HMH Teacher Central Lesson Plan for Whole- and Small-Group Instruction

Instructor: Shytle Date: 1-26-21 Class: 4th Grade

Project: Develop a Patent

Workshop 1 Lesson 23

STANDARDS

ELAGSE4W2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly. ELAGSE4W4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. ELAGSE4SL4: Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Learning Target: I can write a description of and draw a diagram for a new invention.

Success Criteria: I am successful when I can present this patent to my classmates.

HEADS UP

Creating an invention requires students to apply the skills they've been reading about in this Workshop: imagination, resilience, and creativity. During this *extended whole-group lesson*, students will bring their own interests to the Workshop topic as they determine what they want to invent.

Materials

ReaL Book pp. 68–69

FAMILY ENGAGEMENT

Have students ask a family member or caregiver: *What organizations in our community encourage people to think big to solve problems?* (For example, arts councils that provide access to creative expression through the arts or a political group that encourages citizens to solve problems in the community, etc.)

You can also post this question on the class website, email list, push notification service, or social media feed. Encourage family members and/or caregivers to share their insights

with you and the class through the class website, email list, or social media feed. Be sure to follow school and district rules for online sharing.

Invite family members or caregivers involved in one of these creative problem-solving groups to volunteer to speak to the class. Set up a video chat session if they cannot physically visit the classroom. (A video chat can also provide students with a glimpse of the creative environment.)

RESOURCES FOR DIFFERENTIATED INSTRUCTION

- **Support:** Skill Builder: Using Precise Adjectives
- **Extend:** Descriptive Essay
- **Language:** Common and Proper Nouns

Get Resources

OBJECTIVES

Primary Goals

Literacy Goal: Write a description of and draw a diagram for a new invention.

Language Goal: Present a patent using a public voice.

WHOLE GROUP

Today's entire lesson will be completed in small group rotations.

Grade 4 Group 1: Trey, Lexi, Chasidy, Javonn, Travis
Grade 4 Group 2: Artayjah, Ti'syia, Elijah, Aadyn, Ji'Anna, Bentley
Grade 4 Group 3: Rileigh, Kevin, Roberto, Sachari, Walker

DO NOW!

Show You Know

Use the Do Now routine.

1) Display the Do Now and assign the task.

(extraordinary) **One of the most extraordinary places I've ever seen is ________.** (e.g., the rotunda in our state capitol building; the Grand Canyon; Niagara Falls)

2) Prompt partners to share their responses and restate their partners' ideas using the frames.

- **So your idea is _____.**
- **Yes, that's correct.**
- **No, what I meant was _____.**

3) Ask two preselected students to share with the class and guide students to score their own responses.

SHARE TODAY'S GOALS

Primary Goals

Introduce the Literacy and Language Goals. *Today, we become the inventors. We will create our own inventions and design patents for them.*

- **Literacy Goal: Write a description of and draw a diagram for a new invention.**
- **Language Goal: Present a patent using a public voice.**

INTRODUCE AND ENGAGE

Develop a Patent

Explain the characteristics of a patent to students.

- Read aloud the description of a patent. *A patent involves two parts—a written description of the invention and a diagram or drawing that shows what it looks like. Why do you think a patent requires both a description and a diagram or drawing?* (e.g., So that people can understand how the invention works, and they will know what it looks like.)
- Guide students to examine the diagram and model of Edison's lightbulb patent. *What do you notice about the diagram of Edison's lightbulb?* (e.g., it looks like a modern lightbulb; it quickly shows what the lightbulb should look like; it has labels and descriptions that tell what the parts of the lightbulb are)
- Explain that inventions often solve a problem. *What problems did Thomas Edison's lightbulb solve?*
- Use Think (Write)-Pair Share to have students identify what problem the invention of the lightbulb solved.

One problem that Edison's lightbulb solved was that it _____. (e.g., was cleaner and safer than gas or oil lights; stayed lit longer than other electric lights)

Adapt Procedures You may wish to have students identify, plan, and draw a diagram of their invention on one day, draft a description and collaborate to edit on a second day, and present on a third day.

Choose a Topic

Explain that students will create patents for their own inventions. *Today, you will all get to be inventors! First, you will each brainstorm ideas for a new invention that solves a problem. After you have an idea for your invention, you'll need to develop a patent, just like a real inventor would. Your patent will need to include a description that tells what your invention is and how it works. You will also draw a diagram that shows what your invention looks like.*

- Point out the three topic options and have students star one. Support students who need help choosing a category for their invention. *What problem can you think of that is related to these topics? What could you create to solve the problem?* If students need more support in choosing a topic, guide them to review the Workshop readings to find details related to inventions and the problems they solved.

- Check that all students have chosen a topic.

Identify a Problem and Solution

Explain that taking notes will help students determine their invention and its purpose.

- Remind students that their inventions need to solve a problem. *Remember what we learned from reading the Workshop texts: inventors are problem-solvers. Edison saw a problem with the lightbulbs that other people had created, so he made one that was better and safer. Sierra learned about 3-D printers and realized that she could help make less expensive prosthetic hands for kids who needed them. So, what is a problem related to your topic that needs to be solved?*

- Model taking notes on the problem. Think aloud as you take notes. *I choose food as the category for my invention. I think one problem related to food is that people throw away too many plastic utensils. First, I'll focus on describing the problem: Plastic utensils don't break down after you throw them away. That's bad for Earth. I will write that in the problem section of my notes. What's a solution? How about utensils that people can eat? People can eat them rather than throw away their utensils—problem solved!* Remind students to consider how the function of their inventions will affect their appearance. *Think about what your invention needs to look like so that it will work properly and solve the problem.* Demonstrate how to complete the graphic organizer with notes about edible utensils.

- Pair students who have picked the same topic, and have them compare their notes and share with the group using the frames.

  - **The problem I am trying to solve is _____.**
  - **My invention is _____. It solves the problem by _____.**
  - **My invention is (similar to/different from) (Name)'s because _____.**

Draw a Diagram

Explain that students will draw a labeled diagram of their invention.

- Model creating a diagram for students. On the board, draw a rough sketch of the edible utensils. Encourage students to sketch or draw broadly and to label any working parts or materials. *Make sure you include details to explain how your invention works or information about what materials your invention is made out of.* Remind students to refer to the diagram of Edison's lightbulb on page 68 if they need an example.

Anticipate Challenges Students who lack confidence in their drawing abilities may hesitate when it comes to creating a diagram. Assure students that their drawing skills will not be evaluated and that they should focus on clearly and neatly labeling the important parts of their diagrams.

PLAN, WRITE, AND PRESENT

Describe an Invention

Explain that students will write a description of their inventions.

- Read aloud the model description and explain how you included details from your notes and your diagram. *In my description, I wrote that "Tasty Utensils cut down on plastic waste" because I have in my notes "plastic doesn't break down. This is bad for Earth." That is an important detail about how my invention is solving a problem. I also included specific details about what the utensils look like—which you can see in my diagram—what they taste like, and how people would use them.*

- Remind students to include a catchy name for their invention. *I named my invention "Tasty Utensils." Notice that I capitalized the first letter of each word to show that Tasty Utensils is a proper noun, the name of my invention. Try to think of a catchy name to describe your invention and get people's attention.*

- Monitor students as they write their descriptions and name their inventions, and provide support as needed. As students work, suggest that they focus getting down three to five key details about their invention. Remind them to use clear language to describe their invention so that readers understand exactly what it does or how it works.

FORMATIVE ASSESSMENT	
LITERACY GOAL: Write a description of and draw a diagram for a new invention. **Observe** Review students' descriptions and diagrams for details about how the invention solves a problem and how it works.	
Monitor Progress	**Adapt Instruction/Strategies**
Nearly There Students provide a description, but it lacks some of the stronger details that appear in their diagram or their notes.	Guide students to add additional details to their patent descriptions. *You included some strong details from your notes. Now let's see if we can include any additional details from your diagram into your description. Try adding details about what materials your invention is made out of.*

Not Yet Students' patent descriptions and diagrams do not include details that describe the invention or explain how it works.	Guide students to review the problem and solution they identified in their notes or the details they drew in their diagrams. *You wrote and drew great details here about what your invention looks like and what problem it solves. Can you include those details in your description?* After students create their patents, have them circle or highlight the problem the invention addresses and three details explaining how the invention works to solve this problem. Guide them to add any missing elements.
On Track Students' descriptions and diagrams provide clear details about how the invention solves a particular problem and explain how it works.	

Check and Edit

Use the Peer Feedback routine for self- and peer assessment.

- Review the checklist and have students check their own patents.
- Have partners read each others' patents, check items on the list, and provide feedback using the Language to Give Feedback frames.

Publish a Patent

Have students write their final drafts and revise their diagrams. *As you edit your patent, revise your drawing and labels to include the changes you made to your patent description.*

Follow With Feedback As students work on their final drafts, guide them to act on partner feedback. *Your partner said she wasn't sure what your invention was for, what its purpose was. How will you follow up?*

Present a Patent

Teach the presentation skill, and have students read their patents.

- Read and display the presentation guidelines for using a public voice. *When we present our work, it is important that our audience understands what we are saying. We need to speak slowly and loudly enough. When you speak that way, your audience will be able to understand what you are saying.*

- **Speak three times louder than your everyday voice.**
- **Speak two times slower than your everyday voice.**

- Present the model patent for "Tasty Utensils," modeling the presentation skills.
- Have students present their own patents.
- Guide students to share reactions to their classmates' patents using the Language to React frames.

Make It Relevant Explain that learning to speak with a public voice is a valuable skill that is best developed through lots of practice. *Although you might at first be nervous or uncertain about speaking this way, with practice you will become more comfortable using a public voice during presentations.*

FORMATIVE ASSESSMENT	
LANGUAGE GOAL: Present a patent using a public voice. **Observe** Listen to students' presentations of their patents. As students share, notice if they speak clearly, slowly, and loudly.	
Monitor Progress	**Adapt Instruction/Strategies**
Nearly There Students present using public voice most of the time but may occasionally mumble or speak too quickly.	Model using a public voice. *Your volume was great, but this time try to speak in a slower voice, like I'm doing now.* Encourage students to repeat all or part of their presentations while using their public voices.
Not Yet Students are uncomfortable presenting their patents and do not demonstrate effective presentation skills.	Offer strategies to help students feel more comfortable presenting, such as allowing them to rehearse with you ahead of time. Provide supportive feedback as students rehearse. If you notice students are consistently not using their public voices while rehearsing, pause them at an appropriate stopping point. Model using a public voice and have students echo your speed and volume. Then have them practice their presentations again.
On Track Students present their patents, speaking clearly, slowly, and loudly enough for listener comprehension.	

WHOLE GROUP

WRAP UP

Reflect

Guide students to share their responses to the Wrap Up question with a partner.

- **What is one question you still have after our lesson today?**
- **One question I still have is ________.**