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|  **Outdoor Education Plan** |
| **Lesson Focus – Forces Used when using a Bow and Arrow**  |
| **Year Group - Years 3,4,5 & 6** | **Term - Four** | **Date – Week 17/02/18** |
|  | **Outline** | **Curriculum Links/****Learning Objectives** | **Health and Safety considerations** | **Equipment** |
| **Session Procedures** | **Before** - Check for rubbish, glass, hazards. Check weather forecast**During –** Remind children about looking after their eyes.**After** – clear everything away and return any natural objects to their original place**Clean hands.**  | Sc3/4.2a    compare how things move on different surfacesSc5/4.2a    explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling objectSc5/4.2b    identify the effects of air resistance, water resistance and friction, that act between moving surfacesSc5/4.2c    recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect | Wash hands after touching outside objectsRemind the children about how sharp some sticks can be and to be careful of brambles and stinging nettles.Remind children to be careful not to let the sticks fly out of their hands and go in someone else’s eye.Wear safety googles to protect eyes when shooting arrows if deemed necessary. | Hazel sticksWillow sticksStringScissorsNewton apple |
| **Introduction and Activity Opportunities** | **Starter activity in class*** Discuss the discovery of Gravity by Isaac Newton in the 1680s **-** [**http://bpes.bp.com/primary-resources/science/ages-9-to-11/forces/super-scientists-isaac-newton/**](http://bpes.bp.com/primary-resources/science/ages-9-to-11/forces/super-scientists-isaac-newton/)
* Discuss the forces that are effecting a flying object (if time make paper airplanes)

**Main Activity** * Demonstrate to the class how to attach the string to each end of the stick using a clove hitch (we need to reuse the string and sticks so all knots must be removed at the end)
* Demonstrate how to hold the bow and arrow and how to shoot from the bow.
* Give very clear instructions on how we must be incredibly careful not to shoot at people and equally must not walk in front of a loaded bow (put cork on the end of the arrow). When we are working with sticks it is everyone’s responsibility to make sure that no one gets hurt including yourself.
* Test the bows and arrows on the playground and end up with a competition to shoot the furthest.
* Where are the forces on the bow and arrow (pull arrow, pull string, push arrow with string, bend stick, stretch string, air resistance, gravity, friction between arrow and stick)

Half the class - * Test the paper airplanes made in class – whose goes the furthest? Why do you think this is so?
* Test other flying items from the flight box (parachutes, bubbles, winged bean bag, helecopters…)
 | **Vocabulary** |
| HazelClove HitchWillowIsaac NewtonForce FrictionAir resistance |
| **Plenary** | What do you think effected the distance that the arrow would fly?What would you change next time?Make Friction chatterboxes | **Evaluation** |