



BOOM! SNAP! WHIZ! ZAP!

# The MAGNIFICENT MAKERS



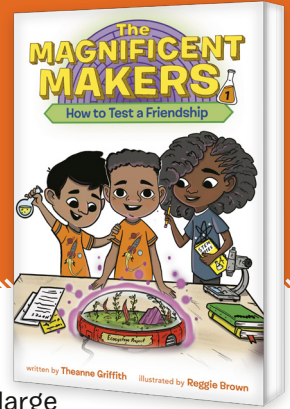
Series Educators' Guide  
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Discussion points, activities, and writing prompts for

# The Magnificent Makers: How to Test a Friendship



## 1. Get to know the characters in *Magnificent Makers #1: How to Test a Friendship*.

- Who is Pablo? Draw an outline of a human figure, which will represent Pablo, on a large piece of paper. Write any known details about Pablo inside the outline. Outside of the outline, write any questions about Pablo that you might have. Discuss them.
- Who is Violet? Draw an outline of a human figure, which will represent Violet, on a large piece of paper. Write any known details about Violet inside the outline. Outside of the outline, write any questions about Violet that you might have. Discuss them.
- Who is Deepak? Draw an outline of a human figure, which will represent Deepak, on a large piece of paper. Write any known details about Deepak inside the outline. Outside of the outline, write any questions about Deepak that you might have. Discuss them.

## 2. The Science Space at Newburg Elementary is super cool. It has plastic bins filled with safety goggles, magnifying glasses, magnets, and even two drones! But the Maker Maze is not your average makerspace. Describe the Maker Maze in your own words, using specifics from the book.

- Draw a picture showing a comparison between the two spaces.

## 3. Mr. Eng asks his class to make lists of living things that are producers, consumers, and decomposers in the town of Newburg. Make a list of producers, consumers, and decomposers in your local ecosystem.

- Once your list is complete, create a poster to illustrate the ecosystem.

## 4. Dr. Crisp invites the kids to suggest a topic to the golden Maker Maze book. Pablo suggests ecosystems, as that is what they were learning about in class. What topic would you like to explore in the Maker Maze?

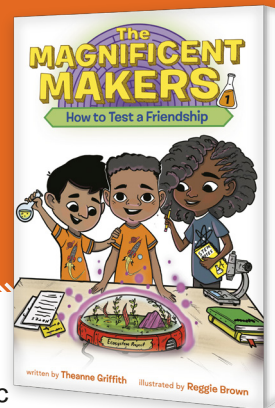
- Design a few challenges that you might face in your own Maker Maze based on your chosen topic.
- Then write a story about Pablo, Violet, and Deepak in your Maker Maze.





Discussion points, activities, and writing prompts for

# The Magnificent Makers: How to Test a Friendship



5. Each challenge within the Maker Maze requires that Pablo, Violet, and Deepak work as a team to complete it. How does the trio utilize teamwork in the maze? Use specific evidence from the book to support your answer.

- a. Teamwork is about working together and making use of each individual's strengths in order to accomplish a task. What would you say are Pablo's strengths? What about Violet? And Deepak?
- b. How did each character's strengths allow them to complete the challenges?

6. Pablo and Deepak are alike in some ways—for example, they are wearing the same T-shirt and sneakers. But they are different in a lot of other ways. Finding what you have in common with other people is a good way to start a meaningful relationship.

- a. Make a list of commonalities between Pablo and Deepak. Then make a list of differences. Are there more commonalities or differences? Do the differences mean they cannot be friends? Explain your answer.
- b. Think of one of your closest friends, and come up with a list of things in you have in common. Completely obvious answers such as “We both have hair” or “We are in the same grade” are not allowed!

7. Dr. Crisp says, “Friend groups are a lot like ecosystems.” Explain what you think she means in your own words. Use examples from the book and your own friendships to support your answer where applicable.

8. Mr. Eng says, “Science is fun, but it's also serious,” to which Pablo responds, “Science is seriously fun.” How do you feel about science? Do you think it is serious or fun? Support your answer with examples.

9. Pablo admits that he was not nice to Deepak at first because he was scared Deepak was going to replace him as Violet's best friend. Pablo was jealous. What does it mean to be jealous? How does Pablo express his jealousy? How does Pablo overcome his jealousy? Have you ever been jealous of someone else? How did you or could you overcome this jealousy?

10. Brainstorm together and create your own board game version of the Ecosystems Maker Maze in which players help Pablo, Violet, and Deepak complete each ecosystem challenge through board game elements (cards, pathways, challenges, dice, a timer, etc).

Guide prepared by Marcie Colleen.



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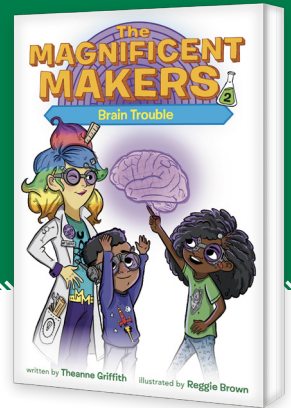


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Discussion points, activities, and writing prompts for

# The Magnificent Makers: Brain Trouble



**1.** Get to know the characters in *Magnificent Makers #2: Brain Trouble*. If you're new to the series, follow the instructions in c for both Pablo and Violet.



- a. Grab the outline of Pablo that you have been working on. What new things have you learned from this book? Have any of your questions been answered? Update your outline!
- b. Grab the outline of Violet that you have been working on. What new things have you learned from this book? Have any of your questions been answered? Update your outline!
- c. Who are Skylar and Devin? Draw two outlines of human figures, which will represent each twin, on a large piece of paper. Write any known details about Skylar and Devin inside the outlines. Outside of the outlines, write any questions about either of them that you might have. Discuss them.



**2.** Newburg Elementary is celebrating brain awareness week with a brain fair organized by the local college. The students were told that the brain fair would include lots of games and activities. Describe the brain fair in your own words, using specifics from the book.



- a. Draw a map of the gym during the brain fair. Be sure to incorporate the stations mentioned in the book, while also adding any stations you would include.



**3.** Violet and Pablo sit down at a station where a college student, Claire, is baking brains with Devin and Skylar. The kids learn about the three parts of the brain. What are the three parts, and what does each part do?



- a. Create a poster to illustrate the three parts of the brain. Make each part a different color and include information about what it does.



**4.** Create a papier-mâché thinking cap that you can actually wear!

- \* Start by creating a head shape from wire or a balloon, or use a bowl to build your cap around. Balling up some newspaper and covering it with masking tape will also work. Try to use something close to the size and shape of your head so you can wear your cap.
- \* Cut strips of newspaper. Mix papier-mâché paste (2 parts white glue to 1 part water). Coat the newspaper strips with the paste, and place them one by one on whatever you are using to form your cap.
- \* Let each newspaper layer dry before you add a new layer. Add enough layers to give you a strong structure. When the structure is dry, remove the underlying mold.
- \* You can then paint the thinking cap to show the different parts of the brain.



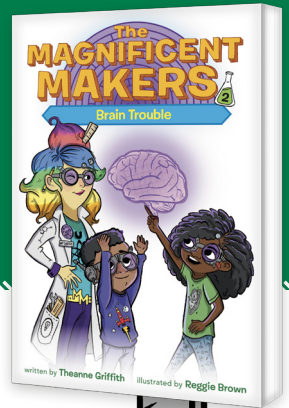
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Discussion points, activities, and writing prompts for

# The Magnificent Makers: Brain Trouble



**5.** The first challenge in the Maker Maze required the kids to match each hologram with the part of the brain that is used to complete the action. Describe each hologram in your own words and explain which part of the brain is being used.



- a.** Play your own Charades-like game. Mime an activity with gestures and facial expressions. Then have others try to guess which part of your brain you are using.
- b.** For an extra challenge, see if you can come up with actions that would use all three parts of the brain!



**6.** In order to complete each challenge successfully, the kids need to learn to work as a team. Did you know that your eyes and your brain work together as a team, too? What do the kids learn about their brains from the challenge with the bean bags and the prism goggles?

- a.** Experiment with how your eyes work with your brain by holding a small object in your hand. Cover one of your eyes. Place a target several feet away on the floor. Then, with one eye covered, attempt to toss the small object onto the target. Why is it so hard to judge depth and distance with only one eye?

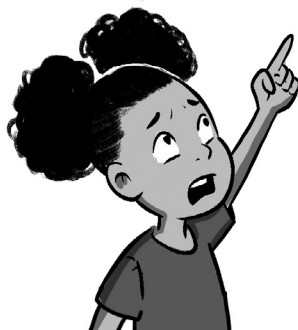


It's all about teamwork! We are created with two eyes so that our eyes can work as a team to see everything. Both eyes send information to the brain, and our brain compares the information to understand it. With only one eye, we don't have depth perception—it is very hard for us judge how close up or far away things are.



**7.** Violet admits that she treated Skylar differently because she is an artist. But in many ways, science and art are the same thing. They are both attempts to understand and describe the world around us. Choose one of the following forms of art, and create something to better help others understand our brains and how they work.

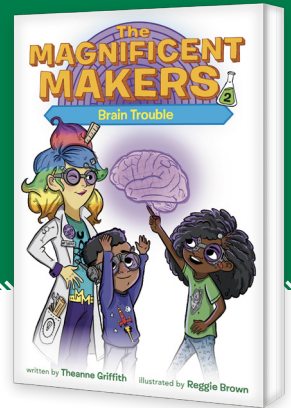
- a.** Photography
- b.** Collage
- c.** Dance
- d.** Song
- e.** Poetry





Discussion points, activities, and writing prompts for

# The Magnificent Makers: Brain Trouble



**8.** In the name that brain challenge, the kids needed to match each animal with its brain. Dr. Crisp says, “If you get stuck, think about what makes each animal special. What makes an animal special also makes their brain special.” How do the kids determine which brain belongs to which animal? Describe in your own words.

**a.** Using the information in chapter ten, design a made-up creature and its brain. Be sure to describe what makes your creature unique, and make sure that uniqueness is reflected in its brain.



**9.** Even though all human brains look the same, our life experiences and the things we learn help create new neural pathways in our brains that make them different. Neural pathways are like electrical wiring—connections are formed as you learn new knowledge and have new experiences. To illustrate this, try the following activity.

**a.** Draw ten dots down the left-hand side of a piece of paper. Then draw ten more dots down the right-hand side of the paper. These dots represent neurons. Assume that each neuron makes connections with the ten dots on the other side of the paper when new input is received.



**b.** Watch a video on YouTube about a science topic you would like to learn more about. Each time you hear new information, pause the video and connect the top left dot with a dot on the right while repeating the new information you just heard, creating a pathway. Once the left dot has connected with each of the right dots, move on to the next left dot.



**c.** Soon the web of pathways will become very complicated. But this is simplified; in actuality, each of your brain’s neurons may make *thousands* of connections with other neurons.

**10.** Brainstorm together and create your own board game version of the Brainsy Maker Maze in which players help Pablo, Violet, Skylar, and Devin complete each challenge through board game elements (cards, pathways, challenges, dice, a timer, etc.).



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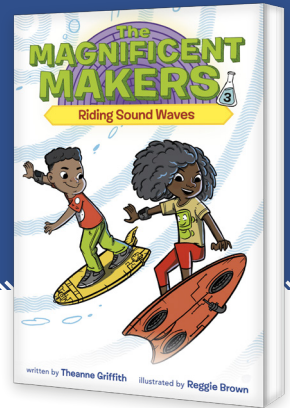
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Discussion points, activities, and writing prompts for

# The Magnificent Makers: Riding Sound Waves



1. Get to know the characters in *Magnificent Makers #3: Riding Sounds Waves*. If you're new to the series, follow the instructions in c for both Pablo and Violet.

- Grab the outline of Pablo that you have been working on. What new things have you learned from this book? Have any of your questions been answered? Update your outline!
- Grab the outline of Violet that you have been working on. What new things have you learned from this book? Have any of your questions been answered? Update your outline!
- Who is Henry? Draw an outline of a human figure, which will represent Henry, on a large piece of paper. Write any known details about Henry inside the outline. Outside of the outline, write any questions about Henry that you might have. Discuss them.

2. Mr. Eng's class is on a field trip to the City Science Museum. The students are directed to the Kids' Corner. Describe the senses exhibit in your own words, using specifics from the book.

- Many cities have science museums. Find the website for a science museum in your state. What exhibits are currently on display? Can you visit them, virtually or otherwise?
- Create a brochure for your own science museum, highlighting all the exhibits you would include. Be sure to incorporate descriptions of each exhibit and a museum map.

3. Cooking and baking use science and math and our sense of taste to create delicious things. Can you solve this tricky recipe riddle? You will need: ziplock bags, lemons, water, sugar, straws, a juicer (or way to squeeze the lemons), a measuring cup with multiple measurements on it, a knife, and a teaspoon. Ask students to predict which of the following numbers go in each blank: 1,  $\frac{1}{4}$ , and  $\frac{1}{2}$ .

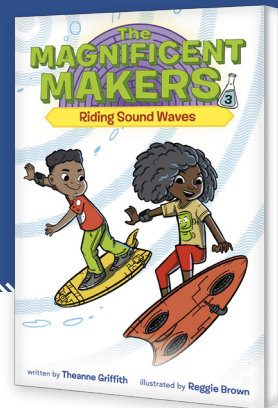
- In the ziplock bag, place the juice of \_\_\_ lemon, \_\_\_ cup of water, and \_\_\_ teaspoon of sugar.
- Zip the bag securely and gently mix the contents for about thirty seconds.
- Open a small section of the top of the bag and insert the straw. Taste the lemonade.
- How does the lemonade taste? Need more lemon? More water? More sugar? Try the recipe again, this time switching the numbers until your desired taste is achieved.





Discussion points, activities, and writing prompts for

# The Magnificent Makers: Riding Sound Waves



4. Just like Pablo, Violet, and Henry, you can experiment with your sense of smell. Plan a Nose Knows field trip. Write down all the smells you find.



- Collect items that have a fragrance (two of each) and place them in opaque containers. Poke holes into the top of the containers and mix them up. Try to match the containers that have the same item.
- Noses and brains are supposed to help you find foods that are good to eat. Collect at least ten different items that smell—some should be things that are edible, such as cheese, curry powder, spices, mushrooms, and fruits, and some items that are inedible. See if you can pick out things that can be eaten and those that can't. Suggested scents: lemon, orange peel, cedarwood, perfume-soaked cotton, banana, pine needles, chocolate, coffee, dirt, vanilla, garlic, onion, mint, vinegar, moth balls, rose flowers, sawdust, ginger, peppermint, pencil shavings, and potato chips.



5. Violet, Pablo, and Henry's first Maker Maze challenge is all about the sense of touch. Dr. Crisp explains that they must each reach into a box of goodies and grab an object. Then, using their sense of touch, they must guess what the object is. What objects do Violet, Pablo, and Henry take out of the box?



- Make your own sensory challenge by decorating an empty shoe box and cutting a hole in one of the ends. Attach a sock (with the sealed end cut off) to the hole so the rest of the sock serves as a tube into the box. Place various items, one at a time, into the box (for example, LEGO brick, pinecone, Play-Doh, feather, etc.). These should be very tactile items. Although you might be able to identify the object, try to describe it using adjectives (hard, soft, squishy, bumpy, etc.) so that others might be able to help you guess.
- Try the challenge again, this time wearing mittens. How does the experience change? Is it more difficult or easier? Why?



6. With a piece of paper and a pen, sit quietly for five minutes, writing down all the different sounds you hear. For example, a lawn mower outside, birds chirping, doors closing, voices in the hallway, coughing, etc.

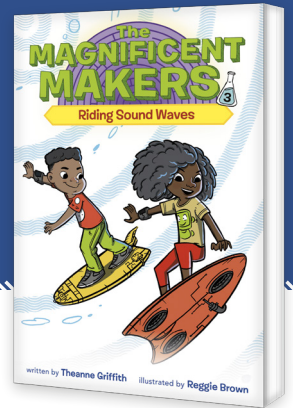


- Then listen for sounds for another five minutes, this time taking note of how loud or quiet the individual sounds are using a scale of one to five—one being the quietest and five being the loudest. How many different sounds did you hear? What rating did you give them on the volume scale?
- What factors play into how loudly we hear sounds? Does it matter if they are far away? What about if we hear lots of sounds at once? What else affects our hearing?
- Our sensitivities may make us experience noise and other stimuli differently from someone else. But our differences make us special. Who is more sensitive to noise, Violet, Pablo, or Henry? Explain your answer using evidence from the book.



Discussion points, activities, and writing prompts for

# The Magnificent Makers: Riding Sound Waves



7. Experiment with sound waves by making an ear trumpet. Take a piece of paper and roll it into a cone. Place the small end of the cone up to your ear. Be careful not to poke your ear. Listen to a distant sound. Is the sound louder or quieter with the ear trumpet? Why? The ear trumpet gathers sound waves and funnels them into your ear, and because the funnel is bigger than your ear, it gathers more waves.

a. Now, thinking about this idea of sound waves, experiment with ways to make loud noises quieter.

8. How does turning on sensory mode make the Maker Maze more welcoming for Henry?

a. How can you be more welcoming to those who have sensory differences from you?

9. Our eyes benefit from working together. For this activity, you will need an eye patch (optional), a penny, and a cup.

a. Place the cup on the floor in front of you. Then, while wearing the eye patch or closing one eye, hold your arm out straight with the penny in your fingers. Slowly move your hand above the cup, and try to drop the penny in. It's harder than it looks!

b. Try dropping the penny in the cup without the eye patch. Is this easier or more difficult? Explain.

c. What do Violet, Pablo, and Henry learn about the sense of sight? How can you support this with your own findings?

10. Brainstorm together and create your own board game version of the Five Senses Maker Maze, in which players help Pablo, Violet, and Henry complete each challenge through board game elements (cards, pathways, challenges, dice, a timer, etc.).



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Discussion points, activities, and writing prompts for

# The Magnificent Makers: The Great Germ Hunt



1. Get to know the characters in *Magnificent Makers #4: The Great Germ Hunt*.

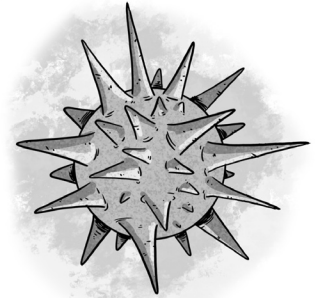
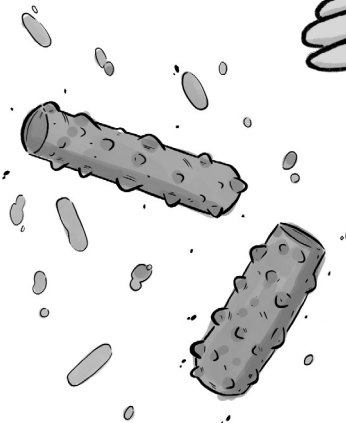
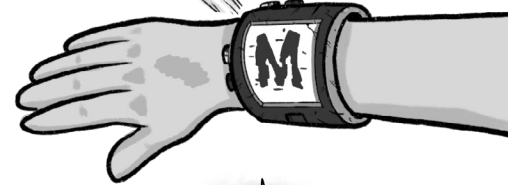


- a. Who is Pablo? Draw an outline of a human figure, which will represent Pablo, on a large piece of paper. Write any known details about Pablo inside the outline. Outside the outline, write any questions about Pablo that you might have. Repeat these steps for Violet and Aria.

2. Mr. Eng teaches the class about the different kinds of germs, bacteria, viruses, and fungi. Create a poster to illustrate their differences.



3. Aria keeps asking Violet whether she still has the flu. But Violet insists that she has allergies. What are Violet's symptoms? Do online research to determine some common allergies. What is causing Violet's allergic reaction? Are allergies contagious? Why or why not?



4. Why does Aria have to be extra careful not to get sick?

- a. What are some precautions Violet can take to make sure she doesn't pass her illness to someone else, like Aria?



5. The second challenge in the Maker Maze requires Pablo, Violet, and Aria to learn about what three types of viruses?

- a. How does each type of virus affect humans?
- b. Why does hologram Pablo not get sick from the influenza virus?





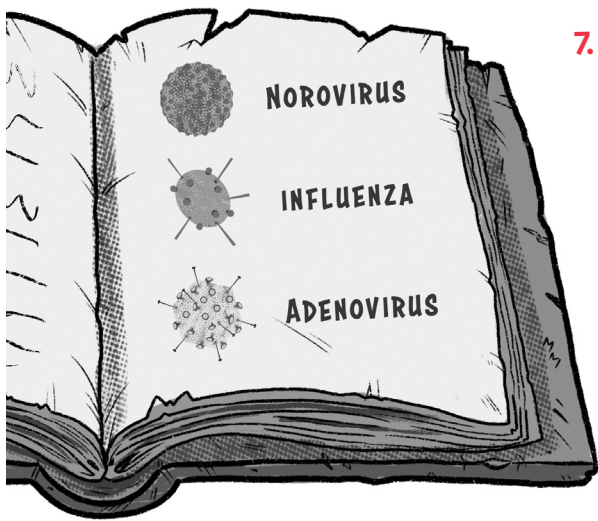
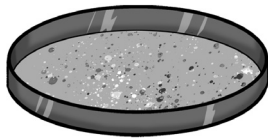


Discussion points, activities, and writing prompts for

# The Magnificent Makers: The Great Germ Hunt



## AGAR



6. *The Magnificent Makers: The Great Germ Hunt* is filled with lots of germ-related vocabulary. Make a list of all the new words you do not know. Create a flash card for each of the vocabulary words. Include a drawing to help you remember the word and its definition.

7. The third challenge in the Maker Maze asks Pablo, Violet, and Aria to cough into a petri dish without getting germs on it. What are the first, second and third strategies they try? What are the results of each strategy?

- a. What strategy yields no germs on the petri dish? What does this tell you about how to prevent spreading illness when you are sick?
- b. Create an illustrated pamphlet to teach others best practices to stop the spread of germs, based on the Maker Maze petri dish experiment. Hand out the pamphlet to people in your family, neighborhood, and school community.

8. Mr. Eng says, “Some germs are icky and can make us sick. But did you know there are a lot of good germs, too?” Use the internet to research good germs and their benefits.

- a. At the end of the book, Mr. Eng tells the class they are going to be looking at bacteria from different kinds of yogurt. If yogurt contains bacteria, why do we eat it?





Discussion points, activities, and writing prompts for

# The Magnificent Makers: The Great Germ Hunt



9. “Of course, real germs are so small that they can be seen only with a microscope. However, germs are like glitter—there are a lot of them, they spread easily, and it takes proper hand washing to get rid of them,” says the Centers for Disease Control and Prevention. Demonstrate how germs spread with this glitter experiment.



- \* Place a drop of unscented lotion into your hand and rub your hands together to spread the lotion evenly.
- \* With hands held over the trash can, place a pinch of glitter in the palm of one hand.
- \* Make a fist and then spread your fingers out. What do you notice about the glitter?
- \* Rub your hands together and then touch a nearby surface or another person’s hand. What do you notice?
- \* Wipe your hands clean with a paper towel. Did it get all the glitter? Or does some remain?
- \* Lastly, wash your hands with soap and water. Did all the glitter come off?

How easy was it to pass the glitter from your hand to someone else’s hand or to a surface?

10. If one person spreads their germs to two people who each spread their germs to two people and so forth, how quickly would the germs spread to 10 people? 100 people? 1000 people?

- a. Create a diagram that shows the spread starting with one person and ending with 100 people.

11. Create your own board game version of the Germs Maker Maze in which players help Pablo, Violet, and Aria complete each germ challenge. You can use anything you’d like, including cards, pathways, challenges, dice, or a timer!

Guide prepared by Marcie Colleen.



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Discussion points, activities, and writing prompts for

# The Magnificent Makers: Race Through Space



1. Get to know the characters in *The Magnificent Makers #5: Race Through Space*.



- a. Who is Pablo? Draw an outline of a human figure, which will represent Pablo, on a large piece of paper. Write any known details about Pablo inside the outline. Outside the outline, discuss and write any questions about Pablo that you might have. Repeat the steps for Violet and Deepak.



2. Why are the students of Newburg Elementary out in the center of the Newburg Meadow?

- a. Imagine that you are Mr. Eng and create a flyer about this field trip to tell students and families what to expect. Be sure to use specifics from the book where applicable.



3. According to Pablo, what is a meteor shower?

- a. Go to YouTube and search for videos of meteor showers to see one for yourself. How would you describe a meteor shower to someone who has never seen one?
- b. Search online for when the next meteor shower will be visible from your town. Be sure to note the best days and times to view the most activity. Maybe you could plan your own field trip.



4. Find a map of our solar system online. Create your own a diagram of our solar system, including all the objects listed in “A Space Case: Name That Object” on page 10.

- a. Can you name all eight planets in our solar system?
- b. For their third challenge, the kids travel to three different planets. They must then guess which planets they are observing. Create a list of observations the kids make while visiting each planet.

c. Draw a picture of each planet, based on the description in the book. Label your drawing.

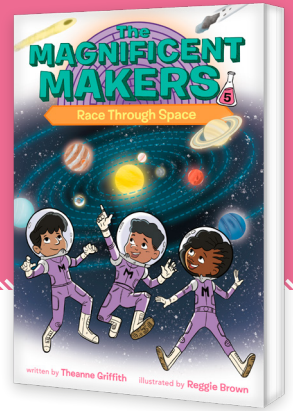
d. Imagine that you are in the Maker Maze, and you visit the additional five planets in the solar system. Research the remaining planets. Create a list of observations you might make while visiting each planet and draw a picture to accompany your observations.





Discussion points, activities, and writing prompts for

# The Magnificent Makers: Race Through Space



5. In the Maker Maze, the kids and Dr. Crisp travel via wormholes. What are wormholes? Do wormholes really exist? Do some research to find out.



6. Why does Pablo feel disappointed in himself while in the Maker Maze? What hurtful words did Pablo's cousins say to him about being an astronaut? Why does the comment from his cousins bother Pablo so much? What does Dr. Crisp say that makes Pablo feel better?

7. What scary fact about black holes does Pablo share with Violet at the beginning of chapter one? What do black holes do to dark energy?



a. Dr. Crisp uses a sheet, a large black ball, and marbles to demonstrate how black holes and dark energy interact. What does each item represent, and what do the kids learn about how dark energy, black holes, and space objects interact?

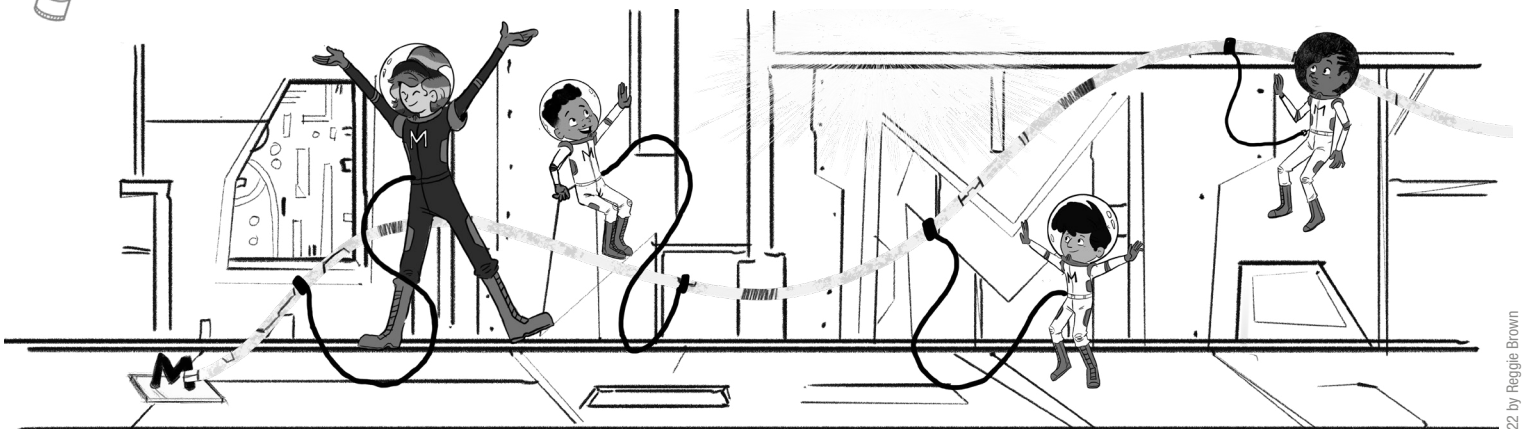
8. Create your own board game version of the Maker Maze in which players help Pablo, Violet, and Deepak travel through the space challenges using board game elements (cards, pathways, challenges, dice, a timer, etc.).



9. Dr. Crisp invites the kids to suggest a topic to the golden Maker Manual. Pablo suggests space because they were just about to watch a meteor shower. What topic would you like to explore in the Maker Maze?

a. Based on your topic, design a few challenges that you might face in your own Maker Maze.

b. Write a story about Pablo, Violet, and Deepak in your newly designed Maker Maze.



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