

How to fit blocks together

What you will learn

When you have finished this section, you should be able to:

- Lay dry blocks to make a wall
- Keep the wall level and square
- Cut blocks to size.

Note: In this session you work with blocks with no mortar— to see how things go together and how you can keep them straight and level.

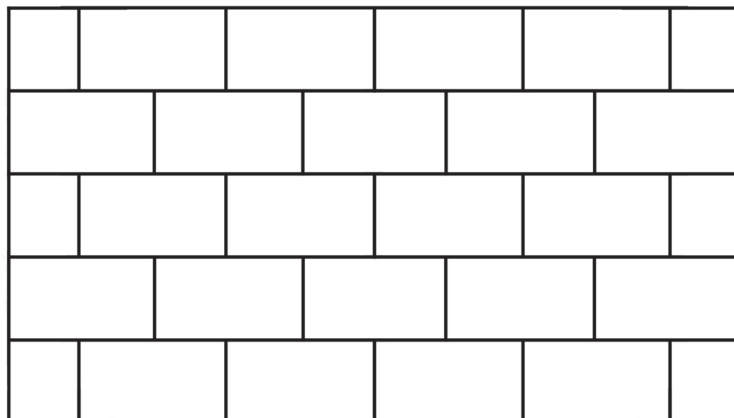
The tools you need to keep blocks level and straight are described at the back of this section.

Layers of blocks

Blocks can be put together in different ways to make a wall.

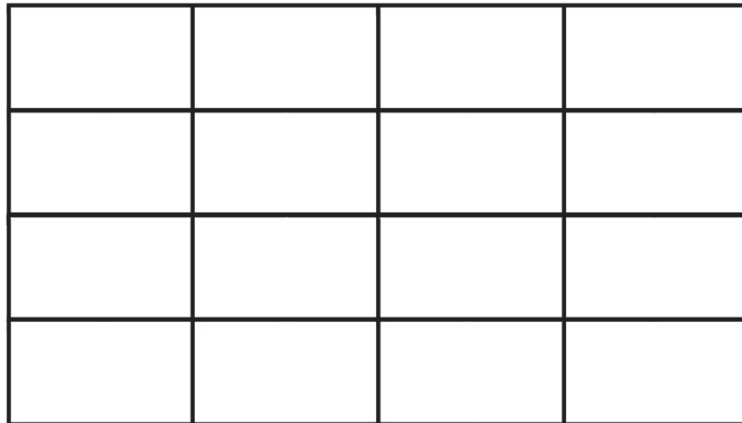
The pattern they make is called the *bond pattern*.

The most common pattern is the *Stretcher bond* (also called the *half bond*).



It looks good and it is strong because the up and down joins are not all in a line.

Another pattern is the *Stack* bond — like this



The up and down joins are all in a line so the wall is weaker and the joins could crack. Some build this way — just to have a different ‘look’.

Activity

Build some dry blocks together using the *stretcher* and then the *stack* bond patterns.

- Make them about 4 blocks high
- Push them from the side and see how the stretcher bond holds together even without mortar.

What happens when you push the stack bond?

What other bond patterns can you make with the blocks you have?

You can make quite a lot of patterns by mixing different sizes of blocks — Try standing a block on its end. These patterns are really only any good for decoration.

You can even lay the block on its side — so the hollow core is showing. You can see some blocks like this on the video. They are for decoration — and to let plants grow out of a garden.

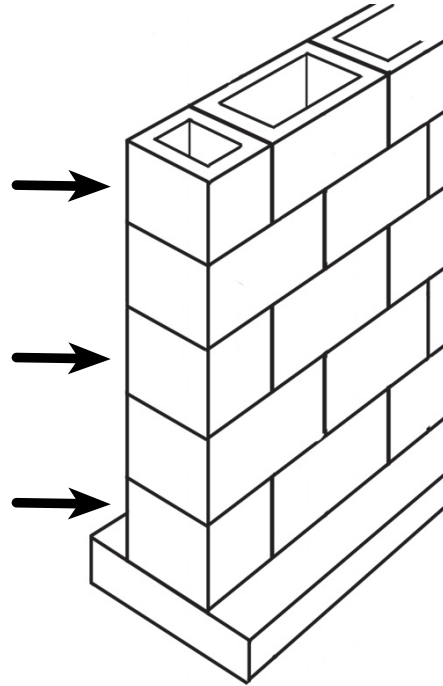
In this course we will build using the stretcher bond pattern.

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Layout of a simple wall

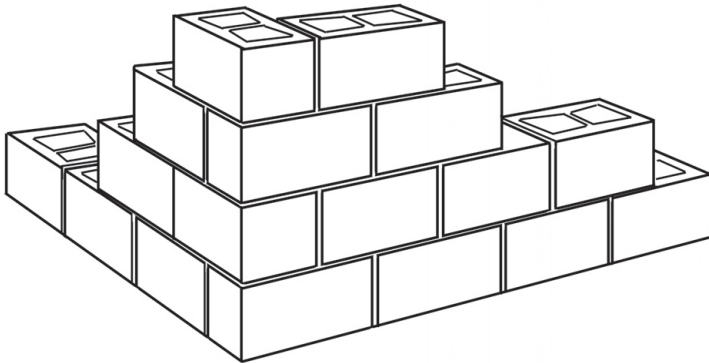
This wall needs a half-block at the end of each second layer.

Think about the hollow cores. They will still be all in a line.



Layout of a corner

The blocks from the two walls fit and lock together — no half blocks are needed if you are using standard 200mm blocks.



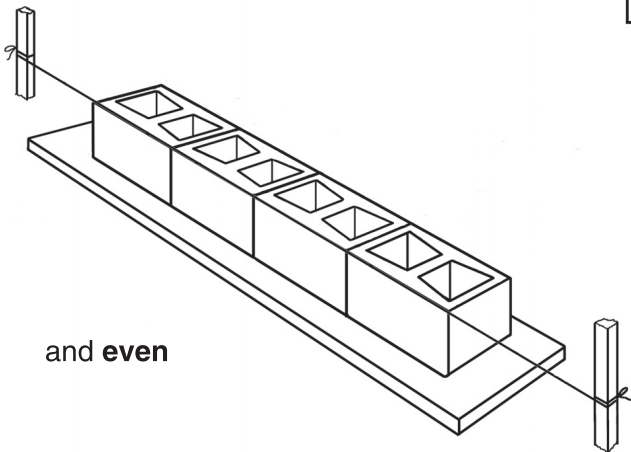
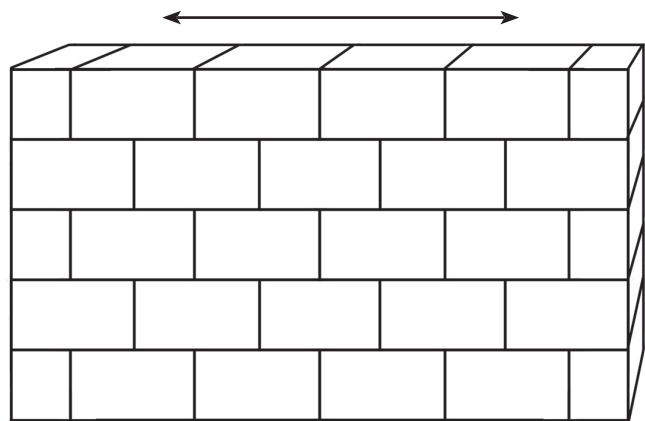
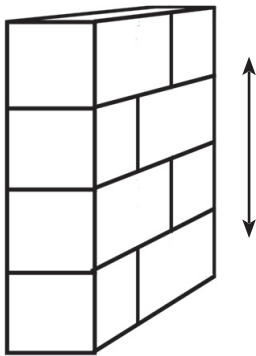
How do I keep walls square and level?

Walls that are level, square and well finished look good and show that you have done a good job!

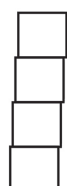
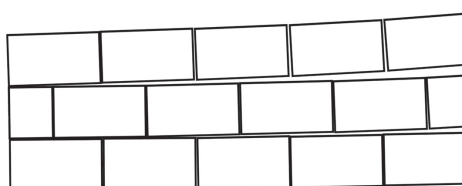
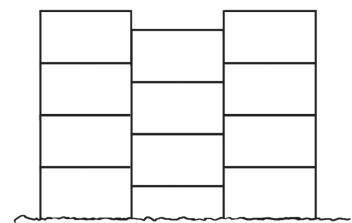
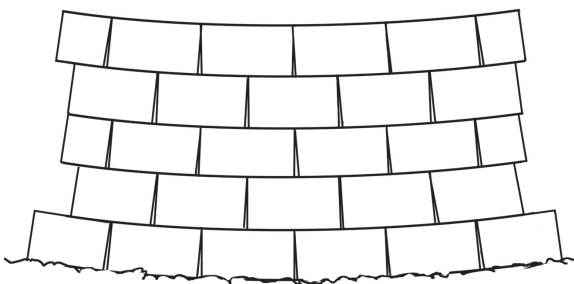
— More importantly, well built walls are stronger and will last longer.

Walls must be upright —
sometimes called “**plumb**”

and **level**



It takes a lot of care **not** to build walls like these:



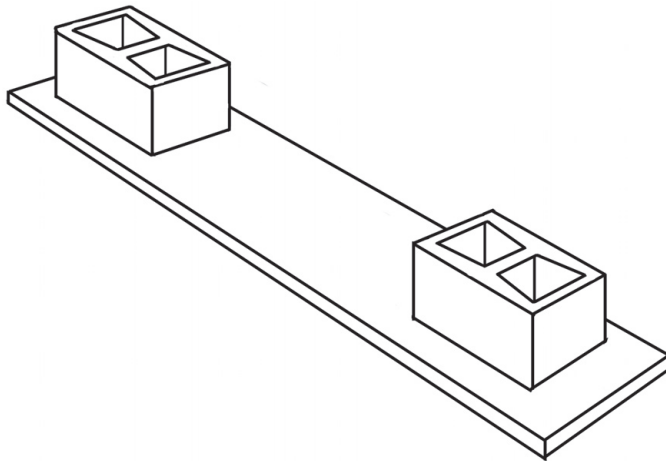
Simple steps to keep blocks in line

The tools you need are described at the end of this section.

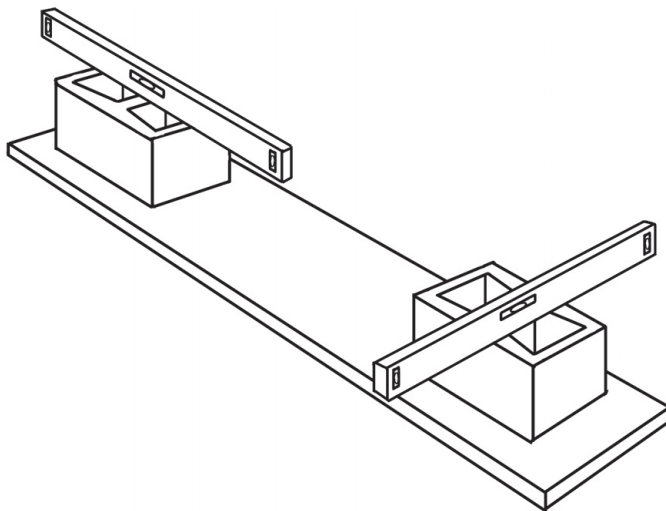
The way to keep blocks in line is to build inwards from the ends or corners of the wall.

Step 1

Lay the two end blocks exactly in place on the foundations



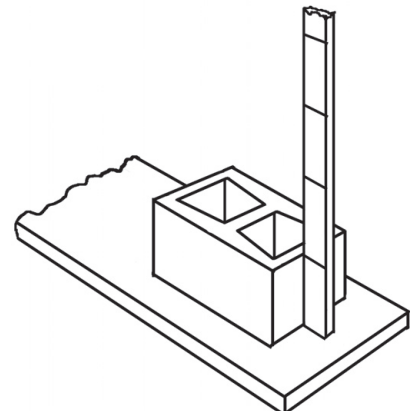
use a spirit level to check that each one is level



this way — and this way

check the blocks are at the correct height with a tape measure (or height or gauge stick)

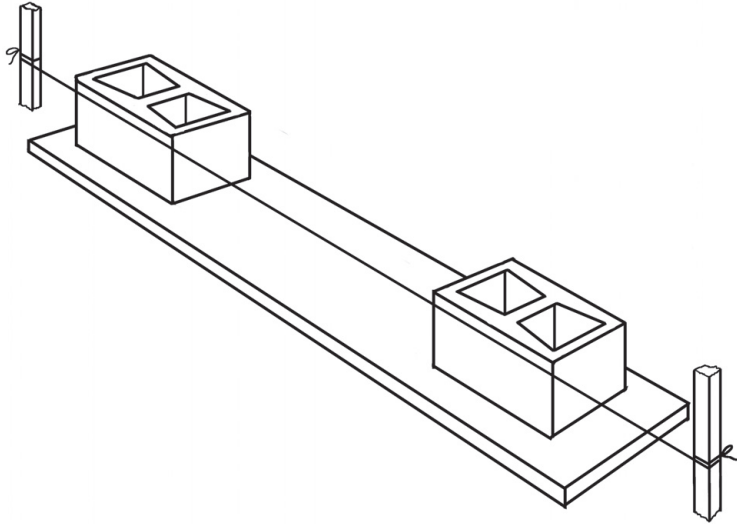
— remember there will be mortar below the block



You now have the corner blocks exactly right.

Step 2

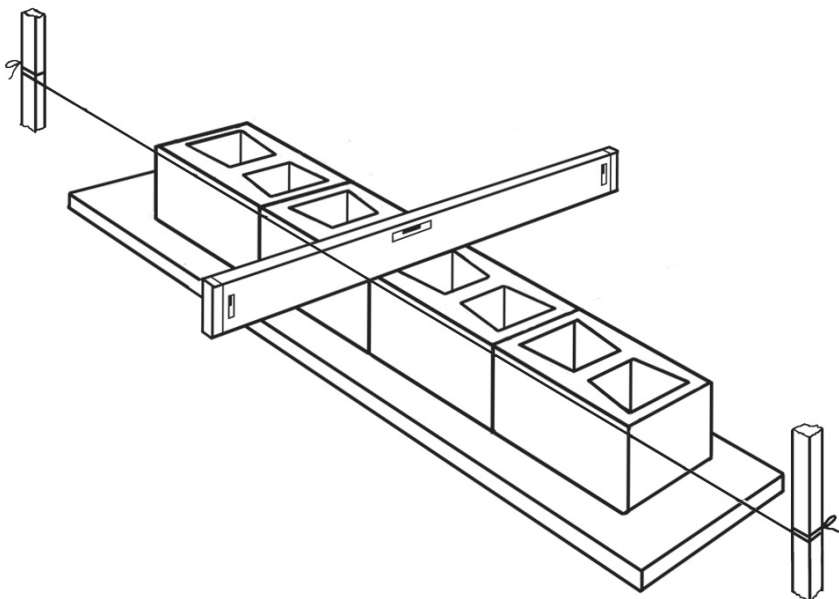
Put a string line between the two blocks — running along the top edges.



Step 3

Lay the blocks in between the end blocks using the string line as a guide for level and straight

Check blocks with a spirit level — this way.

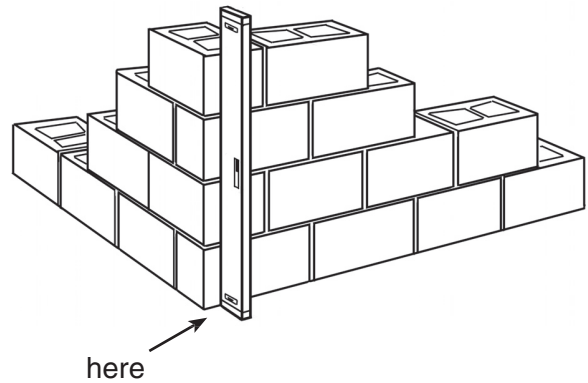
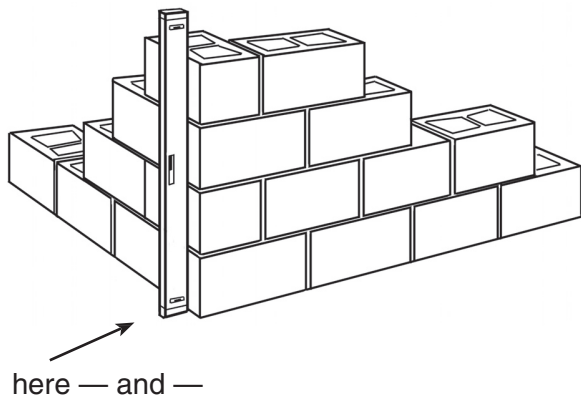


That is the first layer done.

Step 4

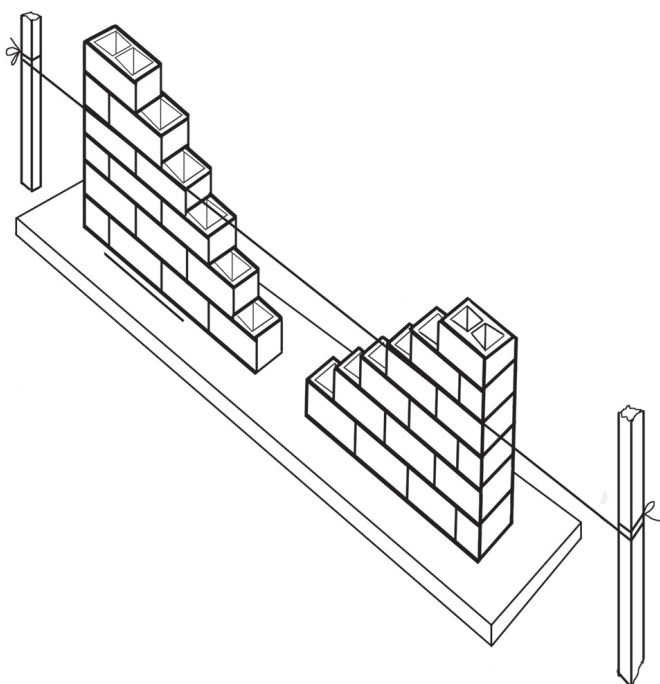
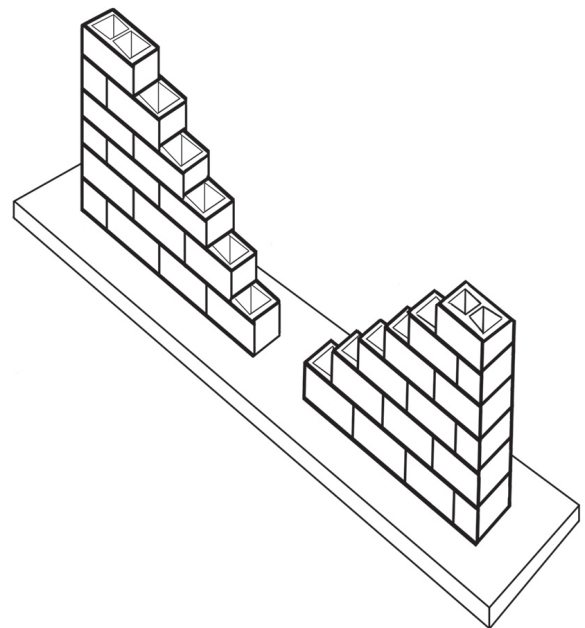
Now do the same steps for the next layers above.

But also check that the end or corner blocks are exactly on top of the block below and that they are upright (or plumb). Use a spirit level — or a plumb-bob — to check



Some experienced block layers like to build the ends, or corners, to four or five blocks high before they put in the blocks between.

This gets most of the difficult work set out first.



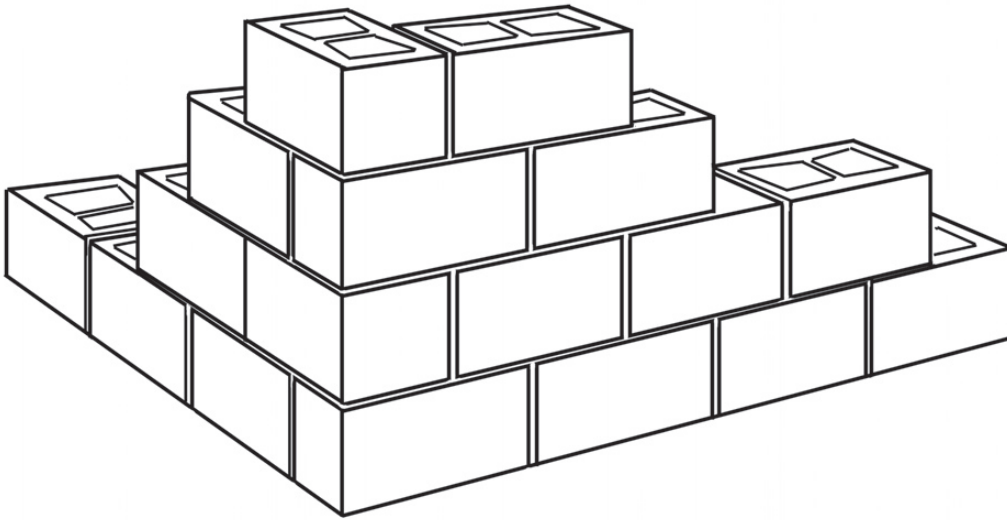
Then use a string line between the ends to keep the other blocks in line. On the second layer upwards, you can use pins for the string line pushed into the mortar instead of the separate line sticks.

Activity

Work on level ground and use blocks with no mortar.

1. Build a wall corner four blocks high using the stretcher bond pattern.

Like this:



Make sure the corner is level and plumb.

2. Build a wall at least five blocks long and three blocks high.
 - Use a spirit level, tape measure and string line
 - Follow the steps above to make sure your wall is level, straight and upright (plumb)

Remember — this is good practice to see how things work. It will be more difficult when you use mortar and the blocks move about!

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Cutting blocks

You may need to cut a standard concrete block to a special size or fit.

For example, you may need to cut a half-block or make a channel in a row of blocks for reinforcing.

The best and neatest way is to cut the block with a grinder or power saw fitted with a concrete-cutting blade.

You can also cut blocks by hand using a hammer and bolster.

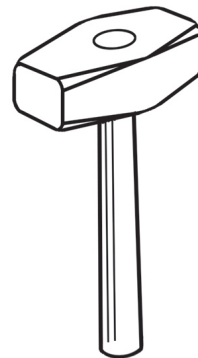
Safety note

- Whichever way you cut blocks, you **MUST WEAR EYE PROTECTION**. Concrete chips **WILL** fly — and they can blind you.

Cutting blocks by hand

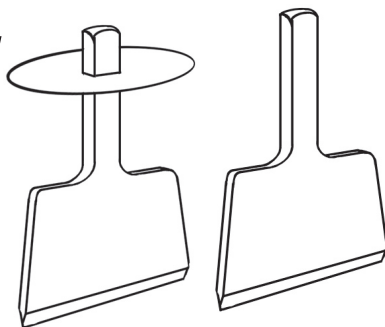
Use a club hammer and a bolster.

The club hammer has a short handle and a heavy head (around 1–2 kg). Woodworking or engineering hammers are too light for this work.



Club hammer

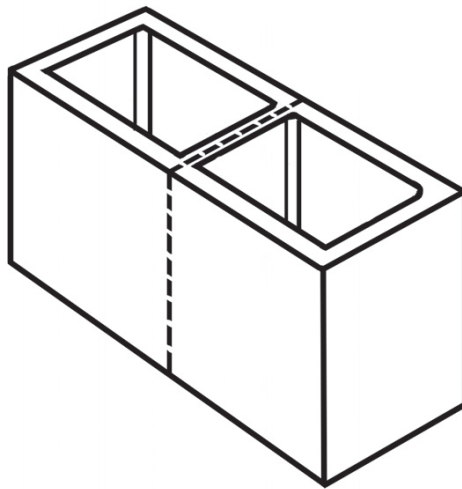
Bolsters (with and without protector)



A bolster is a special, wide chisel with a hard steel blade. The blade is usually about 100 — 120mm wide. Good bolsters have a wide plastic protective grip to help protect your hand if you miss.....

To cut a block:

Measure the place where you need to cut the block and mark carefully all the way around the block.



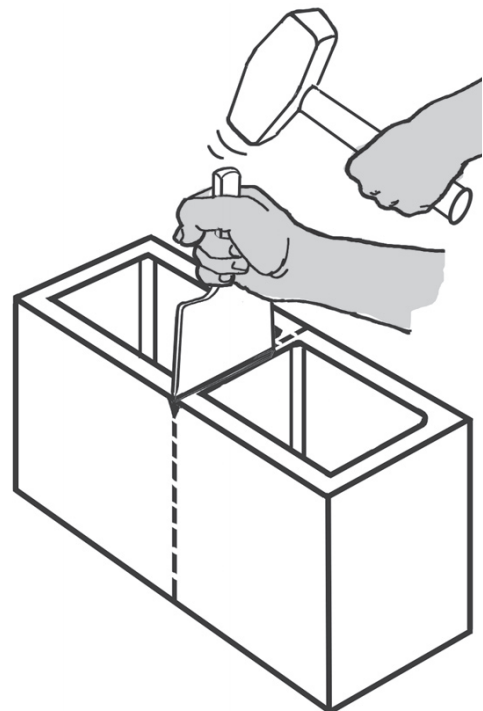
Put the block onto a hard surface — such as another block **or** you can lay the block onto a bed of firm wet sand.

Put the bolster chisel on the mark and strike firmly with the club hammer — but not too hard. Do this again along the line of your mark — and gradually go around all four sides. You are trying to weaken the block and make it to crack along your marks.

When you have gone all the way around, go round again but hitting harder with the hammer. Keep doing this, and the block will crack all the way through.

Chip off the rough edges with the bolster, or the hammer.

To cut out part of a block face, use the hammer with a smaller bolster (or cold-chisel) and chip out small pieces at a time.



Cutting with a power saw

Power saws for concrete can be electric or petrol driven. They can be mounted on a bench — or held in both hands.

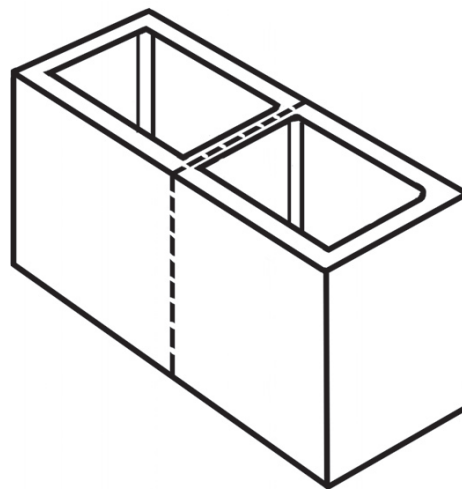
They all cut with a special cutting disc that spins at a very high speed.

These saws can be very dangerous.

! **Do not** try to use a power saw unless you have had special training and experience in setting up the saw and how to use it.

Always use eye protection — and wear a dust mask if you have one (a piece of cloth over your mouth and nose will do. You will not believe how much dust is in one block! — and the dust is bad for your health.

Mark the block all the way around.



Cut along the marks on each side until the block is cut through.

Activity

1. Cut blocks to size using a club hammer and bolster.

Try cutting first using old or broken blocks!

Once you get the 'feel' of it, try cutting a half block from a full size block.

Make sure you wear eye protection — and make sure other students wear it too!

2. If you have one available, cut a block using a power saw.

Get your tutor to show you exactly how to use it correctly and safely. They can be very dangerous if you do not use them correctly.

You will need eye protection and a dust mask.

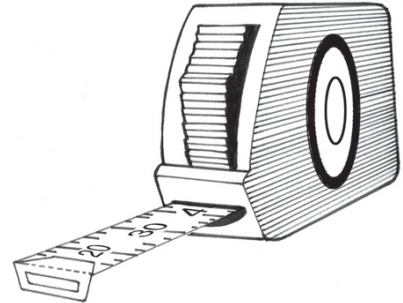
Keep other students out of the way.

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Tools to keep blocks level and straight

Tape measure

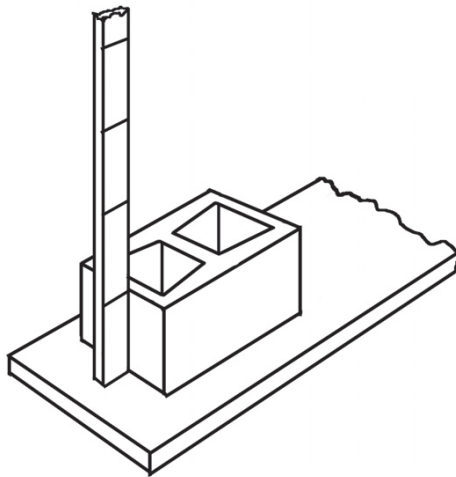
Use the tape measure to check and mark length, height, positions of blocks.



Height stick

You can make this simple tool for yourself.

Use it to keep each layer of blocks at the correct height.



It is easier to use than a tape measure and it does not matter if it gets dirty or covered in mortar.

Measure and mark along the timber the correct height of each layer of your blocks.

For a standard concrete block this will be at every 200mm. (Remember, that is 190mm for the block and 10mm for the mortar). If you have blocks of a different size, use that size instead.

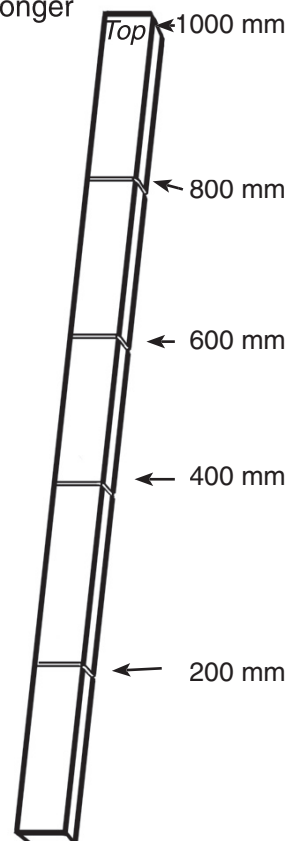
On this example, the marks are at 200, 400, 600, 800 and 1000mm.

You could leave the marks in pen or pencil, but it is better cut along the marks with a saw or a sharp knife — and go around the timber on all sides.

You will be able to see the marks easily — even when the timber is wet or dirty.

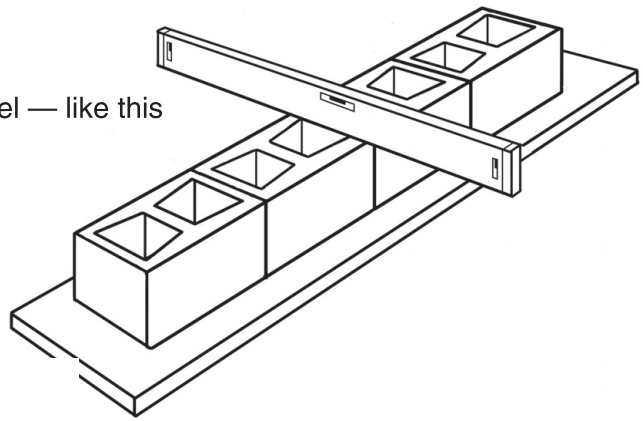
It is good idea to mark the top of the stick in some way — so that you know which way up it should be.

Use a piece of timber that is a bit longer than the height of your wall.

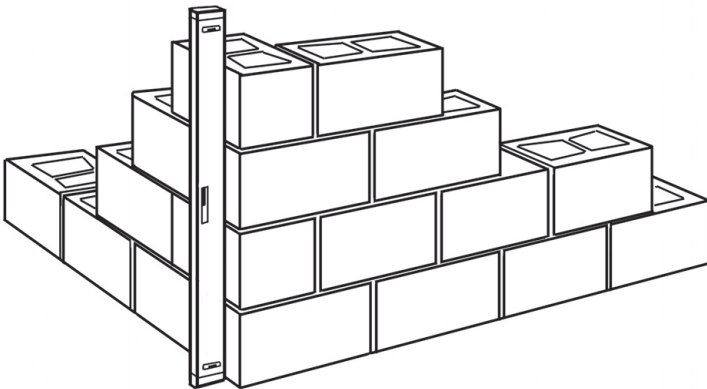


Spirit level

Use the spirit level to check that blocks are level — like this



and upright, or 'plumb' — like this



Levels can be made of metal, wood or plastic. You can damage them easily if you drop them. Be careful when you use them — and keep the edges clean of mortar or they will give a wrong reading.

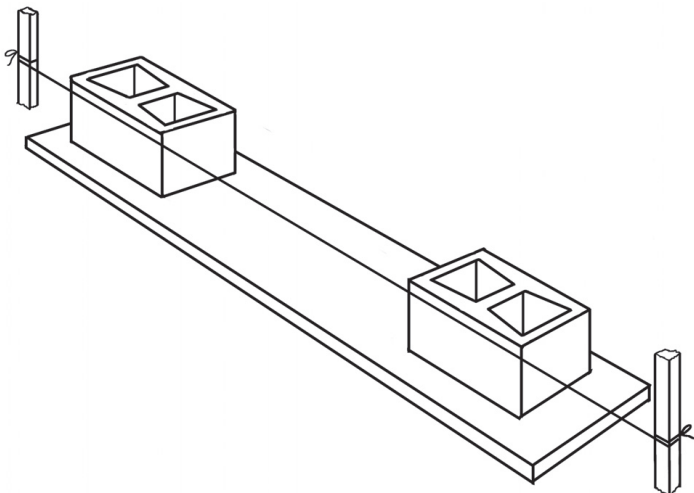
String line

Some people call this a 'builders line'.

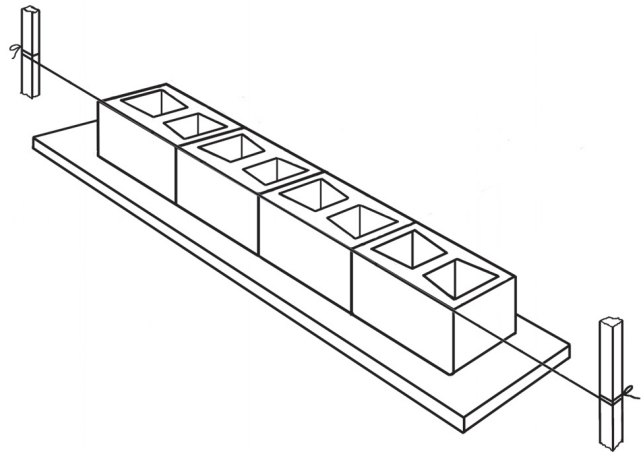
The string line is used to set the level and alignment of blocks in a layer.

Fix it tightly between the end/corner blocks, so that the line runs along the top outside edge.

Here the line is running between two pegs or sticks.

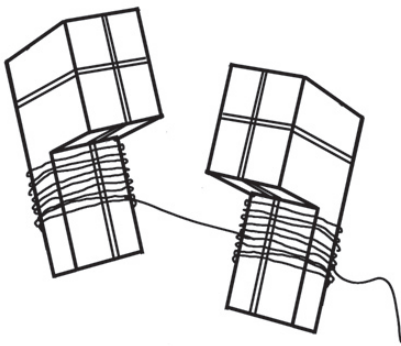


Lay the rest of the blocks on that layer so that their top outside edge **just** touches the string line.



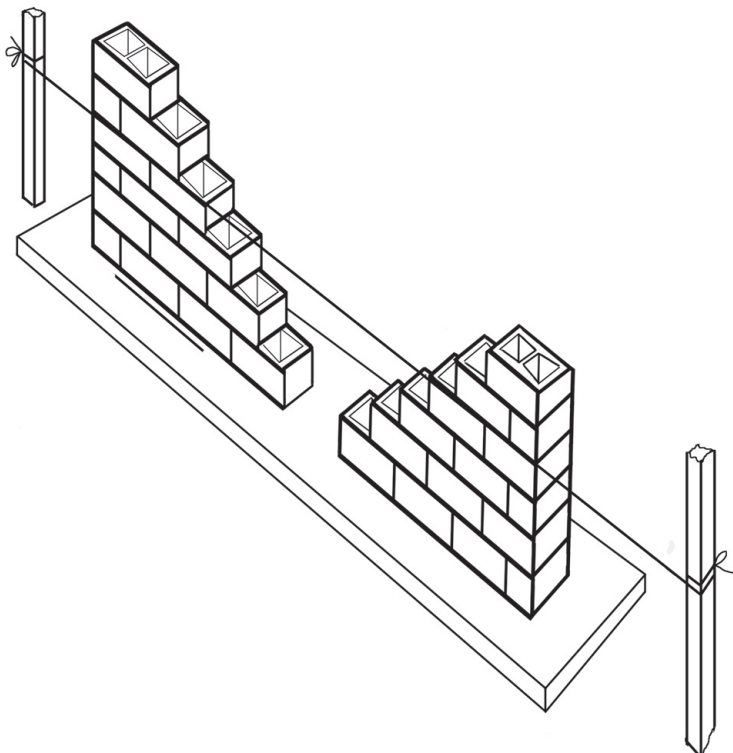
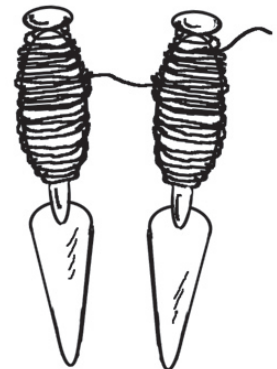
You can buy a line and fixings, or you can make your own.

The string should be thin and strong. Natural string or Dacron is best. Nylon is not good because it will stretch and sag.



You can use wooden blocks like these to help the line keep to the edge of the block.

For the second layer of blocks — and upwards from there — you can use pins to fix the end of the line. A thin piece of wood or a nail is OK. Push them into the soft mortar at the side or back of the blocks.



Or you could move the string line up taller stakes or posts.