



Hour Pre-Visit Lesson Plan

FFOREST

Date:

Years 3 - 6

Teacher:

Lesson Objectives

- To excite the children about their trip.
- To establish that a force is a push or a pull.
- To establish that gravity and friction are forces.
- To understand that when different forces act upon objects, they can make them move, stop or change direction.
- To explore what affects the movement of a paper helicopter
- To establish that forces can be represented with arrows.

Starter Activities

10
mins

- **PowerPoint:** Show the children Slides 1 and 2 and click on the link. Explain that they will be visiting Zip World Fforest and will be having a turn on the Fforest Coaster and Treetop Nets, as well as looking at Plummet 2. Spend time navigating the website, and watching the videos!
- Explain that the rides and attractions work because of forces. Ascertain from the children that all forces are **pushes** and **pulls**.
- **Years 3 and 4: PowerPoint Slide 3** – spend a few minutes in pairs looking for pushes and pulls around the classroom/playground (having a few toys around the classroom in preparation may be helpful – invite the children to make them move). Come back together and ask the children to share what they found – give a volunteer a ‘push’ and ‘pull’ label (**Worksheet 1**) to stick on their example and ask the class if they agree. Record different examples on the board. Where would we put examples that use both pushes and pulls?

Main Activity

15
mins

- **PowerPoint Slide 4:** Establish that there are different kinds of forces – whisper to your partner all the forces you know – hear the children’s ideas and look at the slide together – focus on **gravity, friction**, (and **air resistance** for years 5 and 6).
- Give out the cards (**Worksheet 2** (shown on Slide 5)) to mixed ability pairs (choose appropriate cards for your year group/ability).
- Support and encourage the children’s discussions – at a basic level, can the children relate the push/pull force to movement? Older children may grasp that multiple forces are playing a part - can they determine which forces are at work in their picture and describe what movement/change the force is causing? More able children may start to understand the idea of balanced and unbalanced forces in a Tug of War.
- After a few minutes, choose a few volunteers to share their ideas and use **Slides 6/7** to help.
- **Slide 8:** Establish that forces can **start/stop something moving, change its speed or change its direction** Forces can also change the shape of an object.



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	25 mins	<ul style="list-style-type: none">● Slides 9 – 10: In pairs or small groups, children are to create a paper helicopter, that when dropped from a height, will show the force of gravity and the effect of air resistance (Worksheet 3). Ensure they drop from the same height each time. Take care if balancing on chairs.
Extension Work	-	<ul style="list-style-type: none">● Encourage more confident children to consider how to make● a 'better' helicopter – how might changing the thickness of the paper, the length of the blades or the shape of the blades make a difference? How might they create more air resistance so that their helicopter takes longer to reach the ground?
Plenary	10 mins	<ul style="list-style-type: none">● Slide 11: Encourage some groups to show their helicopters. Discuss the force making them fall (gravity) and the force acting against this (air resistance). Did anyone manage to slow their helicopter down? Discuss ways of designing the helicopter so that it takes longer to reach the ground (increasing air resistance). What else could you have tried? What else would you like to find out? Drop a flat piece of paper and a crumpled up piece of paper to demonstrate the effect of air resistance.● Slide 12: If time allows, relate their findings to the rides at ZipWorld – how will gravity and air resistance affect their movement – how could they slow/speed up the drop from Plummet?!
AfL	-	Observing, contribution to discussion and verbal responses to questions.
Key Skills	-	Collaboration, questioning, communication, reflection.
Key Words	-	Push, pull, force, gravity, friction, air resistance, motion, balanced, unbalanced.





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Differentiation and Success Criteria	-	<p>Group children in mixed ability groupings; peer support.</p> <p>Offer more guidance to less confident children.</p> <p>Encourage more confident children to consider that multiple forces act at once on objects.</p> <p>All children will know that a force is a push or a pull and name some examples of forces.</p> <p>Most children will understand that there are different types of force, including gravity and friction, and that they can affect motion. They will know that forces create, change or stop movement.</p> <p>Some children will understand how other forces such as air resistance can affect an object's motion, using arrows to show the size and direction. They may understand the difference between balanced and unbalanced forces.</p> <p>They can identify and explain what affects the movement of their helicopter.</p>
Resources/ Preparation Needed	-	<ul style="list-style-type: none">• Push/pull toys• PowerPoint• Activity sheet 1 (cut out)• Activity sheet 2 (cut out) – enough for one card per pair• Activity sheet 3 (printed on various thicknesses of paper and card) – enough for each group to have multiple attempts• Scissors per group• Paperclips• Spare paper for own designs.• Timers for experiments if needed
Evaluation	-	For teacher to complete:

Note: Please amend PowerPoint and Worksheets to suit your cohort and year group.

Children in years 5 and 6 should omit push and pull starter exercise and take more time on the helicopter activity.

