

Interlock

Homes that grow with you.

What is Interlock?

A unique/modern home

An adaptable home



A portable home

A sustainable home

My inspiration



The exterior of my chosen concept design steamed from this image (inhabitant, prefabricated way to build). As it has a unique and futuristic look, this appealed to me as I am designing the home of the future. This image also gave me the idea to be able to interlock different rooms onto the house, to increase and decrease the size of the home depending on the owner's needs. I also liked how the different rooms in the home had different materials for the exterior cladding, as it makes it obvious where the separate rooms within the home are placed. These images are my inspiration for the larger family homes.

My inspiration



These images gave me inspiration on how the minimum size accommodation will look, which will be mainly purchased by students and pensioners. I liked these concepts as they are simple yet can be built upon in the future and include everything needed for a basic home. Although they are very simple and square they still have a futuristic/modern aesthetic look to them.



My inspiration



This image (homeedit, benefits of having a roof top garden) gave me the idea of including a roof top garden within my building. By incorporating a roof top garden it encourages both wildlife and fresh air. It will also save surface area as a ground floor garden will not be required, as one is on the roof which is making the most of the available space.



This image gave me the inspiration to use bamboo as the main exterior cladding produced for my buildings. This is because the brown bamboo cladding gives a modern aesthetic look to the home. Using bamboo in construction also has many environmental positive effects as bamboo is one of the fastest growing plants in the world, growing up to 98 inches in 24 hours which makes it a very sustainable material to use.

My Inspiration



I have decided to make building prefabricated as there are many benefits to doing so. These include:

- Shorter construction time
- Higher quality due to the controlled environment
- Reduced site disruption
- Eco Friendly

These advantages are an obvious reason to make my building prefabricated and the process is a more futuristic way of construction which is another reason why I have chosen to use it for my home.

My inspiration



This image inspired my idea of the interlock homes being portable. This means the home will move with you. I believe the homes of the future will be portable, as leaving your home behind after spending/investing lots of money into it and creating lifelong memories within it can be upsetting. This is why I have made the Interlock homes portable as you will be able to invest into your home from the start and live within it your whole lifetime no matter where you move.

Due to the Interlock being prefabricated, they will be constructed in a way where they can easily connect/disconnect within each other. This means that they can be disconnected and transported to the new site where the owner wishes to move, and easily reassembled on site.

How it works?

1. Choose the location
2. Decide on your size/rooms
3. Choose the design (materials and shape)
4. Send an order to Interlock
5. After 29 days the home will be complete and ready to be dispatched of too site.

Prefabrication process



Advantages:

- Shorter construction time
- Higher quality due to the controlled environment
- Reduced site disruption
- Eco Friendly

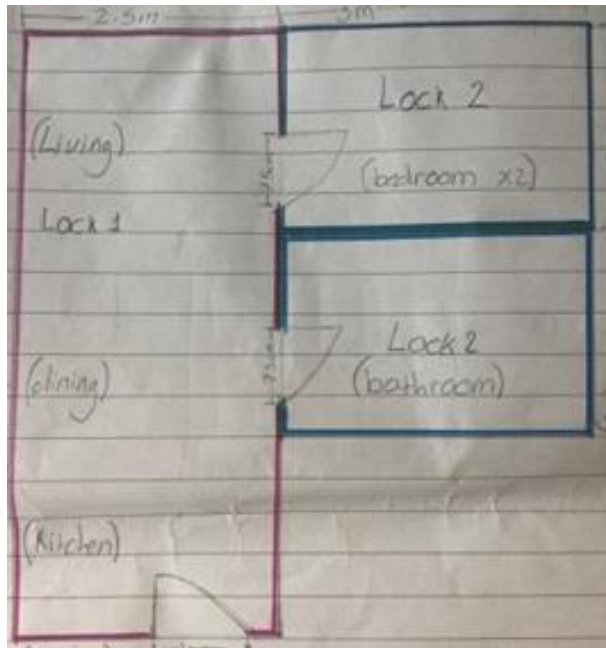
The construction process



- The Concrete pour will consist of cement being poured into the trenches and filled to the top. The concrete should be left for at least 7 days before any other activities are carried out above. This is why there is a 7 day gap of no works taking place on my Gantt chart as the concrete needs to dry/harden.

Minimum size Home

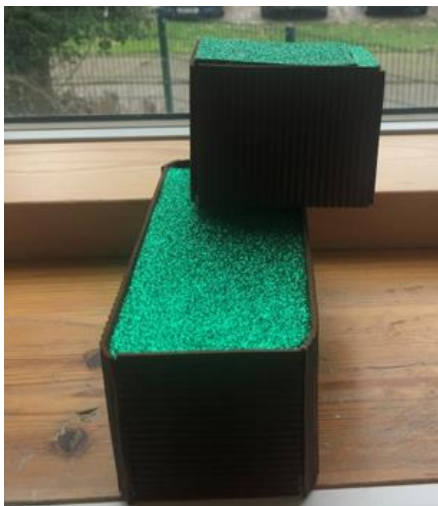
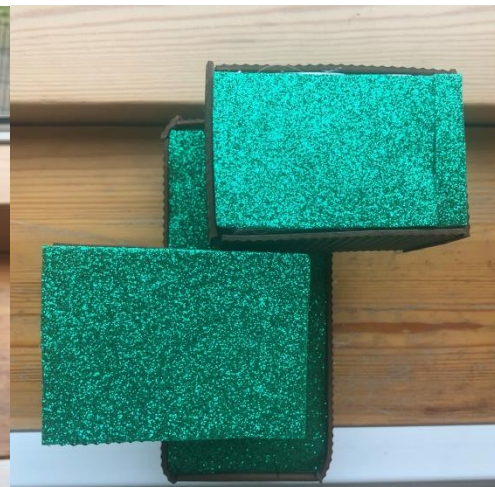
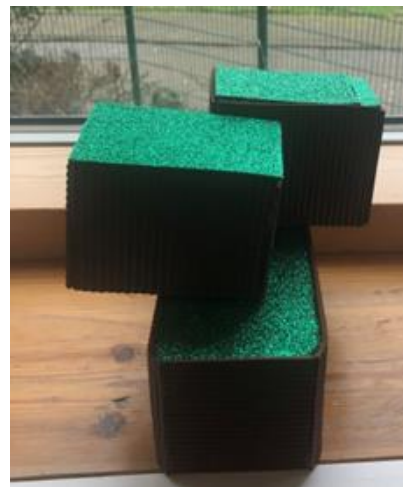
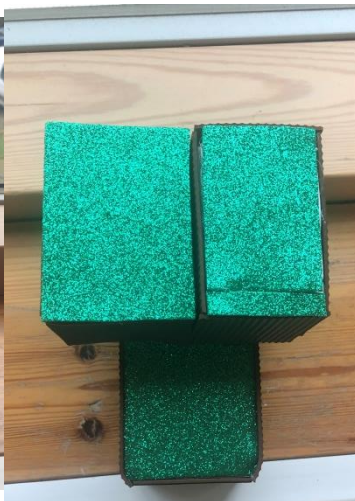
Floor plan



Model



Other designs



Family size Home (G floor)

Floor plan



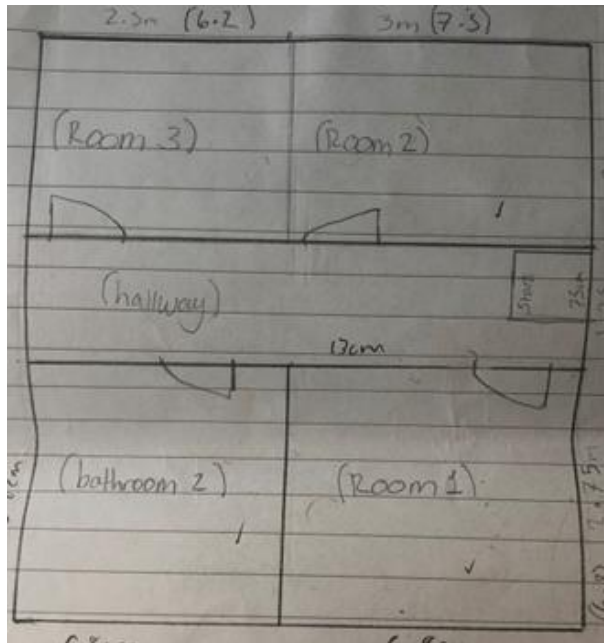
Model



Entrance

Family size Home (floor 1)

Floor plan



Model





**Family size home—
both floors (Traditional shape)**



Who is Interlock for?

- Interlock is a personalised home made to grow and fit all types of people and climates.
- The materials, colours, shapes and layout used is completely unique to each client.
- The home is able to increase and decrease in size so will adjust to your life.
- Affordable so more money can be spent on the furnishing and extra pods.
- Portable, so can move with you.

The pods

- Can be sold to other interlock owners
- Can be donated to homeless charities



Unique designs



Types of Interlock homes

- Beach Homes:



Types of Interlock homes

- Town House:



Types of interlock homes

- Woodland homes:



Types of interlock homes

Holiday home:



The unique features included

- The roof top garden –



The unique features included

- Sustainable materials used =

Bamboo cladding:



The average cost of a 1 bed home in Harlow = £200,000



Markwell Wood
Harlow, CM19 5QU
1 bed · 1 bath

£170,000

* JUST IN



Malkin Drive
Harlow, CM17 9HL
1 bed · 1 bath

£260,000



Tickenhall Drive
Harlow, CM17 9PF
1 bed · 1 bath

£235,000

Reference =

<https://www.bing.com/maps?q=1+bedroom+house+for+sale+harlow&form=EDGEAR&q=PF&cvid=c4a2c9e31c0646fdb1d53b17894b16af&cc=GB&setlang=en-GB&plvar=0&PC=HCTS>

The average UK salary = £28,677

- After tax = £23,036
- Take home per month = £1,919.68
- Mortgage for £200,000 home =
Over 20 years = £1,159 per month
- Left with = £760 per month

Dependent on interest rates at the time

Current 20-year-fixed interest rate = 3.49%



Current housing prices

The number of adults aged 25-34 living with their parents could be set to grow, as property prices continue to rise.

- One in three adults living with parents don't ever expect to own a home

A quarter of the 2,000 Brits polled said it is possible they could be forced to sleep rough at some point

Harvey Sullivan

Current housing prices

Rising costs

An increase in house prices are partly to blame, but [skyrocketing rents are what have really fuelled a rise in homelessness](#). Since 2010, private sector rents in England have increased three times faster than wages. So it's hardly surprising that many people are finding it hard to keep up with costs.

But why has the increase been so uneven? Most analysts agree the trend has been driven by a shortage of new homes – especially [affordable housing](#). The same problem makes it tough for young people to get on the housing ladder.

The cost of a 1 bedroom Interlock Home = £8685.62

- Price does not include labour or land rent
- Will need to cost **£191,314.38** to match a traditional homes retail price. (very unlikely to be that expensive)



If labour and transport for example costed the same = **£17,371.24**

The average UK salary = £28,677

- After tax = £23,036
- Take home per month = £1,919.68
- Mortgage for a £17,371 home =
over 20 years = £101 per month
- Left with = £1,818 per month



Specification (materials only)

flooring

- **Lumber** - The recycled plastic lumbers will be attached to the bottom of the interlock buildings as this will ensure that the building has a smooth and easy installation when arriving on site - recycled mixed plastic lumbers have been chosen as plastic does not rot, unlike timber which is most frequently used for lumbers however require maintenance. Using recycled plastic is environmentally friendly and 100% recycled and recyclable. Each plastic lumber costs £10.79 each (Kedel, Lumber prices)
- **Minimum accommodation** – Lock 1 = 15m^2 – 15 plastic lumbers required (1 lumber per metre)
- Cost = $15 \times 10.79 = £161.25$ <Lock 1
- Lock 2 = $12\text{m} \times £10.79 = £129.48$
- Total cost = $£129.48 + £161.25 = £290.73$
- **Family accommodation** – Floor 0 = $33\text{m}^2 \times £10.79 = £356.07$,
- Floor 1 = $33\text{m}^2 \times £10.79 = £356.07$
- Total = 712.14
- **Insulation** - Thermafleece wool is a great natural insulter as it dampens sound, is breathable, locally grown, fire safe and is sustainable (The benefits of sheep's wall). For these pros I have decided to use Thermafleece as the insulator for my buildings, a 4.8m roll of Thermafleece ranges from around £24 per roll. (Celtics sustainable, Thermafleece)
- **Minimum accommodation** – $27\text{m}^2 \div 4.8\text{m} = 5.625 = 6$ rolls needed
- $6 \times £24 = £144$
- **Family home** – floor 0 = $33\text{m} \div 4.8\text{m} = 6.8 = 7$ rolls needed
- Cost = $7 \times 24 = £168$
- Floor 1 = £168
- Total cost = $£168 + £168 = £336$
- **Flooring** – cork floor is 100% natural and renewable, as it is made from the bark of the cork oak and is harvested without felling the trees. Cork floor has insulating properties which effectively help to reduce energy costs. 1m^2 + will cost £34.99 per m^2 . (wood2u, Cork Flooring)
- **Minimum house** – $27\text{m}^2 \times £34.99 = £944.73$
- **Family house** – floor 0 = $£34.99 \times 33\text{m}^2 = £1154.67$
- Floor 1 = £1154.67
- Total cost = £2309.34

Specification (materials only)

Roofing

- **Ceiling joists** – composite joists are long lasting and effective joists to use as unlike timber they do not rot, warp or mould. These joists cost £7.99 per 3m, these joists will not require much or any maintenance due to its durable qualities. (Dino decking, Ceiling joists)
- **Minimum house** –
 - Width of house = 5.5m
 - 3m joists x 2 = 6m joist
 - One 6m joist = £15.98
 - Length = 4m, £15.98 x 4 = £63.92
 - 3m (joist) x 2m (length) = 6 joists
 - 6 x £7.99 = £47.94
 - Total = £ 111.86
- **Family house** –
 - Width of house = 5.5m = 2 x 3m joists= 6m joists needed per metre to fit width.
 - 6m joist = £15.98
 - Length of home = 6m
 - 6 joists required = 6 x £15.98 = £95.88
 - 2 floors = £95.88 x 2 = £191.76
- **Decking** – composite decking is waterproof, durable and anti-slip which are important factors to have on a roof gardens floor. This is to ensure the tenants are as safe as possible whilst on the roof by having a reliable roof decking material. The average cost for composite decking is around £6.78 per metre and £44.61 per m² (Composite decking, Deckorum, cost, [Online]).
- **Minimum home** = £44.61 x 27m² = £1204.47
- **Family home** = floor 1 + floor 0 = 66m², 66 x £44.61 = £2944.26
- **Felt** – EPDM Rubber roof covering is important to have beneath the roof garden and above the ceiling as it will prevent any leaks due to the felt being waterproof. This is a necessary material to have as the grass/plants will hold lots of moisture so protection for the rest of the home must be put in place. The average cost of this roof covering is £10.16 per 2m and is 0.53mm thick (Rubber 4 Roofs, EPDM Rubber, cost [Online])
- **Minimum home** = 27m² ÷ 2 = 13.5 < 14 needed
- 14 x £10.16 = £142.24
- **Family home** = floor 1 + floor 0 = 66m²
- 66 ÷ 2 = 33, 33 x £10.16 = £335.28
- **Turf** – The Turf I have chosen to use is a multi-purpose garden lawn turf which is freshly harvested, fast rooting, lightweight and easy to maintain. These objectives are necessary for a garden roof, the average cost which the turf is being sold at is £2.38 per 1m² roll. (Turf, HALLSTONE, [Online])
- **Minimum home** = 27m² x £2.38 = £64.26
- **Family home** = floor 1 + floor 0 = 66m²
- 66m² x £2.38 = £157.08
- **Ceiling** – drywall Gypsum is a recyclable material and the lining paper is typically 90% recycled. Gypsum can also regulate humidity through moisture absorption, the materials itself is not toxic and enables quicker and cheaper construction. (Greenspec, Gypsum plasterboard, [online]) The average price which gypsum plasterboard goes for is £2.65 per M² (B&Q, Plastering supplies, Gyproc standard square edge [Online])
- Minimum home – 27m² x £2.65 = £71.55
- Family home – 66m² x £2.65 = £174.90

Specification (materials only)

Walls –

- **Timber frame** – For the timber frame, timber beams will be used which are both strength graded and kiln dried for extra stability. The average price of a timer beam is £1.90 per Metre. (Wickes, Studwork Timber [Online])
- **Minimum home** = width = 5.5m x £1.90 = £10.45 per beam
- 8 beams needed, (1 per 0.5m) 8 x £10.95 = £83.60
- Width = 2.5 m x £1.90 = £4.75
- 4 beams needed = 4 x £4.75 = £19.00
- Total = £19.00 + £83.60 = **£102.60**
- **Family home** = width of house = 5.5m x £1.90 = £10.45 per beam
- 1 beam per 0.5m
- Length of house = 6m x 2m = 12m, x2 length walls = 22m
- 22m x £10.45 = £229.90 < length walls
- Width walls > 5.5m x 2 = 11m
- X2 width walls = 22m, 22m x £10.45 = £229.90 < width walls
- Width walls + length walls = £229.90 + £229.90 = £459.80 x 2 (2 floors) = **£919.60**
- **Damp Proof Course** – A damp proof course is a layer in the walls which prevents moisture from moving up the walls and into the living area. This is important to have to ensure the living area does not become damp with moisture. The average price of DPC is £3.58 per 100mmx30m. (Toolstation, DPC, 10mm x 30m [Online])
- **Minimum home** - 27m² = 1 DPC = £3.58
- **Family home** – x2 width walls = 11m
- X2 length walls = 12m
- 12 + 11 = 23m
- 23m x 2 = 46m, 46m ÷ 30 = 1.53 = 2 DPC needed
- £3.58 x 2 = £7.16
- **Plaster Board** – drywall Gypsum is a recyclable material and the lining paper is typically 90% recycled. Gypsum can also regulate humidity through moisture absorption, the materials itself is not toxic and enables quicker and cheaper construction. (Greenspec, Gypsum plasterboard, [online]) The average price which gypsum plasterboard goes for is £2.65 per M2 (B&Q, Plastering supplies, Gyproc standard square edge [Online])
- **Minimum home** – 27m² x £2.65 = £71.55
- **Family home** – x2 width walls = 11m, x2 length walls = 12m
- 11m*12m = 23m
- 23m x 2 (2 floors) = 46m
- 46m x £2.65 = £121.90

Specification (materials only)

Bamboo exterior wall Cladding –

The Bamboo plant is the fastest growing plant reaching 20 metres within a couple of months, which means once cut down it can regrow 1 metre per day resulting in bamboo being a sustainable and efficient plant to use (Moso, Bamboo [online]). Teak Bamboo sandstone split face cladding tile for outdoor cladding 20x60cm price £9.99 each (EBAY, Bamboo cladding tile, [online]). <https://www.moso.eu/en/bamboo/sustainable-choice>

- **Minimum home** – $0.2\text{m} \times 0.6\text{m} = 0.12\text{m}^2$
- $27\text{m}^2 \div 0.12\text{m} = 225$ tiles
- $225 \times £9.99 = \textbf{£2247.75}$
- **Family home** – $0.2\text{m} \times 0.6\text{m} = 0.12\text{m}^2$
- $33\text{m}^2 \div 0.12\text{m}^2 = 275$ tiles
- 275×2 (2 floors) = 550 tiles
- $550 \times £9.99 = £5494.50$

Groundworks –

- Depending on the ground type will depend on the groundworks which will be necessary before the interlock buildings are installed /brought to the site. If the ground type has adequate soil the only main groundworks which will be necessary are as follows: Cut and Fill, this will be necessary if the ground is at different levels, the cut process will be needed either way as a trench will need to be dug up to create a foundation for the home. The foundation used for a prefabricated building would be a trench foundation, this is carried out by the total perimeter of where the building is sitting on will be excavated to a certain depth depending on ground conditions, once the trench is complete concrete can be poured and blocks can be laid on top for a smooth flat surface for the building so sit on.
- The concrete which will be used to fill the trench will be concrete type C20/C25, this concrete costs £85/£95 per m^3 . Depth of foundations = 2m, Width of foundation trench = 0.5m. (London City Concrete, Costs)
- The Minimum student accommodation foundations will cost:
 $2\text{m} \times 0.5\text{m} \times 20\text{m}^3 = 20\text{m}^3$ <Volume of foundations, Cost = $20\text{m}^3 \times £90 = £1800$
- The family accommodation foundations will cost:
 $23\text{m}^3 \times 0.5\text{m} \times 2\text{m} = 23\text{m}^3$ <Volume of foundations, Cost = $23\text{m}^3 \times £90 = £2070$

Specification (Family home schedules)

| <Window Schedule> | | | |
|-------------------|--------|-------|------|
| A | B | C | D |
| Cost | Height | Width | Mark |
| 250.00 | 1210 | 1810 | 2 |
| 250.00 | 1210 | 1810 | 3 |
| 250.00 | 1210 | 1810 | 4 |
| 250.00 | 1210 | 1810 | 5 |
| 250.00 | 1210 | 1810 | 6 |
| 250.00 | 1210 | 1810 | 7 |
| 250.00 | 1210 | 1810 | 8 |
| 250.00 | 1210 | 1810 | 9 |
| 250.00 | 1210 | 1810 | 10 |
| 250.00 | 1210 | 1810 | 11 |
| 138.00 | 910 | 1810 | 14 |
| 138.00 | 910 | 1810 | 15 |
| 138.00 | 910 | 1810 | 17 |
| 138.00 | 910 | 1810 | 18 |

Large windows -

<https://www.wickes.co.uk/Wickes-White-uPVC-Casement-Window---Side-Hung-1770-x-1160mm/p/113068>

Small windows -

<https://www.wickes.co.uk/Wickes-White-uPVC-Casement-Window---Top-Hung-905-x-1010mm/p/113065>

Total cost = £3052

| <Door Schedule> | | | | |
|-----------------|--------|-----------|-------|------|
| A | B | C | D | E |
| Cost | Height | Thickness | Width | Mark |
| 23.00 | 2110 | 38 | 810 | 2 |
| 310.00 | 2050 | 44 | 2270 | 3 |
| 310.00 | 2050 | 44 | 2270 | 4 |
| 23.00 | 2110 | 38 | 810 | 5 |
| 23.00 | 2110 | 38 | 810 | 7 |
| 23.00 | 2110 | 38 | 810 | 8 |
| 23.00 | 2110 | 38 | 810 | 9 |
| 23.00 | 2110 | 38 | 810 | 10 |
| 23.00 | 2110 | 38 | 810 | 11 |
| 23.00 | 2110 | 38 | 810 | 12 |
| 750.00 | 2110 | 38 | 1010 | 13 |

Internal small door - <https://www.wickes.co.uk/Wickes-Woburn-White-Grained-Moulded-6-Panel-Internal-Door---1981-mm/p/9000218630>

Garage door -

<https://www.wickes.co.uk/Products/Doors+Windows/External-Doors/Garage-Doors/c/1000604>

Front door -

<https://www.wickes.co.uk/Products/Doors+Windows/External-Doors/Front+Back-Doors/Composite-Doors/c/1000652>

Total cost = £1554

Specification (minimum home schedules)

| <Window Schedule> | | | |
|-------------------|--------|-------|------|
| A | B | C | D |
| Cost | Height | Width | Mark |
| 138.00 | 910 | 910 | 1 |
| 138.00 | 910 | 910 | 2 |
| 138.00 | 910 | 910 | 5 |
| 138.00 | 910 | 910 | 6 |
| 138.00 | 910 | 910 | 7 |

Windows - <https://www.wickes.co.uk/Wickes-White-uPVC-Casement-Window---Top-Hung-905-x-1010mm/p/113065>

Total cost = £690

| <Door Schedule> | | | |
|-----------------|--------|------|-------|
| A | B | C | D |
| Cost | Height | Mark | Width |
| 750.00 | 2110 | 1 | 1010 |
| 23.00 | 2110 | 2 | 810 |
| 23.00 | 2110 | 3 | 810 |

Front door -

<https://www.wickes.co.uk/Products/Doors+Windows/External-Doors/Front+Back-Doors/Composite-Doors/c/1000652>

Internal doors - <https://www.wickes.co.uk/Wickes-Woburn-White-Grained-Moulded-6-Panel-Internal-Door---1981-mm/p/9000218630>

Total cost = £796

Specification: Total costs

- **Total Cost for the construction of the “Minimum House” = £8685.32 (labour or transportation cost not included)**
- **Total cost for the construction of the “Family House” = £20379.89 (labour or transportation cost not included)**

Thank you for your time



Interlock

Homes that grow with you.