



This journal belongs to the

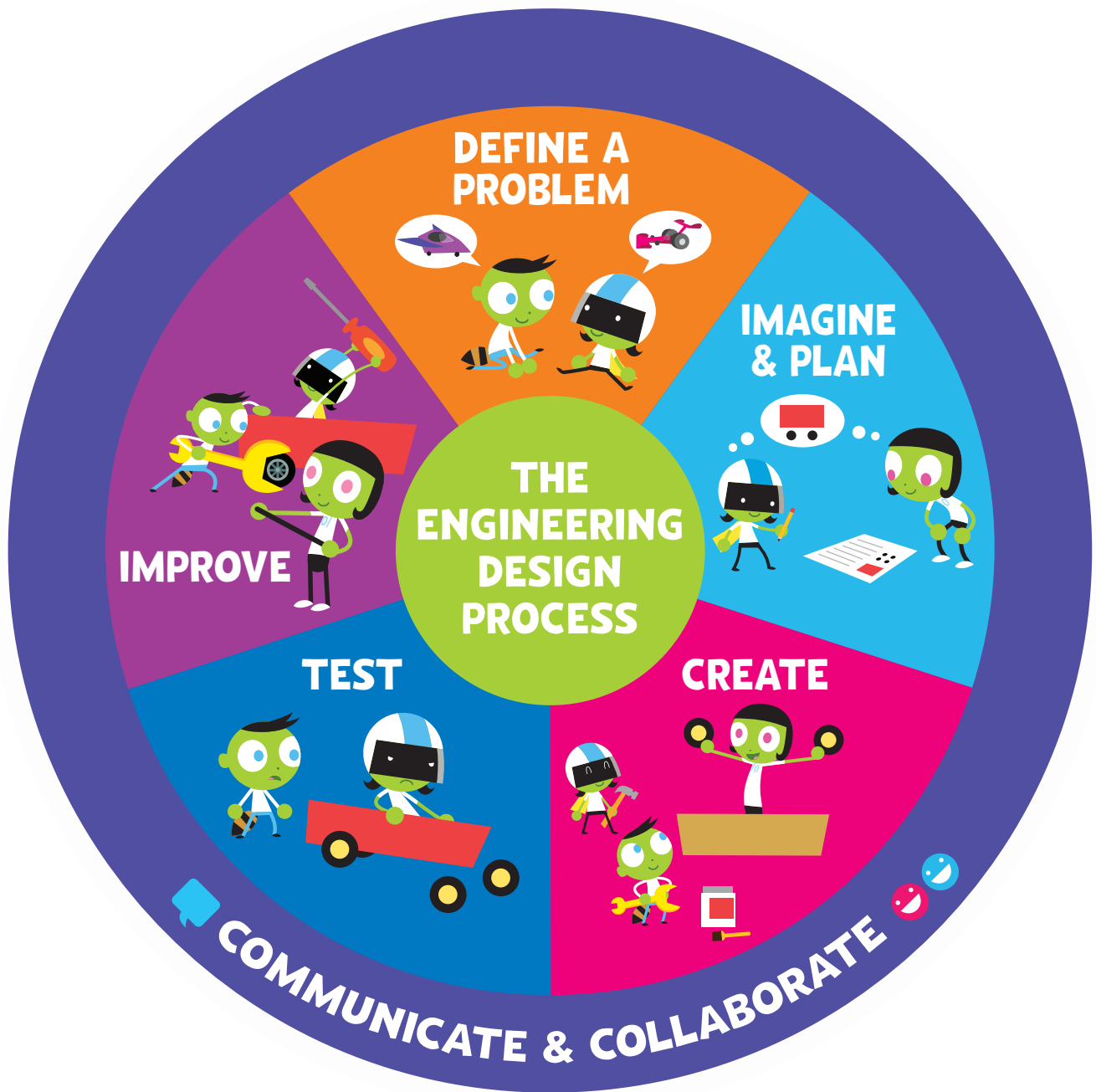
Family



Table of Contents

Engineering Design Process Graphic.....	Page 4
Inquiry Process Graphic.....	Page 5
Mix It Up: Playing With Mixtures.....	Page 6
Material World: Investigating Material Science.....	Page 13
Stick or Slide: Exploring Friction.....	Page 19
Build It Up: Learning About Structures.....	Page 26
Family Activity Pages.....	Page 31
Glossary.....	Page 43







Mix It Up!

Playing With Mixtures

Media References

pbskids.org/ruff/kitchen

- **Video:** *Ruff Mixes It Up*

Ruff and his brother Scruff are in the middle of a cooking competition and their challenge is dessert. How they will come up with a dessert that has different colors, and keeps them all separated?

- **Game:** *Ruff's Cookie Creator*

Practice predicting, testing, observing, reflecting and revising in a simulated cooking game.

Use Your Senses

Use your five senses to notice and observe the properties of the materials for your mixtures.



what do the
MATERIALS
LOOK LIKE?

SMELL
LIKE?

FEEL
LIKE
?

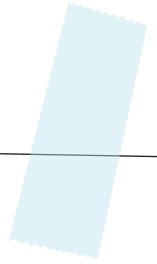
SOUND
Like? / / /

TASTE
Like? / / /



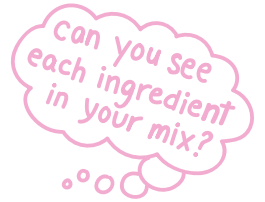


Our Trail Mix Recipe



Name of our mix: _____

Ingredients
in our mix:



What does
your mix
**TASTE
LIKE?**

could you
UNMIX
YOUR MIX?

INVESTIGATE

My Play Dough Recipe

Here is one Play Dough recipe:

2 parts corn starch

1 part conditioner

Mixing bowl

Mixing spoon

Measuring cup

Food coloring (optional)

Glitter (optional)

Rubber gloves (optional,
to avoid coloring hands)

Describe your dough recipe:

how was
⇒ YOUR ⇒
RECIPE
different?

what did your
DOUGH
feel like?

Sticky

Squishy

GOOEY

Properties Table



Properties	Trail Mix	Play Dough
Has several ingredients		
Can see all the ingredients		
Is a solid		
Is a mixture		
Can be unmixed		
Cannot be unmixed		

Notes & Reflections



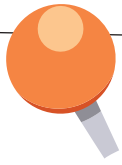
I
LEARNED...



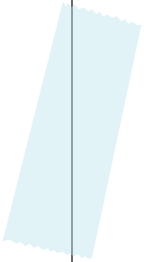
I COULD
WORK ON...

I FEEL...





Share your ideas!



Material World

Investigating Material Science

Media References

pbskids.org/ruff/materials

- **Video:** *A Dry Pet Is A Happy Pet*
Ruff and his friends test out different materials to see if they are waterproof.
- **App:** *Photo Stuff with Ruff*
Observe and investigate the material properties of the world around you, as you are challenged to photograph specific materials based on different characters, settings, and scenarios.
- **Game:** *Dress That Rhino*
Help Ruff dress-up a rhino by choosing materials with different properties.
- **Offline Game:** *Rope Relay*
Players run in pairs while holding different materials, from tin foil to toilet paper, while trying not to break the materials.

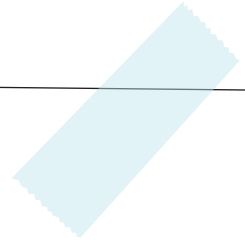
Materials Challenge

Define a Problem



We are working on this challenge:

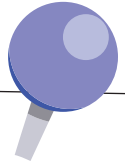
Imagine



We might use these materials:

Materials Challenge

Plan



Sketch 1

take turns
SKETCHING

Sketch 2

Sketch 3

nice
IDEAS

Materials Challenge

Test

How we plan to test:

The results of our test:

Improve

What do
YOU
think?

Notes & Reflections

I 
OBSERVED...

I 
LEARNED...

I LOOK
FORWARD
 TO...





**SHARE
IDEAS**

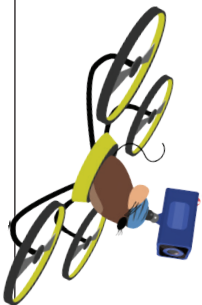
Stick or Slide

Exploring Friction

Media References

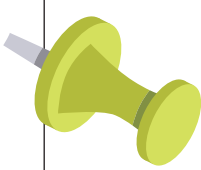
pbskids.org/ruff/sports

- **Video:** *Pulling for the Plushie*
Ruff and his friends investigate friction.
- **Video:** *Plushie on Ice*
Ruff and his friends investigate force, a push or pull that changes how an object moves.
- **Game:** *Fish Force*
Try out multiple solutions with varying positions, force, and friction to help Ruff rescue his plushie toy!



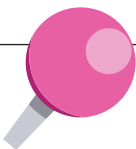
Friction Frenzy Surface 1

Material Used: _____



Observations

Predictions



OBSERVE

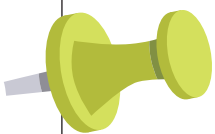
where have you seen
THIS MATERIAL
before?

How FAR
do You think
the Car will
GO?

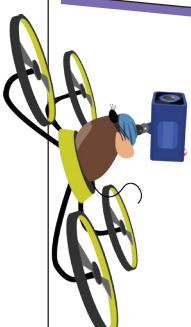


Friction Frenzy Surface 2

Material Used: _____



Observations

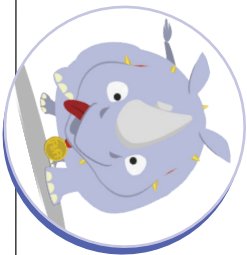


Predictions

DESCRIBE the
TEXTURE
of this surface

DO YOU THINK
THE CAR
WILL MOVE
VERY FAR?

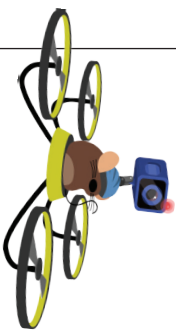
KEEP USING
THAT **BRAIN!**



Friction Frenzy Surface 3

Material Used: _____

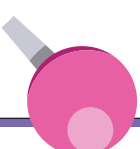
Observations



TOUCH EACH SURFACE...
HOW DO THEY
FEEL?

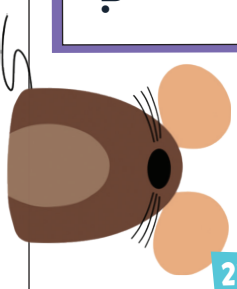
Predictions

???



Friction Frenzy Results

Use words or pictures to describe the results of your investigation.



Surface
1

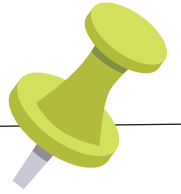
COLLECT
Data

Surface
2

Surface
3

Zoomi

Notes & Reflections


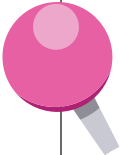


I LOOK
FORWARD
→ TO...

I FEEL...

I 
OBSERVED...





DRAW A PICTURE
OF YOUR FAMILY! ↘

Build It Up

Learning About Structures

Media References

pbskids.org/ruff/structures

- **Video:** *Eye of the Hamster*

Ruff's friends build an obstacle course for a hamster!

- **Game:** *Hamster Run*

Experiment with a variety of building pieces to construct stable and sturdy structures that help the hamster get to its carrot. Play through leveled challenges, or create your own!

- **Offline Game:** *Tower Time*

Build a tall, stable tower using materials of different shapes and sizes.

Build a Playground

Define a Problem



Imagine and Plan



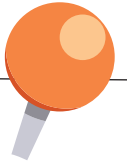
Sketch some ideas here:

Build a Playground

Test

How we plan to test:

The results of our test:



Improve



You're
doing
GREAT!

Notes & Reflections



I FEEL...

I LOOK
FORWARD
→ TO...

I COULD
WORK ON...





ASK
MORE
QUESTIONS!



Things We're Curious About



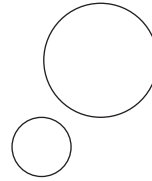
As a family, jot down things you are curious about and want to explore more.

_____ name

is very interested in...

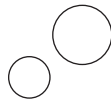
_____ name

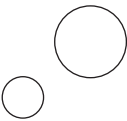
is curious about...



_____ name

would like to find out more about...



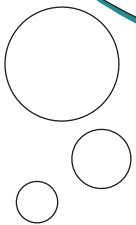


name

is interested in...

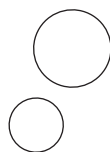
name

has been thinking
about...




name


would like to learn
more about...




5 Things We Learned

What did you learn at Family & Community Learning with Ruff?







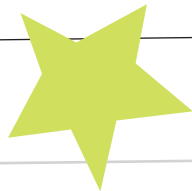






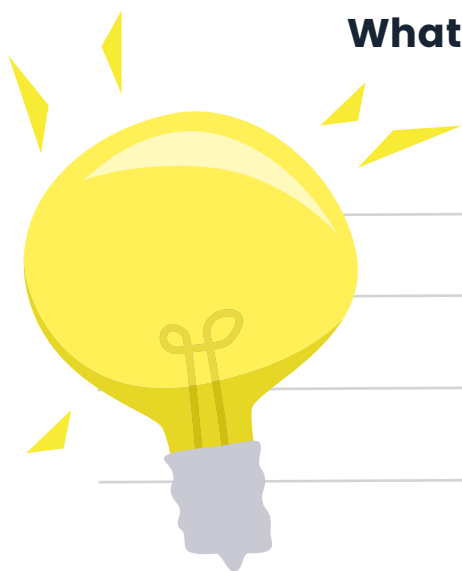
Things We Want To Learn

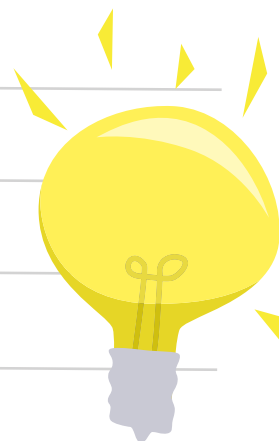
What things do you want to explore more?

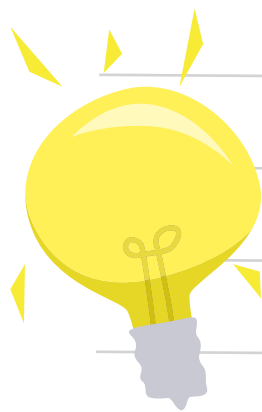
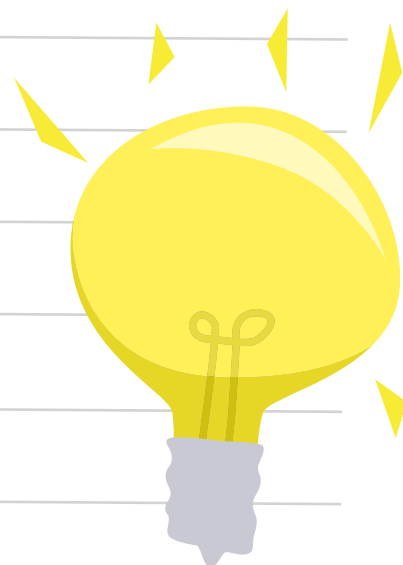


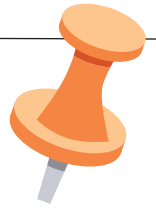
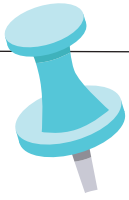
Things That Inspire Us

What sparks your imagination?



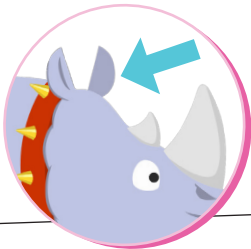
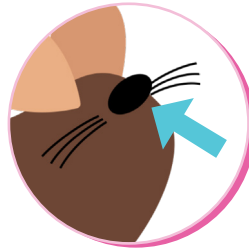






Use Your Senses

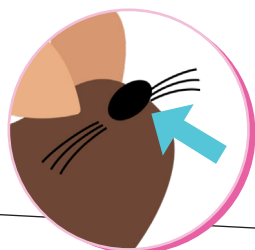
Take a moment to focus on each of your senses: hear, see, taste, smell, and touch.



Close your eyes and listen. What do you hear?



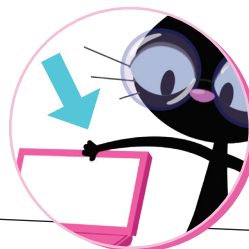
Pick up an object familiar to you, but observe it closely. Do you notice something new about it you've never seen?



Smell a few different things.
Describe their smell. Do they smell
like anything you've smelled
before?



At a meal, pay close attention to
your first bite. Really pay attention
to the tastes of the food. Can you
taste different ingredients?

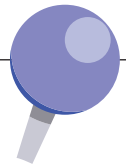


Find a surface - grass, concrete,
brick, etc. - and gently and
slowly rub your fingers across it.
What does it feel like? Can you feel
small bumps, crevices, spaces, or
individual pieces (such as blades
of grass)?

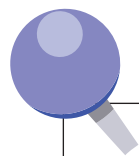


Accomplishments

Something we worked on even though it was really hard was...



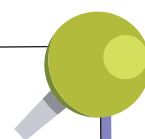
Something we figured out as a team was...



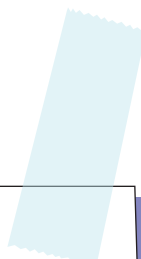
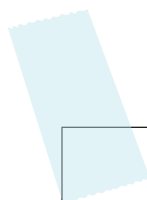
Something we asked for help on so we could keep working was...



Something amazing we made was...



An awesome idea we had was...





↙ ASK ↗
QUESTIONS

PLAN and
PREDICT

DRAW
CONCLUSIONS

Career Connections

There are all kinds of interesting jobs that use the skills you've practiced in your Family & Community Learning Workshops. Here are just a few!

Mixtures

Chemist



PHARMACIST



BAKER



CHEF



Materials

INTERIOR
DECORATOR
* * *

CONSTRUCTION
WORKER



FASHION
Designer



ARCHITECT



Force & Motion

Engineer



PILOT



ASTRONAUT



Athlete



Structures

Engineer



ARCHITECT



BUILDER



DEVELOPER





Glossary



Absorbent	Soaks up liquids.
Base	The bottom of something.
Collaboration	Working together with others.
Data Collection	Gathering information about the results of your test.
Distance	The amount of space between two things.
Force	A push or pull on something.
Friction	A force that slows the motion of an object. Friction is created when the surface of two objects rub together and push and pull against each other. For example, you can't slide across the floor very well in sneakers, because there is a lot of friction between the sole of a rubber shoe and the floor.
Investigate	Explore things and find stuff out.
Irreversible Change	When something can only change once, like bread into toast (it can't change back).
Material	What something is made out of.
Mixture	A new substance made by combining two or more substances.
Observe	Using your senses to gain information about something.

Glossary

Predict	To describe what you think will happen based on what you already know.
Properties	Characteristics of an object or substance.
Results	What happened from your test or investigation.
Reversible Change	When something can change back and forth, like water and ice.
Senses	Our senses help us understand the world around us through what we see, hear, taste, touch, and smell.
Stability	Doesn't move easily.
Structure	Something that is built.
Sturdy	Strong.
Substance	A particular kind of stuff with specific properties.
Surface	The outside layer of something.
Symmetry	The same on both sides.
Texture	The feel of a surface.
Test	Trying something out, to see if your prediction is right.
Waterproof	Does not absorb, or soak up, liquids.