



# WATER BUG CHALLENGE

7-12 yrs | 10 min | Stage 2-3

## Mission Question

Can you improve your pond so it can hold MORE water bugs?



### ? Wonder & Predict

I PREDICT THAT.....

- |                                       |                                             |
|---------------------------------------|---------------------------------------------|
| <input type="checkbox"/> Bigger cup   | <input type="checkbox"/> Smaller paperclips |
| <input type="checkbox"/> Colder water | <input type="checkbox"/> Larger paperclips  |
| <input type="checkbox"/> Warmer water |                                             |

There are no wrong predictions.

#### Before you begin

What ONE thing do you think will help your pond hold more water bugs?

This experiment builds on the FREE experiment on the website. Visit this for how to float a paperclip on water.



### What you will need



- 2 plastic cups



- Small paperclips



- Large paperclips



- Jug of water



- Pencil



- Investigation sheet



### Investigation Record

Follow the steps carefully while observing.

1

#### Build Your Starting Pond

- Build your pond exactly the same way as before.
- Count how many water bugs it can hold.

Starting score

2

#### Change Just ONE Thing

- Real scientists keep everything the same...except ONE thing.
- Which ONE thing will you change?

- |                                            |                                         |                                      |
|--------------------------------------------|-----------------------------------------|--------------------------------------|
| <input type="checkbox"/> Cup size.         | <input type="checkbox"/> Paperclip size | <input type="checkbox"/> Water level |
| <input type="checkbox"/> Water temperature |                                         |                                      |

3

#### Build Your New Pond

Build the pond with your ONE change, count carefully, record your new count.

New score:

4

#### Compare Your Results

Compare your Starting score and New score.

- ☐ Held MORE water bugs — my change helped
- ☐ Held FEWER water bugs — my change made it worse
- ☐ Held the SAME number — no difference

Was your prediction correct? ☐ Yes ☐ No ☐ Partly right

5

#### Improve your investigation

What would you test next to hold even more water bugs?

- |                                             |                                                   |                                                |
|---------------------------------------------|---------------------------------------------------|------------------------------------------------|
| <input type="checkbox"/> Different cup size | <input type="checkbox"/> Different paperclip size | <input type="checkbox"/> Different water level |
| <input type="checkbox"/> Hotter water       | <input type="checkbox"/> Colder water             |                                                |



### Observe & Record

What happened?

- ☐ My pond held more water bugs.
- ☐ My pond held fewer water bugs.
- ☐ The surface broke quickly.
- ☐ The surface stretched further.
- ☐ It was easier to place the paperclips.
- ☐ Something surprised me





## What happened?

Fill in the sentences using words from the box.

surface tension | water molecules | invisible | support | stretched | broke | sink

1. Tiny \_\_\_\_\_ are always pulling towards each other.
2. They form an \_\_\_\_\_ skin across the top of the water.
3. Scientists call this \_\_\_\_\_.
4. This invisible skin can \_\_\_\_\_ very light objects.
5. As more paperclips were added, the surface \_\_\_\_\_ further and further.
6. Eventually the invisible skin \_\_\_\_\_ and the paperclips began to \_\_\_\_\_.



## The science behind it

### Why Did The Paperclips Float?

Water is made from millions of tiny particles called water molecules.

These molecules are always pulling towards each other. At the surface of the water, they form a very thin, stretchy layer.

Scientists call this surface tension.

Think of it as a tiny invisible skin stretched across the top of the water.

If a very light object is placed gently onto this surface, the invisible skin can support it.

That's why your first paperclip stayed on top of the water instead of sinking.

As you added more and more paperclips, the invisible skin stretched further.

Eventually, the weight became too great.

The surface broke...

...and the paperclips sank.

★ Continue your adventure inside... ★

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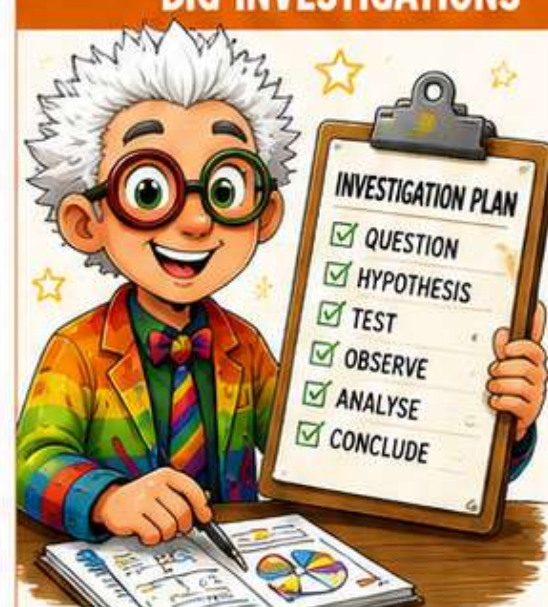


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