

Spirit of Innovation

STEAM Resources



Maths

Year Two

Number, Measure & Statistics

Loop the Loop

Links

Number – number and place value

- Recognise the place value of each digit in a two-digit number (tens, ones)
- Identify, represent and estimate numbers using different representations, including the number line
- Compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs
- Read and write numbers to at least 100 in numerals and in words
- Use place value and number facts to solve problems

Measurement

- Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit, using rulers
- Compare and order lengths and record the results using $>$, $<$ and $=$
- Solve simple problems in a practical context involving addition and subtraction

Statistics

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- Ask and answer questions about totalling and comparing categorical data

Resources

- A4 paper
- Thin cardboard
- Straws (paper if possible)
- Scissors
- Ruler
- Sticky tape
- Pencils
- Markers
- Tape measure/metre sticks
- Masking tape
- Chalk
- Ruler
- Clipboard
- Result sheet ([Download](#)) on paper or electrical device

Skills

- Follow instructions
- Accurate measuring
- Reading and recording numbers
- Identifying the furthest/nearest measurement
- Compare distances
- Understand the reasons for a fair test
- Create a fair test
- Discuss findings using vocabulary such as; heavy, light, bigger, smaller, more, less and furthest

Questions

- How are you going to make your plane?
- If you want a plane to fly a long way, what do you need to consider?
- How will we make it fair?
- How will we know how far each plane has gone?
- What will we use to measure?
- Which units allow for the greatest accuracy? Why? (centimetres, millimetres, metres)
- How will we record the results?
- How will we identify whose plane went the furthest?



PIONEERS OF POWER



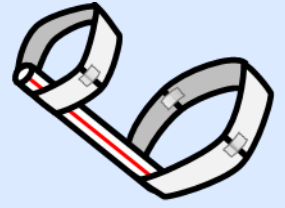
Activity

Activity One

Whole Class/individual/Pairs

(2 x 40 mins)

Additional space required outside area/hall



Introduce the topic of loop the loop planes to the pupils, telling them there will be a 'test flight' to see which one(s) goes the furthest.

These may not look like a plane, but they fly remarkably well. The two hoops maintain its balance as it flies. The big hoop creates 'drag' or air resistance, whilst the smaller hoop keeps your plane from turning off course.

These planes can be made by individuals or as pairs.

1. Cut 3 strips of card, that measure approximately 2.5 cm by 15 cm.
2. Tape 2 of the strips and together into a hoop. Overlap the pieces about 1cm so keep a circular shape once taped.
3. Use the last strip of paper to make the smaller hoop, overlap the edges a bit more than the larger hoop.
4. Tape the paper loops to the ends of the straw on the inside of the hoop.
(Please use paper straws where possible for environmental reasons)
5. All pupils to add their name to their plane, in order to identify them.

Bring the class together before the 'test flight' to discuss how to make it fair. For example: mark out a place where everyone throws from, decide if planes are going to be thrown one at a time, how many throws per plane etc.

Mark out the 'flight path' with a throwing line and then run a tape measure, or some metre sticks, along the edge of the flight path.

Pupils should hold their straw in the middle with the hoops on top and throw it into the air angled slightly up, similar to throwing a dart. Once all pupils have had time to practice throwing their planes, return to the classroom.

Next, ask the pupils to make a second plane, explaining that you would like them to alter the diameter of the hoop and/or the length of the straw.

Return to the marked out 'flight path,' to throw these planes. Once a plane is thrown, mark the ground with chalk, or masking tape if inside, with the name of the thrower. Record the distance on the result sheet ([Download](#)) (If recording results on paper, and throwing more than once, add the pupil's names before printing the required number of copies.)

As a class, reflect on the most successful planes. Discuss 'why' they think these designs travelled further. Maybe compare it to others that didn't go so far.

Activity Two

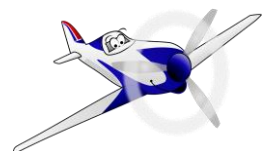
Whole Class/individual/Pairs

(40 - 60 mins)

Additional space required outside area/hall



PIONEERS OF POWER



Select the top four planes from Activity One.

In small groups make observations of these four planes. Use a ruler to measure the diameter of the hoops and fuselage/straw length, record these findings on a table ([Download](#)) Discuss their observations in small groups or as a whole class.

Using this knowledge and data, ask individuals/pairs to design and make a third plane.

Repeat Activity One

Extension

Compare the data from plane two and plane three.

Did the improvements to the design reflect in the distance travelled?

If so:

How much further did it travel?

Suggest what improvements lead to plane three's success?

If not:

Why not?

What improvements do you think your plane still needs to go further?



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