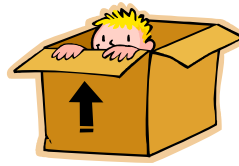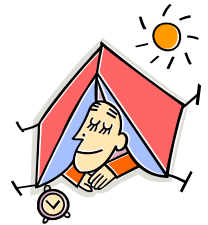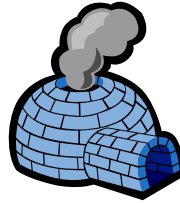# Shelters

Name : _____

Class : _____

Shelters

Look at the various shelters above. Use the table to show what the users of each of the shelters are protected from.

Tick the box for the protection each shelter has:

	Hot/ Sunny	Windy	Rain	Snow	Cold
Wig-Wam					
House					
Tent					
Bus Shelter					
Umbrella					
Cardboard Box					

Which of the shelters do you think protects users from all the different types of weather?

_____

_____

_____

Shelters

Strengthening Materials:

Investigate how you could strengthen an A4 piece of paper to hold a significant amount of weight. Record some of the examples below and write a comment for each structure:

Shelters

We are going to test the **water resistance** of 3 different materials.

Add 20 drops of water to the sample resting on dry blotting paper.
Measure the size of the blot after 5 minutes.

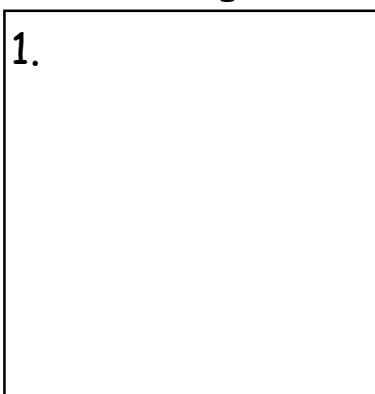Sample name _____
The blot measures _____
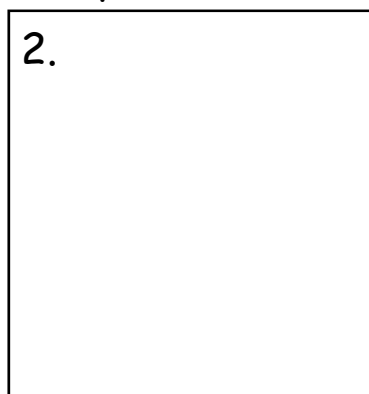
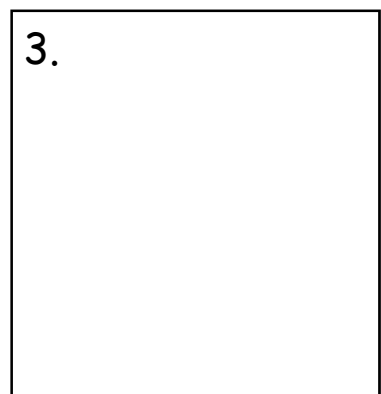Sample name _____
The blot measures _____

Sample name _____
The blot measures _____

Which sample is more water resistant?
_____
_____

Draw a diagram of the experiment below :

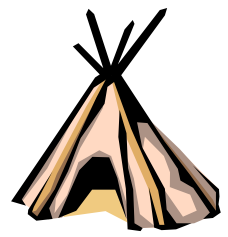| 1.	2.	3.

Shelters

We are going to test the **durability** of the 3 materials. Rub the fabric sample 20 times with glasspaper wrapped around a cork block.

Sample name _____
Observe how worn the first sample is.

Now test another fabric sample
Sample name _____
Observe how worn the second sample is.

Now test another fabric sample
Sample name _____
Observe how worn the third sample is.

Which was the most worn of the samples?

_____
_____

Which was the most durable sample?

_____
_____

Shelters

We will look at the **strength** of the materials in this next experiment. Cut thin strips of fabric and wrap the ends of the fabric around dowel strips and secure with bulldog clips. Measure the length of the fabric strip without any mass on the end of it. Now load the fabric strip with slotted masses. Record how much its length increases with each different mass.

Sample 1 : _____

Amount of mass added (g) : _____

Sample 2 : _____

Amount of mass added (g) : _____

Sample 3 : _____

Amount of mass added (g) : _____

Which sample increased in length the most?
_____

Which sample was the strongest?
_____

Shelters

Taking Shelter Under the Table?

What materials are you using to build your own version of the 'Morrison Shelter?'

1._____   3._____

2._____   4._____

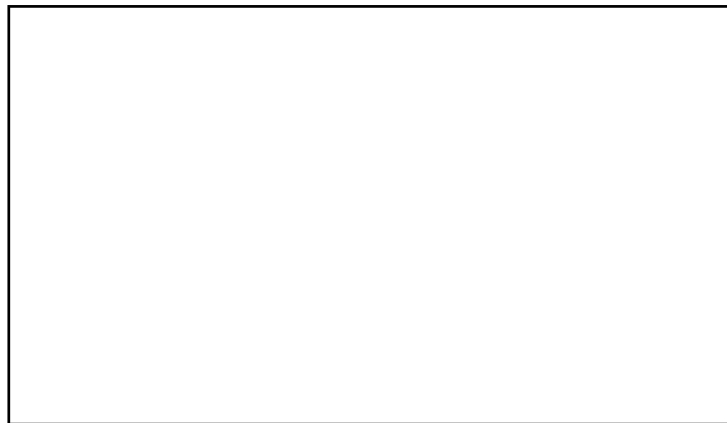What words could you use to describe what is intended to be an excellent design for your shelter?

1._____   3._____

2._____   4._____
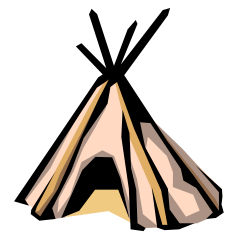
Draw a diagram showing your shelter :

How much weight did your shelter take before collapsing? Was your design successful?

_____

_____

_____

Shelters

Mission Possible-but Challenging!
Are you up to the competition?

Your mission, which you must accept, is to build a shelter for four Lego figures (we'll call them 'The Beckham Family') There will be a prize for the best shelter, with certificates for the two runner-up shelters.

The shelter will be judged as follows:

1. It must be able to withstand a 1 Kg weight being placed on the roof. The two figures must remain protected and undamaged.

2. The two figures must remain dry. This will be judged by placing the two
figures on a tissue. The tissue must remain dry when 200 ml of water is poured over the top of the shelter.

3. The shelter and the figures inside must be able to withstand a 30 second blast from an electric fan.
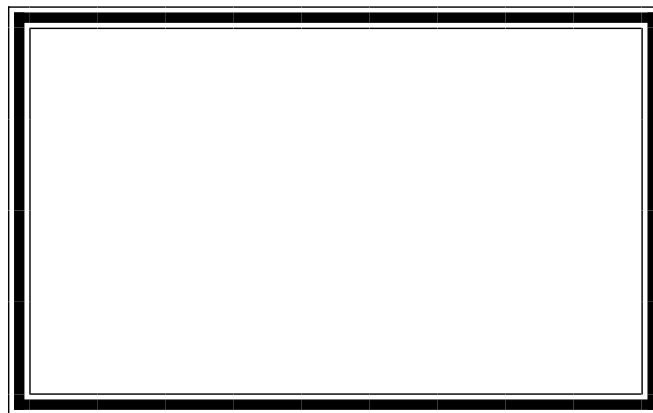
Shelters

Mission Possible-but Challenging!
Are you up to the competition?

How will you make sure it is strong enough to support 1kg?

_____
_____
_____
_____

How will you make it waterproof?

_____
_____
_____
_____

How will we make sure it withstands the blast from the fan?

_____
_____
_____
_____

Did you change your original plan at all? If so, how? And why? What other ways did you try?

_____
_____

Shelters

Mission Possible-but Challenging!
Are you up to the competition?

What materials do you have available for your **impossible** shelter?

1. _____
2. _____
3. _____
4. _____

5. _____
6. _____
7. _____
8. _____

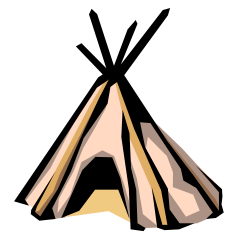What does your design look like?

Side View

Above View

3D view

Are you pleased with your design?

Shelters

How much weight did your shelter take before collapsing?
Were you pleased?

_____

_____

_____

_____

How could you have improved your design?

_____

_____

_____

_____

How else could we have tested our designs?

_____

_____

_____

_____

Keep up the good work!