



# A Framework for Developing Equity-Focused STEM Content for Young Children

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# AGENDA



- Overview
- Framework: Guiding Principles
- Integration in Multimedia Contexts
- Using the Framework
- Lessons Learned + Future Directions





# OVERVIEW



# READY TO LEARN



“Ready to Learn Television supports the development of educational television and digital media targeted at preschool and early elementary school children and their families. Its general goal is to promote early learning and school readiness, **with a particular interest in reaching low-income children.**”

# PROJECT DEVELOPER



Our mission: Enrich lives and strengthen communities through the power of public media

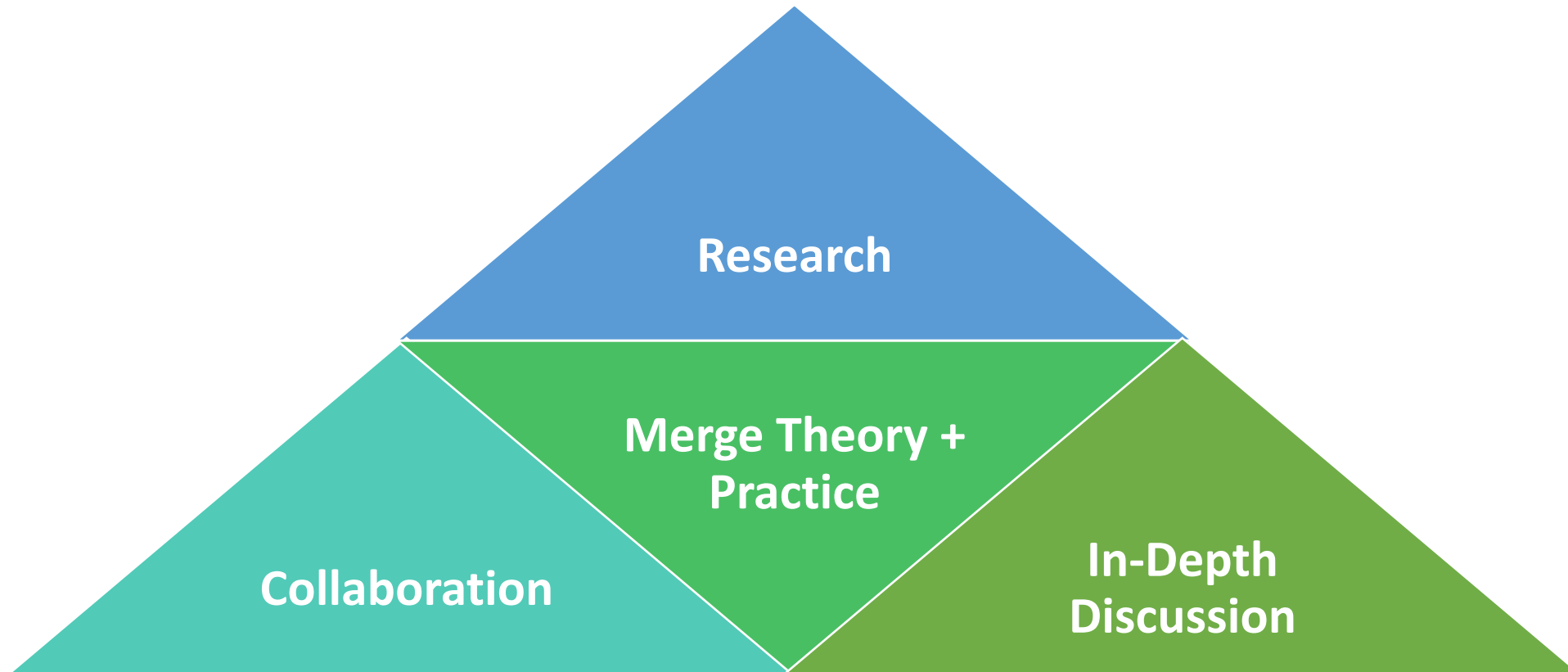


# HERO ELEMENTARY

- PBS Kids
- Grades K–2
- Ready to Learn
- Science + Literacy
- Digital: website, games, apps
- Community-based learning
  - In-person and/or distance
- Research and evaluation



# FRAMEWORK DEVELOPMENT PROCESS



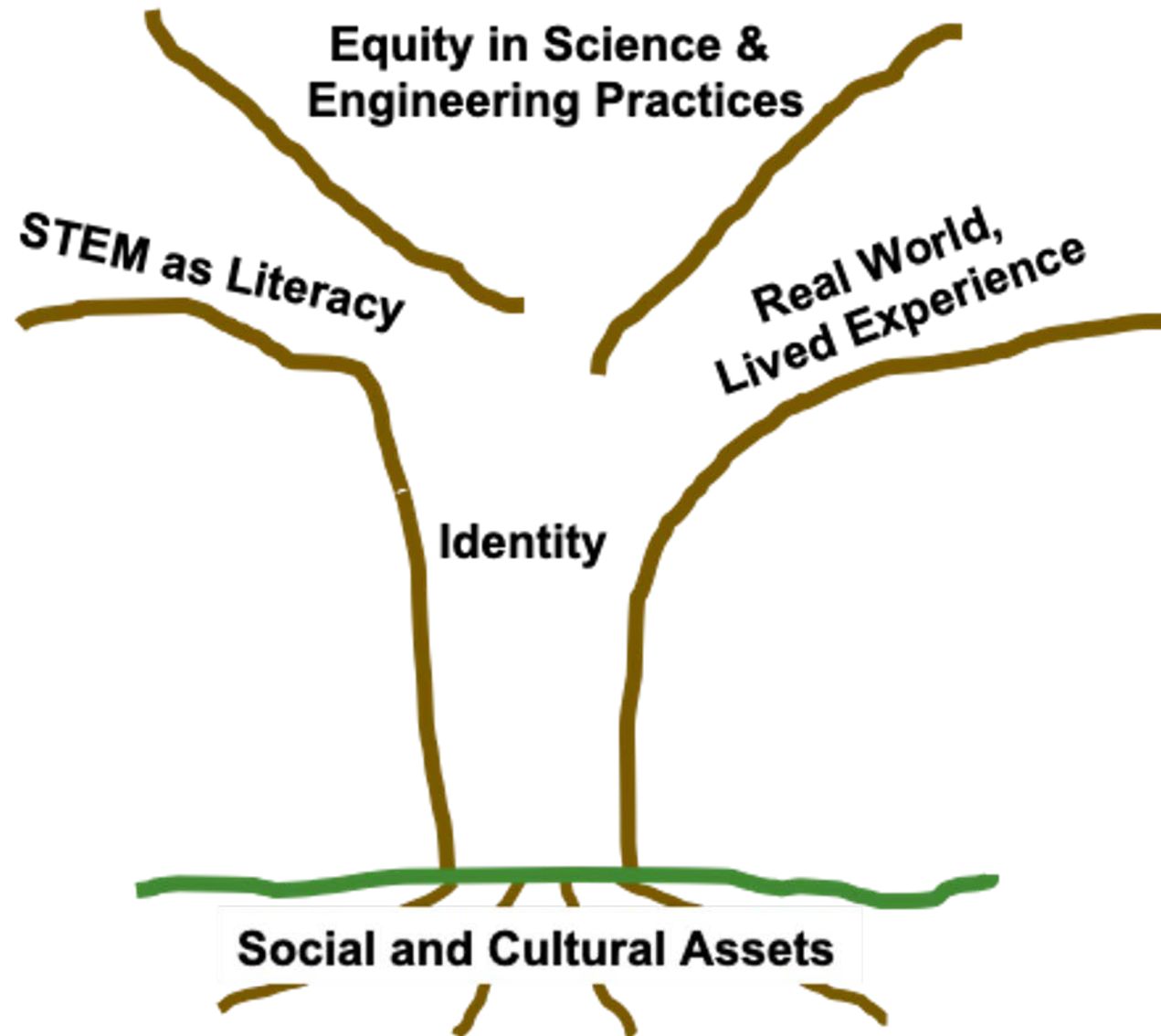




# **FRAMEWORK: GUIDING PRINCIPLES**



# GUIDING PRINCIPLES



# GUIDING PRINCIPLES



## 1. Addressing the Intersectionality of Racial, Cultural, Class, Gender and STEM Identities for Young Learners and Dispelling Negative Stereotypes

- Emphasize community and sense of belonging and that they are a viable part of a STEM community.
- Where can we find the balance? How can we connect what they do in STEM with who they are?
- STEM isn't just for the "special" ones.
- Develop each characters' qualities to make sense for who they are – what are their interests, hobbies, quirks, etc.?





# GUIDING PRINCIPLES



## 2. Grounding “Real World” STEM Experiences in the Lived Realities of Diverse Learners

- Feature realistic environments that feel familiar to Latinx children, Black children, and children from low-income families.
- Superpowers of *Hero Elementary* children grounded in their realities as Black children and Latinx children.
- Our stories start when *Hero Elementary* children get to school; how to bring in their own lived realities?



# GUIDING PRINCIPLES



## 3. Recognizing and Integrating Social and Cultural Assets in STEM Learning Experiences

- Focus on STEM powers to support community and social justice outcomes.
- Creating something out of “nothing” – resourcefulness, initiative.
- Navigating culture when you don’t speak the language.
- Strengths of being female in a male-dominated world.
- Superheroes are not special, they’re just representative.
- Difference between supers, non-supers; what does it mean to be a hero in a power and non-power world?





# GUIDING PRINCIPLES



## 4. Integrating Equity Within Science and Engineering Practices.

- Utilize the Superpowers of Science prominently in TV episodes, games, and activities.
- Feature culturally relevant approaches in hands-on activities.
- Collaborate with communities and families to recognize and reinforce their cultural ways of knowing in our content.
- How do the Superpowers of Science play out in our audience's everyday lives?



# SUPERPOWERS OF SCIENCE



**INVESTIGATE!**



**COLLECT INFORMATION!**

**LOOK FOR PATTERNS!**

**NAME THE PROBLEM!**

**MAKE SENSE!**



**SHARE WHAT YOU KNOW!**

**EXPLAIN!**

**FIGURE OUT A SOLUTION!**

**ASK QUESTIONS!**

**COMPARE!**





# GUIDING PRINCIPLES



## 5. Understanding STEM as literacy.

- STEM as a context for language learning, literacy, and school readiness.
- The Superpowers of Science all involve different kinds of communication.
- Science as a way to “read the world.”



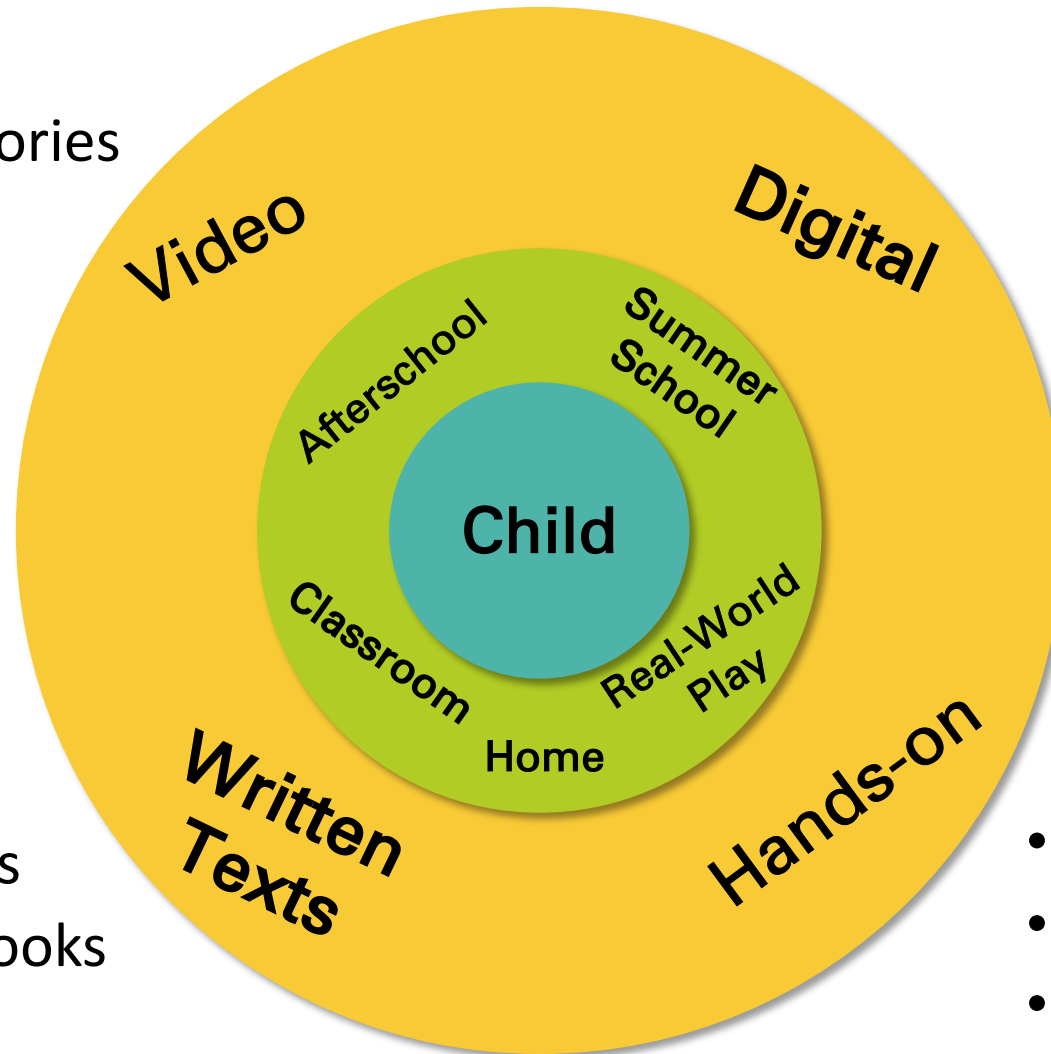


# **INTEGRATION IN MULTIMEDIA CONTEXTS**

# ECOSYSTEM OF LEARNING: MULTIMEDIA MODALITIES



- Episodes/stories
- Songs



- Website
- Digital Games
- Family Science App
- Science Power Notebook

- E-Articles
- Comic Books

- Investigations
- Analog Games
- Discourse





# ADDRESSING NEEDS OF CONTENT DEVELOPERS



- Script writers
- Song writers
- Show producers
- Digital game developers
- UX designers
- Artists
- Animators
- Analog game developers
- Curriculum developers
- ... And many more!



OK, but how?



# STARTING THE CONVERSATION



- It's not always comfortable
- Want to "do right" but afraid to say the "wrong thing"
- We are ALL LEARNING, it's a JOURNEY
- It takes COURAGE!
- And continuous effort
- The Framework gets the conversation started



# 3-PART WEBINAR



**Overview of Framework and Guiding Principles**



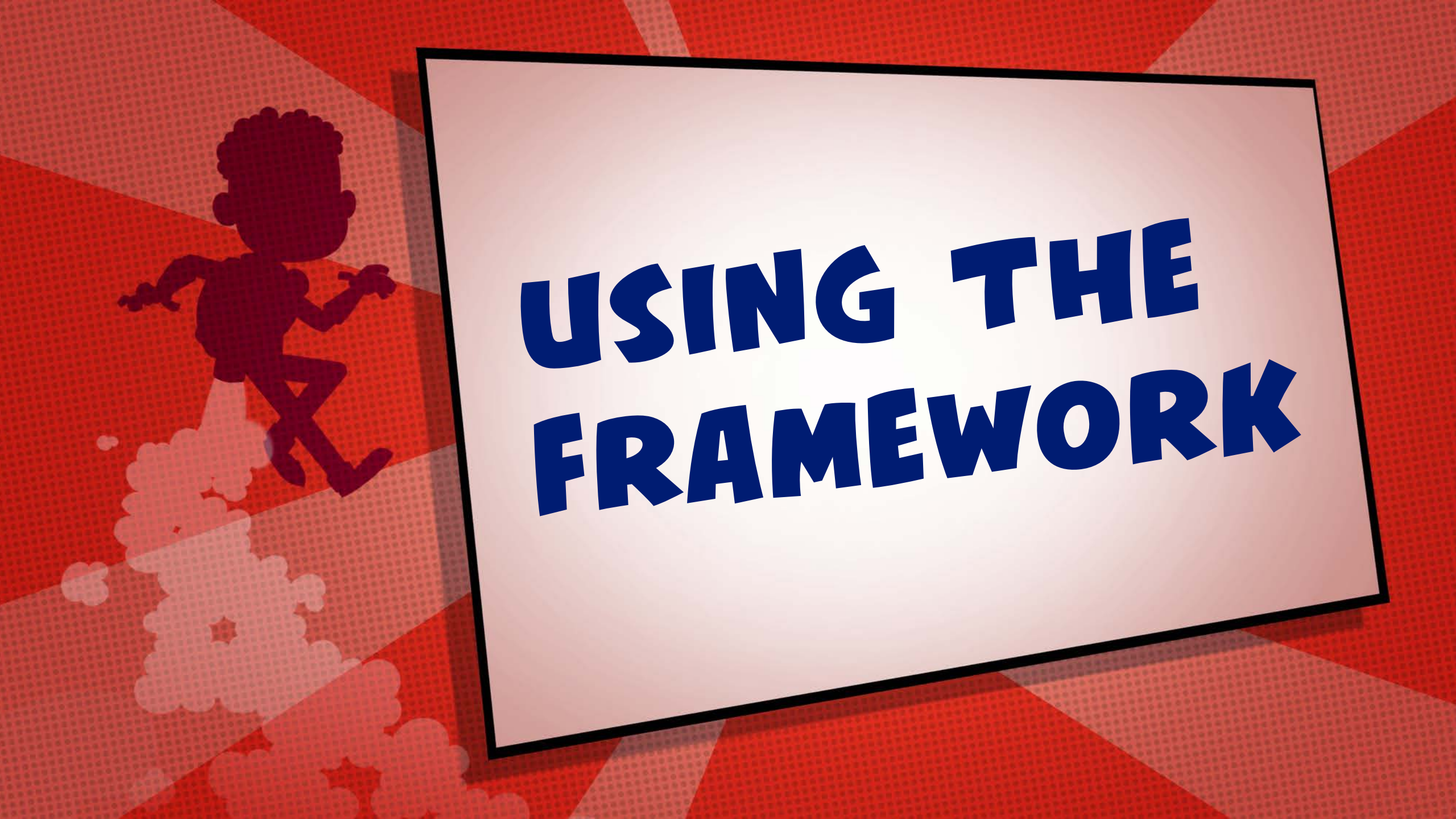
**Applying the Guiding Principles for Script Writing**



**Frequently Asked Questions**







# **USING THE FRAMEWORK**

# EXAMPLE: LIVED REALITIES





# EXAMPLE: LIVED REALITIES

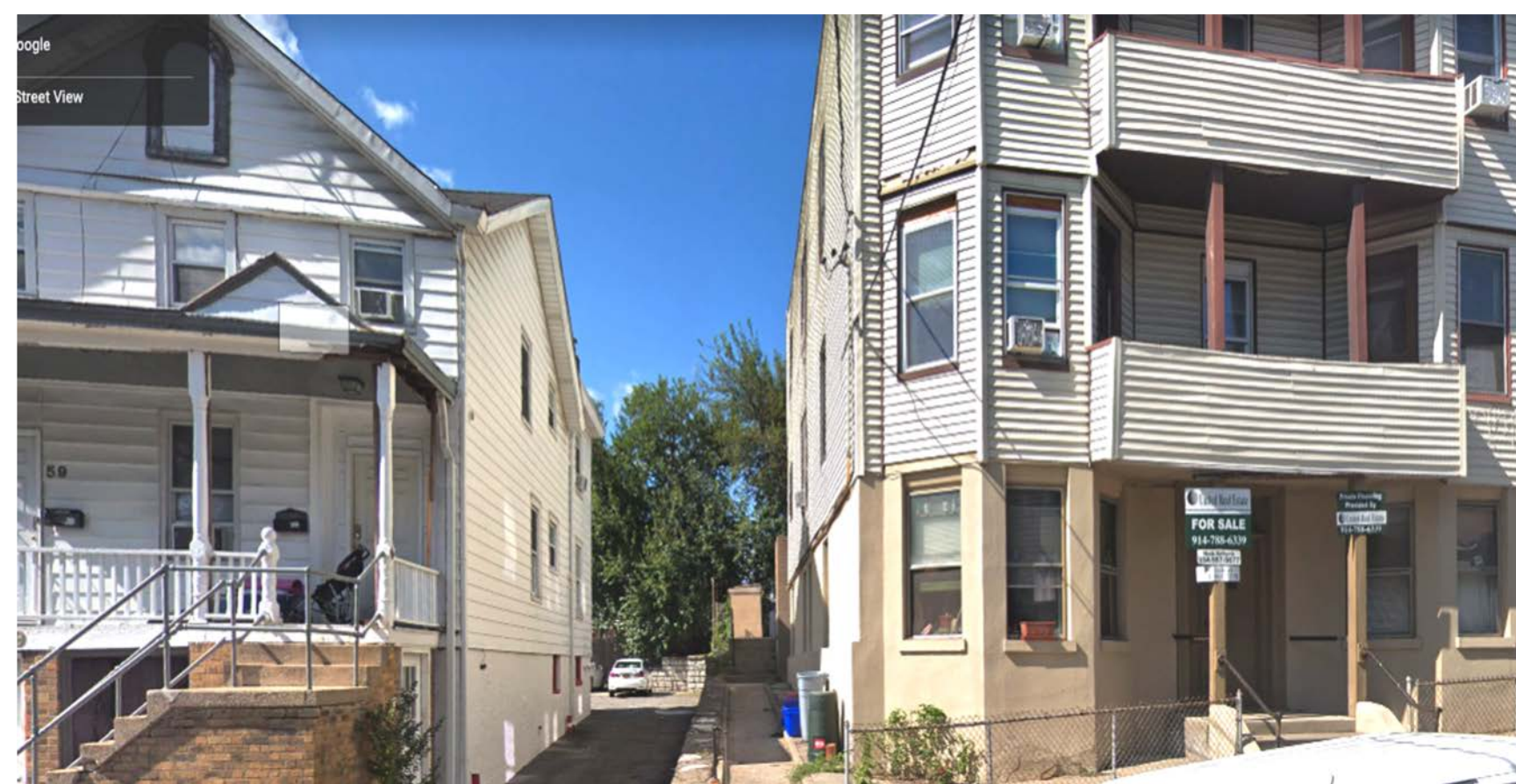


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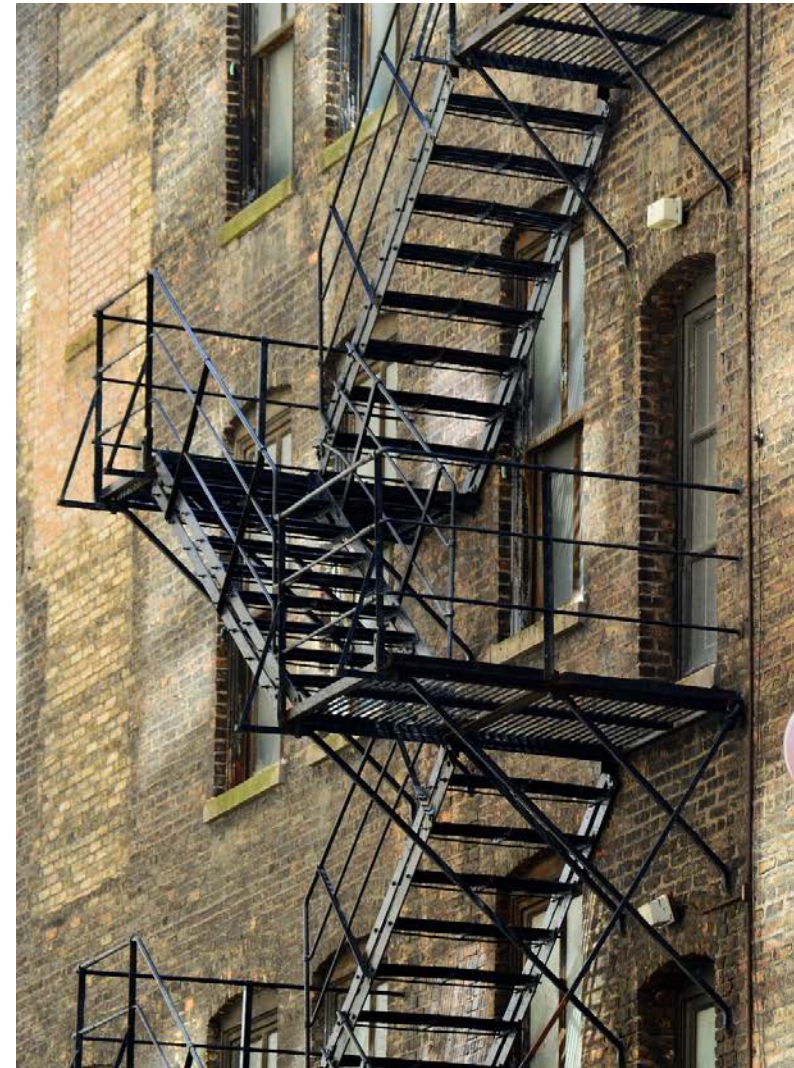


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# EXAMPLE: LIVED REALITIES



# EXAMPLE: SOCIAL & CULTURAL ASSETS



**DR. INVENTORMAN**

**AJ GADGETS**



# EXAMPLE: SOCIAL AND CULTURAL ASSETS







# **LESSONS LEARNED AND FUTURE DIRECTIONS**

- Positive input from educators, children, and parents!
  - **Children:** The characters seem “just like me”
  - **Children:** Love the teamwork and helpfulness
  - **Educators:** So refreshing to see everyday, smart Black and Brown kids
  - **Educators:** Children are eager to engage with *Hero Elementary*, use the Superpowers of Sciences
  - **Parents:** Enjoy seeing families and community members

# LESSONS LEARNED + FUTURE DIRECTIONS



## LESSON

We were walking the road while building the road.

- Needed the Framework at the start.

## FUTURE

Introduce the Framework at the outset.

- Engage all developers and team members in training and discussion.



# LESSONS LEARNED + FUTURE DIRECTIONS



## LESSON

Challenges recruiting and retaining BIPOC developers.

## FUTURE

Expand the reach.

- Improve recruiting & support of BIPOC developers.
  - Writers
  - Digital developers
  - Hands-on investigation developers





# LESSONS LEARNED + FUTURE DIRECTIONS



## LESSON

Value of sharing the Framework broadly.

## FUTURE

Continue sharing our work with the field.

- Share our methodology
- Encourage others to adopt and adapt
- What else are others doing?



# LESSONS LEARNED + FUTURE DIRECTIONS



## LESSON

Listen to your consultants!

## FUTURE

Expand consultants' involvement.

- Continue and expand work with educational equity experts and cultural consultants.



# LESSONS LEARNED + FUTURE DIRECTIONS



## LESSON

Importance of discussion and staying open.

## FUTURE

Continue and expand work with audience community members.



# LESSONS LEARNED + FUTURE DIRECTIONS



**Never stop learning and improving!**







# THANK YOU!



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