

K.S.2 Hidden Forces and Simple Machines – Teacher’s Guide

This teacher’s guide is to help you find your way around the museum. Before your visit you can use the automated powerpoint as an introduction to the museum and the forces/simple machines concepts that the students will be looking at.

You may have also used the pre visit worksheet ‘Sid’s Six Simple Machines’ which explains the six simple machines and familiarises the pupils with them before coming to the museum. You may like to bring this with you on your visit to help with completing the ‘Hidden Forces and Simple Machines’ worksheet while you are at the museum.

The worksheet is intended for a 45-minute walk, but this can be extended by making more detailed observations or taking optional routes which will be mentioned through this support sheet. The museum and the animals also provide lots of distractions!

Route Instructions (map on last page)

You will be starting at the **Treadwheel** (map ref D2). Next continue walking along the top path, away from the entrance, towards Tindalls Cottage (map ref R3) where you will turn right down the hill towards a crossroads.

At the crossroads, immediately in front and to the left of you is the **Horse Whim** (map ref S1).

Continue along the left hand path from the crossroads and walk on towards **Cowfold Barn** (map ref B3). As you walk along this path both wells mentioned in the pupil sheet are either side of you; one outside Winkhurst kitchen (map ref B2) to your right and the other at the back of Bayleaf farmstead (map ref B1) to your left. You may also come across Sid, our cockerel and his hens. The Shire Horses, cattle, sheep and even the pigs may all be in this area.

As you approach **Cowfold Barn** you will see the Tudor machines along the side of the barn. If you are able to look inside there should be the plough and a levered press which helps to break the flax for linen production, alongside a variety of other tools.

(If you want an extended walk you can continue up the path as it bears left to the Wood Yard (map ref W1), where there is an interesting hand operated timber crane and levered clapper gate. You will then need to return back to Cowfold Barn.)

With your back towards the barn you will see a courtyard on your right with a signpost to the toilets. Inside the courtyard on the left is **Goodwood Cattle Shed** (map ref S7). Tucked up in the left hand corner is a room about the shepherds and their shears. There is a variety of machinery in the cattle shed where you can see gears, wheels and axles and more.

Walk past the toilets, down the little lane to the right of the block which gives you great views of the Downs, West Dean and possibly the cattle and Shire Horses. Along this path is the **Hay Barn** (map ref S5) which contains a threshing machine; this separates the corn from the rest of the wheat crop. It just needs the rotating cutters at the front and an engine to make it a combined harvester.

Continue past the Hay Barn and follow the path around the edge of the field. At the end of the lane turn right up past the stables and back towards the Horse Whim to have a look at the machines in the **Charlwood Shed** (map ref S2). The students should be able to see the second set of simple machines and understand them more.

Return to the path leading up to the crossroads and take the left hand path (if you are looking up the hill) heading back towards the Market Square. Just before getting to the market square you will spot the levered water pump on your left outside of Whittakers Cottages (map ref V1). Turn towards this and go past it towards the field. On your left you will see the **Vehicle and Implement Gallery** (map ref C16).

As you return to the Market square take the path that runs to the left along the side of the Horsham shop. This will take you to the **Plumbers Workshop** (map ref C1), the **Carpenters Shop** (map ref C4) and also the **Building Crafts Gallery** (map ref C2). As you come out of the carpenters shop you will see the **Pugmill** (map ref C6) and also the geared Victorian water pump called the **Horse Gin** on your left. (Time might be against going into all of these areas and you may just want to go over to the Watermill.)

As you pass the Pugmill follow the path round to the left; the **Watermill** (map ref C9) will be on your right. This will give you the chance to see how all the simple machines you know about are being used.

(To extend the walk continue on the same path towards **Court Barn** (map ref C13) and find out about the Victorian water pump in more detail, stonemasons and a variety of other trades.)

Additional Information to help as you go around

Treadmill

A story is told that a boy once slipped in a similar wheel when the full bucket neared the top, the weight of the bucket reversed the wheel and whirled him round and round at increasing speed until it reached the water again.

Horse Whim

The roller should reduce friction and stop the rope from being worn away and make less work for horse. The brake also uses friction.

The compound machine is the wheelbarrow as it has the wheel and axle, but the wheel also acts as pivot for the lever. The weight acting down and the effort of being lifted.

The shears have the pivot at the end which may help them understand the wheelbarrow more. The pulley was on one of the wells.

Vehicle and Implement Gallery

The wheel investigation is a possible investigation back at school. You can use an inclined plane to release a cart/van/car, then measure how far the object moves. You can change the size of the wheels or how much it carries which can generate lots of discussion about fair testing, accurate measuring, predictions, repeating the experiment.

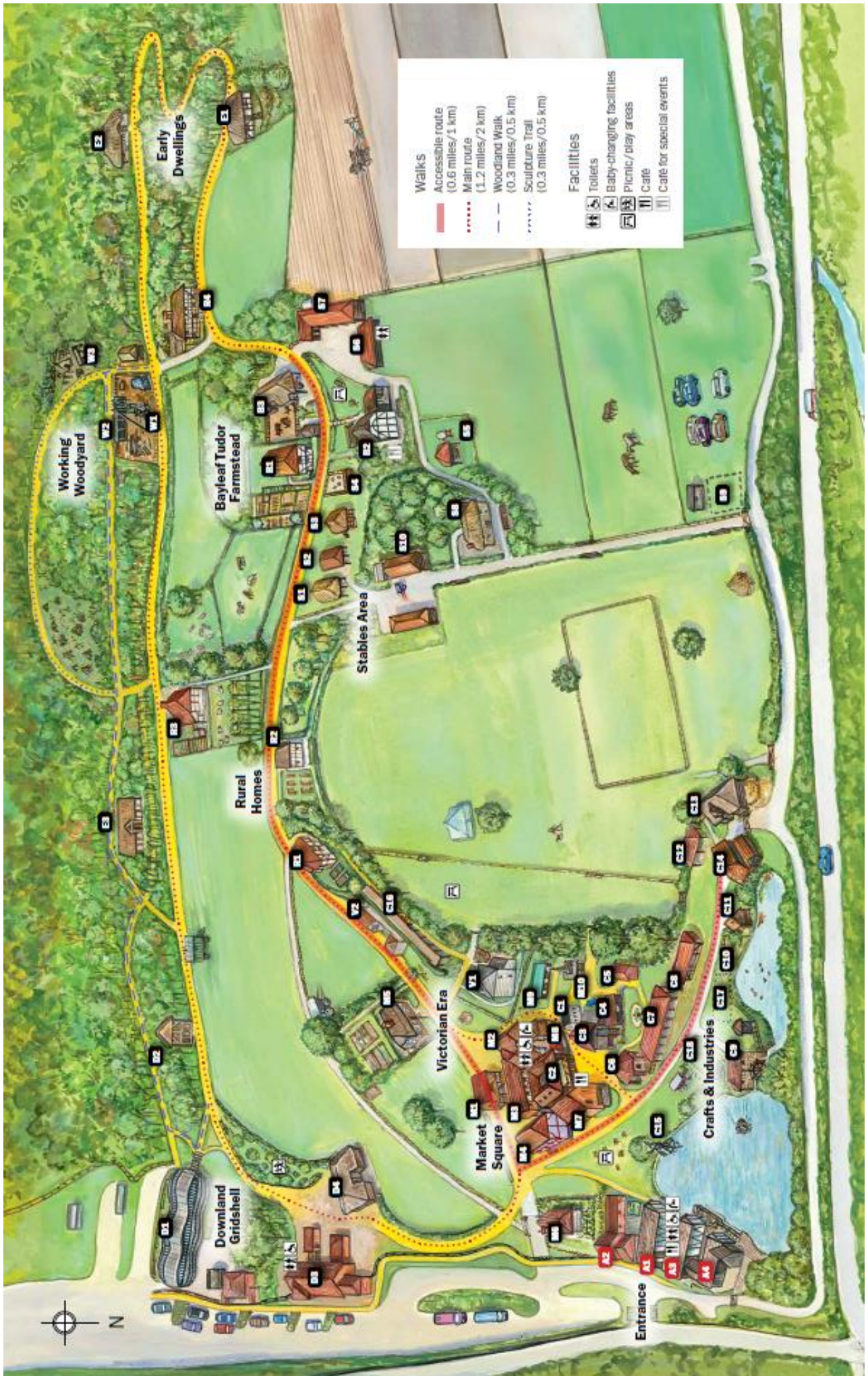
The Plummer and Carpenter workshops

These are a bit tight for space so you might like to split the group.

Watermill

This is full of examples of simple machines. The Millers are always happy to talk about how it works. The mill stones hover above each other with millimetres between them, but should they touch, then the friction would be so great it would all stop.

We hope you have an interesting and enjoyable walk.



Walks

- Accessible route (0.6 miles/1 km)
- Main route (1.2 miles/2 km)
- Woodland Walk (0.3 miles/0.5 km)
- Sculpture Trail (0.3 miles/0.5 km)

Facilities

- Toilets
- Baby-changing facilities
- Picnic/play areas
- Cafe
- Cafe for special events



Early Dwellings

Working Woodyard

Bayleaf Tudor Farmstead

Stables Area

Rural Homes

Victorian Era

Market Square

Downland Gridshell

Crafts & Industries

Entrance