

**Sensational
Science Camp**



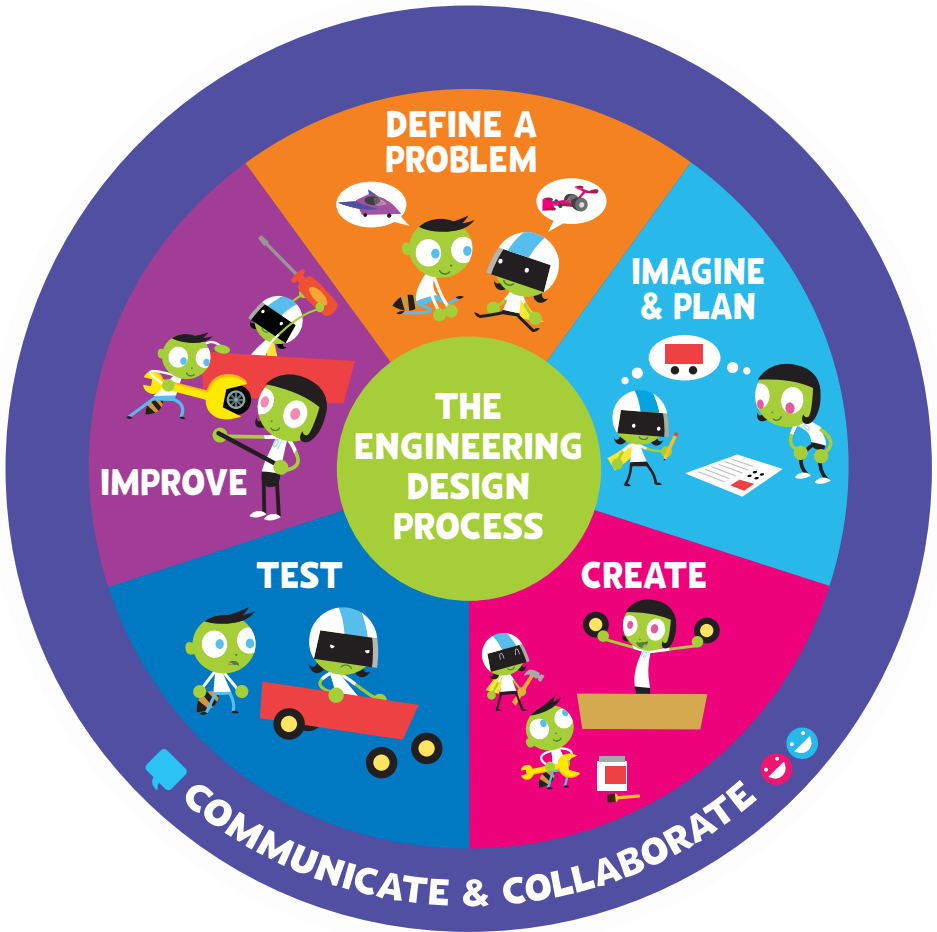
with **Ruff Ruffman™**

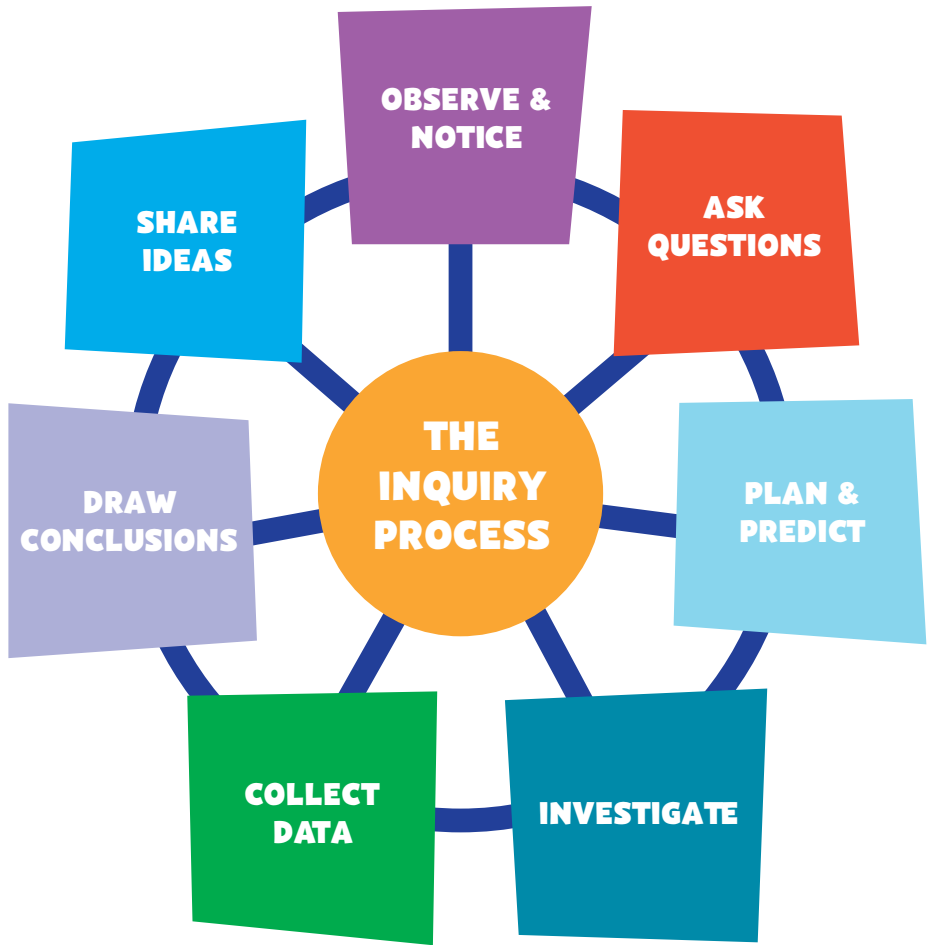
This journal belongs to

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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 your mix: _____

Ingredients in your 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		



Accomplishments

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



Something I figured out with others was...



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



I am working on this challenge:

Imagine

I might use these materials:

Materials Challenge

Plan



Sketch 1

DO SOME
SKETCHING

Two hand-drawn arrows: one pointing to the left and one pointing downwards, both in a light blue color.

Sketch 2

Sketch 3

nice
IDEAS

A simple line drawing of a lit lightbulb with three short lines radiating from the top, indicating it is glowing.

Materials Challenge

Test

How I plan to test:

The results of my test:

Improve

What do
YOU
think?



Accomplishments



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



An awesome idea I had was...



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

HOW FAR
do You think
the car will
GO?


Where have you seen
THIS MATERIAL
before?

Friction Frenzy Surface 2

Material Used: _____



Observations

DESCRIBE the
TEXTURE
of this surface

Predictions

DO YOU THINK
THE CAR
WILL MOVE
VERY FAR?



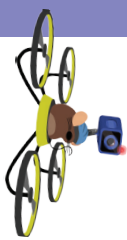
KEEP USING
THAT
BRAIN!



Friction Frenzy Surface 3

Material Used: _____

Observations



TOUCH EACH SURFACE...
HOW DO THEY
FEEL?

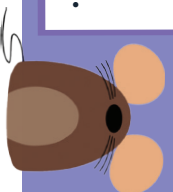
Predictions



Where do
YOU
PREDICT
the car will
STOP?

Friction Frenzy Results

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



COLLECT
Data

Surface

1

Surface

2

Surface

3

Zoom!



Accomplishments

Something amazing I made was...



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

Notes & Reflections

I LOOK
FORWARD
→ To...

I FEEL...

I 
OBSERVED...



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 & Plan



Sketch some ideas here:

Build a Playground

Test

How I plan to test:

The results of my test:



Improve



You're
doing
GREAT!

Future Design Ideas





Accomplishments

Something I figured out with others was...



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



Notes & Reflections



I FEEL...

I LOOK
FORWARD
TO...

I COULD
WORK ON...





ASK
MORE
QUESTIONS!



Finale!

Media References

pbskids.org/ruff

- **Video:** *Now We're Cookin'!*

Ruff and his brother Scruff sing about all they know about food prep based on what they learned about mixtures, liquids and solids, and reversible and irreversible change.

- **Video:** *I Won't Give Up, Ruff Ruffman Action Plushie!*

Ruff sings about all the ways he was surprised by force, friction, and gravity while trying to get his plushie back to deliver it to his Grandma for her birthday.

- **Video:** *A Well-Dressed Rhinoceros*

In this song, Ruff and Fluff show how clothing made out of different materials has different properties.

- **Video:** *That'll Work!*

In this music video, Ruff reviews different approaches to structures and ideas that will and won't work.



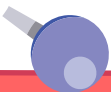
Song Organizer

Theme:

Words:

Rhyming Words:

Sentences:



Notes



A series of horizontal grey lines on a white background, providing space for writing notes.

Notes





Accomplishments

Something I figured out with others was...



An awesome idea I had was...





Things I'm Curious About



Jot down things you are curious about and want to explore more.

I'm very interested in...

I'm curious about...

I would like to find out more about...



I'm interested in...

I've been thinking
about...


I would like to learn
more about...

5 Things I Learned

What did you learn at
Sensational Science Camp with Ruff?













Things I Want To Learn



What things do you want to explore more?





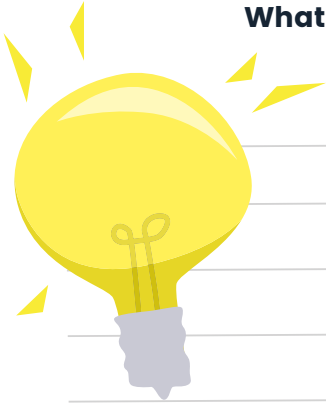


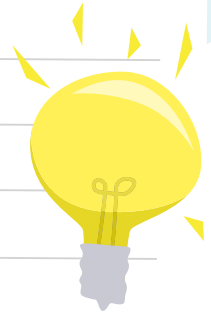


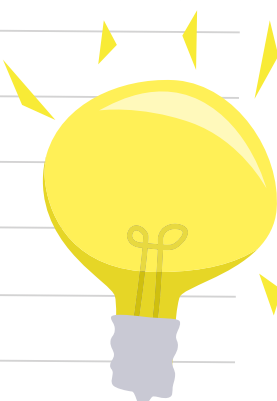




Things That Inspire Me

What sparks your imagination?





A large, glowing yellow lightbulb with a grey base and several yellow rays emanating from it, positioned in the upper right corner of the page. The page is white with horizontal ruling lines and is held in place by blue tape at the top corners.

A smaller, glowing yellow lightbulb with a grey base and several yellow rays emanating from it, positioned in the lower left corner of the page. The page is white with horizontal ruling lines and is held in place by blue tape at the top corners.A cartoon orange dog with large eyes, a wide smile, and a yellow belly patch, pointing upwards with its right hand. The page is white with horizontal ruling lines and is held in place by blue tape at the top corners.



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?



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



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



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)?

↙ASK↘
QUESTIONS

PLAN and
PREDICT

DRAW
CONCLUSIONS

Career Connections

There are all kinds of interesting jobs that use the skills you've practiced in Sensational Science Camp. 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



BUILDER



ARCHITECT



DEVELOPER



Glossary

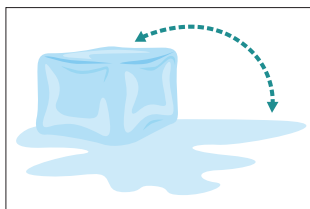
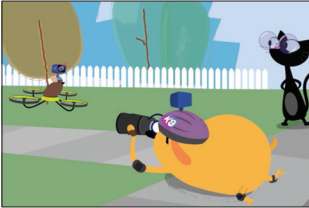
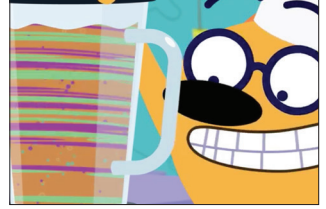
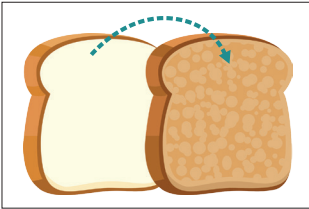
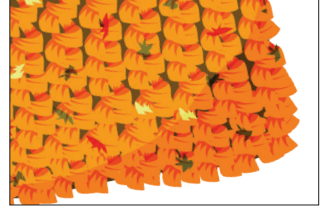
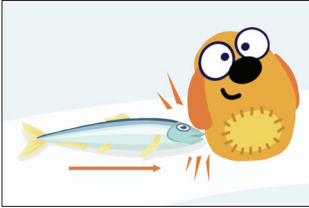


Absorbent	Soaks up liquids.
Base	The bottom of something.
Collaboration	Working together with others.
Data Collection	Gathering information about the results of your test.
Distance	The amount of space between two things.
Force	A push or pull on something.
Friction	A force that slows the motion of an 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.

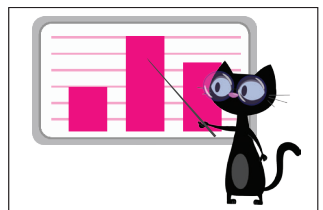
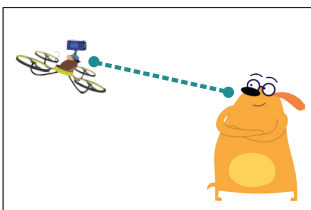
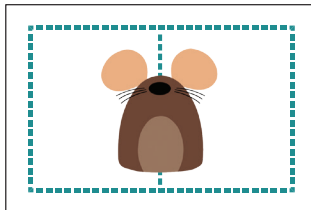
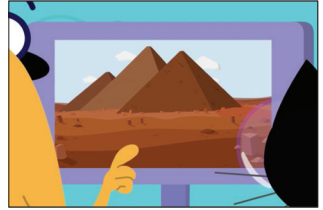
Glossary

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.

Stickers



Stickers



Stickers

