BATTLESHIPS

This puzzle is based on the classic game. Information is given that enables you to work out where every ship must be.

Each ship in the fleet is divided into sections. The number at the end of each row and column tells you how many sections of ship are to be found in that line.

Some squares may be marked as empty sea (wavy lines) which means they don't contain any parts of a ship. Others will give you a section of ship.

There's one vital rule: no two ships can be adjacent to each other in any direction: horizontally, vertically or diagonally. In other words, each vessel is entirely surrounded by water.

Now, let's solve a puzzle together.

Here are the ships to be found.

Aircraft carrier:
Battleship:
Cruiser:
Destroyer:

And here's where we have to look for them:

	A	B	C	D	E	F	G	H	J	K	
1								≋			2
2											0
3							□				4
4											1
5											1
6									□		2
7											1
8	≋										1
9											7
10											1
	5	0	2	0	2	1	2	3	1	4	

As in the original game, it is as important to fill in those squares which must be water, as those which are sections of ships. The first step is to put an X (for empty) in every square in every line that contains a zero. Squares 2A to 2K must be empty. So are B1 to B10 and D1 to D10.

Marking the X in H2 means that the ship whose middle section is in H3 cannot go down the H column, but must lie along row 3. So we know G3 and J3 are ship parts. The section in J3 means that the rest of the J column must be empty, as that column ends with a 1. As that ship must be surrounded by water, we can put Xs in F4, G4, H4 and K4.

The section of ship in K6 is a middle part. So K5 and K7 must be ship sections and can be filled in – but we don't know yet if this is the aircraft carrier or a battleship.

	A	B	C	D	E	F	G	H	J	K	
1		x		x				≋	x		2
2	x	x	x	x	x	x	x	x	x	x	0
3		x		x			□	□	□		4
4		x		x		x	x	x	x	x	1
5		x		x					x	△	1
6		x		x				x	□	2
7		x		x				x	□	1
8	≋	x		x					x		1
9		x		x					x		7
10		x		x					x		1
	5	0	2	0	2	1	2	3	1	4	

Just as zeros are useful, so are high numbers. Row nine has a 7 by it. We've already marked three squares as empty, so the rest must be occupied. This row must contain the aircraft carrier. As there must be empty water around the aircraft carrier, E8-H8 and E10-H10 can be crossed off. The vessel in column K must be a battleship, so K8 must be empty. The ship in row three must also be a battleship, so F3 and K3 can be marked as empty.

Row eight has one ship part and only C8 is available, so that can be filled. There are only two ship parts in column C, so the rest of that column can be crossed off.

	A	B	C	D	E	F	G	H	J	K	
1		x	x	x				≋	x	x	2
2	x	x	x	x	x	x	x	x	x	x	0
3		x	x	x		x	◁	□	▷	x	4
4		x	x	x		x	x	x	x	x	1
5		x	x	x				x	△	1
6		x	x	x				x	□	2
7		x	x	x				x	▽	1
8	≋	x	△	x	x	x	x	x	x	1
9	□	x	▽	x	◁	□	□	▷	x	○	7
10		x	x	x	x	x	x	x	x	1
	5	0	2	0	2	1	2	3	1	4	

Column K has all four parts required so K9 must be a destroyer and the rest can be marked as empty. The same applies to rows five and seven. Row ten has one ship part and only A10 is available, so that is filled and we have located a second cruiser.

Columns F and G both have their quota of parts, so the other squares in these columns can be marked as empty. Column H needs a third ship part and only H6 is available, so that is the site of one of the destroyers. This in turn means that row six is complete so A6 and E6 are empty.

We have two sections in column A and it needs three more, so A1, A3 and A4 must be filled, giving us another destroyer and the third cruiser. E4 must be empty as that row has its one section and E3 is empty as row three is complete. This means that E1 must be filled, giving another destroyer. The solution is now complete.

	A	B	C	D	E	F	G	H	J	K	
1	○	x	x	x	○	x	x	≋	x	x	2
2	x	x	x	x	x	x	x	x	x	x	0
3	△	x	x	x	x	x	◁	□	▷	x	4
4	▽	x	x	x	x	x	x	x	x	x	1
5	x	x	x	x	x	x	x	x	△	1
6	x	x	x	x	x	x	○	x	□	2
7	x	x	x	x	x	x	x	x	▽	1
8	≋	x	△	x	x	x	x	x	x	1
9	△	x	▽	x	◁	□	□	▷	x	○	7
10	▽	x	x	x	x	x	x	x	x	1
	5	0	2	0	2	1	2	3	1	4	