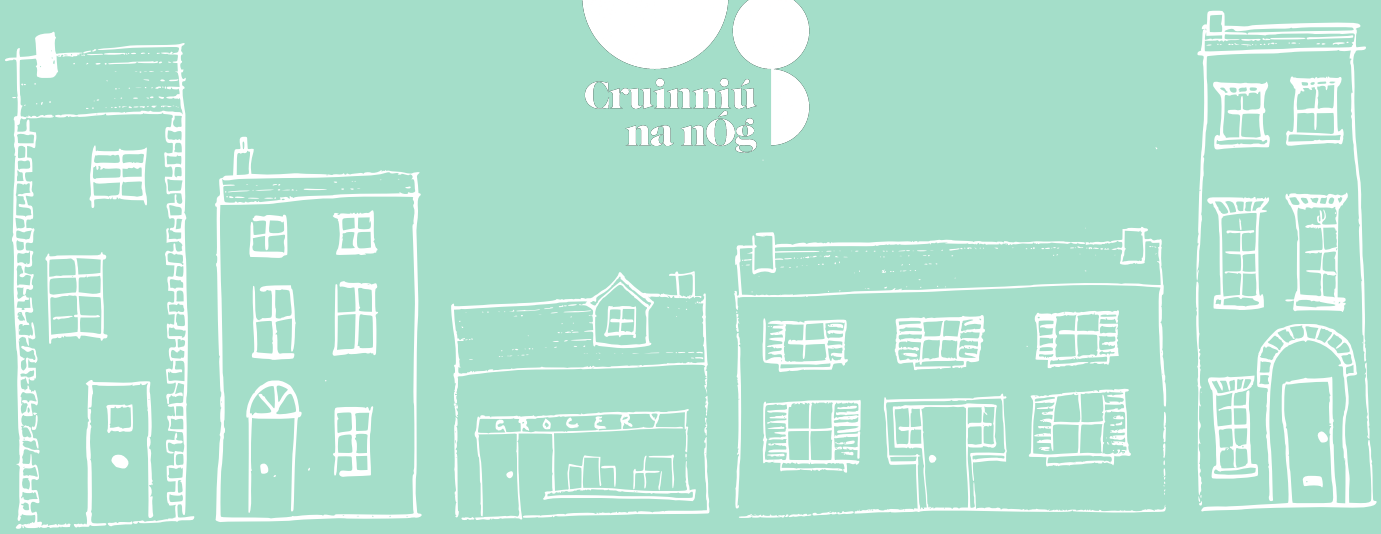
Cruinniú na nÓg



DREAM · DESIGN · DRAW

Activity Workbook

for Designers

Created by Selene Murphy

CLONMEL JUNCTION ARTS FESTIVAL
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Time for TIPPERARY
Fáilte Ireland
IRELAND'S ANCIENT EAST

Hi there!

So you want to be an awesome architect or an expert engineer? Or maybe you love to design all kinds of things and invent solutions to peoples problems?

This workbook is full of puzzles, challenges and activities that will introduce you to the life of a designer.

You will learn how to...

 talk like a designer

 draw like a designer

 see like a designer!

You will design, create and make your own projects and spaces.

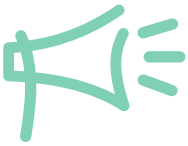
There is no wrong or right answer in design - the only limit is your imagination! Try something, make mistakes, see what works and try again.

Be wild and outrageous or simple and direct, doodle everywhere, ask questions, look for ways that you can make the world better with your designs!

So, grab a pencil and let's dive in!

Enjoy!

Selene



To begin with, can you unscramble the words below?
If you're stuck, check out the back page for solutions!

TRICHEATC ----------

EIEGNENR ----------

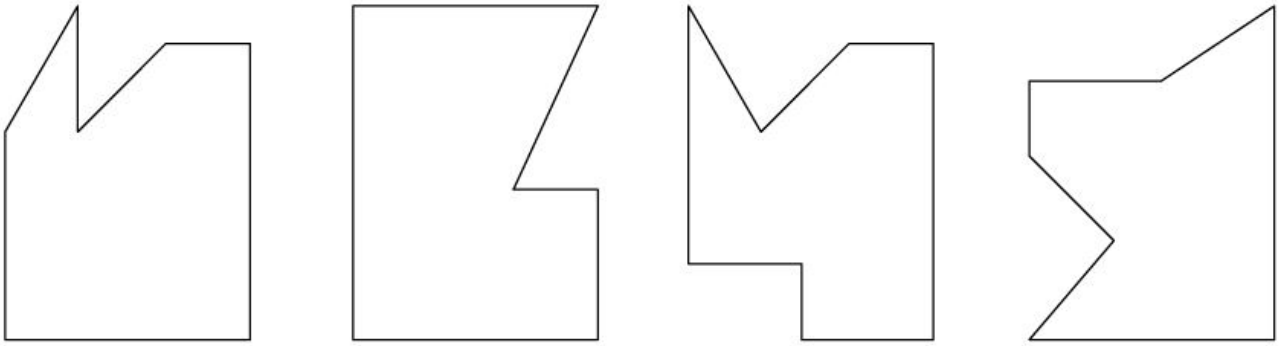
NDEGIS ----------

ECASP ----------

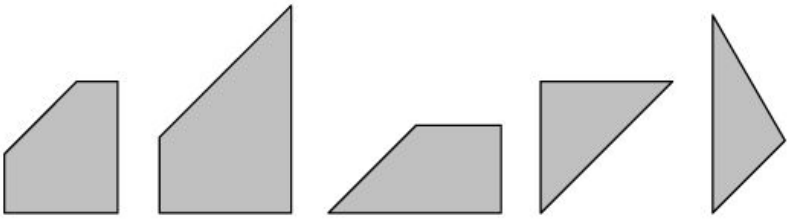
IBUGNDLI ----------

Spatial Thinking

Which of these shapes can be made from the components below?
Tip! Try cutting out the component parts and moving the pieces around like a jigsaw!

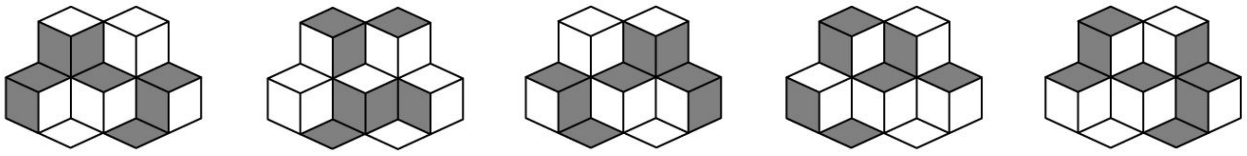


A B C D

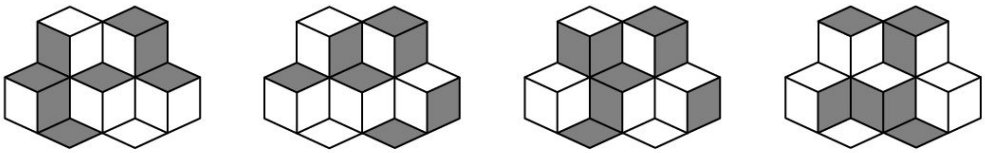


Components

Each of these shapes has a mirror copy. Except one!
Can you find it?



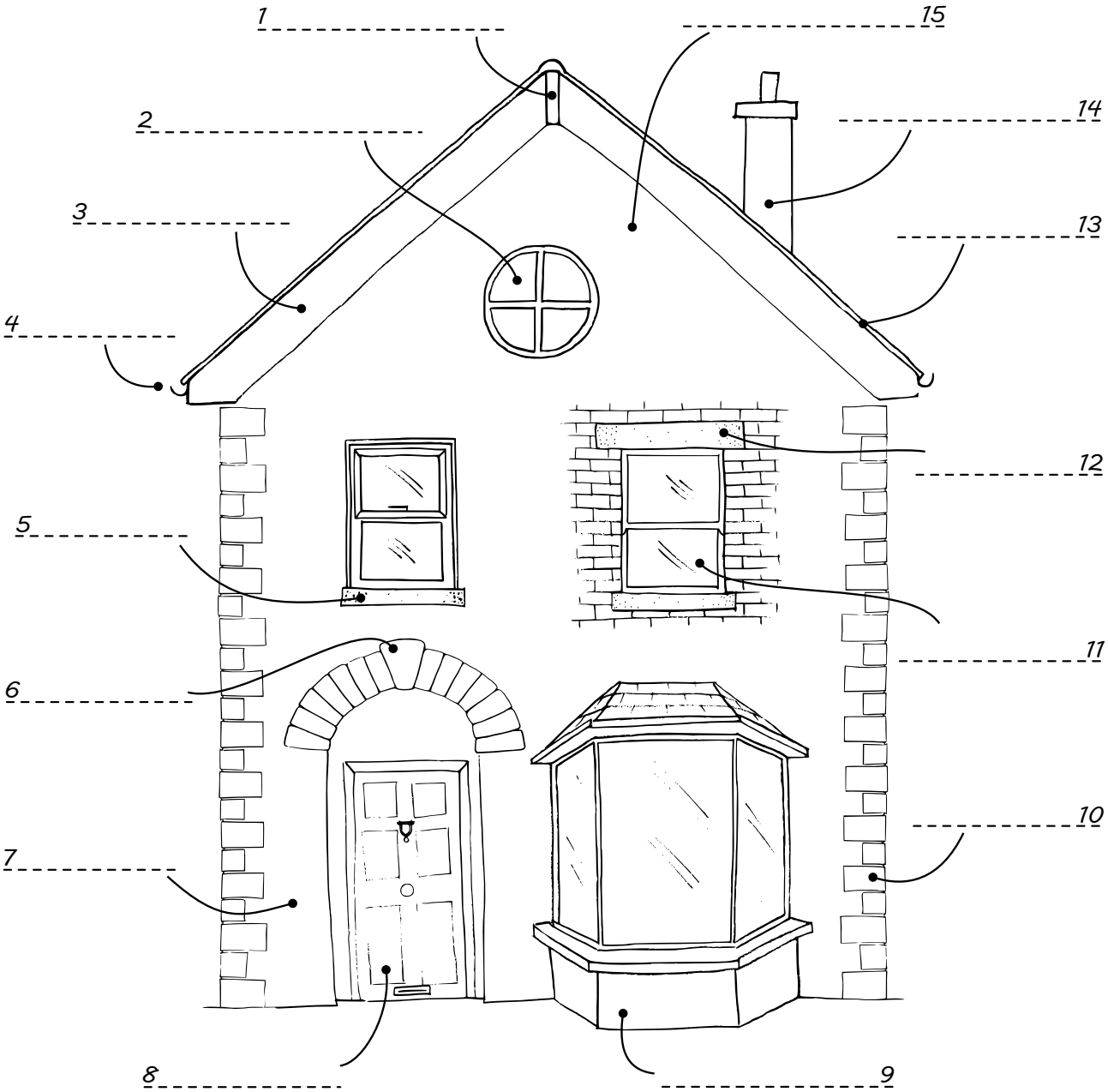
1 2 3 4 5



6 7 8 9

At Home

There is a huge variety of design features to be found right at home. Here are some of them. See if you can label them all correctly!
Hint: Check out the glossary at the back for descriptions!



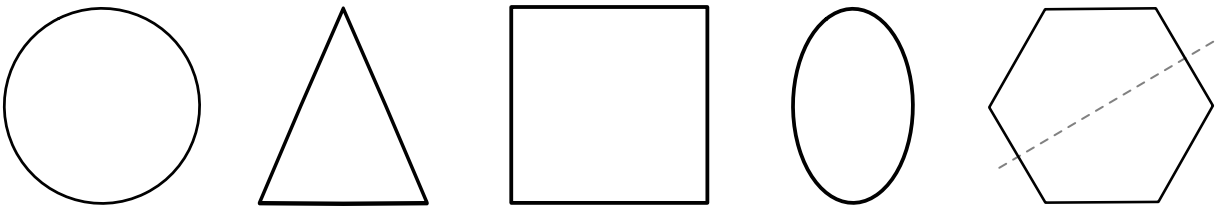
chimney
oculous window
keystone
slates
gutter
quoins
sash window
ridge board
fascia
plaster
sill
bay window
door
gable
lintel

Design Principle: Symmetry

Something that is symmetrical has two halves that match exactly.
A line (or axis) of symmetry can be drawn through the middle to divide it into two equal parts.

Can you can draw the lines of symmetry in these shapes?

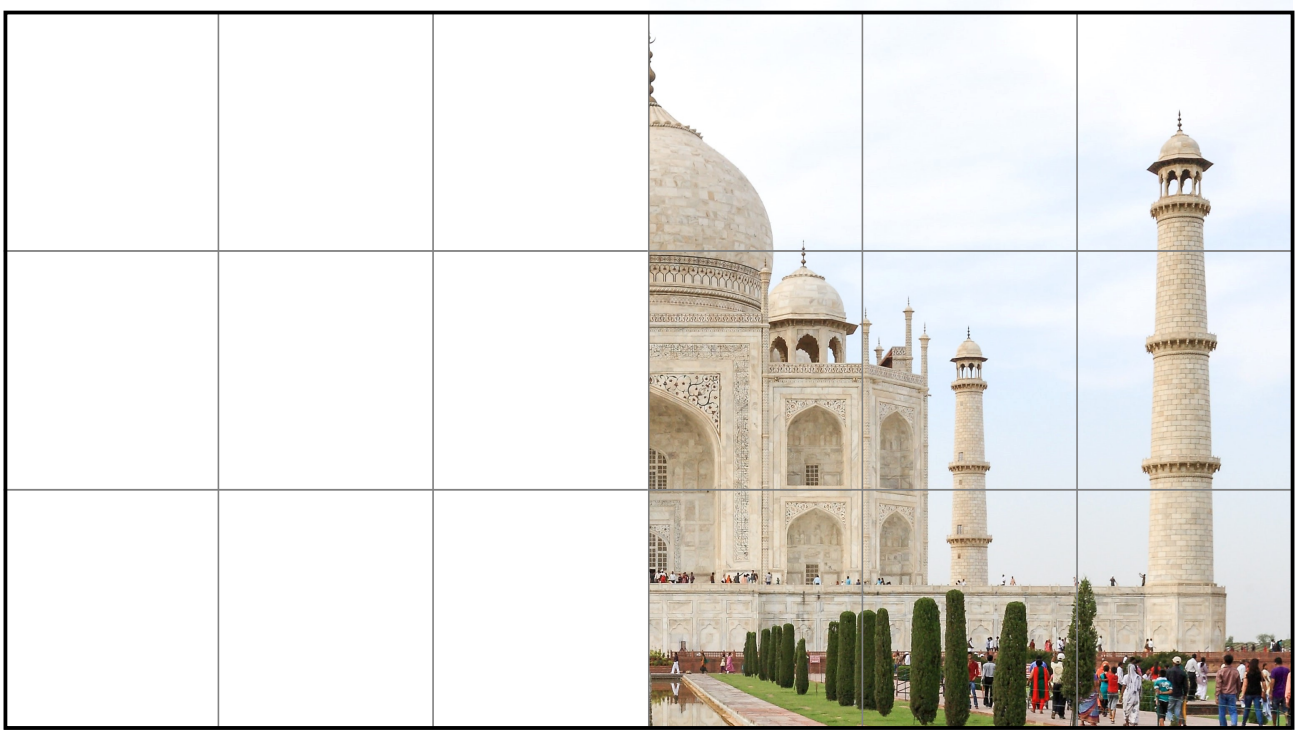
Hint: Some of them have more than one axis! If it's confusing, try cutting them out and folding them in half to find the symmetry. I did one to get you started!



Symmetry is used by designers to make a building or object feel and look balanced.
This famous building is perfectly symmetrical, see if you can draw the missing half!

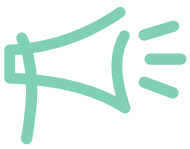
Tip! Use the grid to copy the image one square at a time!

Bonus points if you can name the building!



Wordsearch

C S C A N T I L E V E R N M U L O C E N
O N E N G I N E E R A R C H Y I R U L B
M O T B E J S Z R M D K D M N L L J R T
P I W A V P X U T R T T P S R F N N N X
R T B L I D L L S B W S U E W O D N I W
E R G C S E D A N T N L T D I G K Z Y R
S O N O S S L B S O A F I T E E A K N Y
S P I N A I D J I T A I A N B D R B D B
I O D Y P G M T I R E L N O T J A Z L V
O R D P B N A O S E L R D A M E T C D E
N P A Y Y D N T B E T A J D B D L T A A
B K L X N Y E U T E L E V A T I O N I F
U M C U P E I S P C R B R D S W L C D P
T L O L L L A O E U E E X C M L S I M M
T F A R D C R S T C S T B R N A L T T V
R N T I T T J C E O T E I M F O E A N Y
E T N G I A U D F V L I D H I Y C B W D
S G J C N R R F L A A Y O Q C T J Q Z J
S D O J T Y I Q C G T E L N V R V G X G
W X N S Z T D S D L M Y K G K Y A T N Y



There has been a lot of new words so far. Can you find all of them and more in this wordsearch?

Do you know what they all mean?

castellation
foundations
elevation
flue
portico
buttress
gable
scale
section
cantilever
adobe
proportions
window
timber
column
walls
rafter
facade
plaster
beam
eaves
engineer
plan
design
compression
concrete
steel
mortar
arch
structure
insulation
passive
cladding
balcony
building
lintel
soffit
sustainability
fascia
architect

Materials and Textures

Have you ever stopped to look at what buildings are made of? How the materials look, feel, smell?

Some materials are natural like wood, slate and stone. Others are man-made like concrete, steel and plastic.

Sometimes, materials can start out life as a natural material, but humans transform them to be able to use them for building. Glass, for example, starts out life as sand!

Metals can come from the earth, but are mixed with other metals to make them stronger.

A lot of energy goes into making materials ready for building with. Some take a lot more energy than others and produce a lot more carbon dioxide or other greenhouse gasses.

The health of the environment is very important and construction sites all over the world have a big responsibility to think sustainably.

Sometimes we need materials to be strong, or heavy, or beautiful, or light, or thick, or thin. All materials have pros and cons and choosing the right one depends on what you're going to build or make!

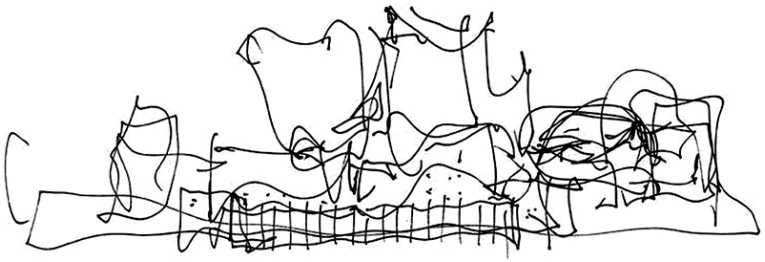
Look at materials in your house or neighbourhood. Fill out the table below with what you find. Some things are made of more than one material!

	window	door	walls	floor	radiator	sink	toilet	fence	roof	chimney	drainpipe	fireplace	steps	ceiling	shelves	what else?
wood	●															
glass	●															
brick																
stone																
plastic																
plaster																
slate																
metal																
ceramic																
other?																

Take a texture rubbing! Put a page over a material and rub a crayon over it to discover what pattern the texture makes!

Flash design challenge

Architect Frank Gehry is so famous he was in The Simpsons! This building is the Walt Disney Concert Hall in LA. Below is the first sketch idea he did. Can you see the similarity?



Designers can find inspiration in lots of ways. Some people say that, when he was starting to design this building, Gehry scrunched up a piece of paper, put in on the table and drew what he saw!

So grab a pencil, a page, scrunch up a piece of paper and try it for yourself!

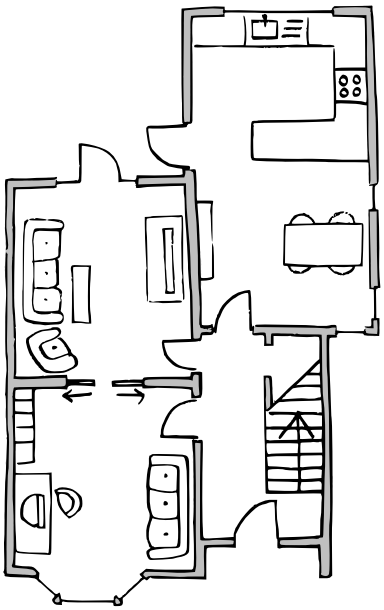
Examine the scrunched up piece of paper. What shapes do you see? Look at it from all angles, twist it around, re-shape it, experiment with it!

Look closely at the way the light creates shodows, shine a torch from different angles to change them, make them lighter and darker.

Draw everything you see. Look at everything you've drawn. Can you see a building start to emerge?

Drawing for Architecture

Designers use drawings to communicate their idea to others. The three most important types are called: Plan, Section and Elevation.



Plan
This birds-eye view shows all of the rooms in a house.

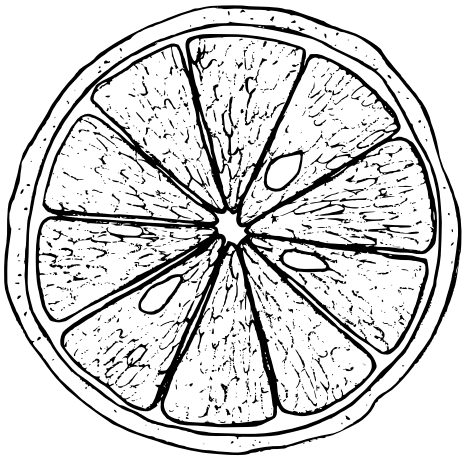
Try to draw a plan of your house! If you have an upstairs, draw one plan for each floor. Think about where the doors and windows go and how big each room is compared to the others. Where does the furniture go?

Tip! Start at the front door and go room by room!

Section
This cuts through the middle of a building from top to bottom to show the insides and levels.

Carefully cut a piece of fruit in half. Experiment with cutting longways or crossways.

Study what's called the cross-section of the fruit. Can you see patterns and shapes and all the different layers? Draw what you see!



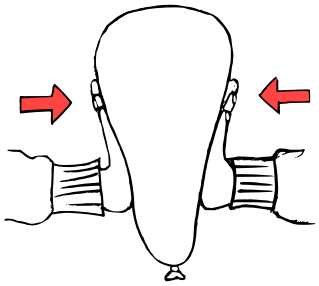
Elevation
These show how the building looks from the outside. There are usually four - one for each side of the building!

Draw the elevations of your house!

Structures and Forces

Understanding how a building stands up is really important for designers to design good and safe buildings! Two types of forces that affect buildings are: Compression and Tension!

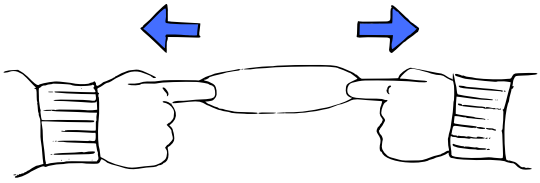
Compression (Push)
This is when force is applied from each side ***towards*** the middle of an object.



Grab a balloon or ball. Put one hand each side and push.

What happens?

Tension (Pull)
This is when force is applied from each side ***away*** from the middle of an object.

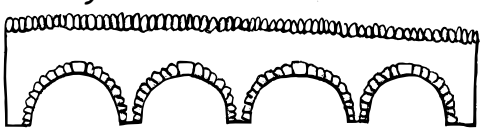


With an elastic band or piece of string, pull from each end.

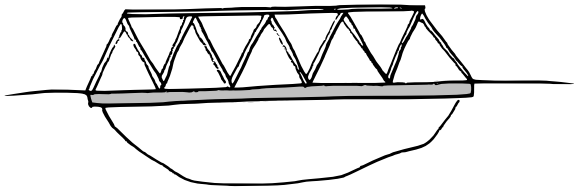
What happens?

All of these bridges use compression and tension to stay up. Can you tell which does what?

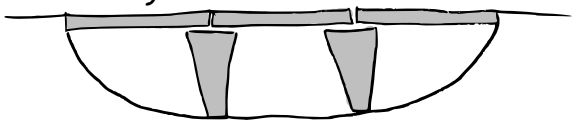
Arch bridge



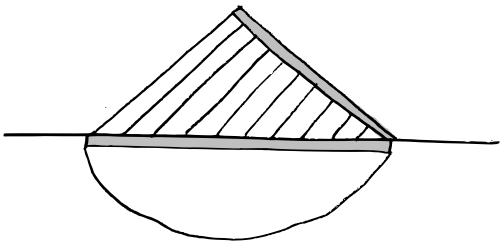
Truss bridge



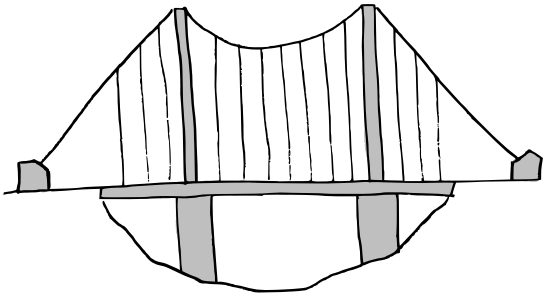
Beam bridge



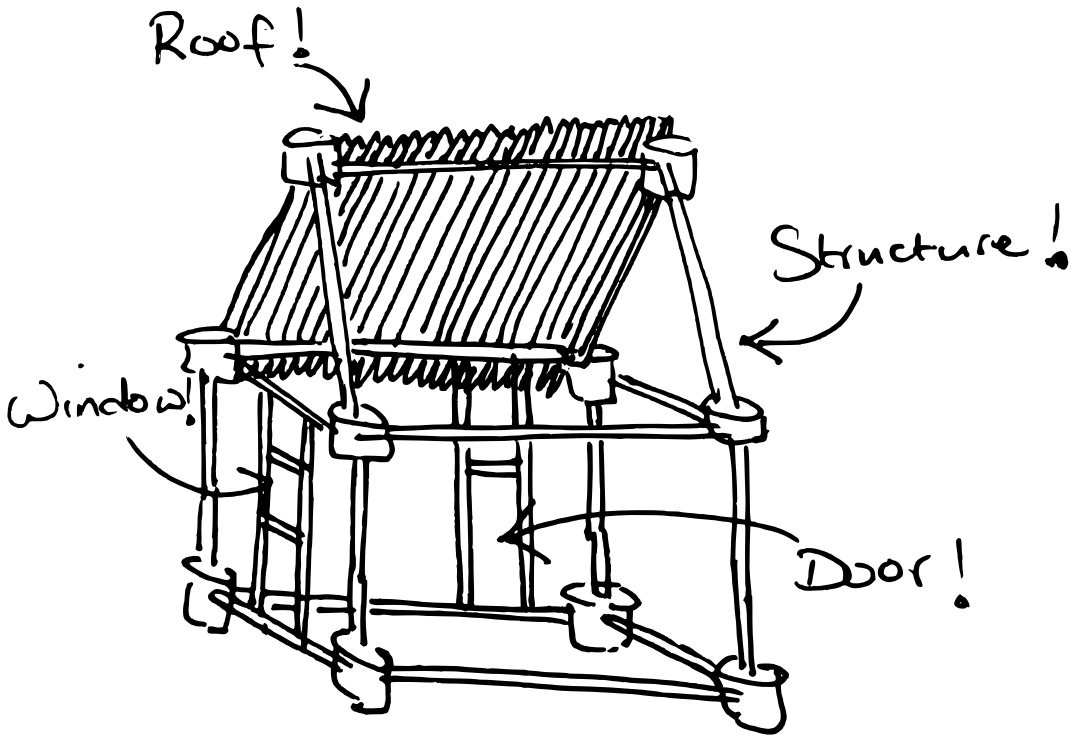
Cable-stayed bridge



Suspension bridge



Design a Simple Shelter



PLAN

Look for inspiration from books, magazines and the internet! Collect pictures, write notes and sketch ideas.

Who is it for? Your family, friends, just you?
What do you need? Bouncy walls, pool on the roof, ice-cream on tap?
Where is it? In a forest, the desert, underwater, on Mars?
What is it made of? Stone, Wood, Glass, Fabric, Jelly?

CREATE

Make a mood board with all your inspiration and planning.
Draw the plans and elevations of your shelter. If you can, try a 3D drawing.
Build models of your design. Use any materials you like! Good ones could be cardboard, paper, colours, sellotape, glue, sticks, stones or anything at all!

PRESENT

Use all your new knowledge and words and present your design to your family and friends! Tell them what inspired you, what you designed and how you made it!

Glossary and Solutions

GLOSSARY A-Z

Chimney
The chimney sends smoke from the fire out of the house.

Door
This is the threshold of the house, the dividing line between inside and outside.

Fascia
This board protects the edges of the rafters that make up the roof shape from getting wet.

Gable
The triangle top of a wall that fills in the space that the roof makes. Often on the sides of the house.

Gutter
Rain collects here and travels down the drainpipe into the sewers or is collected for the garden.

Keystone
The central stone in an arch, notice the wedge shape. It uses a force called compression to hold the arch up.

Lintel
A strong piece of stone, concrete or steel that supports the structure above windows and doors. You can't always see it - sometimes it's covered with plaster, but with brick it's exposed!

Plaster
This covering on a house proects the structure inside. It's like the icing on a cake!

Quoins *(pronounced "coins")*
These larger stones add strength to the corners on the building.

Ridge board
This beam runs along the top of the roof like a spine and all of the rafters lean against it.

Sill
At the bottom of a window, the sill is on a small slant to send water away from the building.

Slates
These overlap to send water away from the building. Can be called tiles too, they can be made of slate (a stone) or when they're made of wood they're called shingles.

Window
bay - sticks out from the building
oculous - round or hexagonal shapes, decorative
sash - the bottom pane slides up to open

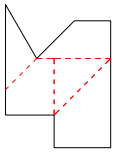
SOLUTIONS

Word Unscramble

1.architect 2.engineer 3.design 4.space 5.building

Object Jigsaw

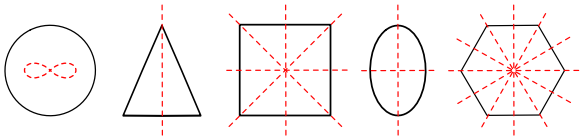
Shape C:



Mirror Images

Shape: 8

Symmetry shapes



At Home

1. Ridge board
2. Oculous window
3. Fascia
4. Gutter
5. Sill
6. Keystone
7. Plaster
8. Door
9. Bay window
10. Quoins
11. Sash Window
12. Lintel
13. Slates
14. Chimney
15. Gable

Wordsearch