

Nettle Goodness

Learn about the many benefits of nettles. Discover recipes and forage for this abundant plant.

Nettles are an important food source for butterflies and a home for young ladybirds. Pack nettle leaves with fruit to keep them fresh for longer by keeping mould away. Native Americans have used nettles to treat aches and pains. They are high in vitamin C, A and full of calcium, magnesium, iron and potassium.

Picking Nettles: Nettles have a concoction of chemicals in fine needles on their stem and underside of leaves that are injected into our skin, to give the familiar stinging sensation. This gives them protection from animals that want to eat nettles. When picking use sturdy gloves to protect yourself, scissors are handy too. Once laid out and wilted they will no longer sting.

Nettle Tea: Take a handful of nettle leaves (1 cup) and add to a pan of water (2 cups). Bring to the boil and simmer for 10 minutes. Add optional sugar or honey to taste.

Nettle Soup: Fry 1 onion, 1 carrot, 2 celery sticks and garlic clove in butter. When soft add 1 litre of vegetable stock and a cooked large diced potato. Simmer for 15 minutes.

Add 500g of nettle leaves and boil for 5 minutes. Blend with optional double cream, salt and pepper.

Nettle Pesto: Add 50g of wilted nettle leaves, 50g pine nuts, 3 garlic cloves, 50g parmesan cheese to a food processor. Then add olive oil until it thickens and mix further. Salt and pepper to taste.

Crispy Nettles: Fry nettle leaves in butter with a pinch of salt for a couple of minutes until golden and crispy. Great for a quick snack or as part of a main meal.

Notes:

Allways cook nettles or leave out until wilted to destroy the stinging acid. They can't be used in salads!

Health and Wellbeing

Identify and adopt a healthy lifestyle

Time:
30 min+

Space:
Park, Woods

Equipment:
Nettles, Gloves



Potty About Potatoes

Watch the fascinating process of root growth and stem formation of a plant, as the potato grows.

Normally we miss the opportunity to view this process when we plant things in the ground. Try this activity to see it happening from your own windowsill.

Activity:

1. Take your potato and stick four toothpicks into the sides. If it is too large for the container cut in half.
2. Fill your container with water.
3. Rest the toothpicks on the side of the container and ensure the bottom of the potato is submerged in water.
4. Leave the potato on a windowsill and watch it grow.

Extension:

Set up different containers and experiment with adding something different to the water; try plant food, food colouring, salt and sugar.

Experiment with different amounts of sunlight.

Try growing other plants the same way. For example; sweet potato, avocado seeds, garlic, rosemary, cut off the ends of lettuce, cabbage, cucumber, spring onions or even pineapple and place in water!

Notes:

Sprouts should develop in 1-2 weeks. Place on a sunny windowsill for best results.

Keep the water topped up to make sure the bottom stays wet.

Clean the water every 1-2 days to keep it fresh and clear.

Environmental Awareness

*Experience Awe and Wonder
Appreciate and draw inspiration from
the environment*

Time:
10 min+

Space:
Windowsill or Sheltered
Outside

Equipment:
Glass or Jam Jar, Cocktail
Sticks x4, Small Potato.



Referenced from www.ltl.org.uk and www.royalparks.org.uk

Toilet Paper Tuna

Create your own BBQ tuna- great fun to try at home for a tasty lunch snack. It's also perfect for your next camping adventure.

Steps to making toilet paper tuna (TPT):

1. Find somewhere flat, e.g. a paving slab, BBQ. Make sure there isn't anything flammable nearby. If you're on the grass dig a pit as described in sheet 'Firelighting, at Home' - it will burn the grass and potentially catch fire.
2. Open your tuna can, taking care not to spill the oil.
3. Fold your four sheets of toilet paper into one.
4. Press the toilet paper into the oil, the corners need to stay dry. You should only see the circle of the tin in the oil, with the corners sticking up.
5. Let the paper absorb the oil, once saturated set fire to the dry corners.
6. Allow the paper burn, until it stops (normally 15-20 mins).
7. Make sure the flames have gone out and carefully peel off the burnt toilet paper.

***THE TIN WILL BE EXTREMELY HOT. TAKE CARE.**

8. Wait to cool and enjoy!

Bonus challenge:

See if you can boil water over the flames whilst the tuna is cooking. Place some large rocks around the tuna and then balance a grill on top. Use an old pan / mess tin to boil your water in.

Notes:

Do not leave fire unattended. Supervise young children around the flames. The flames can get quite large, and bits of toilet paper can blow off in the wind. Always keep a safe distance.

For 'Firelighting at Home' sheet see

https://www.aretecentre.co.uk/wp-content/uploads/2020/05/fire-lighting_at-home.pdf

*Enjoyment and
Appetite for
Learning*

Enjoy being outdoors

Time:

5 mins prep, 20 mins cook

Space:

Any Outdoor Space

Equipment:

Can of Tuna in Oil, 4 sheets of Toilet Paper, Lighter/Matches



Garden Planters

Upcycle a plastic bottle by creating a garden planter. Your imagination is the limit here!

We use plastic every day, most plastic is used once and then thrown away. Millions of tonnes of plastic end up in the ocean or landfill each year.

Look at a used coke or squash bottle differently and give it a new lease of life as a garden planter!

Activity:

1. Select plastic container.
2. Cut a wide enough space out to enable the filling of the planter with soil.
3. Pierce the base several times to allow the water to drain through.
4. Decorate the planter. It could be a rocket, animal or a submarine!
5. Fill the base with some rocks or gravel for drainage.
6. Top up the planter with a mixture of soil and compost.
7. Plant a seedling into the soil and water it in thoroughly. Try chives, they are easy to grow and the bees love them!

Notes:

Think about where to place your planter and what plants need to grow. Growing something from seed requires patience and care!!

Make sure you recycle plastic bottles.

Try reducing your use of plastic or even better refusing.

Environmental Awareness

*Appreciate and draw inspiration from the environment
Understand the impact of human activities on the environment*

Time:
20min+

Space:
Any Outdoor Space

Equipment:
Old Plastic Containers, Art Crafts, Scissors, Soil/ Compost, Gravel, Seeds



Japanese Hapa Zome

Try this simple, fun and creative activity. Calming and relaxing method to create art from any natural objects that are all around you.

Hapa Zome is an ancient Japanese art form. It is also known as 'leaf printing'

Activity:

1. Gather flowers, leaves, berries from your garden, local park or hedgerow. Choose ones that you feel drawn to.
2. Lay your piece of cotton cloth material flat on a hard flat surface and arrange your flowers.
3. You can either do a symmetrical image and place the flowers on one side and fold in half. Or you can simply cover with a second piece of fabric.
4. Take a hammer, large smooth stone, rolling pin or similar. Bash the top layer of material until you see the dye seeping through.
5. Open the fabric and brush away the plant matter to reveal the pretty patterns.
6. Why not turn your finished piece into a flag, bunting, greetings card or anything else you can think of!

Important

Think about your impact when picking your flowers / leaves- the aim of this activity is not to destroy plants but to engage and be inspired by them. Only take one or a few petals/leaves from each plant and take care not to damage them.

Notes:

This works best when the flowers and leaves are full of water, so do this as soon as you can after picking.

You can add more detail by using fabric pens or paint.

Perhaps do this activity away from any family members who are trying to work!

Referenced from www.ltl.org.uk

Environmental Awareness

*Appreciate and draw inspiration from the environment
Understand the impact of human activities on the environment*

Time:
20 min+

Space:
Any Outdoor Space.

Equipment:
Flowers, Leaves, Berries,
Old T-Shirt / Bed Sheets,
Hammer / Smooth Rock /
Rolling Pin



Scavenger Hunt

Challenge somebody to pick up natural items of your choosing. Make it harder by asking for a certain colour, shape or size.

Enables the participant to look closely at the natural environment around them as they discover items they didn't realise were hidden away. Exploring textures and different materials

Activity:

1. Choose a natural item for the other person to find. For example if you choose a leaf then your partner has to go and find a leaf. There is a short list below.
2. They then challenge you to find something
3. Keep going until you run out of ideas of items to seek out

Here are some examples of items:

- Stones
- Sticks
- Feathers
- Metal
- Flowers
- Bark
- Leaf

Vary the request by instead asking for a particular colour (green, red, white), shape (triangle, circle, square), feel (spiky, smooth, fluffy), size (5cm or less, 30cm long).

Notes:

To increase the challenge use the internet to identify any object you find. Once you start identification pick specific species ie a birch twig, leaf or bark.

Don't take any living items, only scavenge from the ground.

Environmental Awareness

*Appreciate and draw inspiration from the environment
Experience a range of different environments in different conditions*

Time:
20 min+

Space:
Garden, Park

Equipment:
A partner, Any loose natural materials



Enjoyment and Appetite for Learning

Enjoy being outdoors

Learn lots by doing nothing! Spend time in nature, relax and realise what is around you.

Head to an outdoor space and seek out a quiet corner. Woods are ideal, off the main path, but any patch of green grass can work.

Spend time using a range of senses to realise what is around you. Promotes further understanding of the natural world, prompting an array of questions on how does that work? A great way to develop language to describe feelings and a positive effect on health and wellbeing.

Activity:

1. Go and find your outdoor spot, leaving behind distractions such as phones.
2. As the young person, lead the walk through the outdoor space. Wander and explore as you see fit. If there are notable hazards make sure these are known to be out of bounds. Otherwise encourage imaginative exploration.
3. Select spots to stop and wait. Maybe studying up close particular trees, flowers or leaves.
4. Close your eyes, be silent and listen. What can you hear? What can you feel?
5. Let the young person have space to explore separately. Encourage them to discover new sounds, smells and textures.



Reflect on what was discovered. How did the space make you feel? How do you feel now you've quietly spent time, calmly discovering the outdoor area?

Notes:

Use the quiet time to combine with the 'Amongst the Clouds' activity sheet.

<https://www.aretecentre.co.uk/wp-content/uploads/2020/05/amongst-the-clouds-compressed.pdf>

Who is Framed?

Create a portrait picture from natural objects to resemble someone else's face.

Enables the participant to look closely at the natural environment around them as they discover items they didn't realise were hidden away. An example of 'transient art' in that it can and should change through time. Adapt the face as new items are found or rearranged to create new expressions or look of the face.

Activity:

1. Make a picture frame. This could be from twigs or stones laid out in a rectangular shape or chalk markings on a patio.
2. Collect as much loose natural material as you can find that is already on the floor. Grass, leaves, stones, seeds, weeds - use your imagination to see what you can find.
3. Think of a face to create. This could be a family member, friend or teacher.
4. Now assemble the natural items to create the face you have chosen.

Get someone else to look at your portrait and guess whose face it is.

Take a picture of your portrait and send it to them.

Notes:

If it is difficult to find natural objects, the activity can be done using household items.

As an alternative, use the opportunity to go on a litter pick and create the portrait out of rubbish you have found. Can be combined with 'Richie's Rubbish' and 'Everything is Useful' activity sheets.

Referenced from www.ltl.org.uk

Environmental Awareness

*Appreciate and draw inspiration from the environment
Experience a range of different environments in different conditions*

Time:
20 min+

Space:
Garden, Park

Equipment:
Any loose natural materials



Charcoal Paint

Become an artist, but with natural paint, paint brush and the great outdoors as the canvas.

Use our 'Fire Lighting, at Home' activity sheet, in version 1, to gather part burnt wood and charcoal together. Then discover a simpler, but similar, paint that was used in the stone age which contained similar ingredients. Cave paintings have been found to date back to 40,000 years ago during the last ice age.

Activity:

1. Use the rock to grind off black powder from the charcoal and onto a plate, cup or flat surface.
2. Add a little vegetable oil and water mixing together until it has the consistency of a thick paint.
3. Make a paintbrush. Take a stick about the width of a thumb and snap to the desired length. Wind an elastic band around the end so it is secure, but not too tight. Slide in any natural item to try - leaves, grass, feather.
4. Now paint away! It is natural and washes away, but bear in mind it can stick around for a while. Try a face on a tree, directions for someone to follow, cave paintings on stone or even as face paint.

Environmental Awareness

*Appreciate and draw inspiration from the environment
Experience 'awe and wonder'*

Time:
20 min+

Space:
Any Outdoor Space

Equipment:
Charcoal, Veg Oil, Small Rock. Paint brush or Stick, Natural Product & Elastic Band



Notes:

Activated charcoal is used for medical uses such as water filtration, teeth whitening, diarrhea and absorbing gases. Formed by superheating charcoal in the presence of a gas.

For firelighting see the home activity sheet

https://www.aretecentre.co.uk/wp-content/uploads/2020/05/fire-lighting_at-home.pdf

Worm Charming

Enjoyment and Appetite for Learning

*Enjoy being outdoors
Motivated to participate and persevere
showing resilience with new
challenges*

Vibrations cause worms to rise to the surface. How many can you collect in 5 minutes?

It is unclear why worms rise up out of their burrows upon feeling vibrations. The popular explanation is the vibrations mimic a mole, who can eat up to 100 worms per day! The technique is used by fishermen to retrieve worms for bait and birds for a nutritious food source.

Activity:

1. Mark out a plot 3m x 3m size using twigs or string.
2. Stamp on the spot for 5 minutes within your plot, trying to make continuous vibrations through the ground. Set the time for longer if needed.
3. As the worms rise up and out of the soil within your plot put them in the pot which contains damp soil.
4. Count how many worms you have charmed up and out of the ground. Make it competitive and compare numbers to another fellow competitor.

Time:
5 min+

Space:
Grass

Equipment:
For Collection: Pot, Soil



Compare different plots with the number of worms found. Think about how it can be made to be a fair test - same plot size, length of time and number of stamps.

Worms like damp soil, so under these conditions you may find more worm. How else could you create vibrations through the ground?

Notes:

World Worm Charming Championships in Cheshire each year. In 1980 511 charmed in 30 minutes! <https://www.willastonprimaryacademy.co.uk/worm-charming/>

More information on Worm Charming https://en.wikipedia.org/wiki/Worm_charming

Build a Dam

Try being a beaver and use your ingenuity to create a real life dam. Find natural products to stop and divert a water flow.

Beavers use logs, mud and stones to create partial dams and create pools. These provide protection and food storage. They also create new wetland habitat which increases the number of species. The dams are also natural flood control, allowing excess water to pass but slowing the flow.

Activity:

If you have access to a natural running brook or stream then this is the ideal venue. A wet day may provide running water in gutters or into puddles.

A water flow can be artificially created using a hose or bucket of water. A river channel can be created by digging a shallow trench in the grass. Plastic sheets or even foil can be shaped in a long shallow V channel, propped up using stones. Alternatively use old guttering or shallow containers. A micro version can be played with on a lego board with a lego dam or diversions.

Now find and make a pile of natural materials such as stones, leaves, twigs and mud.

Build a creation to

1. Slow up the water flow
2. Stop the water flow
3. Change the direction of the water flow

If using a bucket or hose, add the water once the dam you've created is ready to be tested.

Notes:

Beaver Dams: https://en.wikipedia.org/wiki/Beaver_dam

Man-made dams, good or bad? Hydroelectricity produces renewable energy, but large dams can stop an ecosystem. Many animals requiring access up and down a river and sediment needs to move naturally down towards the floodplains.

https://en.wikipedia.org/wiki/Environmental_impact_of_reservoirs

Physical Skill

*Develop and acquire technical knowledge and skills
Develop physical skills that they can adapt and apply*

Time:

30 min+

Space:

Garden, Park

Equipment:

Any loose natural materials. Maybe Hose / Bucket, Sheet / Guttering



Can you see the possibilities in everyday objects? Test your resourcefulness in this eye opening activity.

We live in a world of consumerism; we buy something, use it, and then dispose of it. We need to REDUCE our consumption, by REUSING what we already have. That way we will reduce our demand on the planet's resources and move towards a sustainable future.

Did you know that horse chestnut and birch tree leaves can be made into soap, juice cartons can be recycled into place mats, and dandelion flowers can be made into honey!

Activity:

1. Gather as many materials as you can in an allotted time. These can be natural or man made, (don't pick anything that's alive or sharp).
2. What would be useful or helpful around your home or bedroom? Brainstorm as many uses for your gathered objects that you can think of.
3. Once you have discovered what you can make- have a go at making it!

Ideas: storage for toys or art, decorations, plant holders, bird feeder

You can follow this up by researching what products or uses have been developed from your objects.

Notes:

For further inspiration see

<http://beautyharmonylife.com/25-diy-ideas-to-recycle-your-potential-garbage/>

Referenced from Dirty Teaching, A Beginners Guide to Learning Outdoors

Environmental Awareness

*Appreciate and draw inspiration from the environment.
Demonstrate care for the environment through their actions*

Time:

20 min plus

Space:

Any Outdoor Space

Equipment:

Recycling / Natural Materials



Geocaching

Join the world's largest treasure hunt. Use a smartphone and free geocaching app to search for real hidden boxes, all over the UK.

'Geocaching is an any day, any time adventure that can take you to amazing and beautiful places, or even just a place in your town that you've never been before'. There are millions of geocaches worldwide.

Go to www.geocaching.com for more information.

Activity:

1. Download the geocaching app onto a mobile phone.
2. Sign up and create a free account.
3. Your local geocaches will load and show up on your screen - they are everywhere.
4. Choose one you'd like to find, then navigate to its location using the on screen map.
5. What you are looking for varies, geocaches come in different shapes and sizes, some are easy to find, some are hard.
6. Once you've found one, sign the log book and log your find online
7. Make sure you return the geocache to where you found it once you are done.

Notes:

Like any outdoor activity, geocaching can be dangerous. Pay attention to your surroundings. You may need an adult to accompany you. Remember to wash hands when opening boxes or items.

Referenced from www.geocaching.com

Enjoyment and Appetite for Learning

*Motivated to participate and persevere showing resilience with new challenges
Enjoy being outdoors*

Time:
30 min+

Space:
Local Area

Equipment:
Phone, Geocaching App



Contour Models

Understand what map contours are. Make your own 3D model and then transcribe it into a 2D contour map.

Enables the participant to begin to understand how maps, a birds eye 2 dimensional model of the world are created from a 3 dimensional landscape.

Contours are lines on a map which join areas of equal height. Contour interval refers to the difference in height between the lines, for example, on Ordnance Survey (OS) maps the contour interval is 10 metres in mountain areas and lowland areas are 5 metres.

Activity:

1. Draw a shape on the cardboard. Cut it out. Write number 1 on it
2. Place your first shape on the cardboard and draw around it with a 1-2 cm margin, to create a slightly larger shape. Cut out. Write number 2 on it.
3. Repeat 4-5 further times, for shapes up to 6 or 7.

For your 2D Map of the Mountain

Take your largest shape and draw around it on a piece of clean paper. Place the next piece inside the lines and repeat with drawing around all the pieces to create a contour map of the mountain.

For your 3D Mountain

Stack all the pieces together in number order with the highest number on the bottom and shape number 1 on the top.

Take a photo of your finished 3D and 2D models side by side

Notes:

Be careful using the scissors to cut out the cardboard

Mapping information is available at <https://www.ordnancesurvey.co.uk/> and <https://www.harveymaps.co.uk/>

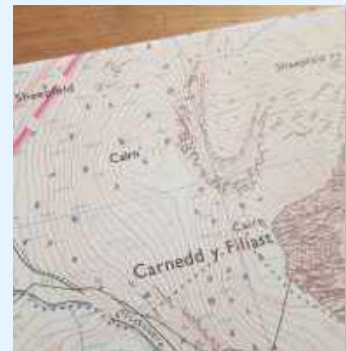
Physical Skill

*Develop and acquire technical knowledge and skills
Develop physical skills that they can adapt and apply*

Time:
20 min+

Space:
Table Top, inside or out

Equipment:
Cardboard, Paper, Pens, Scissors



Magic Number Square

Create a 3x3 grid and use each number from 1 to 9 just once to fill each grid space, so each line adds to 15. It is all created with natural objects that can be moved around.

15 is the magic number every row and column can total for a 3x3 grid, when the numbers 1-9 are only used once. An activity to problem solve and think in numbers all in one.

Activity:

1. Use the sticks to create a grid 3x3 in size. Chalk on the floor could also be used. Same dimensions as a noughts and crosses board.
2. Find nine different natural items like pebbles, feather, pine cones, seeds. Just 1 object is needed for the first item (eg 1 feather), then 2 items for the second item (eg 2 leaves), then 3 items for the third (eg 3 twigs) etc up to 9 items. This will be 45 items in total.
3. Start with just one row. Can you select three different items, one for each section of the grid row, so that they total 15 when counting every item in the row.
4. Now add items to the remaining grid squares so every row and column add up to 15. Move all the items around until the problem is solved, including the original row if necessary.

Possible Solutions:

6	1	8
7	5	3
2	9	4

4	9	2
3	5	7
8	1	6

Notes:

To make it harder try a 4x4 grid. The magic number is now 34 using numbers 1-16 only once.

Use the board to play noughts and crosses, or replace these shapes with stones and leaves.

Referenced from www.ltl.org.uk

Personal Qualities and Skills

Respond positively in challenging situations
Develop independence and use initiative

Time:
20 min+

Space:
Any Outdoor Space

Equipment:
Sticks, Small Natural Items totaling between 1-9.



Knots for All

Knots are useful in all aspects of life, here are a few for you to try.

Reef Knot:

Used for joining two ends of rope. Remember: Left over right, under. Right over left, under...

Physical skills

*Develop and acquire technical knowledge and skills
Develop physical skills that they can adapt and apply*

Time:
20 min+

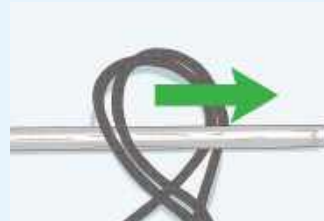
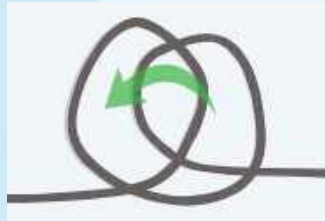
Space:
Anywhere

Equipment:
Rope or string



Clove Hitch:

This is a great way to attach a rope to a pole, post or karabiner. Note one loop is in front and one is behind.



Double Barrel Knot:

Another method for attaching two ends of rope together, much stronger than a reef knot.



Notes:

Knots can be stressful if they don't turn out right, be patient!

Start a fascination with Space. Use the opportunity of a clear night sky to view and even identify what is beyond the Earth.

Develop your observational skills and over time track changes in the night sky. Look for patterns and discover the science behind the changes. Generally quiet observation outside at night will develop a sense of awe. It can be linked to creative writing of space journeys.

Put on warm clothes, head outside on a clear night and make yourself comfy. Reduce any artificial light and wait for your eyes to adjust to the dark. Red light can be used without affecting your night vision.

Star Map: Record your observations. Draw a circle, about 12cm across, to represent the sky above you. Mark where North is and on the circle edge any key trees or buildings you can see on the horizon for orientation.

Look straight up first, and record what you see in the middle of the circle. Then record anything lower on the horizon near the edge of the circle, as you look in all directions.

Add a time, date, location, weather and notes.

Is it a Star? There are many stars (distant suns) but if it moves then it could be a satellite or a shooting star if it then disappears (meteor burning up). Planets appear similar but don't 'twinkle' like a star. Download a free app like 'Sky Map' or 'Stellarium Star Map' for an interactive view to help identification.

Moon: Follow the different phases of the moon through the month, from a no moon being visible to a full moon.

Constellations (collections of stars): Can you identify the Big Dipper (or plough), Orion's Belt, Cassiopeia (W shape)? Can you see the North Star, lining up the last two Big Dipper stars in its 'bowl'? See the three pictures for their shape.

Notes:

General Information: <https://gostargazing.co.uk> **Online star map:** <https://stellarium-web.org/>
SpaceX rocket launch on 30/05/20 and space station docking: <https://www.spacex.com/>

Environmental Awareness

*Appreciate and draw inspiration from the environment
Experience 'awe and wonder'*

Time:
20 min+

Space:
Any Outdoor Space

Equipment:
Paper, Pencil, Warm Clothes



Rocket Launch 1

Launch your own hand built rocket, through the force of a big stomp and using everyday items. Watch and record its flight.

Use as a basis to discuss space and launching rockets into space. Multiple variables can be investigated on launching the rocket through changing the angle and force of stomp or the rocket design weight, number of fins and length. Maths can be added measuring angle, mass and distance and time taken to give speed (speed = distance / time).

Make the Launcher:

1. Take the inner tube and connect it to the top of the plastic bottle. Secure tightly with duct tape and ensure it is airtight. No inner tube? Try hose pipe or plumbing pipe, cutting the right sized hole in the bottle top to insert the pipe and tape.
2. Connect the other end of the inner tube to the cardboard tube as found inside kitchen roll or similar. Again use duct tape to secure tightly and airtight. If you are using garden hose or plumbing pipe you don't need to do this step.

Make the Rocket:

1. Wrap a piece of card tightly around the cardboard tube and use tape to keep the cylindrical shape. If you are using garden hose or pipe wrap the card around this instead.
2. At the top of the taped card make a cone cutting and rolling a semi circle shape. Tape it in place so no air can escape from the top. Blue tack can add ballast.
3. Add fins to the bottom of the rocket.

To Launch:

Place the rocket over the cardboard tube / hose / pipe and hold the tube at the desired launch angle. Stomp on the plastic bottle and watch it fly!

Notes:

Make sure the launcher is airtight and the rocket fits snug onto the end. Build a holder for the tube / hose / pipe in place. Handle of a garden fork in the ground at an angle may work.

Referenced from www.ltl.org.uk

Enjoyment and Appetite for Learning

Motivated to participate and persevere showing resilience with new challenges

Time:

20 min+

Space:

Any Outdoor Space

Equipment:

2l empty Plastic Bottle,
Duct Tape, Bike Inner Tube
& Cardboard Tube or
Garden Hose / Pipe



Rocket Launch 2

Launch your own hand built rocket again, but make it go further in version 2. With pressure from a pump and a 'reaction force' dumping the heavy water. Watch and record its flight.

Use as a basis to discuss space and launching rockets to the space station. Multiple variables can be investigated on launching the rocket through changing the angle, amount of water, length of rocket and fit of the cork. Maths can be added measuring angle, mass and distance and time taken to give speed (speed = distance / time).

Make the Rocket:

1. Find either an old bike tube valve, just cutting out the valve (maybe ask at a cycle shop) or a football pump needle to pump up balls. Insert the valve or pump needle through a cork. If using a valve cut a hole through the cork first. Make sure that any air can travel all the way through the cork.
2. Create a launch pad to hold the bottle at an angle upwards. A garden fork handle works with the spikes pushed into the ground at a low angle.
3. Fill the 2l plastic bottle with about 500ml of water or quarter full. Seal the bottle with the cork and make sure it is a tight fit.
4. Put the bottle in the holder and attach the pump to the valve or needle. Pump away until you have lift off!

As you pump you should see air bubbles going through the water and into the bottle. When the pressure is too great the cork will come out and bottle will fly into the air. Make sure water isn't leaking and air is entering the bottle or that the launch pad isn't holding the rocket back.

Try different amounts of water and see how the flight changes. Can you change the shape of the bottle to improve the flight?

Notes:

The water and air leaving the bottle upon flight creates a reaction force, similar to real rockets through Newton's law of motion. The water is heavy so with it moving out slowly and results in the light bottle moving upwards quickly.

The pressure is built, or energy stored increased, during pumping until the friction keeping the cork in is overcome.

Enjoyment and Appetite for Learning

Adapt and change related to situations Describe their experiences and use them to inspire other aspects of life.

Time:
20 min+

Space:
Any Outdoor Space

Equipment:
2l empty Plastic Bottle,
Bike Tube Valve or Ball
Pump Needle, Bike Pump



Homemade Catapult

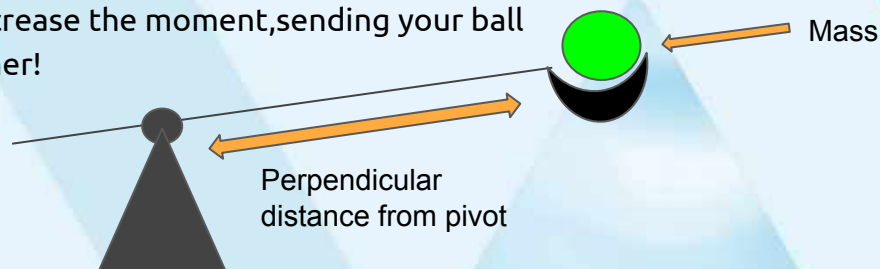
Design and build a fully functioning catapult from items around your home.

- Using items around your home (such as Pringles tubes, bamboo canes, string etc.) design a catapult capable of firing a tennis ball or similar over 4 meters.
- Your creation must be free standing and must be able to hold the ball itself. For this it will need a strong wide base and a method of holding the ball in place during the firing process, such as a cup or cradle.

Further Understanding:

- Newton's third law of motion states that "every action has an equal and opposite reaction". This means for you, that if you exert a force into your catapult, the force exerted onto the ball will be both equal and opposite.
- A moment is the turning effect of a force, it is relevant in the context of catapults as that is what will send your ball flying! The moment of a force is calculated by Force x Perpendicular distance from the pivot (the length of your catapults arm from the pivot).

As the tennis balls mass is constant and assuming the force applied will also remain constant. Increasing the length of the catapults arm will increase the moment, sending your ball flying further!



Notes:

<https://www.bbc.co.uk/bitesize/guides/ztjpb82/revision/1> for more information on the physics.

To make the challenge harder, try hitting a target with your catapult.

Physical Skill

Develop and acquire technical knowledge and skills

Time:

30+ minutes

Space:

Any Outdoor Space

Equipment:

A variety of household 'bits and bobs', String and tape, Tennis Ball



Here are the possible learning outcomes for our activity sheets. We have focused on our Educational Benefits which we apply on our residentials, although there are many more everyday and subject specific skills that can be developed, when completing these activities.

Enjoyment and Appetite for Learning:

Enjoy being outdoors
 Motivated to participate and persevere showing resilience with new challenges
 Encourage others to take part
 Describe their experiences and use them to inspire other aspects of life
 Work cooperatively with others
 Adapt and change related to situations
 Take on a lead role

Health and / or Well Being:

Keep fit and continue interest in outdoor activities
 Have a positive self-image
 Understand link between physical and emotional well-being
 Identify and adopt a healthy lifestyle

Environmental Awareness:

Experience a range of different environments in different conditions
 Understand the impact of human activities on the environment
 Demonstrate care for the environment through their actions
 Appreciate and draw inspiration from the environment
 Experience 'awe and wonder'

Social Awareness

Learn to recognise their own and others strengths and weaknesses
 Understand impact of their actions
 Respect others and develop trust
 Identify the impact of their actions
 Develop and value friendships

Personal Qualities and Skills

Build confidence and self esteem
 Stretch comfort zone and overcome fears
 Identify risk and push boundaries to complete goals
 Develop independence and use initiative
 Effective communication

Physical Skill

Develop and acquire technical knowledge and skills
 Develop physical skills that they can adapt and apply
 Understand how to dress appropriately for the outdoors
 Respond positively in challenging
 Unlock talent