

Topic links: Water, Recycling, Toys	Primary 5/6 Age 8-10	Activity title: Bottle flip
Science skill focus Recording and communicating	Curriculum link: Movement and Energy Force is needed to make an object move, change speed or direction (ME1)	
Progression focus <ul style="list-style-type: none"> • Can children collect and record results systematically? • Can children use their recording to communicate their findings? 		
<p>Activity <i>Today we will be data collectors.</i></p> <p>Give each group an empty plastic bottle (lid on, same size if possible). Ask them to try to flip and land it (see website below). This is almost impossible without liquid inside, so ask the pupils to investigate to find the best amount of water to add to the bottle to complete a successful bottle flip (useful to have: funnels, measuring jugs, access to water/bowl with cup). For example, groups may choose to have 3 flips each for each amount of water, or count how many flips to get 3 successes. As long as they are consistent, any method can provide results. Ask pupils to record their findings, so that results can be compared at the end. Info for teachers: https://www.vox.com/2016/5/26/11785562/water-bottle-flip-physics</p> <p>Adapting the activity</p> <p>Support: Ask pupils to explain their first result and how they will record it. A simpler investigation is to compare different surfaces.</p> <p>Extension: Calculate the proportion/percentage of bottle filled. Is there a pattern? Does this pattern apply to other shaped bottles?</p> <p>Other ideas: Explore other variables: bottle shapes (especially considering the base of the bottle, hour-glass shapes often work best); sit/stand; surface; height of flip; oil/water...</p> <p>Questions to support discussion</p> <ul style="list-style-type: none"> • What variables will affect the way you flip? How can you try to keep the style of flip similar, so that you are just focusing on the water? • Will everyone flip or just the group's best 'flipper'? (<i>The focus is on recording rather than variables, so it is ok to take turns to flip</i>). • How many goes should each person have with each amount of water? • How will you record your results? • Can you use your results to explain what you have found so far? • Which group's recording is easier to understand? 		
<p>Pupil learning indicators</p> <p>Not fully achieved: Pupil recordings are not clear to others, e.g. number of flips are noted but not the amount of water, or vice versa. Their investigation may be unsystematic, with no reason for amounts of water tested.</p> <p>Achieved: Pupil recordings clearly show what was investigated e.g. yes/no is recorded next to names/attempts or number of successful flips is clearly linked to an amount of water. The investigation is systematic e.g. equal intervals of water are tested or a trial-and-error approach is recorded clearly.</p> <p>Exceeded: Pupils consider patterns in their data e.g. <i>we're finding that a third of a bottle seems to work best for these ones</i>. Pupils recognise the need to repeat measures and/or problems with the reliability of their data e.g. <i>we just can't keep it fair because every throw is different</i>.</p>		

