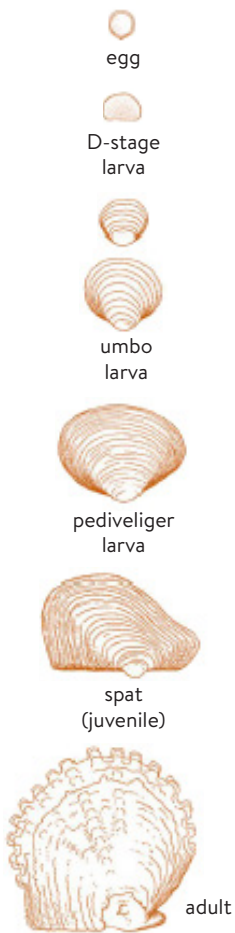


## A Lego™ Challenge

**Build a Lego™ structure inspired by the shell.**



**The Marvellous Mollusc's outer protection - the shell and the mathematical Wow! of its growth**

### How a mollusc grows its shell.

Notice how the shell of a young mollusc (larvae to spat) is like a fully grown shell but in miniature.

Each stage of growth is an exact model of the other.

Although mollusc animals create a great variety of shell types they all use this same basic rule of growth.

As the mollusc animal that lives in a shell grows, the protective outer shell grows in the same proportion, so the animal can keep living inside it.

The mollusc does not grow its shell in a uniform way: it only adds material to one edge of the shell (the open or 'growth' end).

**? Can you find the different 'growth' ends on these shells?**



This growth pattern ensures the new shell is always an exact form to scale of the existing smaller shell and results in an elegant spiral structure (very visible when the shell is sliced). Follow a straight line that links the shell's centre (O being the spiral origin) to points along the growth of the shell and measure the increase.

### What do you find?

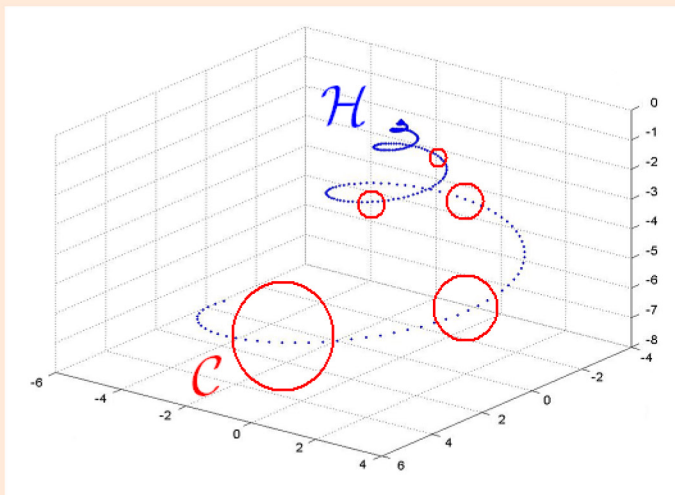
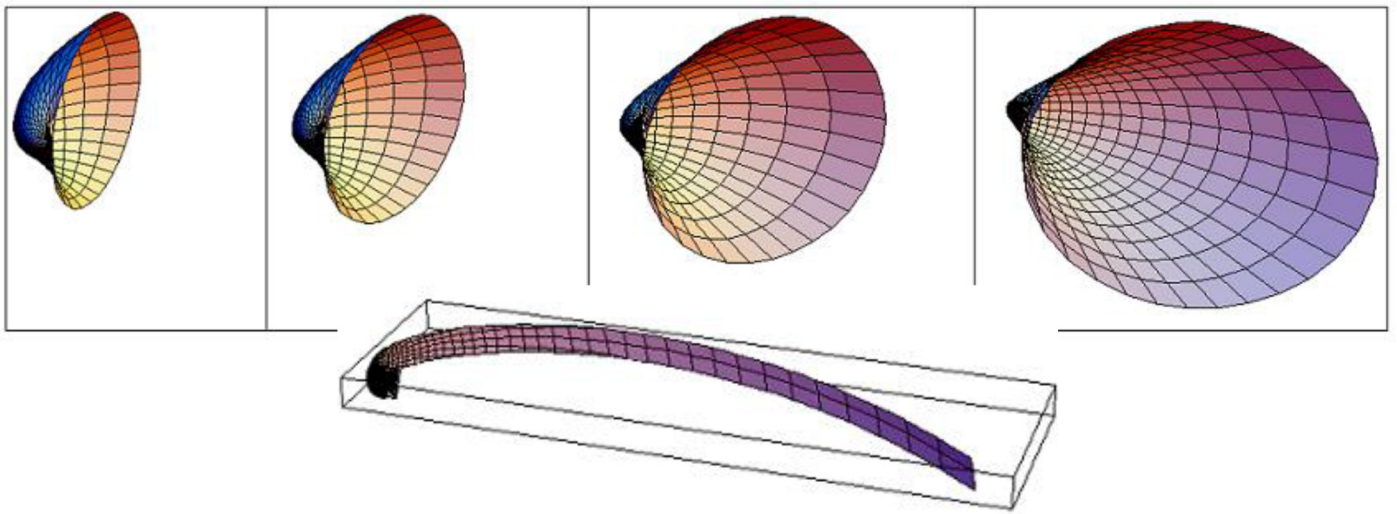
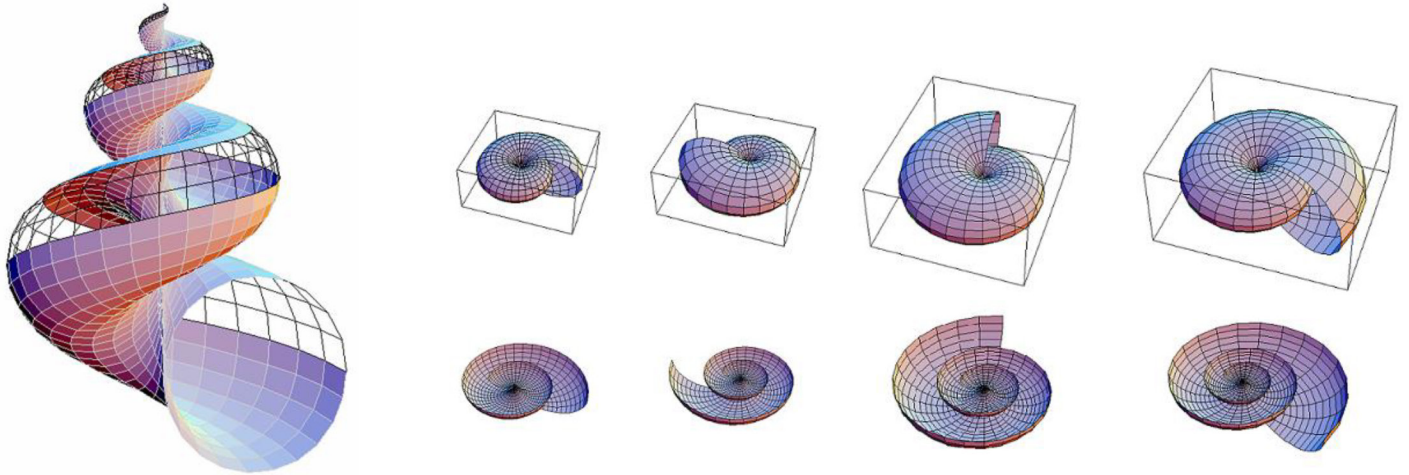
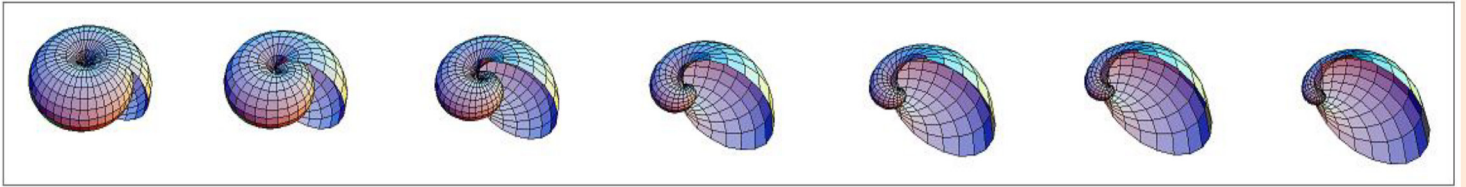
**Is growth a constant doubling of the previous line as the shell follows the rules of a spiral?**

This fact was identified in the 17th century by an English designer, astronomer, geometrician and architect, Christopher Wren and is still used by designers and architects today.

**What other things could you use to construct your design ideas?**

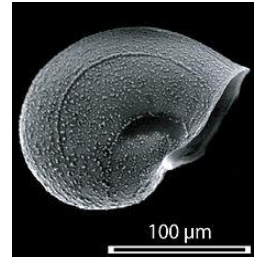
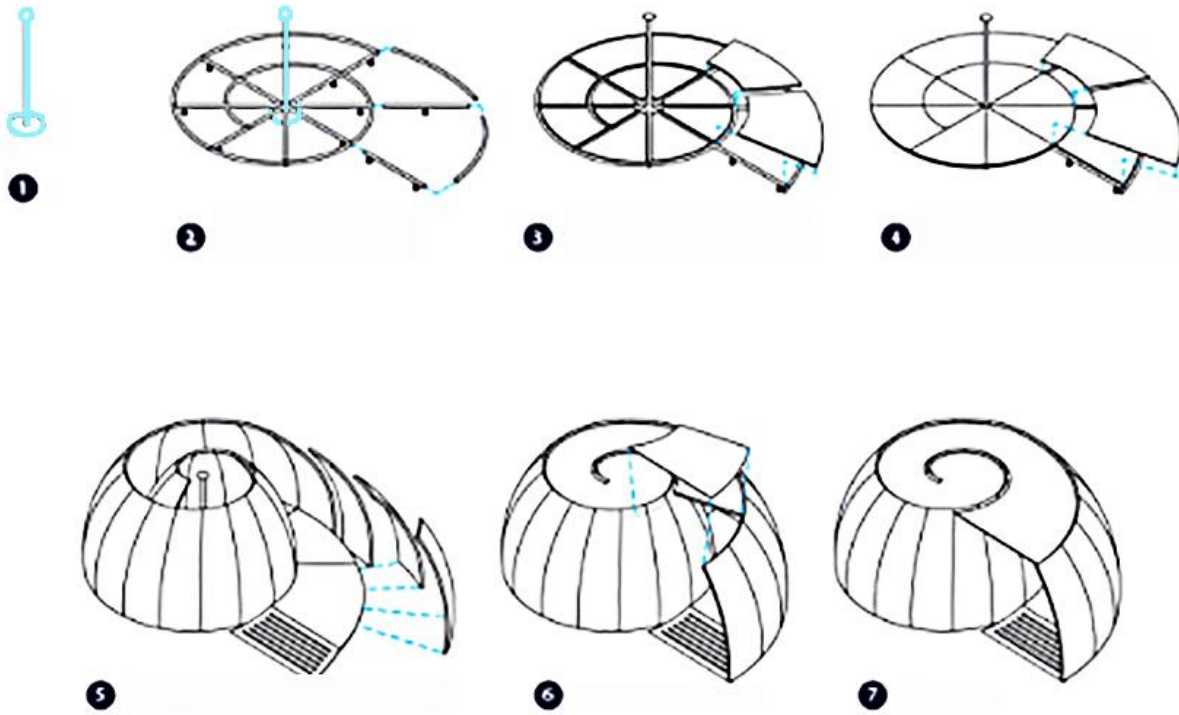
**Post your designs inspired by the shell on the Museum of Geraldton's Facebook page #marvellousmolluscs**

# Building designs and structures inspired by the shell

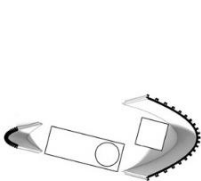
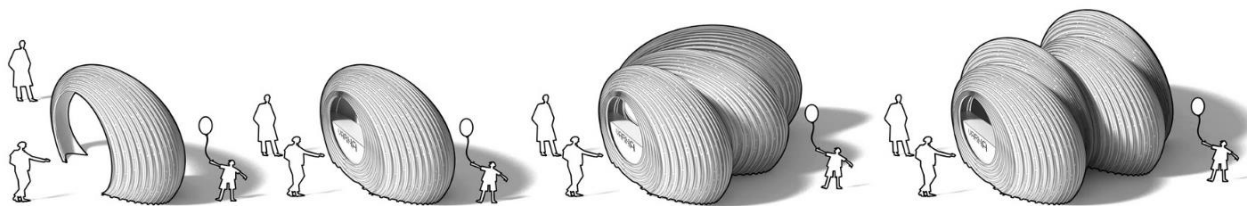


The shape of  $C$  describes the outline of the shell's sections and its 'growth' end, while  $H$  determines the overall shape of the shell.

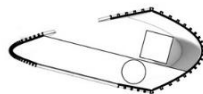
# Building designs and structures inspired by the shell



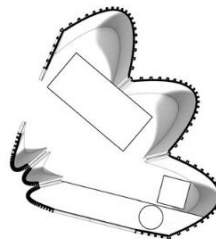
SHELL ARRANGEMENT OPTIONS



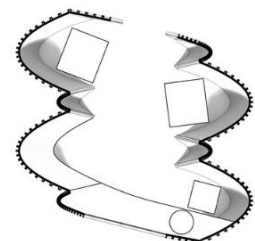
OPEN SHELL



ENCLOSED SHELL



RADIAL SHELL



LINEAR SHELL

# Building designs and structures inspired by the shell

