

YEAR 2 CHEMICAL SCIENCE JOURNAL

Exploring materials,
making changes and
discovering the world
around us!

We ask
questions.



We explore.



We observe.



We test.



We learn.



We care for
our world.



Name:

Class:

Teacher:





Lesson 1 – Materials Detectives

Exploring
Materials



Part 1 – Material Hunt

Find 3 objects made from different materials.

Material	Object I Found	Draw It
_____	_____	
_____	_____	
_____	_____	

Materials you
might find:

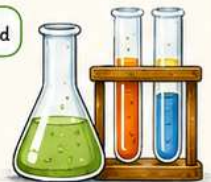
- plastic
- metal
- wood
- glass
- fabric
- paper

Part 2 – Materials Scientist

Choose 2 objects from your hunt.

Property Word Bank: rough • smooth • hard • soft • shiny • dull • flexible • rigid

My Object	Material	Properties
_____	_____	_____ _____ _____
_____	_____	_____ _____ _____



Part 3 – The Bridge Challenge

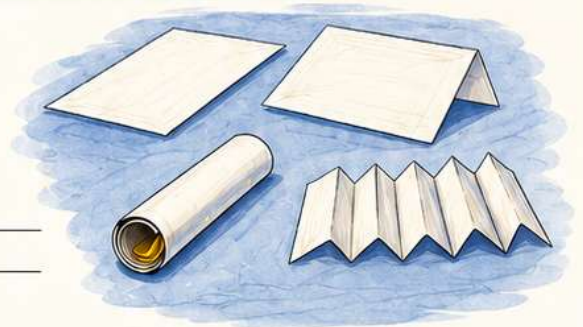
Professor Quill needs a strong paper bridge.

How could we change paper to make it stronger?

MY FIRST BRIDGE IDEA

I think we could
change the paper by:

I think this could make
it stronger because:



TOP 5 VOCABULARY

- material
- property
- strength
- flexible
- rigid



Materials Detective Discovery

Complete the sentences.

Different materials have different _____.

Materials can be chosen because they are suitable for
different _____.



Lesson 2 – Can We Change Materials?

Physical Changes



Part 1 – Changing Materials

Choose 3 materials. One must be paper.

Actions: fold • bend • twist • stretch • scrunch • tear • roll

Material	What did you do?	What happened?	Same material?
Paper			Yes / No
			Yes / No
			Yes / No

Part 2 – Before and After

Choose one material.

My material: _____

I will: ☐ Fold ☐ Bend ☐ Twist ☐ Stretch ☐ Scrunch ☐ Tear ☐ Roll



BEFORE

Draw it before.



AFTER

Draw it after.

What changed?

What stayed the same?

Is it still the same material?

☐ Yes ☐ No

How do you know?

Part 3 – Change the Paper

Try each change and make a quick observation.

Paper	What do you notice?
Flat	
Folded	
Rolled	
Scrunched	



My Science Discovery

When I changed the shape of the material, _____

It was still _____ because _____



Remember

A material can be physically changed without becoming a different material.





Part 2 – Materials Have Jobs

Choose 2 examples.

Object	How was the material changed?	Why is the change useful?

Choose from:

- rolled paper tube
- folded fan
- rope
- folded cardboard
- woven fabric



Part 3 – The Paper Bridge Challenge

Which design do you predict will hold the most weight?

- ☐ Flat ☐ Concertina / zigzag ☐ Rolled ☐ Folded beam

I predict the _____ design will hold the most weight.

Use evidence from what you have already explored.

Something I noticed about changing paper was:

This makes me think my design will be strong because:



★ Science Discovery

Materials can be changed to suit a _____.

Changing the _____ of a material can change what it can do.





Your teacher will show you examples connected to a specific Aboriginal or Torres Strait Islander People, community or source where possible. Aboriginal and Torres Strait Islander Peoples have diverse knowledge and practices.

Choose ONE Experiment

☐ Weaving

– weave strips over and under.



☐ Twisting

– twist strands together.



☐ Plaiting

– plait three strips together.



☐ Coiling

– wind a long strip into a coil.



Before

My material: _____

It is: ☐ flexible ☐ rigid ☐ smooth ☐ rough ☐ soft ☐ other: _____

BEFORE

Draw it.

AFTER

Draw it after your experiment.



What Changed?



What Stayed the Same?

Did changing or arranging it make it more useful?

☐ Yes

☐ No

How?



My Discovery

The _____ changed, but it was still

_____.



How to Change and Arrange Materials

Different ways we can weave, twist, plait and coil natural materials.

1 WEAVE

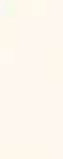
weave strips over and under.



1 Place strips up and down.



2 Take one strip and weave it over, then under.



3 Keep going across the row.



4 Start a new row and weave the other way.



Finished!

Weaving makes a strong and flexible surface.

2 TWIST

twist strands together.



1 Take two strands.



2 Cross one strand over the other.



3 Cross the same strand over again.



4 Keep twisting to the end.



Finished!

Twisting makes materials stronger and tighter.

3 PLAIT

plait three strips together.



1 Place three strips side by side.



2 Cross the left strip over the middle.



3 Cross the right strip over the new middle.



4 Keep going to the end.



Finished!

Plaiting makes a neat and strong braid.

4 COIL

wind a long strip into a coil.



1 Start with the end of a long, flexible strip.



2 Wind the strip around in a circle.



3 Keep coiling tightly.



4 Tuck the end in to hold it in place.



Finished!

Coiling creates strong baskets and bowls.

These techniques have been used by Aboriginal and Torres Strait Islander Peoples for thousands of years to make useful and beautiful everyday objects.

Lesson 5 – Planning a Fair Investigation



Which Paper Bridge Will Be Strongest?



Part 1 – Fair or Unfair?

What happened?	✓ Fair	✗ Unfair
Every bridge uses the same size paper.	☐	☐
One bridge is made from cardboard.	☐	☐
Every bridge crosses the same gap.	☐	☐
One bridge has a shorter gap.	☐	☐
We use the same linking cubes.	☐	☐
We push one bridge but use cubes on the others.	☐	☐

★ A Fair Test

We change **ONE** thing and keep other important things the **SAME**.

Safety First!

- ☒ Work calmly.
- ☒ Use materials carefully.
- ☒ Keep hands and objects to yourself.
- ☒ Ask for help if needed.



Part 2 – Plan Our Investigation



Our Question

Which paper design will make the strongest bridge?



What will we CHANGE?

The shape/design of the paper.

We will test:



☐ Flat



☐ Folded beam



☐ Rolled

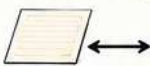


☐ Concertina / zigzag



What will STAY THE SAME?

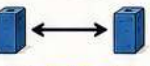
Tick the things we need to keep the same.



☐ Size of paper



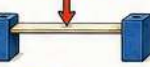
☐ Type of paper



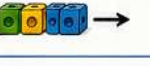
☐ Distance between supports



☐ Type of weights



☐ Where weights are placed



☐ How weights are added



Remember! ★

A fair test helps us find the best answer to our question.



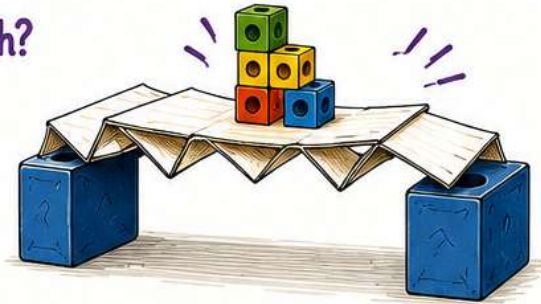


Part 3 – How Will We Measure Strength?

We will add **one** linking cube at a time.

We will measure:

How many linking cubes the bridge holds before it collapses.



Teacher Observation – Fair Measurement Discussion

- ☐ Student suggested how bridge strength could be measured.
- ☐ Student identified something that should stay the same.
- ☐ Student explained why keeping it the same helps make the comparison fair.

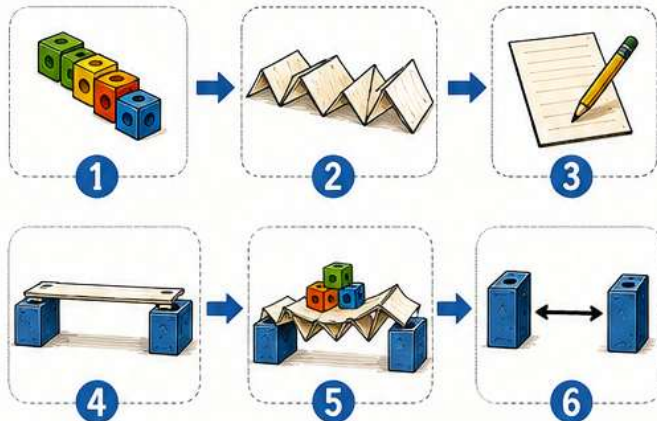
Teacher note: _____



Part 4 – Our Method

Number the steps 1–6.

- ☐ Add linking cubes one at a time.
- ☐ Make the paper design.
- ☐ Record the number of cubes held.
- ☐ Place the bridge across the supports.
- ☐ Stop when the bridge collapses.
- ☐ Set the supports the correct distance apart.



Students do NOT need to rewrite the method.



Part 5 – Work Safely

- ☐ Keep the work area tidy.
- ☐ Add cubes carefully.
- ☐ Follow the investigation steps.
- ☐ Use materials correctly.
- ☐ Tell the teacher if something becomes unsafe.



Part 6 – My Prediction

I predict the:

- ☐ Flat ☐ Folded ☐ Rolled ☐ Concertina
bridge will be strongest.

I think this because:



Lesson 6 – Bridge Builder Investigation

Test Your Bridges



Part 1 – The Fair Test



Remember

CHANGE: paper design

KEEP THE SAME:

paper • paper size • gap • supports • linking cubes • testing method



Test each bridge

- 1 Place the bridge across the supports.
- 2 Add one linking cube at a time.
- 3 Count carefully.
1, 2, 3...
- 4 Stop when the bridge collapses.
- 5 Record your result.
- 6 Repeat for each design.



Part 2 – Record Your Results

Bridge Design	Cubes Held	Quick Observation
Flat	_____	_____
Folded	_____	_____
Rolled	_____	_____
Concertina	_____	_____



Investigate • Measure
Compare • Conclude

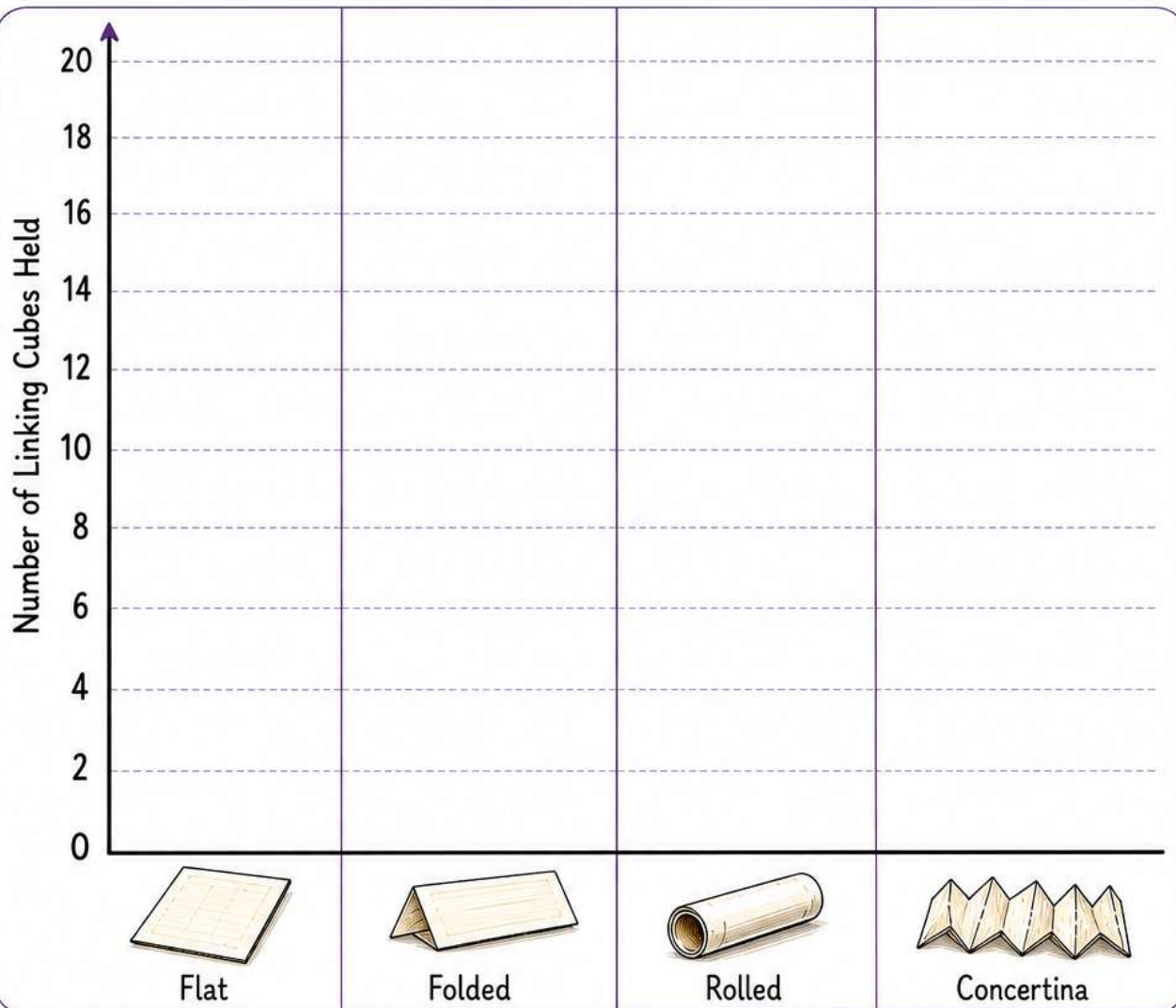
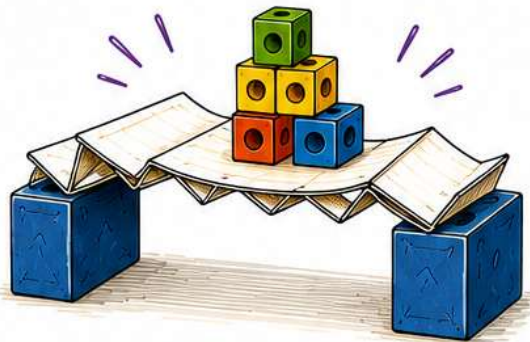


Part 4 – Class Graph

As a class, create a graph:

Which Paper Bridge Was Strongest?

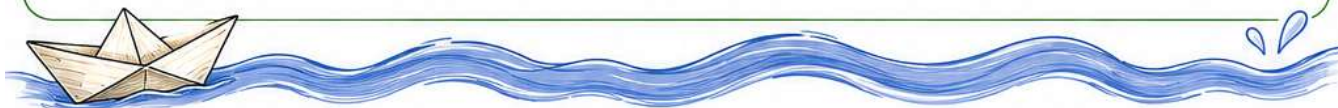
Use your class graph to compare the different designs.



My Conclusion

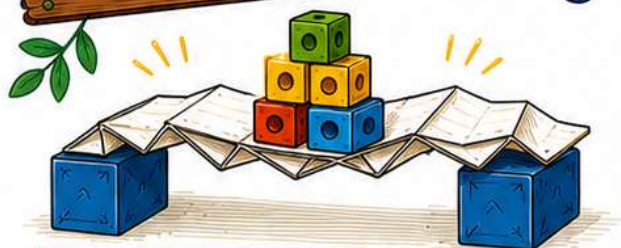
The _____ design was the strongest because it held _____ cubes.

My evidence shows that changing the _____ of paper can change its _____.



Lesson 7

Bridge Engineers Expo



Part 1 – My Bridge



My strongest design was:

☐ Flat ☐ Folded ☐ Rolled ☐ Concertina

It held _____ linking cubes.

I changed the paper by:



MY STRONGEST BRIDGE



Part 2 – Explain Your Scientific Thinking

How did changing the paper make it stronger?

The _____ design

made the paper stronger because _____

Did changing its shape turn it into a different material?

☐ Yes ☐ No

Explain how you know.

Even though the _____ changed,

it was still _____ because _____



Part 3 – Was Our Investigation Fair?

☐ Yes ☐ Mostly ☐ No

One thing we kept the same was:

This helped make our test fair because:

To make it even fairer next time, I would:

VOCABULARY

material



What something is made from.

change



To make something different.

design



A plan or idea for making something.

strength



How much weight something can hold.

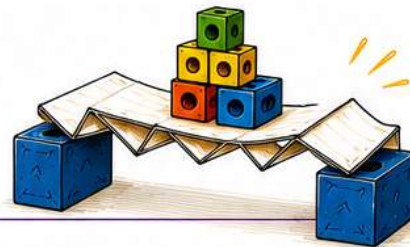
evidence



Facts or observations that prove something.

Lesson 7

Bridge Engineers Expo



★ Part 4 – Compare With Another Group

Another group's strongest design: _____

It held: _____ cubes

Our results were:

☐ Similar ☐ Different

One thing I noticed when I compared our results was:



Comparing helps us learn more!

★ Part 5 – Scientist Reflection

What did you discover about changing paper? _____

What would you improve next time?



★ Part 6 – My Next Investigation

What would you investigate next?

☐ Would cardboard be stronger? 

☐ Which fold is strongest? 

☐ What if the bridge was longer? 

☐ Would thicker paper change the results? 

 My own idea

My new science question is:

I wonder _____?



Bridge Engineers Expo



Use your bridge and booklet to explain your investigation.

Expo Checklist

- ☐ I showed my bridge.
- ☐ I explained how I changed the paper.
- ☐ I shared my results.
- ☐ I used evidence.
- ☐ I explained how our test was fair.
- ☐ I compared my results with another group.
- ☐ I shared an improvement.
- ☐ I shared a new science question.



Scientist Word Bank



material • property • shape • physical change • strength

fair test • investigation • prediction • observation

result • compare • evidence • improve



★ Final Scientist Statement

Changing the _____ of paper changed its _____.

I know this because my evidence showed _____

