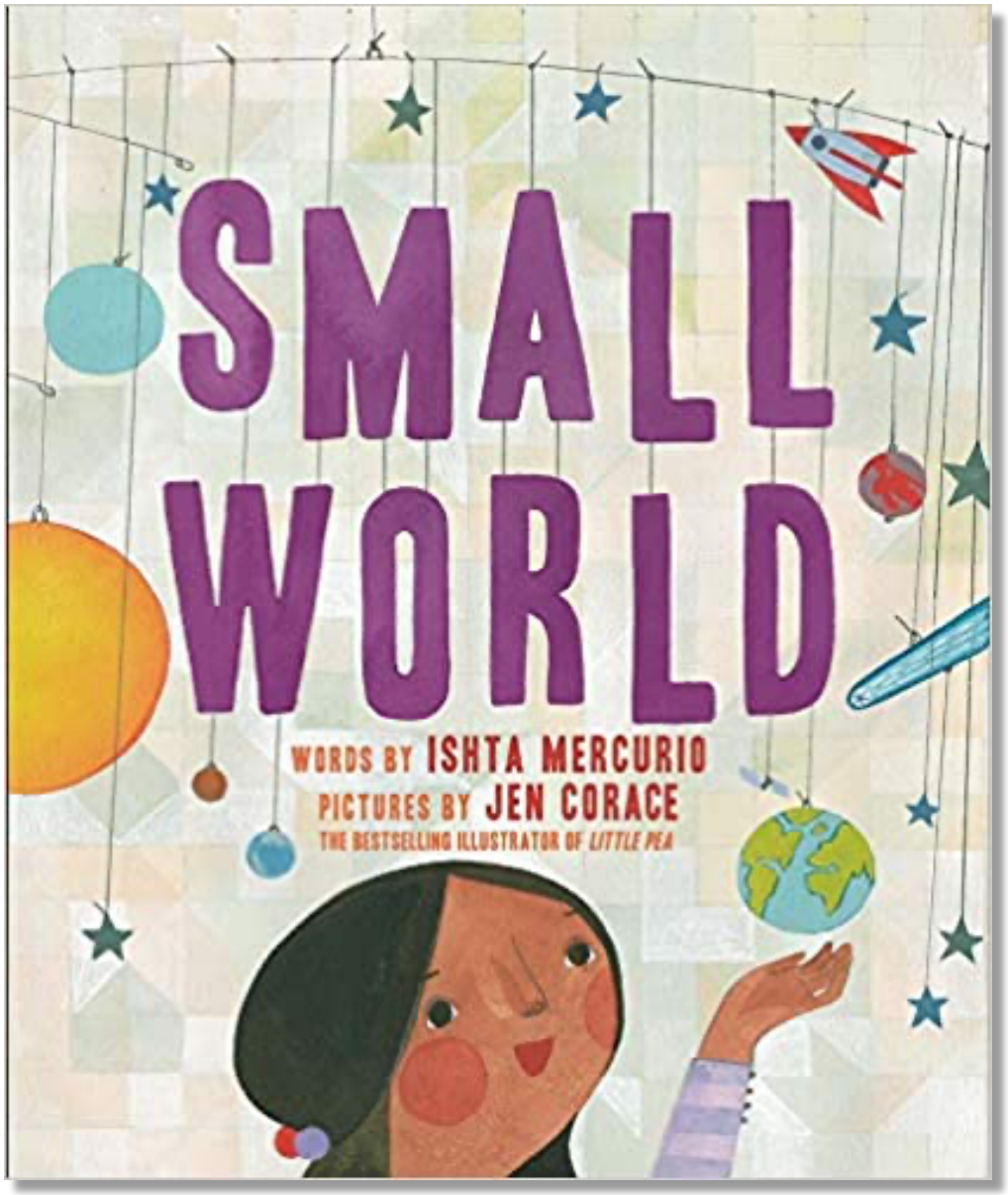
Small World

A teacher's guide created by Marcie Colleen
based on the picture book
written by Ishta Mercurio and illustrated by Jen Corace



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Meet the Author – Ishta Mercurio

Ishta is an author and actor. Raised in Cincinnati, she has traveled around the world and all over the United States. She now lives in Ontario, where she films and photographs plants and wildlife, from the tall to the small, in her backyard. For more information about Ishta's other books and to schedule a school visit, visit her at www.ishtamercurio.com or find her on Twitter as @IshtaWrites or on Facebook at www.facebook.com/theoneandonlyishta.

Meet the Illustrator –Jen Corace

Jen is the illustrator of many books for children, including *Little Pea* by Amy Krouse Rosenthal and *Telephone* by Mac Barnett. She has a BFA in illustration from Rhode Island School of Design, and she lives and works in Providence, Rhode Island. Visit Jen at www.jencorace.com, or find her on Twitter and Instagram as @corachacha.

Meet the Curriculum Writer – Marcie Colleen

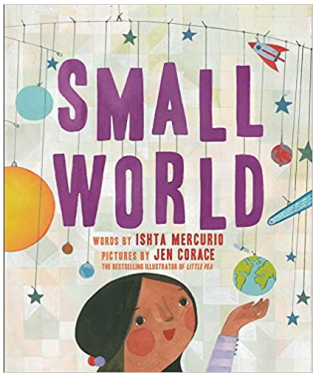
This guide was created by Marcie Colleen, a former teacher with a BA in English Education from Oswego State and an MA in Educational Theater from NYU. In addition to creating curriculum guides for children's books, Marcie can often be found writing books of her own at home in San Diego, California. Visit Marcie at www.thisismarciecolleen.com.

How to Use This Guide

This classroom guide for *Small World* is designed for students in kindergarten through third grade. It is assumed that teachers will adapt each activity to fit the needs and abilities of their own students.

It offers activities to help teachers integrate *Small World* into English language arts (ELA), mathematics, science, and social studies curricula. Art and drama are used as a teaching tool throughout the guide.

All activities were created in conjunction with relevant content standards in ELA, math, science, social studies, art, and drama.



Small World

Reading level: Ages 4-8

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When Nanda is born, the whole of her world is the circle of her mother's arms. But as she grows, the world grows too. It expands outward—from her family, to her friends, to the city, to the countryside. And as it expands, so does Nanda's wonder in the underlying shapes and structures patterning it: cogs and wheels, fractals in snowflakes.

Eventually, Nanda's studies lead her to become an astronaut and see the small, round shape of Earth far away. A geometric meditation on wonder, *Small World* is a modern classic that expresses our big and small place in the vast universe.

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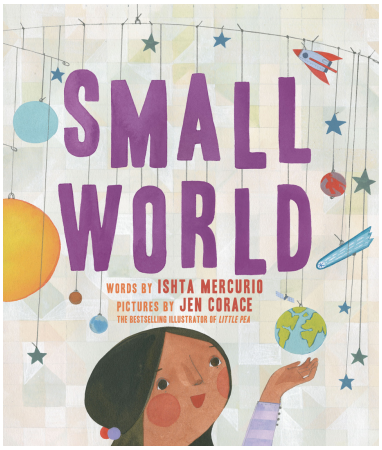
English Language Arts

Reading Comprehension

Before reading *Small World*, help students identify the basic parts of a picture book: jacket, case, front cover, back cover, title page, dedication, copyright information, spine, end papers, and jacket flaps.

The Front Cover ~



- Describe what you see.
- Name four objects you see in the front cover illustration.
- Pretend to be the girl in the illustration. Pose like her.
- How do you think this character feels? How does this pose make you feel?

The Case ~

- Remove the jacket and you will be able to see a different illustration beneath.
- Describe what you see.
- If this is the same girl on the front cover of the jacket, what can you say about her? What clues can you find to tell you what she might be like?

The Title Page~

- Describe what you see. Pay close attention to details.
- Pretend to be the girl, now. How do you think she feels? How does this pose make you feel?
- Where do you think she is in this illustration? Explain why you think that.

Now read or listen to the book. Help students summarize in their own words what the book was about.

- Nanda's mother's arms form a circle around her as a baby. The circle is described as safe, warm, and small. Can you think of three more words to describe this circle?
- Looking closely at the illustration of the family around the table, what four words would you use to describe this circle?
- When Nanda grows older, her world includes playmates. Where might she have found her friends? Where did you meet your friends?
- What do you think the author meant when she says the world suddenly grows to include swaying branches and scaffolds of steel? What is Nanda showing interest in?
- What do you think Nanda studies in college?
- When is the first time Nanda flies?
- What else does Nanda go on to fly?
- Where does Nanda eventually travel?
- What is the circle Nanda is gazing upon at the end?
- The world looks small at the end. Why do you think that is? How has Nanda's world grown throughout the years?

Let's talk about the people who made *Small World:*

- Who is the author?
- Who is the illustrator?
- What kind of work did each person do to make the book?

Take a look at the illustrations in the following spreads:

- Nanda's world has grown to an even bigger circle. Jen Corace uses so many circles in her illustrations. How many circles can you find?

- How would you describe what is happening in this spread?
- List three words that describe what Nanda is doing.
- Create a thought bubble over Nanda to show what she is thinking.
- Jen Corace continues to use circles to create the illustrations, however, as Nanda's world grows, Corace also introduces fractals in the images. A fractal is a never-ending complex pattern created by repeating a simple process over and over. For example: a snowflake with its "spokes," and the crystals branching off of the spokes, and the smaller crystals branching off of the branches, and the smaller crystals branching off of the branches, is a real-life example of a fractal. Can you find fractals in this spread?

- How would you describe what is happening in these two pages?
- How many circles can you find in the illustrations?
- Do you see fractals in the illustrations? Where?
- Create a thought bubble over Nanda to show what she is thinking.

Writing Activities

What Happened? ~ *Small World*'s Plot

Help students define the plot arc within *Small World.*

Beginning	Middle	End
At first…	First Then	A circle called home.
Then, Nanda grows and her journey expands. How? Where?	Next After that Finally	

BONUS: Using the basic plot structure above, create an original story about Nanda. Students can work individually or as a class.

> Art center ~ Provide a variety of art materials including crayons, pencils, markers, paint, scissors, colored paper, old magazines, and glue for students to illustrate the scenes in their stories.
>
> Drama center ~ Provide puppets, costumes, and props so students can recreate their new stories.

Additional writing activity: Using *Small World* as inspiration, write your own story about traveling to outer space. How will you get there?

Who is Nanda? ~ Character Study

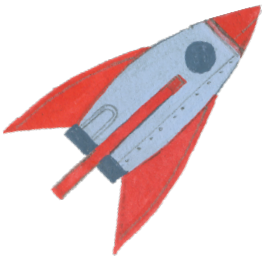
How a character acts can tell readers a lot about who the character is.

Read *Small World*. Scene by scene, record your thoughts regarding Nanda, in a chart like the one below.

Text	What Nanda does.	How would you describe Nanda?
Example: *"It became the circle of her loving family…"*	Nanda is sitting around the table with her family. She is on her father's lap. She is playing with toys.	Playful, curious, full of laughter, surrounded by family and loved ones.

After gathering information regarding Nanda's character, use the scenarios below to write a new scene for *Small World*. What would Nanda do in one of the following situations?

- It's lunch time, but Nanda is busy building something.
- It's Nanda's birthday and she is planning her party.
- The toy rocket ship she is trying to build won't fly.



Writing Narrative and Dialogue

Small World is written in narration. There is no dialogue. This provides a great springboard to discuss narrative and dialogue in a story.

> Narrative ~ An account of the connected events. Often through a narrator who gives information about the feelings and actions of the story.

Speech/Dialogue ~ The written conversational exchange between two or more characters.

Rewrite *Small World* using the following:

- Write a version of the story using only dialogue. No narration.
- Combine this new dialogue version with the published version of *Small World*, in which Nanda and others speak and a narrator carries the action of the story.

Compare all three versions of *Small World*: all narration, all dialogue, and a combination. How do the new versions compare with the original version of *Small World*? Which do you prefer? Why?

Critical Thinking

In fiction stories, a character usually changes in some way. Do you think Nanda changed in the story? How?

How would the story be different if Nanda had not followed her passions and curiosity?

What do you think is the message of this story*?*

<u>Speaking and Listening Activities</u>

Picture books are written to be read aloud. Here are some other ways to bring *Small World* to life in your classroom and have fun with speaking and listening skills!

Mime

- Ask students to silently act out a page from the book, exaggerating body motions and facial expressions. See if others can identify the page that goes along with the mimed action.

Drama

- Create a TV commercial to encourage people to read *Small World.*

<u>Language Activities</u>

New Vocabulary: Brainstorming

Nanda has the mind of a scientist, full of curiosity and wonder. A mind like that does a lot of brainstorming.

What is brainstorming?

- To demonstrate, show the class a paper plate.

- Then, give the class two minutes (use a timer) to list as many things as possible that the paper plate can be used for.
- Record their ideas on the board.
- Once the two minutes is up, review the list on the board.
- Explain that what they were just engaged in was brainstorming.

Look up 'brainstorming' in the dictionary. (Depending on the level of your students, a student volunteer can do this or the teacher can.)

- Read the definition.
- Explain that a brainstorm is when you take all of the ideas in your head and let them out, kind of like how a cloud lets out all of the rain during a storm.

Explain the "rules of brainstorming."

- Nothing is a bad idea. Do not criticize any ideas while brainstorming.
- Hitching is welcome. Listen to others' ideas and let their ideas spark new ideas in you. This way, in group brainstorming, ideas build upon each other.
- Be off-the-wall. Outrageous and humorous ideas are welcomed.

Now knowing what we know about brainstorming, let's try some brainstorming activities.

- Categories Game. Have students sit in a circle and take turns brainstorming items in the announced category. For example, "animals." Go around the circle and have each child name an animal. They cannot repeat a response that another child gave. Go around the circle more than once if kids seem to have more ideas in that category. Other potential categories include fruits, vegetables, colors, items of a specific color, creatures that swim, musical instruments, and things with wheels.

- Hypotheticals. Move brainstorming into the abstract by having students brainstorm answers to hypothetical questions. For example, ask them what a dog might be thinking while he sits at home or what might happen if people could fly. Record all of the answers so they can be read back to the kids when the brainstorming is finished. Rather than going around a circle and putting pressure on kids to think of something new, have students raise their hands to share answers. If a child is quiet, call on him/her early in a round before too many obvious answers have been said.

- Silly Answers. Teach students that they should share anything they can think of in a brainstorm, even if it does not seem like the best answer, by having them share the silliest answers they can think of to some questions. For example, brainstorm the silliest way to get from one end of the room to another. Turn it into a physical activity by having them demonstrate their silly methods, too. When students start running out of ideas, ask: "Who can think of something even sillier?" to prompt more responses.

After better understanding brainstorming, discuss:

- The value of brainstorming.
- Why brainstorming is so important to inventors and creators.
- How students could use brainstorming in their everyday life.

Poetic Language

Small World is filled with poetic language.

"A bubble of giggling playmates…"

"A sway of branches…"

"Scaffolds of steel…"

"A sun-kissed maze of wheat…"

These examples create imagery-filled adjectives to describe playmates, branches, steel, and wheat. These poetic adjectives go beyond simply describing how something looks. They evoke movement, sound, and action.

Have students try to describe playmates, branches, steel, and wheat with non-poetic language.

- How do these two different descriptions (poetic and non-poetic) make you feel?
- Why might you want to use poetic language when writing descriptions?
- How many examples of poetic language can you find in *Small World*?
- Pick five new objects from your home or school environment and describe them using poetic language.

Math

The Geometry of Art

Drawings are simple shapes put together to create an object, and Jen Corace used a lot of geometry to create the illustrations in *Small World*.

Have students find circles, squares, rectangles, triangles, and fractal patterns within the illustrations of *Small World*.

How many can they find?

As a class, create a table to record how many circles, squares, and triangles appear in each spread of *Small World.*

Spread	How many circles?	How many squares?	How many triangles?
Front Cover			
Title Page			
Playground spread			
Rollercoaster spread			

Additional Challenge: Now compare the numbers of circles, squares, and triangles on each spread, using these symbols:

> (is greater than)

= (is equal to)

< (is less than)

Example: On the front cover, the number of circles is > squares + triangles.

Geometric Collage

Provide students with various pieces of construction paper shapes: circles, squares, rectangles, ovals, hearts, triangles, stars, etc.

Challenge each student to use the shapes to create a picture. For example, maybe a rectangle turns into a building with a triangle pine tree nearby and a circle sun in the sky. Try to move students towards creating scenes, as Corace does throughout *Small World*. Encourage adding lines with markers to enhance objects and add detail.

"Shape Up" Field Trip

Divide the students into three teams: Circles, Squares, and Triangles.

Lead them on a field trip to the library, playground, or through the school hallways.

As a group, each team must look for their assigned shape in various objects seen on the trip.

If possible, each team should be given a digital camera to record their findings.

Students should also take notes and jot down what object they found and where they found it.

At the end of the field trip, students will return to the classroom and try to draw or create a photo collage of the items that their team found for display in the classroom.

Optional: For further technological experience, teams can use the computer and a scanner to create a multimedia presentation of their findings to present to the class.

Adaptation for students engaged in distance learning: assign each student a shape (circles, squares, and triangles), and encourage them to look for and take pictures (or draw pictures) of their assigned shape when they next take a walk through their neighborhood with their caregiver. Or, they can find examples of their assigned shape inside their home. Encourage students to make a collage of their found shapes.

Hopscotch to the Moon

This hopscotch activity will help students improve motor skills, balance, and self-regulation behaviors. Additionally, this game will encourage them to learn about math concepts such as number recognition and counting, as well as elements of art including shape and line.

This game can be created for indoor spaces through simply taping out the boxes on the floor and/or traditionally by drawing them on the pavement outdoors.

Materials:

- Masking tape (for indoor version)
- Sidewalk chalk, markers, or dark crayons
- Beanbag or a "moon" rock
- One die

Set Up:

Create the hopscotch boxes.

Students can help draw numbers in the squares. If they are not ready to write numbers alone, try lightly drawing the numbers first and then encourage them to trace over them.

How to Play:

1. Place the beanbag or rock in one of the squares.
2. The first student rolls the die twice and adds the two numbers together to know how many boxes they must hop to. (i.e., 2 + 4 = 6, hop six spaces).
3. The students hop their way through, counting as they go.
4. If they land on the box with the beanbag/rock, they have reached the moon! If they overshoot or fall short they must start all over again.
5. Play continues until the moon is reached by everyone.

For an extra challenge, change the location of the moon each turn.

Math Without Numbers

Inventors and engineers use math skills every day, even when they don't use numbers. These skills are important to anyone who is thinking critically and solving problems.

Help your students practice with the following activities:

Classifying and grouping games: Mix up many kinds of blocks or other objects (shells, buttons, etc.) and ask students to classify them by size, color, or shape. Older children can classify and group themselves based on birthday months, color of clothing, etc. Younger children can classify plastic animals by class (mammals, birds, fish, etc.), outer covering (feathers, fur, scales, etc.), size, color, or means of locomotion.

Estimation: Using dried beans and several containers of different heights and widths, students are to guess which containers will hold the most beans and which containers will hold the least beans. Have students put the containers in order according to their capacity. Once the class has agreed on the order, fill each container with beans, one at a time. Count how many beans are in each container. Were they right about the order?

Patterning: Build a simple pattern using M&Ms, buttons or pieces of paper. Start with an alternating pattern (called an AB pattern): one red candy, one green candy, one red, one green, and so forth. Be sure to repeat the pattern at least once. Next, students should continue the pattern by building a sequence that's exactly like the initial pattern.

"How did you know to start with a red?" or "Why did you use a green here?" Some more difficult patterns to practice are: AAB, ABB, AABB, and ABC.

BONUS:

- How do you think classifying and grouping, estimating, and patterning assist inventors like Lilian Todd?
- How would you use these skills in your daily activities?

Big and Small at the Same Time: Comparing Relative Sizes

In her Author's Note, Ishta Mercurio says, "You can think of the Earth as being both big and small at the same time in the same way that you are big and small at the same time. You are smaller than your parents, but bigger than a pinecone or a snowflake."

Have students gather three objects from around the classroom or their home. It can be helpful if these objects are similar in shape, yet varying in size. For example, a marble, a golf ball, and a soccer ball.

Describe the first object in relation to the others. For example, "the golf ball is smaller than the soccer ball, but bigger than the marble."

How does the object seem to appear in size when held:

- Close to your face?
- At arm's length?
- From across the room?

How is this similar to the size of the moon, planets, or stars?
How would the moon, planets, or stars differ in perceived size based on how close or far away you are?

Science

The Engineering Design Method

The Engineering Design Process is a process that engineers, scientists and inventors use to problem solve. Nanda probably used this process too as she followed her curiosity to outer space.

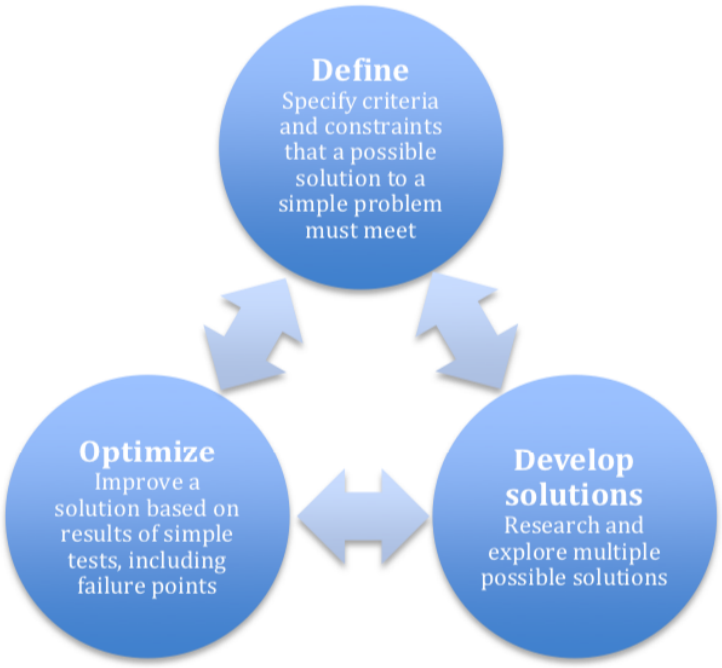


Figure 1 Next Generation Science Standards www.nextgenerationscience.org

After introducing the process to the class, lead them through a discussion.

- Describe how these three steps help with problem solving.
- What do you think would happen if you skipped a step?
- Why do you think there are two-way arrows between the circles denoting the different parts of the process?
- Can you find evidence that Nanda used many of these steps in *Small World*? How so? Use textual examples.

Build an Airplane

This challenge allows students to test out the Engineering Design Process for themselves as they problem solve a way to build an airplane that really works! Of course, a little imagination is going to go a long way here, too!

- Explain to students that they will be working to build an airplane that can fly.
- Provide the students with several craft items (paper, paperclips, stapler and staples, rubber bands, popsicle sticks, etc.)
- Each airplane must:
    - Be able to travel in the air from one point to another.
    - Be a construction, not merely a folded piece of paper.
- Each student must create a Design Notebook for their airplane and carefully document their use of the Engineering Design Process throughout the process of building their airplane.

Once all airplanes have been constructed, test them out one by one as a class. Did they work? Retest. Did they work a second time? If they didn't work, head back to the drawing board like a real inventor.

Offer up awards to increase the competition.

- Longest Flight
- Highest Flight
- Most Materials Airplane
- Least Materials Airplane
- Best Looking Airplane

Bonus: This is a video of the first ever working human-powered helicopter in action, just like the one Nanda powers in *Small World*. https://youtu.be/syJq10EQkog

Additionally, the webpage of the team that built the human-powered helicopter can be found here, to learn more about the project. http://www.aerovelo.com/atlas-helicopter.

Social Studies

Famous Astronauts

Assign a famous astronaut for students to research in the library and on the Internet. A list of 14 are below, but do not feel limited to those on the list.

- Neil Armstrong
- Buzz Aldrin
- Sally Ride
- John Glenn
- Michael Collins
- Alan Shepard
- Jim Lovell
- Valentina Tereshkova
- Scott Kelly
- Mae C. Jemison
- Kalpana Chawla
- Gus Grissom
- Eileen Collins
- Christa McAuliffe
- Ronald McNair

Possible sources for information:

- Nonfiction books
- Library research
- The Internet

Take notes and gather as much information as possible on the following five topics about your astronaut:

- Early Life/Childhood/Family
- Life as an astronaut
- Legacy
- Other fun facts

Once the information is gathered, work to create either an illustrated poster or booklet of the findings.

Women in Space

Are there female astronauts? When did they first join the space program? Are there any women in space now? Did any women walk on the moon? Why do you think men were in space before women?

In 2019, there was an all-female spacewalk. What makes this special? Who were the women? Did they dream of being an astronaut and work like the girl in the book? Can you write their stories?

There are three female astronauts whose portraits are hanging on the walls of Nanda's room in Small World. Why do you think Nanda has their pictures in her room? Can you identify them?

Learn about other female astronauts:
https://www.nasa.gov/education/womenstem/women-in-space

Gender Bias in Science

We hope students today realize that girls can do and be anything boys can. But bias still exists in the science, technology, engineering, and mathematics fields.

While we rarely recognize biases within our own thinking, this activity, adapted from www.smarttutor.com, will raise consciousness and spark discussion.

1. Ask children to draw a picture of an inventor or scientist. They may not ask any questions of you or any of their peers. They must simply draw the first inventor

or scientist that comes to their minds, with no talking or sharing.
2. Then, students should create a brief written description of who their person is and what their person does.
3. Ask them to share their drawings and descriptions with the class.
4. While students are sharing, chart the number of male and female inventors and scientists that students create on a graph. Do not reveal what you are doing to avoid skewing the results.

Discuss the results. Often children draw mostly male scientists or inventors in lab coats with chemicals or something of the sort. Share the graph with the students. Do the results show an internalized gender bias? Challenge the class to discuss where they feel this bias comes from and why it is harmful to society.

More Than Meets the Eye

Just like the Earth, we are all more than what we look like on the outside. At times we might look small, but there are worlds of adventures and dreams inside of us.

The Project:

- Have each student lay down on a large piece of paper while someone traces their body with a pencil.
- Once the student has the silhouette of their body, write words or draw pictures that describe who they are on the inside of the outline. Examples can be likes and dislikes, what they want to be when they grow up, what makes them smile, dreams they have, adventures they want to take, etc.
- Finished silhouettes can be displayed with the title "More Than Meets the Eye."