

Science Experiment: Which Material Absorbs the Most Water?

Investigation Title: Which Material Absorbs the Most Water?

Big Science Question

Different materials behave in different ways when they touch water.

Some materials soak up water quickly.

Some materials soak up a little water.

Some materials do not absorb water at all.

In this investigation, you will test different materials to find out:

Which material absorbs the most water?

Learning Goals

By the end of this investigation, you should be able to:

- write a hypothesis
 - follow a scientific procedure
 - conduct a fair test
 - observe what happens carefully
 - collect evidence
 - record results in a table
 - write a conclusion using evidence
 - write a scientific report
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Safety First

This experiment is safe and simple, but scientists still need to work carefully.

Safety Rules

- Work on a tray, table or waterproof surface.
 - Wipe up spills straight away.
 - Do not drink the experiment water.
 - Do not place wet materials near electrical devices.
 - Wash your hands after the experiment.
 - Ask an adult before beginning.
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Investigation Question

Which material absorbs the most water?

Materials

You will need:

- paper towel
 - tissue
 - cotton cloth
 - sponge
 - plastic bag or foil
 - small bowl or cup of water
 - tablespoon or measuring spoon
 - tray or plate
 - timer or clock
 - ruler, optional
 - pencil
 - evidence collection sheet
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Important Science Idea

What Does Absorb Mean?

To **absorb** means to soak up or take in liquid.

For example:

- A sponge absorbs water.
- A towel absorbs water.
- Plastic does not absorb water easily.

Materials absorb water differently because they have different textures, holes, spaces and surfaces.

Variables

A **variable** is something that can change in an experiment.

In a fair test, we change only **one** thing and keep everything else the same.

Independent Variable

The **independent variable** is the thing you change.

In this experiment, the independent variable is:

The type of material.

Examples:

- paper towel
 - tissue
 - cotton cloth
 - sponge
 - plastic or foil
-

Dependent Variable

The **dependent variable** is the thing you measure or observe.

In this experiment, the dependent variable is:

How much water each material absorbs.

Controlled Variables

The **controlled variables** are the things you keep the same.

In this experiment, you should keep these things the same:

- the amount of water added to each material
 - the size of each material
 - the time allowed for absorbing
 - the surface used
 - the way water is added
 - the temperature of the water
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Fair Test Reminder

A **fair test** means the experiment is fair because only one thing changes.

For this investigation, the only thing that should change is the **material**.

Everything else should stay the same.

Example

If you give the sponge 3 tablespoons of water but the paper towel only 1 tablespoon, the test is not fair.

If every material receives 2 tablespoons of water and has 1 minute to absorb it, the test is fair.

Hypothesis

A **hypothesis** is a scientific prediction. It tells what you think will happen and why.

A strong hypothesis uses this structure:

If I test different materials, then _____ will absorb the most water because _____.

My Hypothesis

If I test different materials, then _____ will absorb the most water because _____.

Modelled Hypothesis

If I test different materials, then **the sponge** will absorb the most water because **it has many tiny spaces that can hold liquid.**

Procedure

A **procedure** gives clear steps to follow.

Scientists write procedures so other people can repeat the experiment.

Method

1. Place the tray on a flat surface.
 2. Cut or fold each material so they are roughly the same size.
 3. Place the first material on the tray.
 4. Add **2 tablespoons of water** onto the material.
 5. Wait for **1 minute**.
 6. Observe what happens.
 7. Record your observations in the evidence collection sheet.
 8. Check how much water is left on the tray.
 9. Repeat the same steps for each material.
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10. Compare your results.
11. Decide which material absorbed the most water.
12. Write your conclusion.

Evidence Collection Sheet

Scientists collect **evidence** to support their conclusions.

Evidence can include:

- observations
 - measurements
 - results
 - drawings
 - photographs
 - tables
 - numbers
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Evidence Collection Table

Material	Amount of Water Added	Time Given	What Happened?	Water Left on Tray	Absorption Rating
Paper towel	2 tablespoons	1 minute		None / Some / A lot	1 2 3 4 5
Tissue	2 tablespoons	1 minute		None / Some / A lot	1 2 3 4 5
Cotton cloth	2 tablespoons	1 minute		None / Some / A lot	1 2 3 4 5

Material	Amount of Water Added	Time Given	What Happened?	Water Left on Tray	Absorption Rating
Sponge	2 tablespoons	1 minute		None / Some / A lot	1 2 3 4 5
Plastic or foil	2 tablespoons	1 minute		None / Some / A lot	1 2 3 4 5

Absorption Rating Scale

Use this scale to rate each material.

Rating	Meaning
1	Did not absorb water
2	Absorbed a little water
3	Absorbed some water
4	Absorbed most of the water
5	Absorbed all or almost all of the water

Observation Notes

Use this space to record details.

Paper Towel

Tissue

Cotton Cloth

Sponge

Plastic or Foil

Evidence

Drawing or Photo Space

Draw or paste a photo of your experiment setup.

Results Summary

After completing the experiment, answer these questions.

1. Which material absorbed the most water?

2. Which material absorbed the least water?

3. Which materials absorbed some water?

4. What evidence supports your answer?

Results Ranking

Rank the materials from **most absorbent** to **least absorbent**.

Rank	Material
1	
2	
3	
4	
5	

Bar Graph Template

Create a bar graph to show your absorption ratings.

Title

Absorption Rating of Different Materials

Material	Rating out of 5
Paper towel	
Tissue	
Cotton cloth	
Sponge	
Plastic or foil	

Graph Space

Scientific Report Scaffold

Use this scaffold to write your scientific report.

Title

Which Material Absorbs the Most Water?

Aim

The **aim** explains what you are trying to find out.

Sentence starter:

The aim of this investigation is to find out

_____.

Hypothesis

The **hypothesis** is your scientific prediction.

Sentence starter:

If I test different materials, then _____ will
absorb the most water because

_____.

Materials

The **materials** section lists the equipment used.

I used:

- _____
- _____
- _____
- _____
- _____

Variables

The **variables** explain what changed, what was measured and what stayed the same.

Variable Type **My Experiment**

Independent variable

Dependent variable

Controlled variables

Method

The **method** explains the steps followed.

1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
-

Results

The **results** show what happened.

Material	Absorption Rating	Observation
Paper towel		
Tissue		
Cotton cloth		
Sponge		
Plastic or foil		

Discussion

The **discussion** explains what the results mean.

Sentence starters:

The material that absorbed the most water was

_____.

This happened because

_____.

The material that absorbed the least water was

_____.

This shows that

_____.

Conclusion

The **conclusion** answers the investigation question using evidence.

Sentence starter:

In conclusion, _____ absorbed the most water. I know this because

_____.

My hypothesis was correct / incorrect because

_____.

Evaluation

The **evaluation** explains how the experiment could be improved.

Sentence starters:

This experiment was fair because

_____.

One thing I could improve next time is

_____.

Next time, I could also test

_____.

Glossary of Key Scientific Terms

Term	Definition
Absorb	To soak up or take in liquid
Absorbent	Able to soak up liquid
Material	What something is made from
Investigation	A careful test or study to answer a question
Experiment	A scientific test used to find out what happens
Aim	What the investigation is trying to find out
Hypothesis	A scientific prediction that can be tested
Prediction	What you think will happen
Variable	Something that can change in an experiment
Independent variable	The thing you change in an experiment
Dependent variable	The thing you measure or observe
Controlled variable	Something kept the same to make the test fair
Fair test	An experiment where only one thing is changed
Method	The steps followed in an experiment
Observe	To look carefully and notice details
Observation	What you notice during an experiment
Measure	To find the amount, size or quantity of something
Data	Information collected during an investigation
Evidence	Information that supports an answer or conclusion
Results	What happened in the experiment
Table	A way to organise information in rows and columns

Term	Definition
Graph	A visual way to show data
Conclusion	The final answer based on the results
Evaluate	To explain what worked well and what could be improved
Reliable	Results that are trustworthy because the test was done carefully

Modelled Scientific Report

Title

Which Material Absorbs the Most Water?

Aim

The aim of this investigation was to find out which material absorbs the most water.

Hypothesis

If I test different materials, then the sponge will absorb the most water because it has many tiny spaces that can hold liquid.

Materials

I used:

- paper towel
 - tissue
 - cotton cloth
 - sponge
 - plastic bag
 - water
 - tablespoon
-

- tray
- timer

Variables

Variable Type	My Experiment
Independent variable	The type of material
Dependent variable	How much water each material absorbed
Controlled variables	The amount of water, the size of the material, the time given and the surface used

Method

1. I placed a tray on a flat table.
 2. I placed one material on the tray.
 3. I added 2 tablespoons of water to the material.
 4. I waited for 1 minute.
 5. I observed how much water the material absorbed.
 6. I recorded my results in a table.
 7. I repeated the same steps for each material.
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Results

Material	Absorption Rating	Observation
Paper towel	4	It absorbed most of the water and became wet quickly.
Tissue	3	It absorbed some water but became weak and started to break.
Cotton cloth	4	It absorbed most of the water and stayed strong.
Sponge	5	It absorbed almost all of the water.
Plastic bag	1	It did not absorb the water. The water stayed on top.

Discussion

The sponge absorbed the most water. This happened because the sponge has many tiny holes and spaces that can hold liquid.

The paper towel and cotton cloth also absorbed water, but they did not absorb as much as the sponge. The tissue absorbed some water, but it became weak when it was wet.

The plastic bag absorbed the least water. This shows that plastic is not absorbent because water cannot easily pass into it.

Conclusion

In conclusion, the sponge absorbed the most water. I know this because it had the highest absorption rating and there was almost no water left on the tray after 1 minute.

My hypothesis was correct because I predicted that the sponge would absorb the most water.

Evaluation

This experiment was fair because each material was given the same amount of water and the same amount of time to absorb it.

One thing I could improve next time is to measure the leftover water more accurately using a measuring cup or syringe.

Next time, I could also test other materials such as wool, cardboard, baking paper or aluminium foil.

Modelled Student Evidence Collection Sheet

Material	Amount of Water Added	Time Given	What Happened?	Water Left on Tray	Absorption Rating
Paper towel	2 tablespoons	1 minute	It soaked up most of the water.	Some	4
Tissue	2 tablespoons	1 minute	It became wet and started to tear.	Some	3
Cotton cloth	2 tablespoons	1 minute	It absorbed most of the water and stayed strong.	Some	4
Sponge	2 tablespoons	1 minute	It soaked up almost all the water.	None	5
Plastic bag	2 tablespoons	1 minute	The water stayed on top and did not soak in.	A lot	1

Modelled Graph Data

Material	Rating out of 5
Paper towel	4
Tissue	3
Cotton cloth	4
Sponge	5
Plastic bag	1

Teacher Notes

Why this experiment works well

This investigation is suitable because it is:

- safe
- inexpensive
- easy to set up
- easy to repeat
- clear to observe
- connected to everyday materials
- useful for teaching variables and fair testing

Common Student Misconceptions

Misconception 1

“If the material gets wet, it absorbed the most water.”

Correction:

A material may get wet but only absorb a little water. Students need to compare how much water is left behind.

Misconception 2

“Plastic is bad because it does not absorb water.”

Correction:

Plastic is not absorbent, but that can be useful. For example, raincoats and umbrellas need to repel water.

Misconception 3

“The biggest material will absorb the most water.”

Correction:

That is why the materials should be the same size. A fair test keeps size the same.

Extension Questions

Answer these if you finish early.

1. Why do towels need to be absorbent?
 2. Why should raincoats not be absorbent?
 3. What material would be best for cleaning up a spill?
 4. What material would be best for keeping something dry?
 5. How could this experiment be made more accurate?
 6. What would happen if each material had 5 minutes instead of 1 minute?
 7. Why is it important to repeat an experiment?
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Challenge Investigation

Try a second experiment.

New Question

Which material keeps water out the best?

This is different from absorption.

A material that keeps water out is called **waterproof**.

Possible materials:

- plastic
- foil
- baking paper
- cotton cloth
- paper towel

New Hypothesis

If I test different materials, then _____ will keep water out the best because

_____.

Scientific Report Checklist

Use this checklist before submitting your report.

Checklist Item	Tick
I included a clear title.	☐
I wrote the aim.	☐
I wrote a hypothesis using “if” and “then”.	☐
I listed all materials.	☐
I explained the variables.	☐
I wrote the method in order.	☐

Checklist Item	Tick
I recorded results in a table.	☐
I used observations as evidence.	☐
I wrote a conclusion.	☐
I explained whether my hypothesis was correct or incorrect.	☐
I included an evaluation.	☐
I checked my spelling and punctuation.	☐

Success Criteria

A successful scientific report should:

- explain what was tested
- include a clear hypothesis
- describe a fair method
- record results clearly
- use evidence
- answer the investigation question
- explain what could be improved

Final Reflection

Complete these sentences.

Today I learnt that absorb means:

The most absorbent material was:

I know this because:

One thing I did well as a scientist was:

One thing I could improve next time is:

Final Reminder

Good scientists do not guess wildly.

They ask a question, make a prediction, test carefully, collect evidence and explain what the evidence shows.

A scientific report is the story of an investigation, but instead of dragons and treasure, it has variables, results and proof. Tiny clipboard, mighty brain.