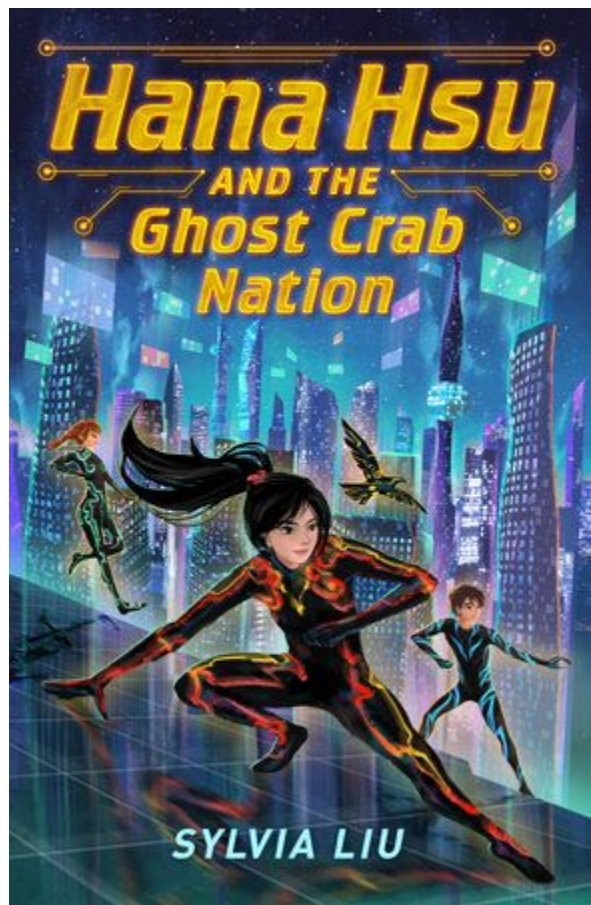


Hana Hsu and the Ghost Crab Nation: Curriculum Guide



Hana Hsu can't wait to be meshed.

If she can beat out half her classmates at Start-Up, a tech school for the city's most talented twelve-year-olds, she'll be meshed to the multiweb through a neural implant like her mom and sister. But the competition is fierce, and when her passion for tinkering with bots gets her mixed up with dangerous junkyard rebels, she knows her future in the program is at risk.

Even scarier, she starts to notice that something's not right at Start-Up—some of her friends are getting sick, and no matter what she does, her tech never seems to work right. With an ominous warning from her grandmother about being meshed, Hana begins to wonder if getting the implant early is really a good idea.

Desperate to figure out what's going on, Hana and her friends find themselves spying on one of the most powerful corporations in the country—and the answers about the mystery at Start-Up could be closer to home than Hana's willing to accept. Will she be able to save her friends—and herself—from a conspiracy that threatens everything she knows?

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Grade (8-12) | ISBN 9780593350393

In this guide you will find STEM focused projects, discussion questions, and creative writing tie-ins to use with *Hana Hsu and the Ghost Crab Nation*. This guide will help educators pull the story into multiple subjects, making it a perfect story to use for read alouds, independent reading, and book clubs! In addition, this guide provides extension questions and projects suitable for older grades (up to 8th grade).

About the Author

Sylvia Liu grew up with books and daydreams in Caracas, Venezuela. Once an environmental attorney protecting the oceans, she now spins stories for children, inspired by high tech, ghost crabs, and strong girls. Sylvia lives in Virginia with her family and a very fluffy cat. Find Sylvia on Twitter @artsylliu or visit her website: enjoyingplanetearth.com

About this guide

This guide was created by Michelle Mohrweis, a STEM teacher and writer for middle school students. Check out more of her work at: michellemohrweis.com

Before You Read:

1. Take a look at the cover for *Hana Hsu and the Ghost Crab Nation*. Based on the cover, what do you think the story is about? What evidence supports your theory?
2. What kind of person do you think Hana will be based on the cover?
3. What genre do you think this story will be? What evidence in the cover supports your theory?
4. Read the book description. What is it Hana wants?
5. What challenges do you think Hana will face based on the book description?
6. What questions do you have about the story based on the cover and description?
7. A good description/blurb will tell a little about a story, and make a reader want to find out more. How does this blurb hook readers in and get them interested in reading more?

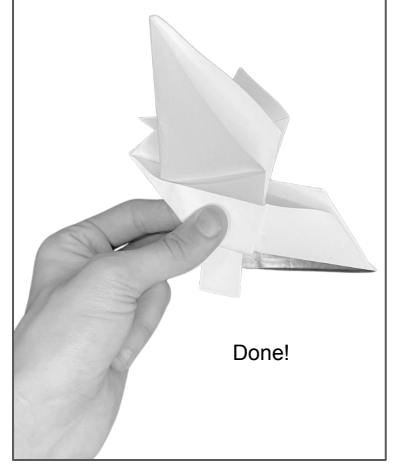
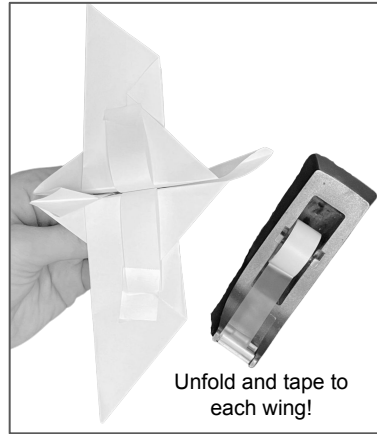
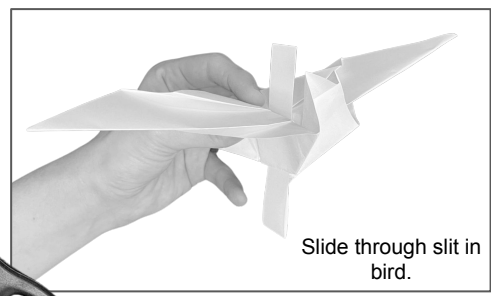
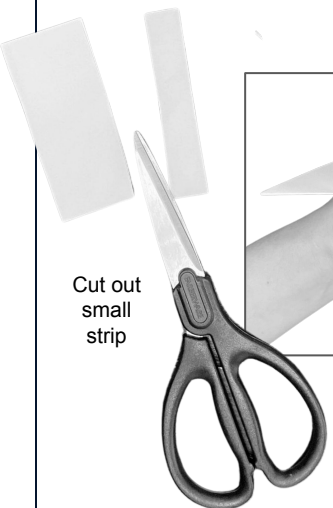
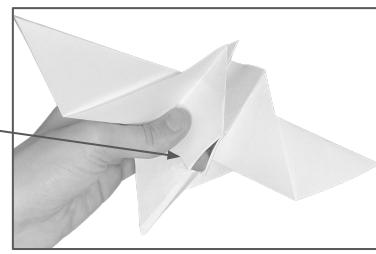
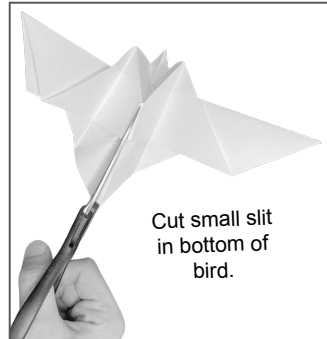
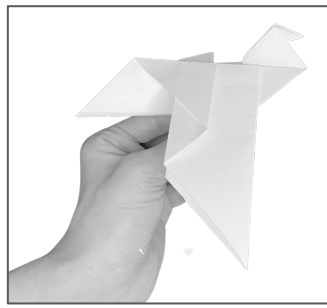
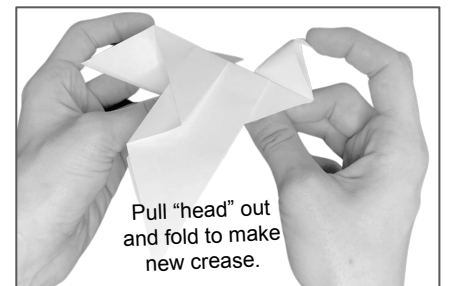
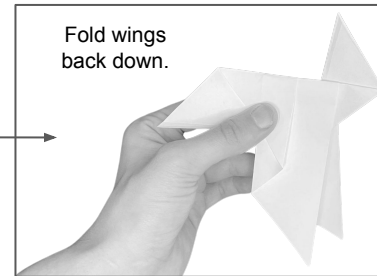
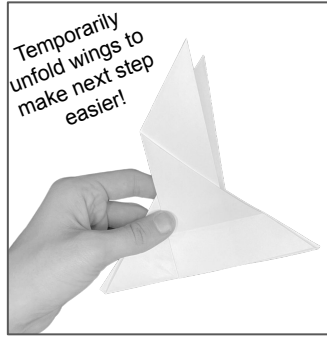
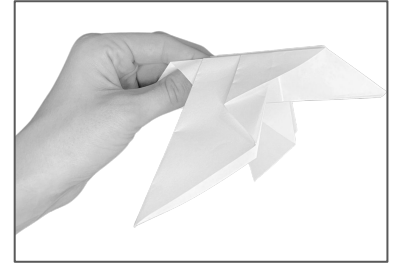
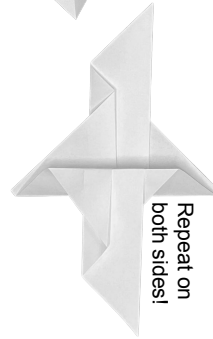
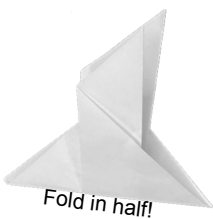
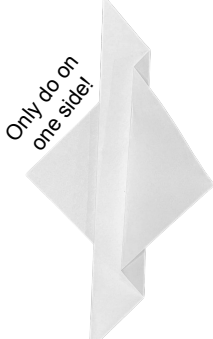
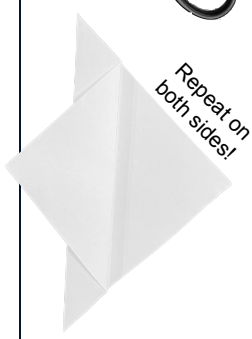
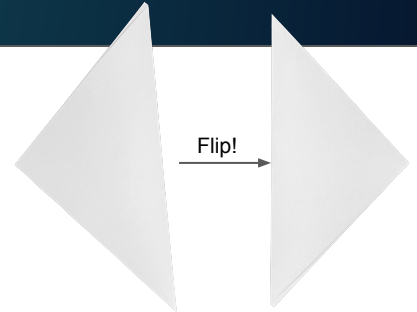
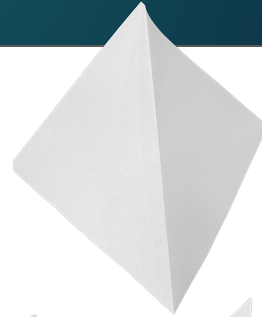
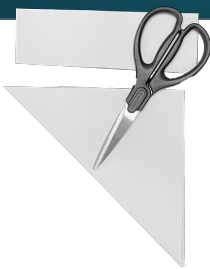
Chapters 1 - 3

STEM Project: Moving Parts

In the story, Hana makes beautiful mechanical creatures that can fly. To do this, she must create mechanisms that move in complex ways. In this project, you will build your own mechanism using paper and the provided directions. This will let you experience the challenges Hana faces when building her own mechanical creatures.



The Flying Bird



Project Discussion:

1. What was challenging about this project?
2. What was easy?
3. In the story, Hana builds complex **automatons** that can fly and have hidden compartments. Based on your own experience, what sort of challenges might Hana face when building her creatures?

Automaton: A self operating machine, designed to give the illusion of moving under its own power. These were elaborate mechanisms, much like a windup toy. In ancient China, automations have been recorded as existing as far back as 1000 BCE!

Project Extensions:

- Direction Time! Picture directions are great, but how would you explain this in words? Write out a series of directions for building the paper bird. Be sure to use transition words like first, next, and last. **Recommended for grades 5 and below.**
- Design your own! Now that you've built the paper bird, it's time to engineer your own paper mechanism. Work on your own or with a group to design a paper animal with a moving part. Not sure where to start? Research existing designs (there's many origami animals you can try for inspiration) and think how you can modify an existing design to have a moving part. **Recommended for grades 6 and above.**
- Writing practice! Hana makes her creatures from all sorts of recycled items and junk. If you were to make any creature, what would you design? What materials would you use? Where would you send it? Write a story about building your own automaton.

Discussion Questions:

1. At the beginning of the story, Hana is looking for the perfect item to add to her mechanical bird. She spots the watch and thinks it will work, but a scavenger kid grabs it first. Why does Hana want the watch so badly?
2. Why do you think the JingZa were after the junkyard kids?
3. What do you think the scroll is for?
4. When Hana speaks to Popo, she wishes Popo had gotten meshed. Why does she feel this way?
5. Do you think Hana is jealous of her sister? Why or why not?
6. Why does Hana want to go to Start-Up school and get meshed?
7. What happened to Hana's Ba?

Chapters 4 - 7

Discussion Questions:

1. Why does Hana and her family get invited to the Enmeshment Day Ceremony every year?
2. Do you think getting to see it happen every year before her own Enmeshment Day could help Hana feel more prepared than other kids? Why or why not?
3. What are some of the benefits of being meshed in the story?
4. When watching Lin do the test, Hana gets overwhelmed and switches away to another student's perspective. Why does Hana do this?
5. Why do you think Hana was able to communicate with Lin, even though the test wasn't supposed to allow that?
6. During the celebration after the Enmeshment Ceremony, Popo gives Hana a strange warning. What do you think Popo is warning Hana about?
7. In the story, Popo tells Hana about how she loved Chinese food but hid her love of it to try and fit in at school. Have you ever hid part of yourself to try and fit in and be accepted? How did it make you feel?
8. Why does Hana return to the junkyard?
9. Why do you think Tish took the bird bot?

Extension Questions:

1. Do you think social media has been helpful or harmful to society?
2. At the beginning of the story, we see corporations with a lot of control over Hana's world. In what ways do corporations exert control in our current times?

Corporation: A business entity that is considered separate from its owners. This means that while somebody might have started it, and it's owned by many shareholders, it's run by a board of directors who make all the decisions for the company.

Art Project!



In the story we learn there are advertisements customized to those who are meshed. What would an advertisement aimed at you look like? Think about some future technology you would love to have, and draw an advertisement for it!

Chapters 8 - 11

STEM Project: Creating Movement

In the story, Hana's automatons are able to move and fly. But how do you make a machine move without electronics and motors? It's all in the **mechanisms** you build! Follow the steps to build a simple automaton car, then try changing it up to make your own design.

Supplies Needed:

Popsicle sticks

Rubberbands

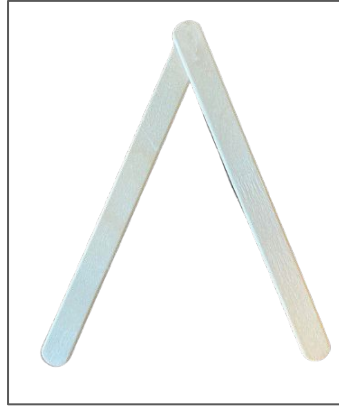
Pencils

Toothpick

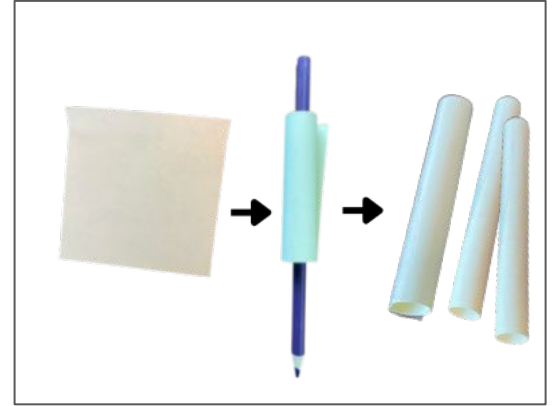
Glue

Sticky Notes

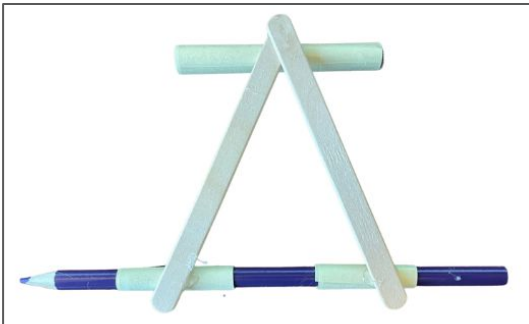
Tape



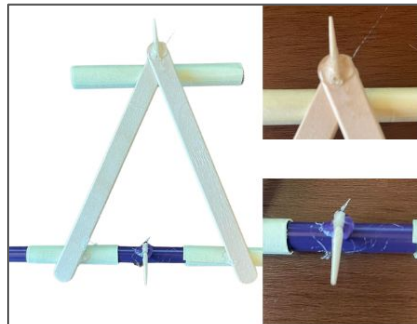
Step 1: Glue two popsicle sticks together to form an upside down V.



Step 2: Use a pencil to roll sticky notes into small tubes. Use tape to stop them from unrolling.



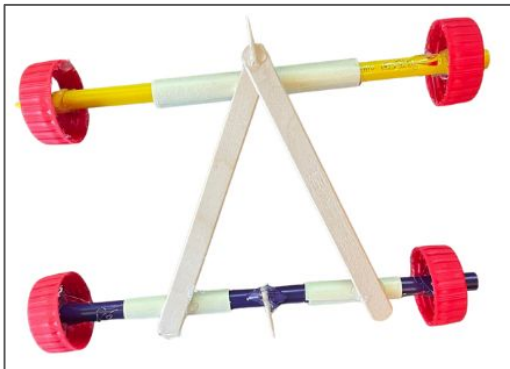
Step 3: Glue the sticky notes to the front and back of the frame. Make sure that a pencil can spin freely when stuck through them!



Step 4: Break the ends off a toothpick and glue them to the front and back of your automaton. The back one should be on the back pencil!



Step 5: Poke or drill holes in 4 bottle caps.



Step 6: Put a pencil through the front sticky note tube, then attach your wheels to the front and back pencils.



Step 7: Hook a rubberband onto the toothpicks. Wind it up, and watch your automaton roll! How fast can it go?



Project Discussion:

1. What happens if you change the shape of the automaton's frame?
2. What happens if you use more rubberbands?
3. Now that you've made your own object that moves, what sort of things do you think Hana must consider in order to create an automaton that can fly? What kind of mechanisms would she need inside the automaton?

Mechanism: A mechanism is a system of parts working together in a machine. In your rolling automatons, you built a mechanism with a rubberband and pencil. By winding up your mechanism, you created stored energy and tension, and when you released it, that powered the mechanism and made the wheels spin.

Discussion Questions:

1. When Hana meets Wayman, she notices that he looks vaguely familiar. Do you have any theories for why? Where do you think she might have seen him before?
2. How do you think Hana feels about how her automatons have been landing in the junkyard? How do you think the junkyard kids might feel when they find the automatons?
3. How is the mesh system different for kids in the junkyard compared to kids like Hana?
4. What makes the historic mall so different than other places?
5. When Hana gets to Start-Up, some kids play *Way of the Warlords* while others play old school games. If Chuck is right and Start-Up is watching to see what they do, what do you think they are looking for?
6. Do you think Chuck and Christa's parents really forgot to keep their nano pills up to date? If not, why would Start-Up tell them that?
7. Would you want a feed that could give you information like the one Hana wears? Why or why not?
8. Why does Hana want to be at the top of the class?

Extension Questions:

1. Hana learns that kids in the junkyard don't get the same mesh tech as Start-Up students. How does different access to tech affect someone's ability to advance in society?
2. Hana, Chuck, and Tomás tell each others' fortunes using I Ching coins. Why do you think people like to believe in things like horoscopes or fortune-telling?

Chapters 12 - 15

Discussion Questions:

1. What does Hana's avatar look like in *Way of the Warlords*?
2. What boost does Hana select during the test?
3. Why do you think Hana makes the bots in *Way of the Warlords* in addition to making them in the real world?
4. What does Ink want from Hana when he meets Hana in the virtual workshop?
5. Why did Hana lose points in the first challenge?
6. Why does the Dowsanto company use cyber bees?
7. Why does Ma not like that Chuck's parents work at Nile?
8. Why does Hana want to stay in Start-Up so bad? How does the dinner with Ma and Lin reinforce that want?

Extension Questions:

1. If people could add artificial intelligence to their brains, what do you think are some of the benefits and drawbacks?
2. Hana has heard several times that "not everything is as it seems." Are there examples in current events that support this statement? How can people learn to tell the difference between conspiracy theories/fake news and real coverups/problems?



Art Project!

What would your avatar look like in *Way of The Warlords*? Think about the things that are important to you, the things that make you who you are. How could you include those in a *Way of The Warlords* avatar? Draw or paint a picture showing what your avatar would look like.

Avatar: An image or figure representing a specific user in video games, on forums, etc. This word didn't always have this meaning, however. In many religions, an avatar is a physical form of a deity, and the word once was used for that. Then in 1985 the word "avatar" was first used to refer to a picture representing a user online, giving it a second meaning.

Chapters 16 - 19

Discussion Questions:

1. Who does Hana work with for the second test? Why does Hana work with them?
2. What happens to Hana's boost during the test?
3. Why do you think the kids are so worn out after their test?
4. What happened to Christa after the test?
5. What are some of the things that Hana, Chuck, and Tomás think are strange?
6. Why doesn't Tomás like Ink?
7. What does Hana trade for the bluejay bot?
8. What do you think the code on the scroll is for?



Art Project!

Hana makes her automatons using items from around the junkyard. Can you make something using old items and trash? Think of your favorite animal, then try to create a model of it using just recycled supplies! Any old item (empty boxes, toilet paper rolls, etc) can be used for this project!

Chapters 20 - 23

Discussion Questions:

1. How are the Bottoms different than the area where Hana lives?
2. How is Ink's technology different than the normal headsets?
3. Hana's virtual space in her workshop, while Ink's is a beach. What would your virtual space look like?
4. Why do you think I Ching wants the genetic code on the scroll?
5. What is the Ghost Crab Nation fighting for?
6. Why does Hana feel like she can't confide in Lin?
7. According to Wayman, how will qigong help Hana?
8. Where does Ink take Hana and Chuck after they are done practicing qigong? What do they do in that place?

Chapters 24 - 27

Challenge Time: Logic Puzzles

Just like Hana has to solve a challenge during her test, students can solve these challenges to test their critical thinking and logic skills. After attempting the challenges, see the answers on the next page!

QUESTION 1: A mother and her daughter are named Lisa and Kara, but you don't know who's who. The mother says, "My name is Lisa," and the daughter says, "I'm Kara!" If at least one of them is lying, what's the mother's name?

QUESTION 2: There are two doors. One opens to a fire-breathing dragon that will roast you to a crisp and the other is a cute bunny rabbit. Two guards know which is the safe door. One guard only tells the truth, and the other one only tells lies. What is one question you can ask either guard and know the right answer?

QUESTION 3: Jamal tells the truth on Mondays, Thursdays, and Saturdays, but lies on all the other days of the week.

One day he said, “I will tell the truth tomorrow.”

On which day of the week did he make this statement?

Make it Virtual Reality!

Want to make a VR version of the challenges for your students to try? Follow these steps!

Step 1: Download the Street View app.

Step 2: Decorate up two file folders (or a testing privacy folder) to make them look like walls. The more elaborate you make them, the better the immersion. You're building a small set where you will take a 360 degree photo.

Step 3: Cut out the logic puzzles and hang them from the file folder “walls”.

Step 4: Open Street View and take a 360 degree photo of the set you made.

Step 5: Share the link with your students. Now they can look around at the riddles in VR using their phones to view the 360 degree photos!



Did your students enjoy this? Have them make their own logic challenges, build a set, and take 360 degree photos to share with their classmates!

Answers -> Riddle 1: Mother's name is Kara; they both are lying ~ Riddle 2: "Which door will the other guard tell me is safe?" Either guard will answer the unsafe option, so you will know which one is safe ~ Riddle 3: Tuesday

Discussion Questions:

1. What was Hana's plan for when at I Ching?
2. In Hana's world, advertisements are everywhere, especially in places like I Ching. How is this different than in our lives? How is it similar?
3. Why does Hana's mom go to the analog workout room to meet Tomás's dad?
4. Do you think Hana's mom is part of a conspiracy? What other explanations can you think of?
5. When Popo says "It's hard to live in a chaotic world when you're a linear person," what do you think she means?
6. Where did Ma hide the flick drive?
7. How does Tomás copy the data from the drive?
8. Why is Chuck worried about working with Hana on the third test?

Extension Questions:

1. The corporations in Hana's world collect a lot of information from their online activities. In what ways do corporations or other entities use the information they collect in your life?
2. Sprinkled throughout the story are news articles set in 2053. Write your own news story from 2053 that might fit in well in Hana's world.

Chapters 28 - 31

Discussion Questions:

1. What is a hacker pocket?
2. What do you think the energy drink they are given at school does?
3. Why does Hana think Chuck's name is on the secret list?
4. What happens to their scores while the Start-Up teachers investigate what they were doing while in Ink's secret space?
5. Why does Chuck want to switch to another team for the challenges?
6. Why did Popo choose to not get meshed?
7. Why does Chuck want to do so well at Start Up?
8. Why do Hana and Check hide their wristbands in the cooler?
9. What happens with the mice in the maze when they are given the serum?

STEM Project: 3D Designed Secrets!

In the story, Hana's automatons have hidden compartments for notes or other items (like the scroll). In this project, you'll design your own object with a hidden compartment... using 3D design! Can you create a model automaton with a hidden compartment?

Step 1: The Software

There's many options for CAD design, but if you've never tried it before, we recommend TinkerCAD. Head on over to tinkercad.com and create an account.



CAD Software: CAD stands for Computer Aided Design, and is any software that can be used to create 3D models with the help of a computer. There's many great CAD programs out there, both free and paid. Below are some popular CAD options that are free or have free versions:

SketchUp Free

Blender

TinkerCAD

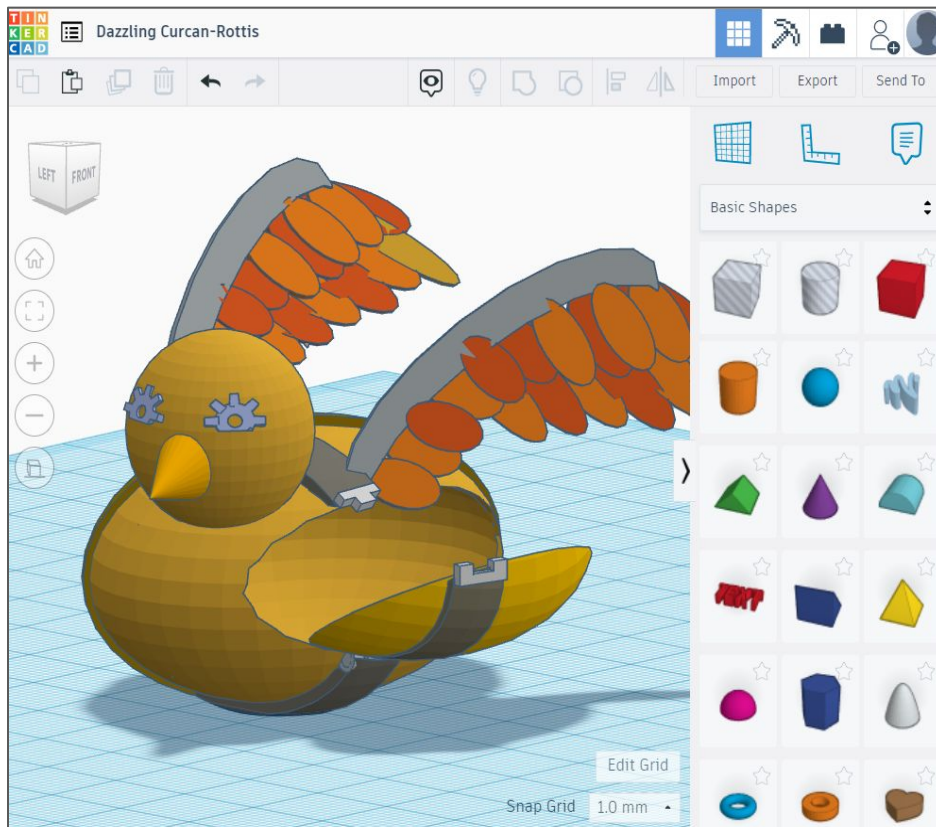
Step 2: Learn the Moves

Before you can make your automaton, you need to know how to use TinkerCAD. Click on the **Learn** option at the top of the screen. This will take you to several great tutorials to try.



Step 3: Plan your design

Think about what you want your automaton to look like. What animal will it be inspired by? Once you have an idea, sketch it out. Don't forget to think about where the hidden compartment will be!



Step 4: Design Time

Use the new skills you've learned to design your automaton. Think about the following:

- Where is the hidden compartment?
- Can you 3D model hinges or other small parts to make it look more realistic?
- How can you make your automaton look mechanical even while having the shape of an animal?
- How can you use color to enhance your design?

Step 5: Present your design

Show your design to your class, reading group, or friends. As you present, think about anything cool you can share. Why did you pick that animal? Did you do anything special with your design?

Chapters 32 - 35

Discussion Questions:

1. How did the JingZa find Hana and her friends?
2. What does Wayman do to help them escape in the cruiser?
3. Why do you think Tomás can already fly the cruiser?
4. Where do the kids go after they escape? Why do they go there?
5. Why does Hana go to the historic mall to meet Lin?
6. In chapter 35, Hana learns her mom is part of the conspiracy. Why do you think Ma is willing to experiment on the Start-Up kids? Is she an evil scientist like Hana fears?
7. How did Start-Up use the games on the first day to decide which kids to pick?
8. What would you do if you learned one of the people you trusted was part of a conspiracy, like Hana learns with Ma?

Chapters 36 - 39

Discussion Questions:

1. Why can't Hana escape when the JingZa catch them spying on Ma?
2. Why is Ma experimenting on the Start-Up kids?
3. What is Wayman's plan for helping the kids who are experimented on?
4. Who is the man in the photo that Hana sees in her Dad's video?
5. Why is Hana upset when she learns who Wayman is?

Extension Questions:

1. Both Ma and Wayman argued their philosophical reasons for supporting or opposing linking brains to the multiweb. Which side is more persuasive to you?
2. What do you think? Would you support or oppose that technology?
3. Can you think of other arguments Ma and Wayman didn't make?

Chapters 40 - 43

STEM Project: Flying Automaton!

Many of Hana's automatons in the story can fly... but just how do you create a flying creature anyways? In this project, you'll use rubberbands and propellers to create an automaton of your own and send it sailing through the air!



Supplies Needed:

Paperclip

Index Card

Popsicle Stick

Scissors

Rubberband

6 inch Hook Nose
Propellor*

How to build:

Step 1: Bend a paperclip into the shape of a V.

Step 2: Tape the paperclip to the bottom of your popsicle stick. Make sure one side sticks out! This will make a hook for the rubberbands!

Step 3: Stick your hook nose propellor onto the top of the popsicle stick! It should be on the opposite side as the paperclip!

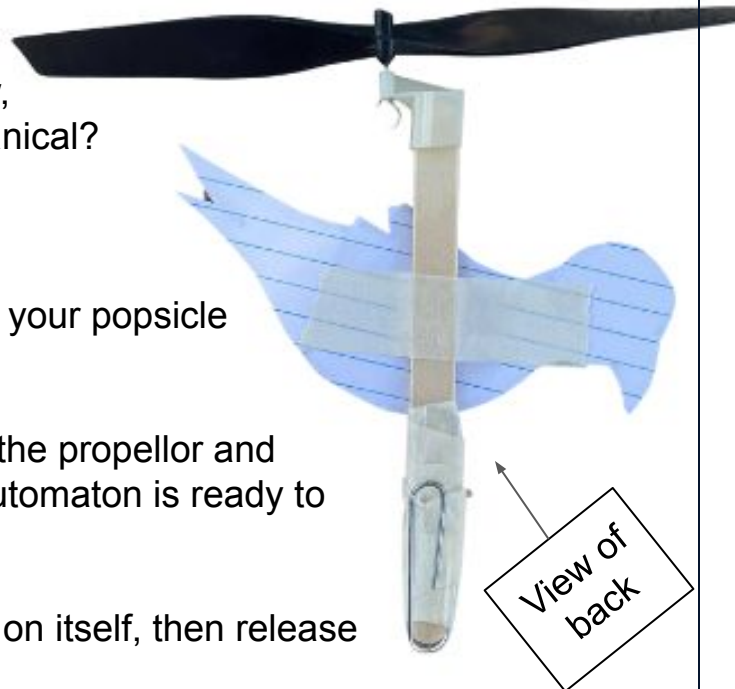
Step 4: Draw your automaton on the index card. Think about what animal or bug you want to draw, then consider... how can you make it look mechanical?

Step 5: Cut out your automaton.

Step 6: Tape the blank side of your automaton to your popsicle stick.

Step 7: Hook a rubberband through the hook on the propellor and through the paperclip on the bottom. Now your automaton is ready to launch!

Step 8: Wind up the rubberband until it's twisting on itself, then release your automaton and watch it fly!



Ways to improve!

Want your automaton to fly even better? Here's a few things to try!

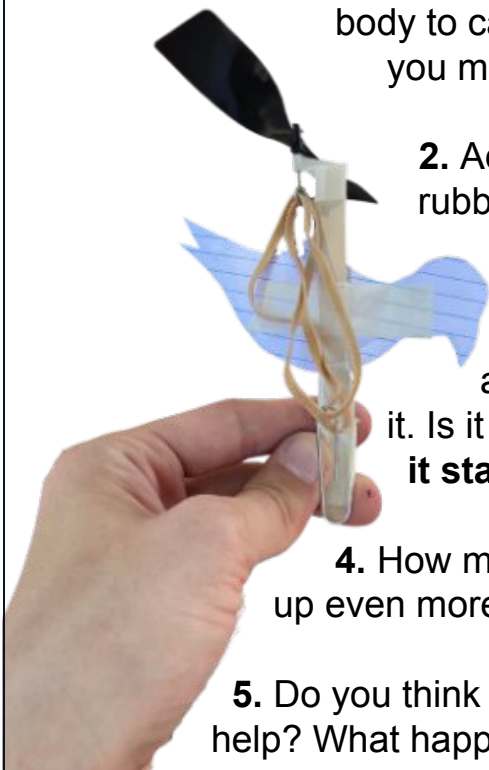
1. Try adjusting the shape of the automaton's body. You want the body to catch the wind and help stabilize how it flies. Can you make it more aerodynamic?

2. Add more rubberbands! Does it fly better with two rubberbands? What about three? Is there such a thing as too many rubberbands?

3. Try changing your technique. When you wind up the automaton and launch it, are you releasing it gently or throwing it. Is it angled up or to the side? **Try releasing the propellor first so it starts spinning, then gently letting go of the popsicle stick.**

4. How much have you wound up the rubberbands? Can you wind them up even more? How much tension can you create before launching it?

5. Do you think adding fins or "wings" that stick out from your automaton can help? What happens when you add more pieces of paper to it?



***Teacher Note:** A hook nose propellor is a small plastic propeller with a metal hook that spins when the propeller is turned. They can be found by searching "hook nose propellor" on most online stores, and you can buy them in bulk for lower prices on sites like Kelvin.com.

Discussion Questions:

1. After learning who Wayman is, Hana goes to Ink's shack. Why do you think she goes there instead of anywhere else?
2. Why is Hana so happy when Chuck follows her?
3. Why do Chuck and Hana go to the gaming house when looking for Tomás?
4. How does Hana plan to use the cyber bees to save the other students?
5. How will Hana's automatons help with the plan?
6. What's the big secret they learn about Tomás in chapter 42?
7. Why does Chuck choose to try the antidote even though it hasn't been tested on people yet?
8. Did the antidote work? How do you know?

Chapters 44 - 48

Discussion Questions:

1. How do they fix the problem of the trapped bees?
2. What plays on all the screens when Hana and her friends get caught?
3. How does Chuck use the bees to help them escape the JingZa?
4. Why did Primo doctor the data sent to Ma? Do you think Ma would have done the experiments if she knew the kids were getting sick?
5. Why did Tomás's dad act as a go-between for Nile and I Ching?
6. Did Popo know who Wayman was? How did she know?
7. How does Ma react when Wayman shows up with Hana?
8. With Start-Up summer school cancelled, what do Hana, Tomás, and Chuck do to pass the time?

Extension Questions:

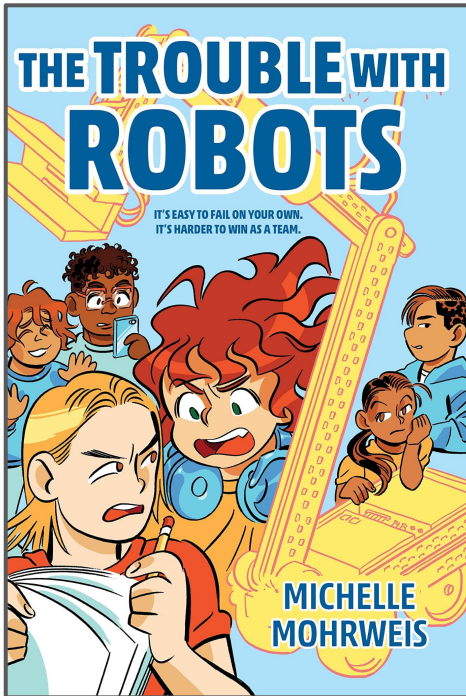
1. This story imagines one way our society will be in the year 2053. How do you imagine our society will be in thirty years?
2. In your opinion, does technology bring people closer together or does it isolate them from each other?

End of Book Discussion:

1. How did Hana grow and change through the story?
2. In the story, Hana makes many unlikely friends. How did these friendships help her through the story? How did she help her friends?
3. Do you think the experiments are over for good, or will somebody try to do them again one day?
4. What message or theme can we learn from reading this story? Do you think it was trying to teach us anything, or was just for fun?
5. Do you think the future will be like in the story? Or will it be different? Why?
6. How was technology used for good in the story?
7. How was technology used in not so good ways in the story?
8. Knowing what you know, if you could give Hana any advice at the start of the story, what would you tell her?

Looking For More?

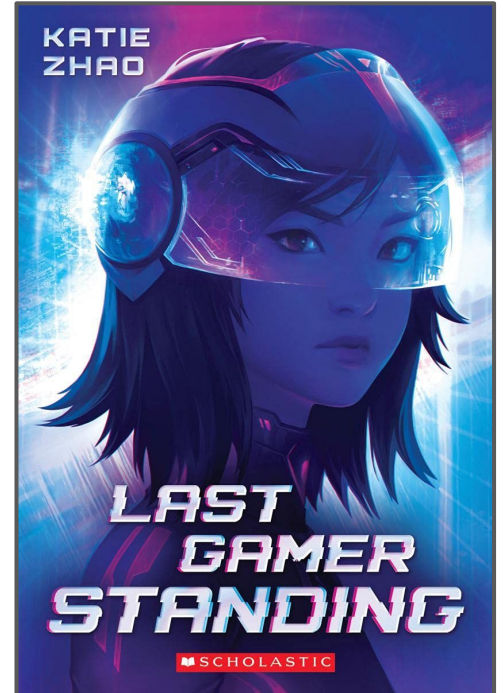
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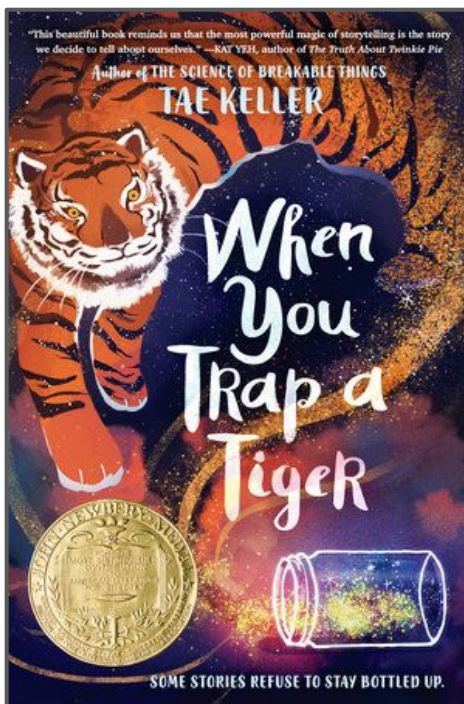
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by Michelle Mohrweis



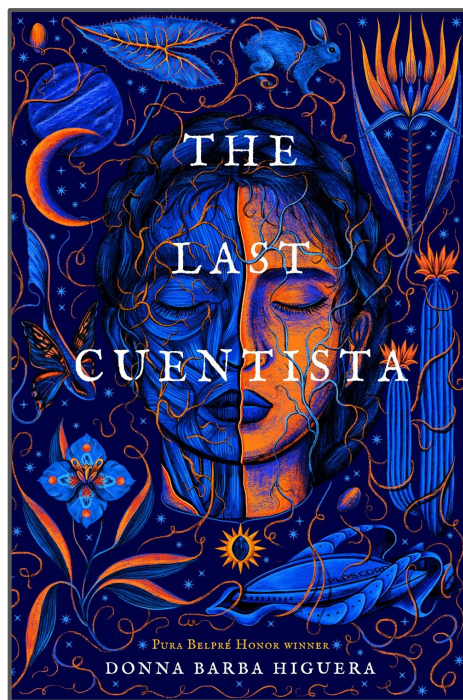
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