



Ruff Ruffman

PBS KIDS Family and Community Facilitator Guide

About Family and Community Learning

PBS KIDS® Family and Community Learning is a series of workshops that engage families in hands-on collaborative and playful learning. Designed for families with children aged 5–9 (and younger/older siblings), the series uses both digital and tangible tools to support the development of science inquiry and engineering design practices as families observe, question, predict, investigate, build, share, and reflect. The series aims to support and foster positive attitudes and perceptions about what science is.

About the Ruff Ruffman Show

The Ruff Ruffman Show is a web series designed to help kids aged 4–8 learn about core science concepts and practices through videos, game play, and hands-on activities. The series canine host, Ruff Ruffman, and friends Blossom and Chet, answer questions from real kids and take on challenges while modeling science inquiry skills.

Facilitator Role

As the facilitator, you play a key role in helping parents and children engage in the workshops. Your role has two main goals:

1. Create and support safe and comfortable social learning environments where people participate freely.
2. Deliver information in a straightforward way as you use your facilitation skills to meet the workshop objectives.

Nine PBS and Partners Roles

1. Build capacity for Nine PBS and partners to support educators, families, and kids within their communities.
2. Strengthen the relationships between Nine PBS and partners and the communities they serve.



Hi, educators!

I am Dr. Arionna Ralleigh, an educator with over 15 years of experience. Currently, I am the Curriculum Design Manager at Nine PBS. My passion for classroom equality is seen in everything that I do.

We welcome all of you who are interested in connecting with Nine PBS in a meaningful way. Let's explore how the kids of our region can learn and grow together.

Please feel free to email me at aralleigh@ninepbs.org



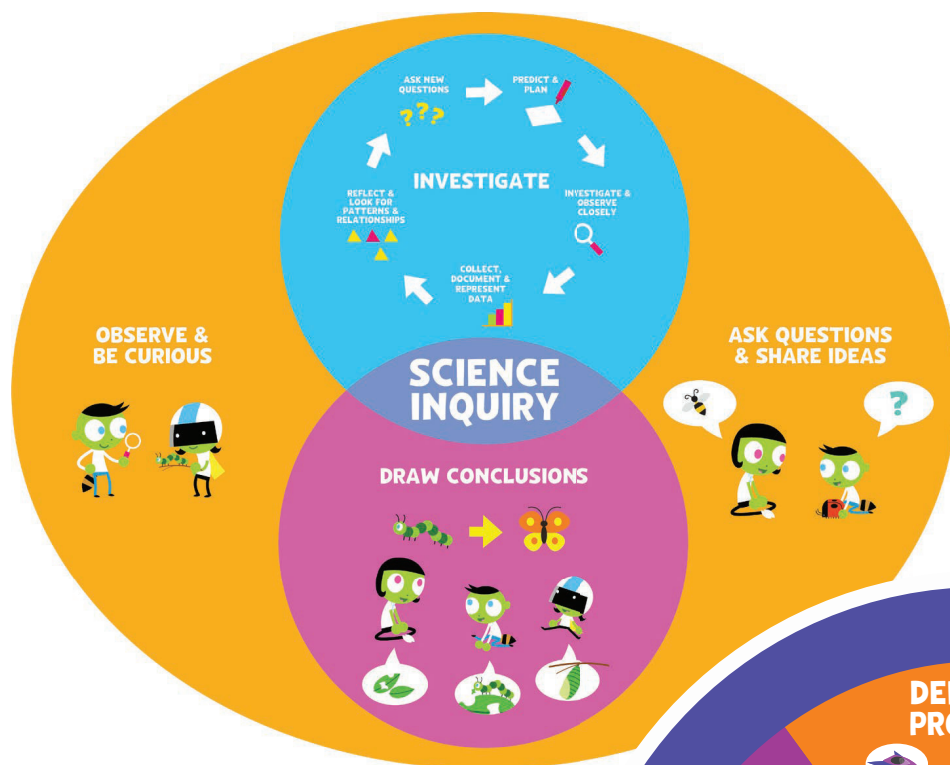
Take the time to explore all the media content before each session begins! This helps familiarize the content.



Science Inquiry and Engineering Design

Instead of focusing on “the what” of science and engineering, science inquiry and engineering design are focused on “the how.” How do scientists do science? How do engineers approach engineering challenges? What practices and processes do they use to learn about the design of the natural world?

- They make observations using all five senses.
- They ask LOTS of questions and/or identify challenges and problems.
- They make predictions.
- They investigate and collect data and information to support their answers.
- They create and test solutions to problems.
- They draw conclusions about the questions they are trying to answer and share information with others.



Both processes are depicted in these two graphics. Developing habits and abilities to engage with these processes will support learning across subjects.



Curiosity Journals

Curiosity journals are interactive workbooks that families keep by their side throughout the workshops. Journals are color coded, so as you go through the sessions you will see calls for families to use their journals.

Encourage your families to use the pages at the end of journals to jot down questions throughout their time at the camp. When the families take their curiosity journals home on the last day, encourage them to keep using them to reflect on ideas they want to continue to explore once the PBS KIDS Family and Community Learning (FCL) workshops are over.

Prepping for Each Session

□ Review the lesson

Read through all four sessions. Next, review the sessions until you feel familiar with the content and timing of activities. The more you know ahead of time, the more comfortable you'll feel when implementing the series so that you have a clear understanding of all the moving pieces.

□ Gather materials

For the hands-on activities, we selected materials that are easily available. Be sure to order or shop for supplies well in advance of your workshops. Because of the number of supplies, you will want to organize each session's supplies in advance. Other equipment, such as iPads or smartphones, are optional supplies. Your community partners may also be able to provide or contribute some materials as a request to check-out.

You will want to have the following prepared for every session:

- A meal to share
- Name badges, lanyards
- Curiosity journals
- Table conversation prompts
- Family game sheets (to pass the time while waiting on families to gather)
- Pencils, pen, markers, scissors, glue, tape, etc.
- Coloring sheets
- Tablets or laptops (if available) with access to Ruff Ruffman website (pbskids.org/ruff)
- Take home materials, including books provided at each session
- Media release forms

□ Practice run

Planning and practicing a run of show before each lesson will help increase your confidence when facilitating. During this time, you can adjust what you see fit based on your resources and the needs of your group. Get comfortable with the vocabulary and content and feel free to come up with your own questions to ask students. This is a great opportunity to get excited about the session and plan out how to express that enthusiasm to students during the real session. Feel free to be creative and have fun!

Virtual Engagement Option

Host a 30-minute, preworkshop virtual “Meet & Greet” session. Use that time for families and facilitators to get to know each other and preview workshop sessions. Take this opportunity to understand whether families include individuals with differing abilities and/or disabilities, family dietary restrictions, language preferences, and other information that will help you design an inclusive and equitable experience.

Lean into community partners to help understand the strengths and needs of families that will inform your workshop design. Learn about which virtual platforms and mediums of communication families are comfortable using and are approved or commonly used by partners, such as school districts, libraries, etc.

Most virtual meeting platforms also allow you to create polls. Use this tool as a temperature check during the workshop and/or at the end of each session as a quick way to gather feedback from families.



Virtual *Molly of Denali* at MRH Early Childhood Center.

Community and Collaboration Guidelines

Share with families that PBS KIDS Family and Community Learning is all about playing and learning together as a family. Explain that when collaborating and learning together as a community, it is really important to have some guidelines to make sure everyone has a fun and positive experience together. Ask the group why they think that might be so.

Reading Time

Read the book “Mix It Up” to the families at the end of every session. Pause often to ask questions and to help make connections to the activities. Make this experience fun!



Wesley House Association



Older children and/or siblings can act as “tech mentors” and can help assist facilitators. Younger children who need an alternate activity can work on coloring sheets of Ruff characters or cut and paste in curiosity journals.

Session 1: Mix It Up!

Playing With Mixtures

Eat Family and facilitator introductions

Explore Ruff Ruffman video, games, and discussion

Share Sharing, comparing, and discussing mixtures



Session Overview: Mixtures

Supply List

Have materials organized and ready for families to easily pick up upon entering.

- Curiosity journals
- Name tags
- Sign-in sheet and pens
- Pencils
- Table conversation prompts (coloring sheets)
- Tablecloth (reusable, if possible)
- Paper goods (made from recycled materials when possible): napkins, plates, utensil, cups
- Aluminum foil
- Trash bags, trash can

Welcome

Use a welcome table for introductions, sign-ins, and name badge creation.

Eat (25 minutes)

- Welcome families and have them create name badges and design covers of curiosity journals.
- Have food and paper goods set out and tables ready with tablecloths when families arrive. Use this time to have families create their name badges until all families have arrived.
- After everyone has arrived, begin the meal. Encourage conversations between families using table prompts while eating.
- Introductions can begin while families enjoy their meal.
- Introduce PBS KIDS Family and Community Learning, a series of interactive sessions that invite families to explore, make and play together using PBS KIDS media, and hands-on activities.

Introduction and Preview

- **Introduce** Ruff Ruffman by asking families if they know who Ruff Ruffman is. Share that Ruff Ruffman is a hilarious, fast-talking, orange dog who loves to explore, play, learn, and hang out with his friends.
- **Preview** the FCL structure: Eat, Explore, Make, Share
- **Eat:** Families will share a meal and have time to get to know one another.
- **Explore:** Families will use media to explore the goals of the experience.
- **Make:** Families will work together on hands-on projects.
- **Share:** Families will share their projects with one another.

Preview the mixture session. Families will have the opportunity to explore the science of mixing and combining different materials. Together families will:

- **Explore:** With mixtures through a Ruff Ruffman video, games, and discussion.
- **Make:** Families will do hands-on investigating as they make two different mixtures with two different sets of materials with different properties. As part of their investigations, they will then make predictions, test different solutions, and revise as they go.
- **Share:** Families will share their observations, comparing/contrasting the two mixtures and their experiences making them.

Explore (30 minutes)

Discuss mixtures, including what a mixture is and examples of mixtures, discuss ways to support science learning in the kitchen or grocery store. Engage your five senses (sight, touch, smell, taste, feel) when you're in the kitchen and or grocery store.

- Introduction of Ruff Ruffman's "Mix It Up."
- (15 minutes) Watch video as a group (pbskids.org/ruff/kitchen/videos); consider pausing on occasion to reflect on vocabulary.
- (10 minutes) Lead discussion on video with questions like: What is mixture? What happened when Ruff tried to unmix his smoothie in the blender, what does Ruff mean by "unmix"?
- Use one of the foods that were a part of your shared meal as an example and ask families if any of the other items they ate were also mixtures. How do they know?
- Engage the five senses.
- What kind of math might be involved in cooking? How about reading and writing?
- Introduce science inquiry.

Make (45 minutes)

- (5 minutes) Review materials for two mixtures: dough and trail mix. Encourage use of senses to observe and describe materials.
- (5 minutes) As a group, make predictions about what will happen when ingredients for each mixture are mixed.
- Record group predictions.
- (15 minutes) Make trail mix.
- Support and engage families with questions.
- Have families record their recipe in their curiosity journals.
- Write names on trail mix bags.
- Discuss:
 - What does your mix smell like? Feel like? Look like? Taste like?
 - If you had to take out one ingredient, could you? Could you unmix all the ingredients?
 - Do any of your original ingredients look different now that you've added them to your mixture? If so, how?

Make Dough (20 minutes)

- Review, discuss dough properties and support families with questions as they make dough.
- Discuss dough results and log into curiosity journals. Ask questions about the mixtures.

Activity One

Super Easy Play Dough Recipe Using Flour, Salt, Oil and Water

- 1 cup flour
- 1 cup salt
- ¼ cup vegetable oil
- ½ cup water
- Optional: food coloring

Mix together the flour, salt, and oil. If using food coloring, put a few drops into the water. Add the water to the mixture until it binds together (you may need slightly less or more). Knead the dough until it is smooth and easy to work with. When done playing, store in a ziplock bag or plastic storage container.

Share (10 minutes)

- **Discuss sharing and feedback norms and expectations**, explain that sharing is an important part of the learning process. Have families share their mixtures: encourage them to discuss what went well or didn't and what they observed about the properties of the mixtures they created?

- **Add to their curiosity journals.**

- **Ask questions like:**

- What happened to the flour in the mixture?
- Can you get the flour back out?
- Did anyone get a mixture that was too dry or too wet?
- How did you fix it or change it?

- **Discuss any remaining questions** and encourage families to use the "Things We're Curious About" page in the curiosity journals to jot down ideas they want to think about.

- **Collect all curiosity journals for next session.**

- **Wrap up the session.**

- **Remember to encourage** families to be on the lookout for vocabulary words:

- mixture, which is a new substance made by combining two or more substances.
- properties, which are the characteristics of a substance.
- predict, which is describing what you think will happen based on what you already know.

Activity Two

Make Trail Mix with a Variety of Ingredients.

- Pretzels
- Marshmallows
- M&Ms
- Cheerios
- Chocolate chips
- Popcorn
- Goldfish
- Ziplock bags
- Paper towels
- Plastic gloves

Pass out ingredients to families to make trail mix. Every member can make their own. Have everyone choose from various ingredients and add them to a plastic bag until they have a unique mix of goodies. As families use ingredients, ask questions to engage in conversation about their decisions.

- Why did you choose these ingredients?
- Have you ever made a mix with these ingredients before?
- What do you predict your mix will taste like?

Have them write their name on bags. When done, encourage family members to discuss the following questions and capture answers in their curiosity journals:

- What does your mix smell like? Feel like? Taste like?
- Could you unmix all the ingredients or take out one ingredient? (Do you want to try?)
- If you want to change your mixture, could you? How? How was your experience making trail mix and play dough similar or different to Ruff Ruffman and Scruff's experiences in the video?

Reading Time

Read the book "Mix it Up."

Wrap-Up and Take Home

- Review family take home materials and go over resources they will be taking home.
- Demonstrate how to access the Ruff Ruffman Show media and activities related to the materials.
- Collect everyone's curiosity journals.
- Have everyone help clean up.
- Give each family their take-home handouts, remind them of the details for the next session, and congratulate them on their great work!

Session 2 Material World

Investigating Material Science

Eat Review and preview

Explore Ruff Ruffman video, games, and discussion

Make Using materials to solve problems

Share Sharing, comparing, and discussing materials



Session Overview: Material Science

Welcome families back. Have them gather materials and curiosity journals.

Eat (25 minutes)

- After everyone has arrived, begin meals, encourage conversation between families using table prompts.
- Lead a quick warm-up activity.
- Preview the session, materials, where families will have the opportunity to explore the properties of materials and design solutions around those properties.

Together families will:

- **Explore:** Through discussion and engagement with Ruff Ruffman media.
- **Make:** Families will use the engineering design process to solve a problem using different materials, just like Ruff. They will create, test, improve, and create more!
- **Share:** Families will share their final designs and experiences engaging in the engineering design process with others, as well share ideas and connections to their everyday lives.

The Engineering Design Process

Engineers use creativity, problem-solving skills, and knowledge of technology, math, and science to design, build, and improve products, machines, and structures for a better world. They curiously explore why and how things work and try to figure out how to make things work better. The process of science inquiry is driven by asking questions, investigating, and finding answers to those questions.

Show families the engineering design process image and take time to introduce the different steps while asking open-ended questions like: Why? How come? What do you think will happen if...?

Explore (30 minutes)

- Introduction of preview of Ruff Ruffman video, “A Dry Pet Is a Happy Pet.”
- (15 minutes) Watch video as a group (pbskids.org/ruff/materials/videos); consider pausing on occasion to reflect on vocabulary. In the video you’ll see Ruff and friends testing out different materials to see if they are waterproof.
- Encourage the children to be on the lookout for vocabulary words:
 - **materials:** what something is made of.
 - **properties:** characteristics of an object or substance.
 - **test:** to try something out to see if your prediction is right.
 - **engineering:** a process of identifying and developing solutions to problems.

If they know what these words mean, encourage them to use them with their families during the session.

- After the video, lead a group discussion before activity.

Quick Game: Grab It and Run

(pbskids.org/ruff/materials/activities)

In this game, players run in pairs while holding different materials, from foil to toilet paper, etc, while trying not to break them. If you choose this option, make sure you have the necessary materials on hand during the session.

Regroup and discuss the game just played, ask questions like: Did the game help you notice any new materials around you? What are they? What are some of the silliest materials you found or used? Did the game help you think of new ways to describe the properties of the materials?

Make (40 minutes)

Families will participate in their own engineering design challenges to further explore materials and their properties. Introduce engineering design graphics, point out that engineers identify problems and then create solutions to those problems.

Families will work through the process to: define a problem, imagine, and plan a solution, create that solution, test it out, and improve upon it based on the results of their tests.

Material Supply List

Have materials in a place where families can observe.

- Foil
- Felt or fur
- Glue
- Plastic bags
- Shower curtain
- Duct tape
- Cardboard
- Fan
- Feathers
- Spray water bottle
- Flashlight
- Binder clips
- Light breathable fabric
- Markers and crayons
- Ruff Ruffman coloring sheets
- Ruff Ruffman action plushie
- Pencils
- Curiosity journals
- A picture containing text, person
- Scissors

Now it is time to create! Have families collect the materials they need.



Challenge 1 Test

Families will use their stuffed Ruff Ruffman and materials at their tables to design something warm and cozy that Ruff could wear in wintry weather. Use materials and then have a family member blow a fan on Ruff. (If you do not have a fan on hand, you can use a sheet of paper to fan.)

Ask questions like:

- Do you think Ruff feel warmer when the cool air blew on him?
- What are some things that keep you warm? What properties do those items have?

Challenge 2 Test

Design something Ruff could wear to keep him dry from water by using the materials provided. Have another family member gently spray Ruff with water from the spray bottle.

- Before everyone starts, make predictions on what will happen.
- Did Ruff stay dry?

Challenge 3 Test

Design something that can give Ruff some shade or sun protection on a hot, sunny day. Use the sun or a strong flashlight and see if it gives Ruff Ruffman shade from the light. Remove the light from Ruff and see if the shade goes away.

After tests are all complete, encourage families to add features even if their tests worked well. The test and revision process can be repeated as often as time allows.



Older children and siblings can act as “tech mentors” and can help assist facilitators. Younger children who need an alternate activity can work on coloring sheets of Ruff characters, and cut and paste in curiosity journals.

Share (10 minutes)

Have families share their designs as well as their curiosity journals in a group discussion.

Share Activity: Show and Tell

- If time allows, have those who are interested demonstrate one of their creations to the group. What happened during their test and how did they improve their solution?

Optional Share Activity: Gallery Walk

- Have families go around and visit other family's designs and encourage them to leave a positive comment. Have families collect feedback after everyone has time to visit designs.
- Regroup for a final discussion on materials and the engineering design process. Reflect on Ruff's video asking: Did anyone use any materials from the video when designing their solutions? If so, how was your use of the material the same or different from how it was used in the video?
- Ask about their investigations and the use of the engineering design process in the activity.
- What was the most challenging part and what was the most fun?

Reading Time

Read the book "Beautiful Oops?"

Wrap-Up and Take Home

- Review family take home materials and go over resources they will be taking home and demonstrate how to access the Ruff Ruffman Show media and activities related to materials. (pbskids.org/ruff/materials/game)
- Collect everyone's curiosity journals.
- Have everyone help clean up.
- Give each family their take-home handouts, remind them of the details for the next session, and congratulate them on their great work!

Session 3 Stick or Slide

Exploring Friction

Eat Review and preview

Explore Ruff Ruffman video, games, and discussion

Make Build ramps to investigate friction

Share Sharing, comparing, and discussing friction



The STL Business Incubator @ Wellston PBS KIDS Play & Learn

Session Overview: Friction

Welcome families back, have them gather materials and curiosity journals.

Eat (25 minutes)

- After everyone has arrived, begin meals, encourage conversation between families using table prompts.
- Lead a quick warm-up activity.
- Preview the session to explore friction.

Explore (30 minutes)

Families will explore friction, watch, and play with media, and work together with hands-on activity to engage in the science inquiry process as they observe, question, predict and investigate, collect data, and share and draw conclusions.

Review science inquiries, discuss friction, including examples of friction, and explore what they already know.

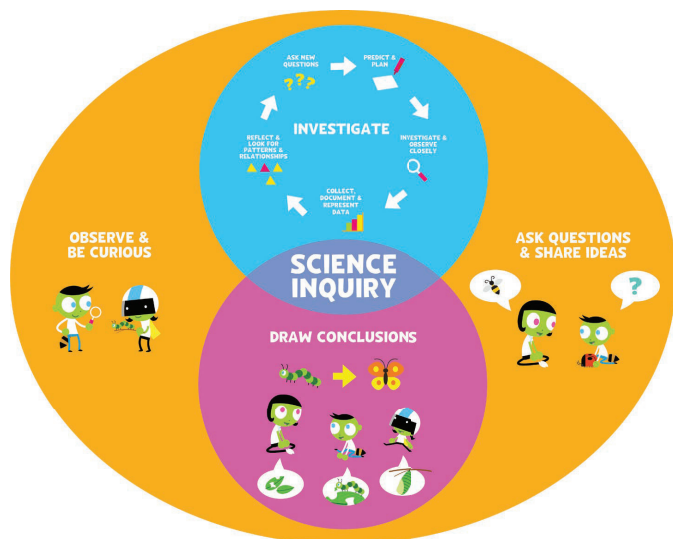
- (15 minutes) Watch video “Pulling for Plushie” (pbskids.org/ruff/sports/videos); consider pausing on occasion to reflect on vocabulary.
- (5 minutes) Lead discussion on video, ask: How did the different surfaces affect the sled’s movement? What was different about the three surfaces (sand, grass, concrete)? Why did the concrete allow the sled to go faster? What properties did it have that made it differ from the other surfaces? After Blossom shows Ruff the three surfaces, Steve pulled him across; why might some surfaces allow him to go faster?
- Review science inquiry.
- After the video, lead discussion.

Make (40 minutes)

- Families will participate in their own investigations to explore friction by using and testing different surfaces to see how they affect the distance an object travels.
- Provide families with materials for different surfaces (such as sandpaper, bubble wrap, grippy rubber (yoga mat), or plastic bags so they can see the differences in their tests.

Families will work through various parts of the science inquiry process as they work through the friction investigation.

- Make observations: Encourage them to touch materials to feel textures. Words to describe textures are smooth, bumpy, squishy, sticky, rough, slick. Ask if a small toy car would have trouble rolling on any of the surfaces? Why?
- Have families log these observations on the “Friction Frenzy Surfaces” pages in their curiosity journal.
- Plan and predict: Have families set up their investigations!
- Prop cardboard up about six inches to create a ramp, use books or other props (so that the ramp is long, not tall).
- Have them test out each material on the board (ramp); have a ruler or measuring tape and stickers ready.
- Starting at the foot of the ramp, have families tape lines six inches apart to serve as distance lines to help them measure how far the car travels after leaving the ramp.
- Mark space between the lines as “zones.” Between the bottom of the ramp and the first line is “Zone 1,” between the first line and second line is “Zone 2,” and so on.



Friction Supply List:

- Coloring sheets
- Crayons/markers
- Pencils
- Curiosity journals
- Sandpaper
- Foil
- Bubble wrap
- Paper bag
- Plastic bag
- Cardboard
- Books
- Binder clips
- Play dough (1 per family)
- Tape (1 per family)
- Ruler (1 per family)
- Small stickers (1 per family) for marking distance



Families can decorate their ramps and suggested materials can be swapped out for any others that are available. Older children can navigate as documenters who take photos or draw pictures of their family learning together.



The STL Business Incubator @ Wellston.

Based on observations of materials, which ones do they think will make the car stop, go far, or go somewhere else on the ramp? Have families log predictions in their journals.

- Investigate and collect data: Families will do several tests by rolling cars down the ramp. Have families play different roles during investigation. Younger children can “run tests” by sending the car down the ramp right after the official tests. The person holding the car should not push the car, they are only holding it steady until it is time to release it. Have the observer document the results of each test in the curiosity journal’s “Friction Frenzy Result” page. Encourage each family to do at least three test runs on each surface.
- Reflect and draw conclusions: After testing all materials, have them reflect on and analyze all the results they documented in their curiosity journals:
- What are the differences in the surfaces tested? What materials let the car travel farthest? Which materials kept the car from moving far? Explain that the work of scientists rarely ends after a single investigation!

Share (10-20 minutes)

- Discuss ways that families acted and thought like scientists using the science inquiry design. Have families share their observations and predictions about how the car traveled on the surfaces. In what way did the kids use their senses to make observations?
- Predicting and planning: Was it helpful to spend time making predictions? How close were the predictions to the actual results?
- Investigating: What challenges did families face during their investigation? Did Ruff model any of those skills?
- Have families share their investigation data.

Reading Time

Read the book “Ada Twist, Scientist.”

Wrap-Up and Take Home

- Review family take-home materials and go over resources they will be taking home and demonstrate how to access the Ruff Ruffman Show media and activities related to materials. (pbskids.org/ruff/sports/game)
- Collect everyone’s curiosity journals.
- Have everyone help clean up.
- Give each family their take-home handouts, remind them of the details for the next session, and congratulate them on their great work!



Encourage families to divide up work roles

- Builder:** a person who creates the ramp, making sure it’s at a good angle.
- Measurer:** a person who marks where each lane will go and help measure distance.
- Designer:** a person who chooses which material goes first.
- Taper:** a person who helps the designer tape down materials and helps tape the distance at the end of the ramp.

Session 4 Build It Up

Learning about Structures

- Eat** Review and preview
- Explore** Ruff Ruffman video, games, and discussion
- Make** Design and build a playground for a Ruff plushie
- Share** Sharing, comparing, and discussing structures



St. Louis Public Library Train-the-Trainers session.

Keep in Touch

- If you plan to continue engaging with families in some capacity, share your plans with them. This could include pointing families to local events and activities to take part in or pointing them to online and on-air resources they can use.
- Make sure families know how to keep in touch with you and your partners (such as through social media, websites, phone, email, or calendar of events).
- Before everyone leaves, be sure to take a group picture!

Wrap-Up and Celebrate

- Take time to engage in a culminating discussion and celebration of their shared experiences together.

Preview Graduation Celebration

- Have everyone help clean up and prepare for certificates and take-home materials.

Present Families with their Certificate of Achievements

- Congratulate them on their great work!

Reading Time

Read the book “What Floats in a Moat.”

Wrap-Up and Celebrate

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Preview Graduation Celebration

- Have everyone help clean up and prepare for certificates and take-home materials.

Present Families with their Certificate of Achievements

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Reading Time

Read the book “What Floats in a Moat.”

Keep in Touch

- If you plan to continue engaging with families in some capacity, share you plans with them. This could include pointing families to local events and activities to take part in or pointing them to online and on-air resources they can use.
- Make sure families know how to keep in touch with you and your partners (such as through social media, websites, phone, email, or calendar of events).
- Before everyone leaves, be sure to take a group picture!



St. Louis Public Library Train-the-Trainers session.



A student is presented her Certificate of Achievement.



If families have gotten close over the course of the experience and want to exchange contact information, help facilitate that sharing. Also be sensitive to those who may not feel comfortable sharing their information.

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