

Challenge 1

1st Level



LEGO

Materials

- 16 envelopes with LEGO
- LEGO challenge cards

Challenge

- Pupils to **work together** to complete the challenge card in the individual pack.
- Pupils can present to the class what they build, how and why.
- Extra cards included if needed.

Benchmarks

TCH 1-09a

Creates and justifies a solution to a given design challenge considering who is it for, where and how it will be used.
Uses appropriate tools and joining methods to construct a model.

LIT 1-02a

Listens and responds appropriately to others in a respectful way, for example, by nodding or agreeing, asking and answering questions.

Challenge 2

1st Level



Paper Chain

Materials

- Paper
- Sticky Tape
- Scissors

Challenge

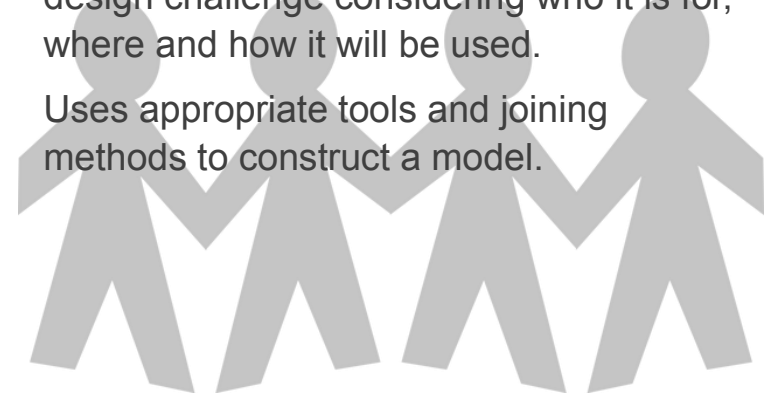
- Pupils to **work individually** to create the longest chain that they can using only one piece of paper.

Benchmarks

TCH 1-09a

Creates and justifies a solution to a given design challenge considering who it is for, where and how it will be used.

Uses appropriate tools and joining methods to construct a model.



Challenge 3

1st Level



Paper Aeroplanes

Materials

- Paper
- Help cards
- Coloured pens/pencils

Challenge

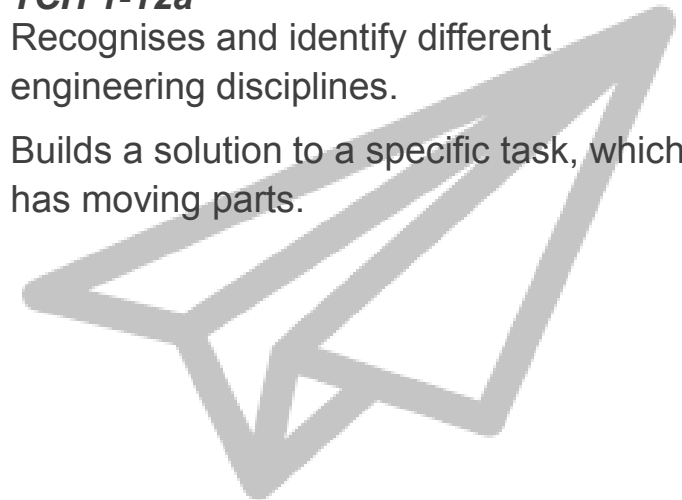
- Pupils to **work individually** to build and decorate a paper aeroplane.
- Pupils then test their aeroplanes to see which travels the furthest.

Benchmarks

TCH 1-12a

Recognises and identify different engineering disciplines.

Builds a solution to a specific task, which has moving parts.



Challenge 4

1st Level



Tangrams

Materials

- Tangram sets
- Help cards

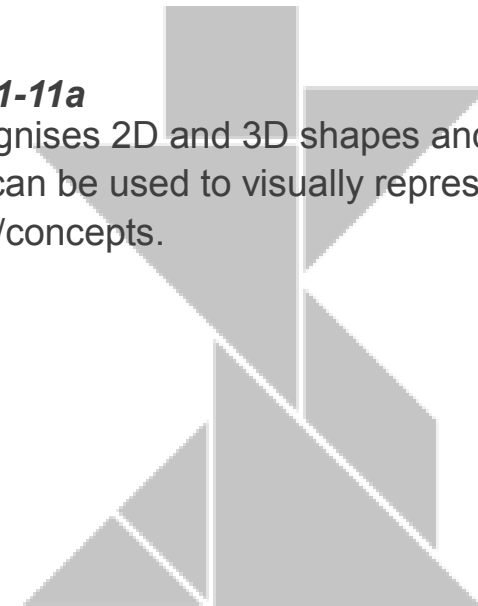
Challenge

- Pupils to **work individually** to complete challenges using the help card.
- Extra challenge can be offered by asking pupils to use all of the shapes to make a square.

Benchmarks

TCH 1-11a

Recognises 2D and 3D shapes and how they can be used to visually represent ideas/concepts.



Challenge 5

1st Level



Straw Towers

Materials

- 10 art straws (per group)
- Sticky tape
- Whiteboards

Challenge

- Pupils to **work in groups** to discuss and plan on whiteboards.
- Pupils work together to build the tallest tower that they can.

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Selects and uses resources to make the solution/ solve the problem.

Assesses the solution against the original criteria.

LIT 1-10a

Communicates clearly and audibly.

Contributes to group/class discussions, engaging with others for a range of purposes.

Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts.

Listens and responds appropriately to others in a respectful way.

Challenge 6

1st Level



Penny Surface Tension

Materials

- Plastic coins
- Droppers
- Cups
- Food colouring

Challenge

- Pupils **working in groups** to predict the number of drops each coin will hold.
- Pupils take turns using the dropper to count the number of drops on the coin.
- Pupils observe the drop that breaks the surface tension and causes the water to leak from the top of the coin.

Benchmarks

SCN

- Inquiry and investigative skills
- Collaborates to undertake investigations.

LIT 1-10a

Communicates clearly and audibly. Contributes to group/class discussions, engaging with others for a range of purposes. Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts. Listens and responds appropriately to others in a respectful way.

Challenge 7

1st Level



Newspaper Hats

Materials

- Newspaper
- Sticky tape
- Coloured pens/pencils

Challenge

- Pupils **work individually** to create a hat.
- Pupils use only one piece of newspaper.
- The hats can be decorated using materials provided.
- The hats can be showcased in a newspaper hat catwalk.

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Selects and uses resources to make the solution/ solve the problem.

Assesses the solution against the original criteria.

LIT 1-10a

Communicates clearly and audibly.

Contributes to group/class discussions, engaging with others for a range of purposes.

Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts.

Listens and responds appropriately to others in a respectful way.

Challenge 8

1st Level



4 in a Row

Materials

- 16 double sided board games
- Whiteboard pens

Challenge

- Pupils **work in pairs** and take turns to answer the calculations in the box.
- When they get it correct, pupils should use a symbol and mark the box with their whiteboard pen.
- The first to connect 4 in a row is the winner.
- Boards can be wiped and then played again.

Benchmarks

NUM 1-02a

Recognises, explains and uses the connections between addition and subtraction and multiplication and division to complete mental and written calculations.

LIT 1-10a

Communicates clearly and audibly. Contributes to group/class discussions, engaging with others for a range of purposes. Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts. Listens and responds appropriately to others in a respectful way, for example, by nodding or agreeing, asking and answering questions.

Challenge 9

1st Level



Paper Ball

Materials

- Paper
- Sticky tape
- Scissors

Challenge

- Pupils **work individually** to make the most exact sphere that they can.
- Pupils to present their solution to the class at the end of the session.

Benchmarks

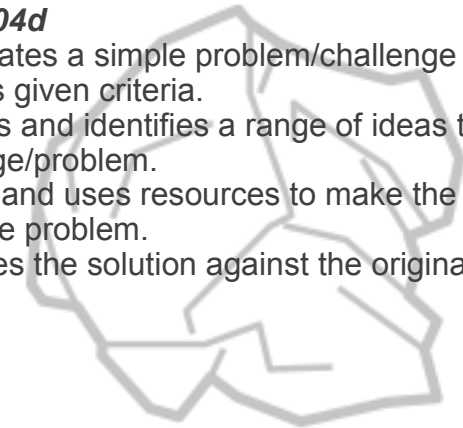
TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Selects and uses resources to make the solution/ solve the problem.

Assesses the solution against the original criteria.



Challenge 10

1st Level



Ted Needs a Seat

Materials

- Newspaper
- Sticky tape
- Teddy bear

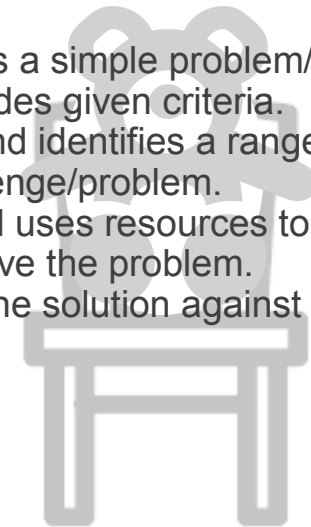
Challenge

- Pupils **work in pairs** to design and build a chair that Ted can sit on.
- The chair needs to be the right size and strong enough to support him.

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.
Explores and identifies a range of ideas to solve challenge/problem.
Selects and uses resources to make the solution/solve the problem.
Assesses the solution against the original criteria.



Challenge 11

1st Level



How Many Triangles?

Materials

- Class set of challenge cards

Challenge

- Pupils **work individually** work out how many triangles there in the picture, exploring all the different options.
- Pupils to share with their shoulder partner how they got on.

Benchmarks

TCH 1-11a

Shares ideas with others.
Recognises 2D shapes and how they can be used to visually represent ideas/ concepts?



Challenge 12

1st Level



Find the Missing Number

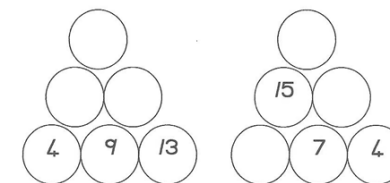
Materials

- Class set of task cards with varying challenge

Challenge

- Pupils **work in pairs or individually** to solve the puzzle.
- Class teacher to demonstrate using a simple example.
- Pupils should be able to explain to their peers how they solve the puzzle and which strategy they used.
- Class teacher to decide who works individually or in a pair.

Benchmarks



NUM 1-02a

Recognises, explains and uses the connections between addition and subtraction and multiplication and division to complete mental and written calculations.

LIT 1-10a

Communicates clearly and audibly. Contributes to group/class discussions, engaging with others for a range of purposes. Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts. Listens and responds appropriately to others in a respectful way, for example, by nodding or agreeing, asking and answering questions.

Challenge 13

1st Level



Design a Planet

Materials

- Paper
- Whiteboards and pens

Challenge

- Pupils **work in groups** to design a planet.
- Pupils should consider the landscape, living things, money, travel and housing.
- Pupils to present their ideas to the rest of the class.

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Selects and uses resources to make the solution/ solve the problem.

Assesses the solution against the original criteria.

LIT 1-10a

Communicates clearly and audibly.

Contributes to group/class discussions, engaging with others for a range of purposes.

Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts.

Listens and responds appropriately to others in a respectful way, for example, by nodding or agreeing, asking and answering questions.

Challenge 14

1st Level



Build a Wall

Materials

- Polystyrene chips

Challenge

- Pupils **work individually** to build the longest and tallest wall using only polystyrene chips.
- Discuss as a class what was tricky and what worked and what did not.

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Selects and uses resources to make the solution/ solve the problem.

Assesses the solution against the original criteria.

LIT 1-10a

Communicates clearly and audibly.

Contributes to group/class discussions, engaging with others for a range of purposes.

Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts.

Listens and responds appropriately to others in a respectful way, for example, by nodding or agreeing, asking and answering questions.

Challenge 15

1st Level



Build a Bridge

Materials

- Wooden stirrers
- Pegs
- Blue paper for river
- Elastic bands

Challenge

- Pupils **work in pairs or groups** to design and build a bridge to cross the river.
- Pupils then explain their design to teacher or peers and share what they have learned and what they would do differently.

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Plans and makes the solution.

Assesses the solution against the original criteria.

Identifies at least one possible improvement.

LIT 1-10a

Communicates clearly and audibly.

Contributes to group/class discussions, engaging with others for a range of purposes.

Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts.

Listens and responds appropriately to others in a respectful way, for example, by nodding or agreeing, asking and answering questions.

Challenge 16

1st Level



Little Owl's Egg

Materials

- Book—Little Owl's Egg
- Paper
- Pencils

Challenge

- Teacher reads the story to the class.
- Pupils **work individually or in pairs** to design a pram to keep the egg safe.
- Pupils then explain their design

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Plans and makes the solution.

Assesses the solution against the original criteria.

Identifies at least one possible improvement.

LIT 1-10a

Communicates clearly and audibly.

Contributes to group/class discussions, engaging with others for a range of purposes.

Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts.

Listens and responds appropriately to others in a respectful way, for example, by nodding or agreeing, asking and answering questions.

Challenge 17

1st Level



Pattern Block Pictures

Materials

- Pattern blocks
- Activity cards

Challenge

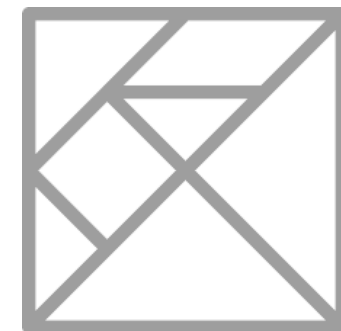
- Pupils **work individually or in pairs** to complete the activity cards with the pattern blocks
- Extension—create their own design for their partner to complete

Benchmarks

MNU 1-16a

Identifies examples of tiling in the environment and applies knowledge of the features of 2D shapes to create tiling patterns incorporating two different shapes.

Names, identifies and classifies a range of simple 2D shapes and 3D objects and recognises these shapes in different.



Challenge 18

1st Level



Tin Foil Boats

Materials

- Tin foil
- Marbles

Challenge

- Pupils **work individually or in pairs** and are given one square of tinfoil.
- They then build a boat.
- The boats are then tested in the sink to see which holds the most marbles.

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Plans and makes the solution.

Assesses the solution against the original criteria.

Identifies at least one possible improvement.



Challenge 19

1st Level



Magnetic Maze

Materials

- Mazes
- Pipe cleaners
- Magnets

Challenge

- Pupils **work individually or in pairs** to create a character from pipe cleaners.
- The pupils then must guide their character through the maze using the magnet on the other side of the paper.
- Extension—Pupils can design and build their own mazes

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Plans and makes the solution.

Assesses the solution against the original criteria.

Identifies at least one possible improvement.

SCN 1-08a

Reports in writing, visually, orally how magnets exert a non-contact force on each other and attract certain materials.

Challenge 20

1st Level



Gorilla Loves Vanilla

Materials

- Gorilla Loves Vanilla (book)
- Paper
- Coloured pens/pencils

Challenge

- Pupils **work individually** to design and label their ideal ice cream sundae with details of flavours and toppings.
- Pupils then present their ideas to the class.
- Pupils then consider what they would change about their design once they have heard each other

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Plans and makes the solution.

Assesses the solution against the original criteria.

Identifies at least one possible improvement.

LIT 1-10a

Communicates clearly and audibly. Contributes to group/class discussions, engaging with others for a range of purposes.

Takes turns and contributes at the appropriate time when engaging with others in a variety of contexts. Listens and responds appropriately to others in a respectful way, for example, by nodding or agreeing, asking and answering questions.

Challenge 21

1st Level



Playing Card Tower

Materials

- Playing cards

Challenge

- Pupils **work individually or in pairs** to build the tallest free standing tower using only playing cards.

Benchmarks

TCH 1-04d

Investigates a simple problem/challenge which includes given criteria.

Explores and identifies a range of ideas to solve challenge/problem.

Plans and makes the solution.

Assesses the solution against the original criteria.

Identifies at least one possible improvement.



Challenge 22

1st Level



Ted Needs a Bed

Materials

- Teddy bear
- Newspaper
- Sticky tape

Challenge

- Pupils **work in pairs** to design and build a bed that Ted can sleep in. The bed needs to be the right size and strong enough to support Ted.

Benchmarks

TCH 1-04d

Investigates a challenge / problem

- Identifies and demonstrates ways to solve the challenge / problem
- Identifies and selects appropriate resources to solve the challenge/problem
- Plans and makes the solution
- Assesses solution against own criteria
- Identifies at least one possible improvement

