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|--|--|--------------------------------------|
| A wooden stick | A piece of dry sponge | One small piece of thread |
| A piece of bread or <i>roti</i> | A crumpled ball of paper | Some puffed rice |
| The cap of a water bottle | Some pieces of <i>kopra</i> (dried coconut) | One plastic ball |
| One small wooden pencil | A biscuit | 10 metal paper clips |
| Chalk pieces | An assortment of buttons | A matchbox without matches |
| Some fresh and dry leaves | A flat piece of aluminium foil | Some ripe <i>jamuns</i> (the fruit) |
| One small uncapped empty cold drink bottle | A small, tightly capped cold drink bottle with some juice. | A handful of moong <i>dhal</i> seeds |
| A sharpener | A piece of Thermocol (polystyrene foam) | One glass bangle |
| A handful of groundnuts with shells | Some coins | Some flowers |
| A used piece of soap | A raw egg | A small lump of clay |

Table I. Objects you can drop into the water. Some sink, some float, some absorb water, and some change over time.

that labels like 'heavy,' 'sinking,' or 'made of stone' do not automatically answer these questions.

C) Commit to predictions: Once you have listed your conditions, think about which everyday objects might best satisfy these conditions (see Table II). Without testing them yet, answer the following questions:

- Which five objects would you choose **first** if your aim was to raise the water level as quickly as possible?
- Which three objects do you feel most unsure about, but are curious to test?
- Which objects look very different from each other, but you think might behave in a similar way in water?

Notice which choices you feel confident about, and which ones are just guesses.

D) Test your predictions: Gently put one object at a time into the water in your chosen container. Watch not only where the object goes in the first few seconds, but also if this changes over the next few minutes. As you test, keep asking yourself: Which predictions were correct, and which ones changed? What did I notice only after I tested my predictions? Which observations were the most surprising?

E) Change the liquid: What if you replaced tap water with a different liquid? For example, can you

predict what would change if you used: (a) Salt water (how much salt would you add?), (b) Sugar solution (how much sugar would you add?), (c) Fresh lemon juice, (d) Bottled fruit juice, and (e) Milk? Using the same objects, which liquid would show the maximum rise? Can you think of another everyday liquid that might show an even greater rise? Do you think any objects in Table I might behave differently in these liquids—if so, why? If you tested these ideas, what observations would surprise you the most?

F) A boundary case to notice: Before drawing any conclusions, try this with a fresh container of water. Gently place a dry needle right on top of the water's surface. Notice what happens. Then, place a second needle (of the same kind) on a small piece of tissue paper and lower it carefully into the water. Watch what happens as the tissue paper gets soaked and sinks. Do the two needles behave the same way? Look closely at the water under the second needle. Is it actually floating, or is something else holding it up? What did the tissue paper do for the second needle that your fingers could not do for the first one? Notice how our usual ideas about 'floating' and 'sinking' do not quite fit what we see here. You do not need to fully explain this 'difference' yet. This is just a reminder that some observations can strain our categories.

G) Reflect: We often remember puzzles like this because of what surprised us. But their

| S. No. | What to think about | Which objects (~2-4) from Table I might fit this? | Make a brief note on why you think so. |
|--------|--|---|--|
| 1 | Shape matters: The same material could behave differently if its shape changes (flat, crumpled, hollow, compact). | | |
| 2 | Trapped air: The object may carry air into the water at first, even if it later sinks or changes. | | |
| 3 | Absorption and change over time: The object may soak up water, swell, soften, or break apart. | | |
| 4 | Placement and balance: How the object is placed (gently, tilted, dropped) may affect what happens. | | |
| 5 | Same material, different behaviour: Objects that seem similar in material may not behave similarly in water. | | |
| 6 | "Feels heavy": Objects that are heavy enough to sink, but still surprise you in how they affect the water level. | | |

Table II. Concept–object mapping. The second column lists some examples of object properties that might affect the water level. Add your own conditions to this list, or create your own. Do not test the objects yet; use this table to commit to your predictions before looking at the physical evidence.

real value comes from what they make us think about afterward. Look back at your predictions, observations, and surprises. Then, think about:

- What mattered most in your observations: the material of the object, its size and shape, or what it did once it entered the liquid?
- Did sinking always mean the object was 'useful' for raising the water level? Did floating always mean it was 'not useful'?
- If your prediction was different from what you observed, did you revise your explanation to fit what you observed? Or did you check whether your observation was affected by an error or limitation? Explain your thinking.

It is in reflecting on these questions that our observations turn into understanding.³ When we pause to examine our own predictions, hesitations, and revisions, we practice the kind of thinking we ask students to do—but rarely give ourselves time

for. With your classroom in mind, consider these:

- If a student made the same predictions you did, what would they need help noticing?
- How often do we expect students to make predictions based on careful reasoning without first giving them time to try things out, observe, wait, and adjust their ideas?

Parting thoughts

This puzzle mirrors the thinking we want students to practice: predicting, observing, and revising ideas rather than relying on assumptions. By trying it ourselves, we uncover hidden details, identify surprises, and refine our reasoning—just as students need to. It helps us anticipate misconceptions, scaffold observations, and ask students questions that deepen their understanding. Rather than being separate from classroom practice, this puzzle is a rehearsal for noticing, guiding, and supporting inquiry in real student investigations.



Notes:

(a) Credits for the image (Everyday objects for investigation, scattered on floor) used in the background of the article title: Created for i wonder... using ChatGPT, under prompting by Chitra Ravi (Dec 2025). License: CC BY-NC-ND.

- (b) The order in which the authors' names and bios appear reflects the sequence in which contributions were made to this article. The author who made the first substantial contribution is listed first, and the author who made the final contribution is listed last. Unlike in academic articles, this order does not indicate the relative amount, importance, or value of each author's contribution.

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DID YOU KNOW?

HOW SINKING AND FLOATING PROPERTIES MATTER

Did you know that the simple question "Will this sink or float?" helps people design boats, keep swimmers safe, clean polluted water, and improve everyday food practices? The science behind sinking and floating is not limited to classroom tubs of water. It is quietly at work all around us, shaping technologies, safety measures, and daily activities.

When an object is placed in water, scientists explain what happens in two connected ways. One is by comparing the object's mass to its volume, a property called (average) density. The other is by comparing forces: the downward pull of gravity on the object and the upward push of water on it, called the buoyant force. Scientists study sinking and floating by measuring mass and volume and by observing how objects behave in water under different conditions. Over time, repeated tests, careful comparisons, and shared observations have built strong evidence for how floating works. Consider boats. A huge ship made of steel floats, while a small steel nail sinks. This does not mean that metal always floats or always sinks. Experiments show that boats float because their shape allows them to displace a large volume of water, which lowers their average density compared to water. Many boat designs also trap air, increasing volume without much increase in mass. Shipbuilders test different designs in water tanks before building real ships. Designs that sink are modified or rejected—evidence comes first, decisions follow. Water itself also matters. Many people notice that floating feels easier in the sea than in a river or pond. Experiments show that salt water is denser than fresh water. For the same person in the same position, denser water provides a greater buoyant force, making floating easier. Scientists have measured this effect in many water bodies, including the Dead Sea, where floating is especially easy. Knowledge of floating is essential for safety. Life jackets contain materials such as foam that trap air, increasing a person's total volume without much increase in mass. Tests show that this helps keep people afloat, and designs are improved through repeated testing in different conditions. The same ideas appear at home. When rice or *dhal* is washed, husks and damaged grains often float because they have lower average density, while healthy grains sink. Oil floating on water is another example, used during oil-spill clean-ups to skim oil from the surface through careful observation and testing.

All these examples show that sinking and floating are not about guessing. They depend on careful observation, testing under varied conditions, and using evidence to explain what happens.

Question for students: Take a bowl of water and a small ball of dough from your kitchen. Place the ball of dough gently in the water and observe for a full minute. Does it sink quickly, slowly, or change as it becomes wet? Using the same dough, without adding or removing any material, reshape it in three ways—for example, a tight ball, a flat sheet, and a hollow form with air inside. Test each shape one at a time. Each time, note how fast it sinks or floats, which part touches the water first, and whether its behaviour changes with time. Ask yourself: What changed—the dough, the water, or the space the dough occupies? How might trapped air or spreading the dough affect the water's push? If you could not use words like 'sink' or 'float', how would you describe what you observed? What test would make your explanation stronger?