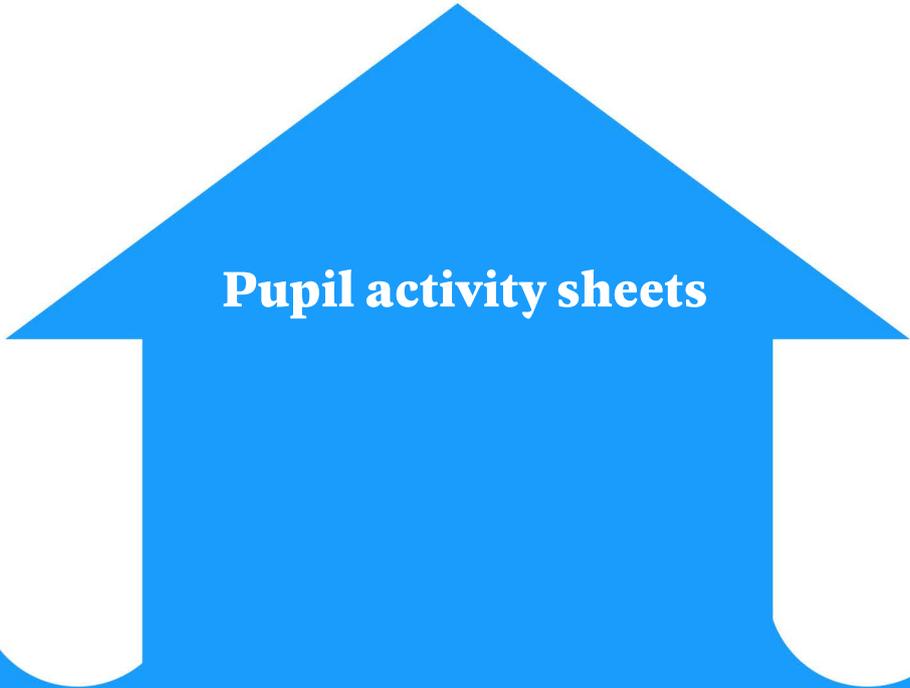


BEAT THE FLOOD



Pupil activity sheets



practicalaction.org/schools/beat-the-flood

**Practical
ACTION**

Where in the world?

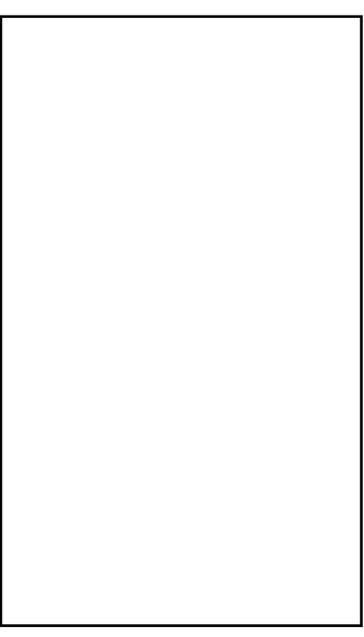
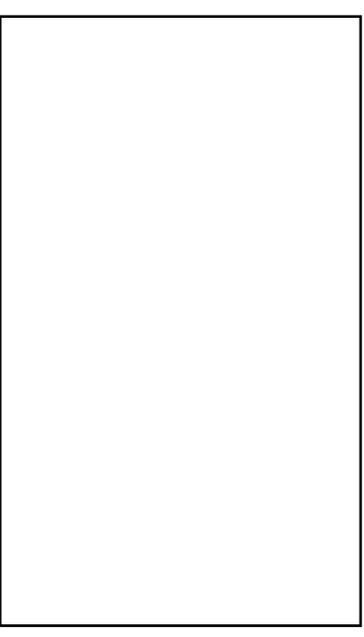
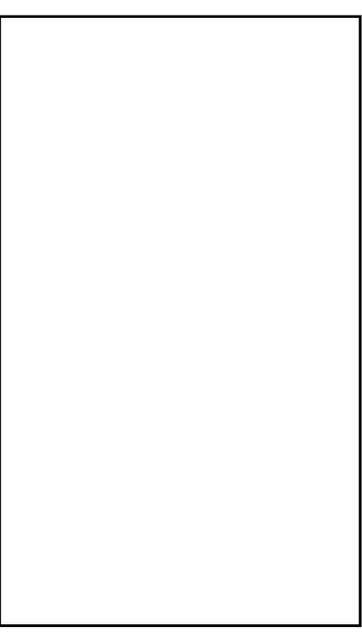
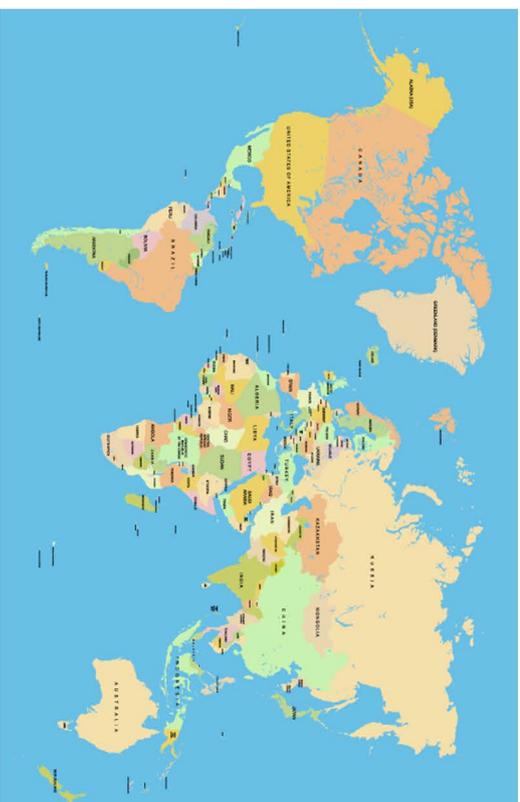
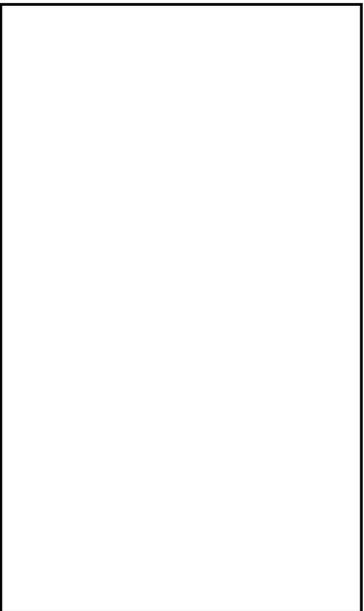
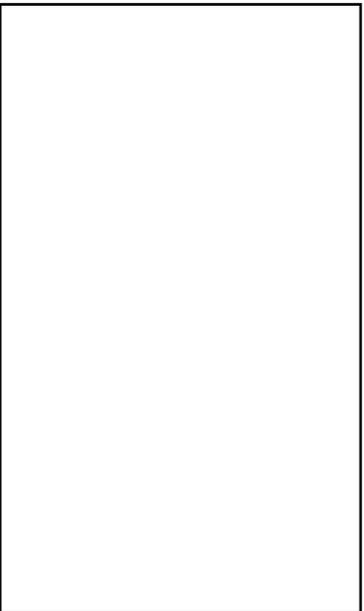
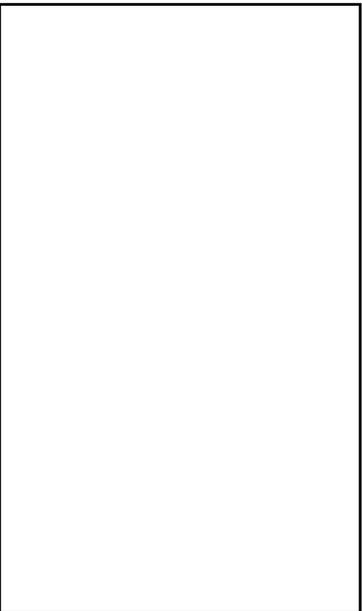
Working in small groups, look at the photographs below of people whose lives have been affected by flooding around the world.

Cut out the pictures and discuss where you think the photographs are from before placing them on the world map.



World map

Cut out the pictures of people affected by flooding and place them where you think they are from on the world map below.



Which of the people in these photographs do you think would be most devastated by flooding and why?

The Sustainable Development Goals

	No poverty	End poverty in all its forms everywhere.
	Zero Hunger	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
	Good Health & Well-being for People	Ensure healthy lives and promote well-being for all at all ages.
	Quality Education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
	Gender Equality	Achieve gender equality and empower all women and girls.
	Clean Water & Sanitation	Ensure availability and sustainable management of water and sanitation for all.
	Affordable & Clean Energy	Ensure access to affordable, reliable, sustainable modern energy for all.
	Decent Work & Economic Growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
	Industry, Innovation & Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
	Reducing Inequalities	Reduce income inequality within and among countries.
	Sustainable Cities & Communities	Make cities and human settlements inclusive, safe, resilient, and sustainable.
	Responsible Consumption & Production	Ensure sustainable consumption and production patterns.
	Climate Action	Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.
	Life Below Water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
	Life on Land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss.
	Peace, Justice & Strong Institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
	Partnerships for the Goals	Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Frame and shell structures - pictures

Bicycle



Skeleton



Cardboard box



Bicycle helmet



Chair



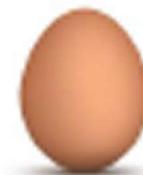
Drinks can



Climbing frame

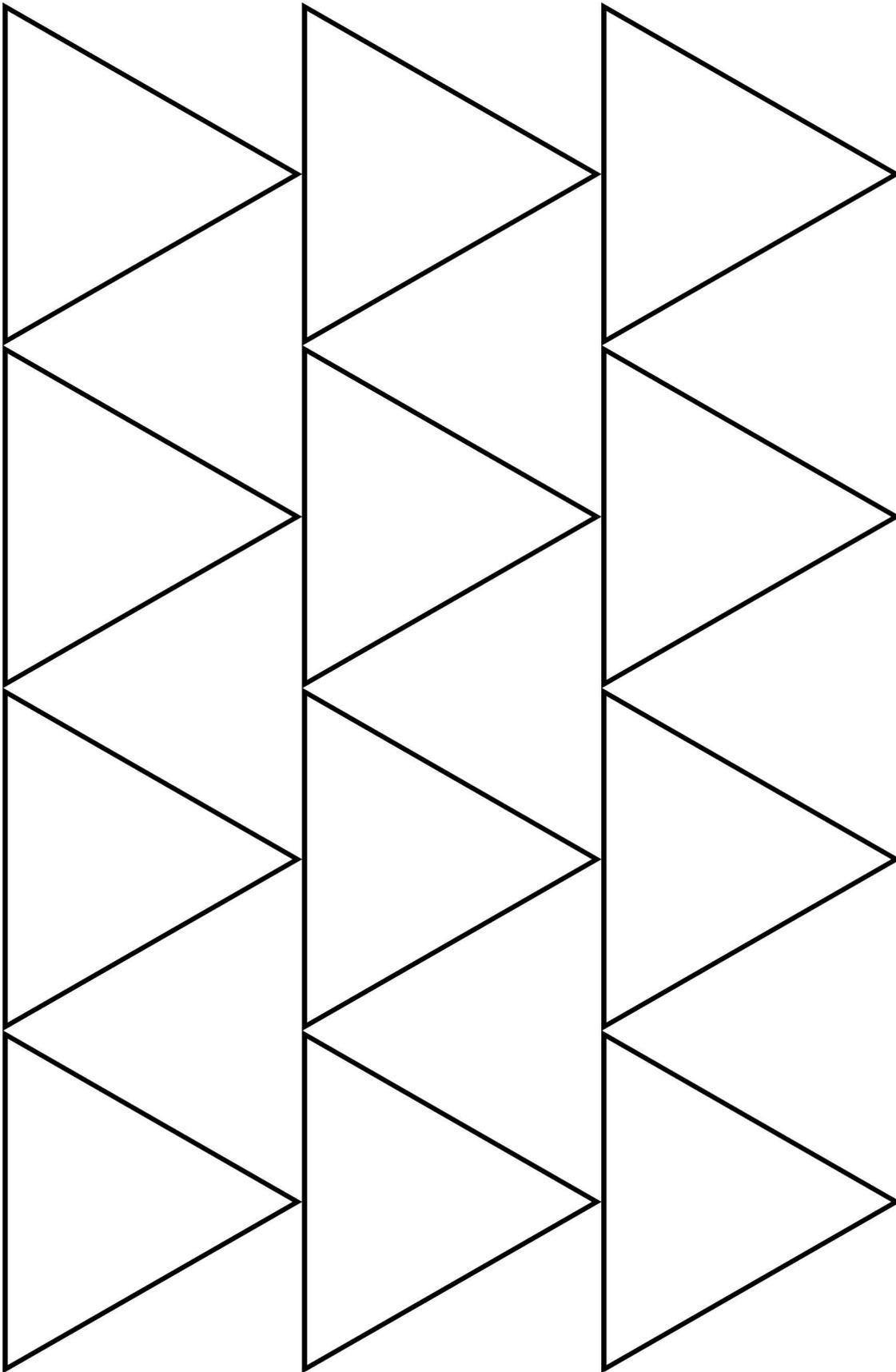


Bird's egg



Structures template 1

Structures template 2



Testing materials for absorbency - results table

Name: _____

Class: _____

Material	Height that the water was absorbed to (cm)			Observations
	Test 1	Test 2	Average height	

Which material absorbed the least amount of water?

Testing materials for strength - results table

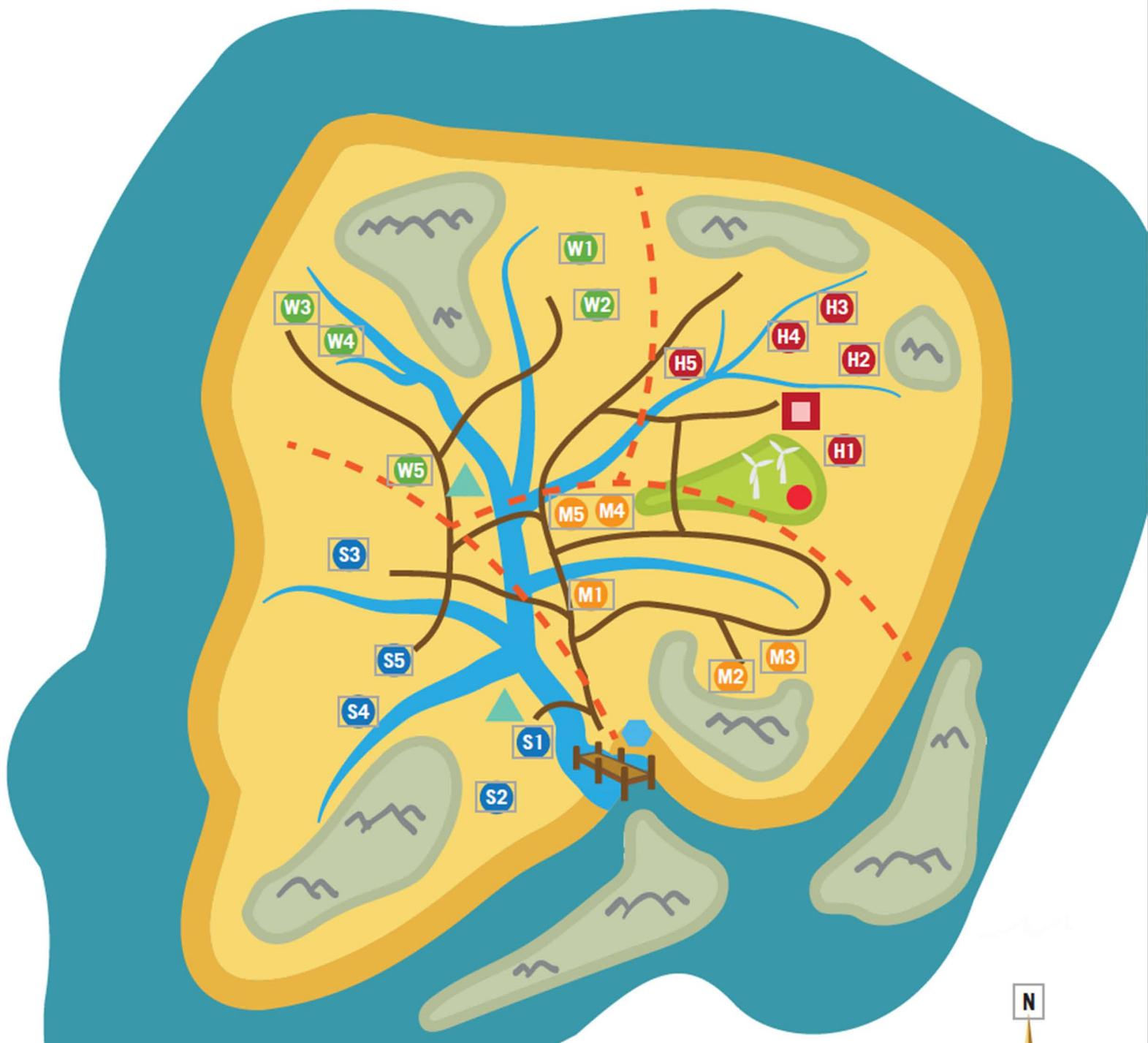
Name: _____

Class: _____

Material	Weight added to material (g)			Observations
	Test 1	Test 2	Average weight	

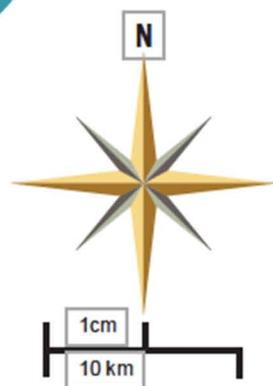
Which material was the strongest?

Watu Island



Key

- | | |
|---|--|
|  Savuvi homes S1-S5 |  Mountain areas |
|  Wazenzi homes W1-W5 |  Forest |
|  Hila homes H1-H5 |  School |
|  Milma homes M1-M5 |  Health centre |
|  Community borders |  Port |
|  Road |  Wind power station |
|  Rivers | |



Watu Island community cards

The Savuvi

Location: South West of the island

Homes: 5

Other buildings: primary school for children

Average household size: 6 people

Main jobs in community: fishermen, skilled at boat building and carpentry



The Milma

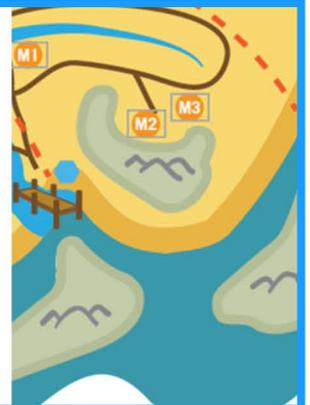
Location: central area of the island

Homes: 5

Other buildings: wind turbine and generator supplying electricity

Average household size: 6 people

Main jobs in community: farmers and skilled foresters



The Wazenzi

Location: North West of the island

Homes: 5

Other buildings: secondary school for 30 pupils

Average household size: 8 people

Main jobs in community: builders of traditional homes and brick makers



The Hila

Location: North East area of the island

Homes: 5

Other buildings: health centre and hospital

Average household size: 7 people

Main jobs in community: land farmers and skilled craft people



Materials cards

Use the cards below to help you to make decisions about the choice of materials for your flood-proof home, your modelling materials and the costs involved.



Polythene Roll

For modelling you could use cling film

Properties: water resistant, does not provide structural strength, tears easily, malleable, non-recyclable, non-biodegradable

Availability: imported onto the island by boat - low transport costs due to its low weight

Material cost: £5 per roll (10m x 1m)



Concrete

For modelling you could use plasticine

Properties: water resistant, very strong, difficult to demolish, durable, malleable, non-recyclable, non-biodegradable

Availability: imported onto the island by boat - weight of material leads to high transport costs

Material cost: £10 per sack covering 10m²



Polyurethane Sheet

For modelling you could use plastic bottles or polypropylene

Properties: water resistant, strong, recyclable, difficult to cut, liable to cracking, non-biodegradable

Availability: imported onto the island by boat - low transportation costs due to weight

Material cost: £40 per roll (10m x 2m)



Steel

For modelling you could use foil food trays or card wrapped in foil

Properties: water resistant, prone to rust, strong, recyclable, difficult to cut into sections, non-biodegradable

Availability: imported onto the island by boat - weight of material leads to increased transport costs

Material cost: £50 per sheet (2m x 3m)



Bamboo

For modelling you could use straws

Properties: water resistant, reasonable strength but will need binding together, biodegradable, recyclable

Availability: easily available on the island

Material cost: £1 per 1m treated bamboo cane



Softwood

For modeling you could use wood splints or lolly sticks

Properties: very absorbent, reasonable strength, susceptible to termites, biodegradable, recyclable

Availability: readily available on the island in all forest areas

Material cost: 2m per 1m lenth



Dung/Soil/Ash

For modelling you could use mud or clay

Properties: malleable, recyclable, biodegradable, repels termites, fibrous which stops soil cracking

Availability: readily available in many areas of the island

Material cost: free



Glass

For modelling you could use perspex, plastic or clingfilm

Properties: recyclable, non-biodegradable, water resistant, highly fragile

Availability: imported onto the island by boat - weight of material leads to high transport costs compared to locally available material

Material cost: £30 per sheet (2m x 1m)



Hardwood

For modelling you could use lolly sticks or balsa wood

Properties: absorbent, strong, durable, resists termites, biodegradable, recyclable

Availability: this needs to be transported onto the island and then down the river. There is no readily available hardwood on the island

Material cost: £10 per 2m plank



Corrugated iron

For modelling you could use aluminium foil or corrugated plastic

Properties: water resistant, prone to rust, strong, recyclable, difficult to cut into sections, non-biodegradable

Availability: imported onto the island by boat - weight of material leads to high transport costs compared to locally available material

Material cost: £40 per sheet (2m x 1m)



Bricks

For modelling you could use plasticine or lego bricks

Properties: strong, weather resistant, durable, recyclable, non-biodegradable

Availability: can be made on the island or imported via boat

Material cost: 50p per brick



Reeds

For modelling you could use grass or leaves

Properties: need attaching to another structure, malleable, weather resistant

Availability: available throughout the island

Material cost: free

Summary of costs

 <p>Polythene Roll Cost: £5 per roll (10m x 1m)</p>	 <p>Concrete Cost: £10 per sack covering 15m²</p>	 <p>Polyurethane sheet Cost: £40 per sheet (10m x 2m)</p>	 <p>Steel Cost: £50 per sheet (2m x 3m)</p>
 <p>Bamboo Cost: £1 per 1m cane</p>	 <p>Softwood Cost: £2 per 1m length</p>	 <p>Dung/Soil/Ash/ Sand Cost: Free</p>	 <p>Glass Cost: £30 per sheet (2m x 1m)</p>
 <p>Hardwood Cost: £10 per 2m plank</p>	 <p>Corrugated iron Cost: £40 per sheet (2m x 1m)</p>	 <p>Bricks Cost: 50p per brick</p>	 <p>Grass/Reeds/Jute Cost: Free</p>
 <p>Nails Cost: 10p per nail</p>	 <p>Metal fastenings Cost : £5 per fastening</p>	 <p>Nuts and bolts Cost: £1 per nut and bolt</p>	 <p>Rope Cost: £5 per 10m</p>

Design Specification

Name:

.....

Class:

.....

Before developing your ideas for your flood-resistant home, think about the features that you want your home to have, and give a reason why these are important.

Materials - What properties do you need the materials in your home to have?

Suitability for the community/family - What features do you want your home to have to make it suitable for the people who will live in it?

Construction method - What type of structure do you think best suits the conditions and materials available on the island?

Environmental issues - Will you consider the effect of your choice of materials on the environment?

Cost - What will you do to keep costs to a minimum?

Design ideas

Name:

.....

Develop a few ideas for your flood-resistant homes and sketch them below.

Class:

.....

Annotate your design ideas with notes alongside your drawings to give additional information. You can include:

- details of hidden parts such as fixings, openings, interior elements
- information about materials and size
- how your design would be suitable for the community
- how the design meets the specification points

