

Primary



50+ STEM
activities for
any primary
classroom



This collection is for teachers, teaching assistants, STEM Club leaders and families. It consists of easy to run, short and practical STEM activities which are ideal for any setting; classroom, outside and home.

Activities can be adapted to suit the setting or time available and require few resources and materials. Each has a suggested list of substitute materials, making them easy to clean up. With minor adjustments they will meet school health and safety requirements.

Activities do not require extensive STEM subject knowledge, enabling anyone to use them irrespective of experience level.

Choose age range:

4-5

View 2
activities

5-11

View 9
activities

7-9

View 9
activities

7-11

View 8
activities

9-11

View 5
activities

9-14

View 17
activities

STEM activities for ages 4-5

2 Activities



Published by British Science Association
Resource Booklet Early Years Resource Pack - Science Week 2019

Published by British Science Association
Resource Booklet Early Years Resource Pack - Science Week 2019

Make a time capsule

Design and make a time capsule to be opened in 12 months' time, to see how different things are compared to today.

Suggested Materials

Large jars; paper; pens; anything they want to include

www.stem.org.uk/rxfrgu

Brain hats

Design and make a brain hat and explore how stories can help us to remember.

Suggested Materials

Left brain template; right brain template; colouring pencils or crayons; safety scissors; glue/sticky tape; 10 everyday objects of your choice: e.g. stationary, toys or ornaments; large sheets of paper; timer

www.stem.org.uk/rxfrgu

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



50+ STEM activities for any primary classroom

STEM activities for ages 5-11

9 Activities



Published by British Science Association
Resource Booklet Primary Activity Pack - Science Week 2019

Published by British Science Association
Resource Booklet Primary Activity Pack - Science Week 2019

Headline figures

Create a visual and engaging infographic to communicate information about the Eurotunnel.

Suggested Materials

Paper; pens; post it notes; rulers; internet/laptop/tablet as required.

www.stem.org.uk/rxfr9r

Tracks and tunnels game

Design, make and play a board game. Discover and share some of the challenges faced and achievements made during the building and running of the Channel Tunnel.

Suggested Materials

Paper large and small; pens; post it notes; rulers; small objects to use as playing pieces; internet/laptop/tablet as required.

www.stem.org.uk/rxfr9r

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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9 Activities



Published by British Science Association
Resource Booklet Primary Activity Pack - Science Week 2019

Published by British Science Association
Resource Booklet Primary Activity Pack - Science Week 2019

Resilient rovers

Create a design for a space rover that would be able to zoom around the Moon! This activity will put knowledge to the test and improve team working skills.

Suggested Materials

Paper; pens; post it notes; rulers; internet/laptop/tablet as required.

www.stem.org.uk/rxfr9r

Make it fly

A paper aeroplane, glider or helicopter falls to the ground much more slowly and gracefully than a crumpled-up piece of paper. This is because of the forces generated by air pressing on and moving over the surface of the paper. Test the theory by designing, making and testing the flight of a paper aeroplane and helicopter.

Suggested Materials

Stopwatch; paper; drinking straw; sticky tape; scissors; paper clip.

www.stem.org.uk/rxfr9r

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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Published by British Science Association
Resource Booklet Primary Activity Pack - Science Week 2019

Published by British Science Association
Resource Booklet Primary Activity Pack - Science Week 2019

Sneeze zone

How far can a sneeze travel and how can we prevent others from getting ill? Learn about the spread of microbes and their potential to infect people and simulate the distance and impact of a sneeze by using water in a spray bottle.

Suggested Materials

Tape measure; spray bottle with water; 10 sheets of flip chart paper or similar; sticky tape; gloves; sugar paper; scissors; coloured pens; tissues.

www.stem.org.uk/rxfr9r

Matilda's floating feat

Learn about static electricity.

Suggested Materials

Tissue paper; pen; scissors; balloon; feathers; optional polystyrene balls; school cardigan/jumper.

www.stem.org.uk/rxfr9r

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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Published by
Resource Booklet

British Science Association
Primary Activity Pack - Science Week 2019

Published by
Resource Booklet

European Space Agency (ESA)
ESERO-UK: Mission to the Moon

Nature walk diary

Explore, observe and document the natural world using all of the senses, and use the findings to write poems. Go for a walk in a park, wood or open field and document observations, by noting the sights, smells and sounds encountered on the journey.

Suggested Materials

Nature walk evidence sheet; clipboard or notebook; pens, bags for leaves and other findings.

www.stem.org.uk/rxfr9r

Highlands and lowlands

Take on the role of astronomers and use light sources to represent the Sun and plasticine to build mountains on a lunar surface. Explore how light from the Sun is blocked by mountains on the lunar surface producing shadows.

Suggested Materials

Torch or lamp; rulers; paper; plasticine or blu-tack.

www.stem.org.uk/rxfrpc

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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9 Activities



Published by
Resource Booklet

European Space Agency (ESA)
ESERO-UK: Mission to the Moon

Finding a landing site

Play a Moon landing sites battleship game.

Suggested Materials

Printed lunar maps from the resource.

www.stem.org.uk/rxfrpc

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



50+ STEM activities for any primary classroom

STEM activities for ages 7-9

9 Activities



Published by | STEM Learning
Resource Booklet | STEM Clubs: Animal Adaptions

Published by | STEM Learning
Resource Booklet | STEM Clubs: Animal Adaptions

Body language

Explore how animals use scent chemicals and movement to communicate and create their own non-verbal communication system.

Suggested Materials

Honey or sweets; 4-5 essential oils or scents; paper or card.

www.stem.org.uk/rxg7nj

Talking without words

Using computing skills; design and create a simple code for a communication system.

Suggested Materials

Computer or tablet; access to Scratch or similar.

www.stem.org.uk/rxg7nj

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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STEM activities for ages 7-9

9 Activities



Published by | STEM Learning
Resource Booklet | STEM Clubs: Animal Adaptions

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Resource Booklet | STEM Clubs: Animal Adaptions

Moving together

Discover how large groups of animals move together without bumping into each other. Create a system to coordinate the members in the group without any of them touching or getting too close.

Suggested Materials

People (3 or more family members or larger group but socially distanced); optional remote controlled device e.g. car, insect.

www.stem.org.uk/rxg7nj

Long-distance journeys

Learn about migration and compare bird size and weight to distance travelled. Make a small glider with varying wings to test the variables of distance versus wing shape and length.

Suggested Materials

Cardboard / paper; scissors; rubber bands; glider template (contained in the activity booklet).

www.stem.org.uk/rxg7nj

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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9 Activities



Published by | STEM Learning
Resource Booklet | STEM Clubs: Animal Adaptions

Published by | STEM Learning
Resource Booklet | STEM Clubs: Fact Finders

Broken food chain

Learn about food chains. Linked, using wool and labels they will plot the food chain based on a real scenario in Guam. This can be supported by the pre-prepared Scratch programme.

Suggested Materials

Drawing pins; pin board or similar; wool; scissors; card; computer/tablet with Scratch.

www.stem.org.uk/rxg7nj

Microwave myth busting

Test the internet myth that microwaved water is bad for plants and explore the effect that different types of water have on plant growth.

Suggested Materials

2 ready grown plants; measuring jug; water heated in a microwave then cooled; sticky labels; digital camera for recording; observation sheet.

www.stem.org.uk/rxeymr

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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STEM activities for ages 7-9

9 Activities



Published by | STEM Learning
Resource Booklet | STEM Clubs: Fact Finders

Friction fables

Find out how strong friction can really be using the pages of a book.

Suggested Materials

Sticky note pads; spiral bound notepads; bull dog clips; books similar to exercise books.

www.stem.org.uk/rxeymr

Published by | STEM Learning
Resource Booklet | STEM Clubs: Extreme Elements

It's raining giant hailstones!

Pupils will create different sized hailstones, learn about their formation and their impact, looking at super sized hailstones and the damage they can cause.

Suggested Materials

Plasticene; ruler; tissue paper; measuring scales; Optional: umbrella, sticky back plastic.

www.stem.org.uk/rxfn3j

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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9 Activities



Published by
Resource Booklet

STEM Learning
STEM Clubs: Extreme Elements

It's electrifying

Pupils will think about what causes lightning storms, and explore how static electricity is created.

Suggested Materials

Beanbags or similar; cardboard box; balloon; woolly jumper/hats, hair; metal spoon; rubber glove; computer/tablet with Scratch.

www.stem.org.uk/rxfn3j

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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8 Activities



Published by European Space Agency (ESA)
Resource Booklet ESERO-UK Resources

Published by European Space Agency (ESA)
Resource Booklet ESERO-UK Resources

From the ground to the sky

Learn about remote observation and discover how the Earth looks from space. Compare photographs of different landscapes (mountains, lakes, rivers, cities, islands, and deserts) taken from the ground with photos of the same places taken by astronauts onboard the International Space Station.

Suggested Materials

Projector or printed photographs from resource.

www.stem.org.uk/rxg8a3

Moon constitution

Using research and debate explore some of the issues that a future settlement on the Moon may face. Create a "Moon Constitution" report from the findings and plan the settlement.

Suggested Materials

Printed debate cards; scissors.

www.stem.org.uk/rxg3nd

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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8 Activities



Published by European Space Agency (ESA)
Resource Booklet ESERO-UK: Earth under the lid

Published by ESERO-UK
Resource Booklet ESERO-UK: James Webb Space Telescope

Activity 2: how do human activities affect greenhouse effect?

Watch a Paxi video and put 6 images in the correct order.

Suggested Materials

Printed images; scissors; glue; projector.

www.stem.org.uk/rxg3nh

Mirror origami challenge

Follow a step by step guide to create an origami hexagon. The James Webb Space Telescope's primary mirror is composed of 18 tessellating hexagons. Work individually to create hexagons, as a group attach them together to create a representation of the telescopes mirror.

Suggested Materials

Sheets of A4 paper.

www.stem.org.uk/rxfp9g

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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8 Activities



Published by
Resource Booklet

Science Museum
Are we alone: the search for planets beyond our Solar System

Published by
Resource Booklet

Science Museum
Are we alone: the search for planets beyond our Solar System

Lesson 9 - travel bureau

Learn all about exoplanets, use research and imagination to design a new exoplanet. Consider the key features and the adaptations that living things would have to make to survive the planet's environment.

Suggested Materials

Paper; coloured pens and pencils; internet/laptop/tablet.

www.stem.org.uk/rxera2

Rocket mice

Five... four... three... two... one... blast-off! Launch a favourite rodent into space to boldly go where no mouse has gone before.
*no animals will be harmed during this activity!

Suggested Materials

Plastic bottle; card; scissors; tape, pens; paper.

www.stem.org.uk/rxetug

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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8 Activities



Published by
Resource Booklet

UK Space Agency (UKSA)
ESERO-UK: ExoMars Collection

Published by
Resource Booklet

European Space Agency (ESA)
ESERO-UK Resources

360 degree periscope

Carefully placed mirrors change the path light takes, making it possible to look over walls, around corners and even behind someone – all without being seen. Design and make a periscope and explore how light can be redirected.

Suggested Materials

Periscope templates; paper; pens; ruler; small craft mirrors; scissors.

www.stem.org.uk/rxetuc

Deciding destinations

Working in small groups investigate the best place to land a Mars rover. Consider six potential landing sites on the planet and weigh up the pros and cons of each to decide the perfect landing spot.

Suggested Materials

Printed landing sheet sites.

www.stem.org.uk/rxfuwf

Ages 4-5

Ages 5-11

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Ages 7-11

Ages 9-11

Ages 9-14



50+ STEM activities for any primary classroom

STEM activities for ages 9-11

5 Activities



Published by | STEM Learning
Resource Booklet | STEM Clubs: Future World

Published by | STEM Learning
Resource Booklet | STEM Clubs: Extreme Elements

Does my outfit look rubbish?

Discover what materials clothes are made from and how they could be recycled. Explore different materials for clothes and their properties.

Suggested Materials

Selection of clothes made from different materials; selection of waste materials: bubble wrap, black bin bags, carrier bags, etc.; sticky tape; paper clips; laptop/tablet for research.

www.stem.org.uk/rxg7nm

Sounds delicious

Carry out an investigation to see whether certain frequencies of sound (measured in hertz) can affect our taste buds.

Suggested Materials

Sound generator/app; paper cups; water; pens; digital scales; sugar; salt; plastic spoon; cotton bud; paper towels; measuring cylinder; pipette; flavoured crisps.

www.stem.org.uk/rxfn3j

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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5 Activities



Published by | STEM Learning
Resource Booklet | STEM Clubs: Future World

Published by | STEM Learning
Resource Booklet | STEM Clubs: Movies and Magic

Grasshopper burger anyone?

Carry out a survey to explore our opinions on different futuristic foods and investigate some of the things we might be eating in the future.

Suggested Materials

Laptop/tablet; word processor / spreadsheet to create a survey or uses pens and paper and template provided; examples of insect products.

www.stem.org.uk/rxg7nm

May the force...

Explore static electricity and how it can make objects move, carry out an experiment to make an aluminium drink can move.

Suggested Materials

Inflated balloons; empty drinks can; foil; salt and pepper; tissue paper.

www.stem.org.uk/rxeyqj
'How to' activity videos: www.stem.org.uk/rxfpxk

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



50+ STEM activities for any primary classroom

STEM activities for ages 9-11

5 Activities



Published by
Resource Booklet

STEM Learning
STEM Clubs: Movies and Magic

The camera never lies

Explore simple movie effects that make one actor appear far bigger or smaller than another. Discover the techniques used in forced perspective and create images using lolly stick and card puppets.

Suggested Materials

Laptop/tablet; small puppets: lolly sticks, card, plasticine, marker pen; glue or sticky tape; ruler.

> www.stem.org.uk/rxeyqj

'How to' activity videos: www.stem.org.uk/rxfpxk

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



50+ STEM activities for any primary classroom

STEM activities for ages 9-14

17 Activities



Published by
Resource Booklet

European Space Agency (ESA)
ESERO-UK Resources

Published by

Design Club

ESA spacecraft - cut out and make models

Templates for cut-out and stick paper models of various ESA spacecraft.

Suggested Materials

Paper, sticky tape; scissors; glue; pre-printed templates.

www.stem.org.uk/rxetru

Design club: design a helpful mobile app

Run a Design Club project, using worksheets, delivery guide and three themed project handouts. At the end of the project, pupils will have designed and prototyped a helpful mobile app aimed at solving one of three environmental problems.

Suggested Materials

Paper; pens; post it notes; rulers; internet/laptop/tablet as required.

www.stem.org.uk/rxgh72

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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17 Activities



Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

Money bags

Design a wallet, purse, or credit card holder for a target consumer, and explain the rationale underlying their design.

Suggested Materials

Paper; pens; ruler; card; scissors; sticky tape and glue; dimensions of bank cards/paper money etc.

www.stem.org.uk/rxuhp

Reaction times

Design an experiment to measure reaction times and use it to test people's reaction times.

Suggested Materials

Paper; pens; post it notes; rulers; timing devices.

www.stem.org.uk/rxuho

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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17 Activities



Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

School holidays

Consider what factors might affect the choice of dates for school holidays and use these to determine the holiday dates for an alternative school year.

Suggested Materials

Paper; pens; post it notes; rulers; calendar; list of term dates; internet access.

www.stem.org.uk/rxu43

Fashion entrepreneur

Using a fashion workshop as the business idea, plan a schedule for six employees time, to complete all of the daily tasks. Consider whether the schedule is a viable solution to producing the garments on time.

Suggested Materials

Paper; pens; post it notes.

www.stem.org.uk/rxu3z

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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17 Activities



Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

Design a table

Design a table for a group of 5 people for daily use. The table must be extendable to accommodate 8 to 10 people for some occasions.

Suggested Materials

Paper; pens; post it notes; rulers; card; internet access.

www.stem.org.uk/rxu3x

Beach guesthouse

This practical exploration is a simulation of a booking system for a small guesthouse. Manage the bookings and, as far as possible, arrange to give people the accommodation they request.

Suggested Materials

Paper; pens; post it notes.

www.stem.org.uk/rxu3v

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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17 Activities



Published by
Resource Booklet

Nuffield Foundation
Applying Mathematical Processes - Practical Explorations

Three dice

This investigation starts with a game. In order to maximize the chance of winning, decide which numbers are most likely to occur when three dice are thrown and the scores are added together.

Suggested Materials

Paper; pens; post it notes; card; dice.

www.stem.org.uk/rxu3u

Published by
Resource Booklet

Nuffield Foundation
Applying Mathematical Processes - Practical Explorations

Symmetry

In this investigation make different symmetrical shapes, using one or more of three given shapes.

Suggested Materials

Squared paper; Templates of the shapes; Mirror; Tracing paper; Scissors; glue; Computer software.

www.stem.org.uk/rxu3t

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



50+ STEM activities for any primary classroom

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17 Activities



Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

Sending texts

Determine the number of text messages sent if four people send texts to each other, and then extending this for different numbers of people.

Suggested Materials

Paper; pens; post it notes; rulers; calculators.

www.stem.org.uk/rxu3r

Paper sizes

Study paper sizes in the A and B international series, exploring relationships within each series and between the series.

Suggested Materials

Paper in various A and B sizes; pens; post it notes; rulers; scissors, sticky tape.

www.stem.org.uk/rxu3q

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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17 Activities



Published by
Resource Booklet

Nuffield Foundation
Applying Mathematical Processes - Practical Explorations

Published by
Resource Booklet

Nuffield Foundation
Applying Mathematical Processes - Practical Explorations

Hide the spies

Determine where spies should sit in a park that has a square grid of benches, interspersed by bushes, so that they cannot see each other, and investigate how many different arrangements are possible.

Suggested Materials

Paper; pens; post it notes; rulers; counters/cubes etc.

www.stem.org.uk/rxu3p

Golden mazes

In this investigation pupils explore the effect of the route, through a series of rectangular mazes, on the number of gold coins that can be collected.

Suggested Materials

Paper; pens; post it notes; rulers; counters/cubes; calculator.

www.stem.org.uk/rxu3o

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

Published by Nuffield Foundation
Resource Booklet Applying Mathematical Processes - Practical Explorations

Fire hydrants

In this investigation pupils experiment with the placing and number of fire hydrants required in a city with square blocks that form a rectangular grid.

Suggested Materials

Paper; pens; post it notes; rulers; counters/cubes; straws.

www.stem.org.uk/rxu3n

Corner to corner

In this investigation pupils investigate how different numbers of squares can be joined corner to corner, and the effect their arrangement has on the area of the rectangle that encloses the squares.

Suggested Materials

Squared paper; Mirror; Tracing paper; Scissors; or interactive drawing software.

www.stem.org.uk/rxu3m

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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17 Activities



Published by

Royal Academy of Engineering

In control

Set small groups of students the challenge of working together to design a gadget that can be attached to and powered by a bicycle.

Suggested Materials

Paper; pens; post it notes; rulers; internet/laptop/tablet as required.

www.stem.org.uk/rxesc9

Ages 4-5

Ages 5-11

Ages 7-9

Ages 7-11

Ages 9-11

Ages 9-14



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