

Appealing visions

Watching the World Cup in high definition or Coronation Street the good old-fashioned way? We've got TVs to suit

Chic flat-panel LCD and plasma technologies are now all the rage, as most manufacturers and retailers have turned their attentions away from the traditional CRT (cathode ray tube).

But despite all the technological hype, we've found that picture quality is actually worse than it was a couple of years ago. Chances are, normal TV programmes won't look as good on a flat-panel set as on a conventional CRT box. And while the prices of LCD and plasma TVs continue to fall, they're still double, triple or even quadruple the price of CRTs.

And yet it's easy to see the appeal of flat-panel TVs. They take up less space, have bigger screens, can be mounted on walls and look incredibly stylish.

Crucially, many are HD-ready. High-definition TV (HDTV) launched on Telewest in March and on Sky this month; it will boast much greater picture detail than current broadcasts (see p37). So even if standard TV broadcasts don't look as good, with a flat-panel HD-ready (or even HD-compatible) set, you'll be better prepared to watch HDTV in all its finely pixelated glory.

All our flat-panel Best Buys display HDTV fantastically – something none of the CRT TVs we tested can do. But among the gems there's some real rubbish. Some of the sets on test are pretty awful, and one 'Don't Buy' plasma TV from Philips is currently awaiting sentencing for crimes against TV.

We combine technical tests with expert assessments to rate viewing quality

Picture quality

As well as subjecting our TVs to a barrage of technical tests, we use an independent expert viewing panel to assess picture quality.

Our experts view all TVs under the same conditions in a dimmed, tungsten-lit room. Brightness and contrast levels are set as equally as possible and the sets all receive the same-quality picture signal. To ensure continuity and impartiality, the same experts take part each time, we conceal the brand names and, of course, the panel members are not allowed to discuss any aspects of the testing.

We show a test card and eight different video clips – each helps the experts assess a different aspect of picture quality. For example, a moving train helps highlight any problems with panning and movement. A still image of a vase of flowers shows sharpness, detail and colour reproduction. We also view the TVs in HD mode via satellite.

We award each image an individual score and each TV an overall picture score. TVs that score well offer a good compromise between different viewing demands. For instance, a sharp, detailed picture is less than appealing when it causes stuttering motion. Likewise, smooth motion shouldn't come at the expense of picture sharpness.

Sound quality

We use a similar mix of technical measurements and expert opinion to assess sound quality. Our experts listen to, and score, male and female voices, classical music, pop music, jazz and a TV drama under controlled conditions. Benchmark samples from previous tests are used to ensure continuity.

What you should look for

On/off button

Many new TVs (including the Toshiba Best Buys) don't have an on/off switch and remain on standby until unplugged. Worth bearing in mind if you don't want to waste energy and money



HD-ready logo

The HD-ready label guarantees the minimum specification that makes a TV suitable for watching high-definition broadcasts



Digital-ready logo

TVs displaying the tick logo can receive both analogue and digital Freeview signals, so there's no need for a digital set-top box (*Which?*, April 2006, p58). They are commonly known as IDTVs



Scarts

These all-purpose plugs and sockets let you connect your TV to other pieces of audio-visual equipment, such as VCRs and DVD players. The more Scart inputs, the better



Phono sockets

Dedicated sockets allow you to connect your TV to a stereo amplifier – useful if its built-in speakers aren't quite up to the job



Computer inputs

If you want to play games, look for VGA (analogue) and DVI or HDMI (digital) computer inputs. Having both is ideal but in our tests, VGA input looked better on the screen. DVI can over-enhance the picture, making it too sharp



72% Pioneer PDP-436FDE £2,200

At 43 inches, this TV is the largest plasma screen on test. It comes with a separate tuner box, so connecting your DVD player and VCR is easy.

The vibrant picture is initially impressive but the Pioneer lets itself down with some juddery movement during sport or fast-moving action. It is HD ready but it's a non-digital model, so it won't receive Freeview without a separate set-top box.

However, the detailed and full sound was a favourite of our expert panel. And you can detach its speakers to help optimise the stereo effect.

WORTH KNOWING Intuitive on-screen menus and an ergonomic remote control are complemented by very large Teletext (viewed in 'enlarged mode').

Cheapest store Richer Sounds **Tuners** Separate analogue **Resolution** 1,024x768 **Sound** Nicam stereo **Sockets** Three Scart (two RGB), HDMI, two S-Video, rear AV inputs **Scart link** Yes **Weight** 39.3kg (plus 3.6kg for the tuner)



67% Panasonic TX-32LXD52 £1,160

The best LCD TV in our test is this HD- and digital-ready 32-inch model.

Picture quality is good across the board, and the especially-sharp resolution picks out colourful detail extremely well. It remains a top choice for watching HDTV. However, the viewing angle is a bit narrow so watching in company could be irritating (see 'How to buy', p38).

The detailed sound makes it one of the best LCD choices for audiophiles. When listening to classical music and jazz, warm tones allow the sounds of individual instruments to bubble to the surface.

USEFUL FEATURE You can record analogue TV programmes with your VCR while watching another channel on digital Freeview – and vice versa.

Cheapest store Comet **Tuners** Integrated digital/analogue **Resolution** 1,366x768 **Sound** Nicam stereo **Sockets** Three Scart (two RGB), HDMI, S-Video, headphones, front/rear AV inputs **Scart link** Yes **Weight** 21.9kg

The Pioneer's vibrantly colourful picture is initially impressive but can suffer from juddery movement



66% Panasonic TH-42PV500B £2,300

This plasma IDTV romps home with the best picture quality on test. It's a consistent performer that's particularly good on movement, so it's a clear winner if you're looking for a big screen on which to watch the World Cup. It's superb at displaying

high-definition broadcasts and has an integrated Freeview digital tuner. IDTV functions such as the electronic programme guide (EPG) are easy to use. It sounds good across a wide frequency range but delivers especially good bass. All that deep booming can cause the speakers to rattle slightly; if this irritates you, link it to your hi-fi.

WE LIKED The memory card slot on the front of the TV. You can view photos from various digital camera memory cards on the big screen.

Cheapest store Woolworths **Tuners** Integrated digital/analogue **Resolution** 1,024x768 **Sound** Nicam stereo, **Sockets** Three Scart (two RGB), HDMI, VGA, two S-Video, headphones, rear AV inputs **Scart link** Yes **Weight** 52.4kg

Widescreen televisions: the jargon explained

Our guide to TV technical terms means that sales assistants can no longer blind you with science

Aspect ratio Shape of the screen (width x height).

Composite video Basic video signal which carries all the necessary information together.

Contrast ratio How dark and bright the picture on a flat-panel TV will go.

CRT Cathode ray tube – the traditional big-box TVs.

DLP Coloured light is bounced off a microchip that contains millions of tiny, pivoting mirrors,

and is projected on to the screen
DVI Standard digital input used for high-definition video.

EPG Displays a schedule of the week's digital programmes on the TV screen.

Flat-panel display Generic term covering LCD, plasma and DLP technologies.

HDMI High-capacity input for high-definition signals

LCD Light shines on to tiny liquid crystal cells that let varying

amounts of colour through to create a picture.

Native/screen resolution Number of pixels displayed on the screen (width x height).

Plasma Tiny gas cells emit ultraviolet light which strikes red, green and blue spots on the screen to make a picture.

Rear projector TV Reds, blues and greens of TV images are projected on to a mirror and then reflected on to the screen.

RF input Socket that connects to your aerial and allows the broadcast signal to be received by your tuner.

RGB High-standard video signal which splits the red, green and blue components to give an improved picture.

S-Video Video signals are split into colour and brightness.

TV projectors These beam huge images onto a screen or white wall (see p40).



64% Toshiba 42WP56P £1,300

This plasma TV offers a consistently good picture whatever you're viewing: the picture is slightly soft but doesn't lose any detail. But if you have a half-decent hi-fi, plug it into the TV's phono sockets: the dull and over-processed sound left our audio experts



unimpressed. And if you're looking to 'future-proof' your purchase, this isn't the TV for you: it isn't digital- or HD-ready.

The screen resolution is too low and with no HDMI or even DVI input, it isn't HD-compatible either.

This model is widely available online but is harder to find in the shops.

WE LIKE The large, clear on-screen menu and the remote control, which is clearly laid out with large buttons that are easy to navigate.

Cheapest online price Widely available **Tuners** Integrated analogue **Resolution** 852x480, **Sound** Nicam stereo **Sockets** Three (two RGB), S-Video, VGA, front/side AV inputs, headphones **Scart link** No **Weight** 47.1kg



62% Sony KDL-W40A12U £2,300

At 40 inches, this HD- and digital-ready Sony is the biggest LCD we've tested and is a good buy if you want to keep up with the latest developments.



On-screen menus are easy to use but the remote control is fiddly and the EPG is over-complicated.

The picture has good depth and detail but colours are a little weak and movement can look jittery. Sound quality is affected by fan noise and over-processing.

This model is widely available online but is harder to find in the shops.

WE LIKE The three Scart sockets that can all display RGB – the best-quality signal that can be carried on a Scart lead.

Cheapest online price Widely available **Tuners** Integrated digital/analogue **Resolution** 1,366x768 **Sound** Nicam stereo, Dolby virtual surround **Sockets** Three Scart (all RGB), HDMI, S-Video, headphones, front AV inputs **Scart link** Yes **Weight** 44.4kg



61% Philips 32PW6720D/05 £500

The only CRT Best Buy costs less than half the price of any other Best Buy.

It's a digital-ready IDTV with a picture that scores well on most aspects but can be a touch too sharp, to the slight detriment of fast-moving action. Sound is clear and detailed if lacking in bass – link it to your hi-fi for better sound.



It features an EPG that covers the TV schedule for the week ahead and automatically scans for software updates (*Which?*, April 2006, p56). Unfortunately, it has a clumsy layout and too many menus.

WORTH KNOWING The 'Contrast +' setting enhances the picture's black levels. It should make the picture darker and more solid, but we think it's better switched off.

Cheapest store Comet **Tuners** Integrated digital/analogue **Refresh rate** 50Hz **Sound** Nicam stereo **Sockets** Two Scart (one RGB), S-Video, headphones, rear AV inputs **Scart link** No **Weight** 50.1kg

Sony's 40-inch LCD is the biggest LCD TV that Which? has ever tested, and is both HD- and digital-ready

Just released

TVs we're currently testing

We've pulled out all the stops to test as many new TVs as we can. We're currently putting a batch of sets through their paces, and all the test results will be online at www.which.co.uk/tvs by the end of May – just in time for any last-minute purchases before the World Cup.

Among the models being tested are the Panasonic TX32LXD60 and Sony KDLV32A12U digital- and HD-ready 32-inch LCDs.

Both available from Comet, they cost £1,300 and £1,800 respectively.



Samsung
WS32Z306VB



Pioneer
PDP-436SXE

New plasmas on test include the 42-inch IDTV and HD-ready Panasonic TH42PX60, which costs just over £2,000 from Currys. We're also testing an IDTV version of our current Pioneer Best Buy: the HD-ready PDP-436SXE costs £2,500 from Comet.

We're also testing more CRT sets, including the intriguing 'slim-fit' WS32Z306VB from Samsung. At 40cm deep, it's almost 20cm slimmer than most other 32-inch CRTs. It costs £400 from Argos.

Track it down

This Sony LCD is not so easy to find these days but it still provides a good viewing experience



Sony KLV-L32M1

There's still a great Sony Best Buy model around in the marketplace that's worth tracking down.

The 32-inch KLV-L32M1 is an LCD TV that's still available at a few online retailers for around £900.

The colour balance, depth and sharpness of

the picture make for fine viewing. Unfortunately, though, the TV is let down by its disappointingly mediocre sound and it isn't HD-ready, either.

But it still managed a Best Buy-worthy total test score of 64 per cent.



61% Toshiba 32WLT58 £1,200

Good detail and pleasing colours make this LCD IDTV pleasant to watch. The sound isn't bad either but the high definition is not quite up to the glorious standards of some Best Buy rivals.

It's easy to tune in and set up for both digital and analogue reception, but the cumbersome and poorly laid out EPG is a tad disappointing.

WE LIKE The two HDMI sockets. You are able to plug in both an HDTV receiver and a compatible DVD player.

Cheapest store Woolworths **Tuners** Integrated digital/analogue **Resolution** 1,366x768 **Sound** Nicam stereo **Sockets** Three Scart (two RGB), two HDMI, S-Video, front/side AV inputs **Scart link** No **Weight** 21.5kg

Avoid our Philips Don't Buy TV like a flock of coughing geese



40% Philips 42PF7520D/10 £1,500

This plasma IDTV falls down at so many hurdles that it's difficult to know where to start.

Expert comments include 'appalling' and 'virtually unwatchable' pictures and even 'honky' sound (yes, it's that bad).

Even when watching high definition, results are shocking. The picture looks washed out and suffers interference from red and green dots. Things get no better when you use the frustrating and unintuitive EPG – the clumsy layout makes it hard to find many of the menu functions, leaving you fumbling for the right button on the remote control.

VERDICT Avoid it like a flock of coughing geese.

Insider info

Our TV expert Mike Briggs gives you the lowdown on high definition

If you buy an HD-ready set, don't expect to get home, plug it in and start watching picture quality of the like you've never seen before. HD-ready means the TV is ready to display high-definition broadcasts but you must have an HD signal to receive. This currently means signing up to expensive satellite or cable services. The BBC is trialling terrestrial HD broadcasts this year and may provide a Freeview-type service in the future. But don't expect HD programmes via your rooftop aerial before the analogue TV signal is switched off: there just aren't enough spare airwaves to broadcast them.



Budget Buys

Non-Best Buy CRT TVs

Conventional TVs are big and bulky and you can't put them on the wall. But they're less than half the price of a same-sized LCD, a quarter the cost of a plasma and still punch above their weight for picture quality. So while manufacturers keep making them, we'll keep testing them.

All the conventional TVs we tested have flat screens and are 50Hz sets – they refresh their screens 50 times a second. At this rate, some people notice screen flicker but 50Hz sets are less likely to suffer from the over-sharpness or motion judder that can bedevil 100Hz conventional sets and flat-panel TVs.



JVC AV-32E50 £450

A good picture, decent sound and an easy-to-navigate EPG make this integrated digital set a good choice. It's the only conventional IDTV that uses the EPG to control a compatible VCR or DVD recorder – a lot easier than using timers.

SCORE 59%



Philips 28PW6520/05 £300

The picture on this CRT TV is a good all-rounder, and better than many flat-panel sets at a fraction of the cost. But it does lose some detail while screening DVD movies and the sound doesn't cope with bass very well.

SCORE 59%



Toshiba 28YT56B £350

This IDTV boasts impressive picture detail and the best overall CRT picture quality on test. But the EPG is cluttered and the remote control unresponsive. There's no audio out so if you want to link up your hi-fi, you have to use a Scart link.

SCORE 59%



Bush RF6683VPL £230

Unfortunately, picture quality is only average and the sound is a bit thin, even though this is the only CRT to come with virtual surround sound. But it's the cheapest TV we tested and is straightforward to use. Neither Bush model comes with a stand.

SCORE 51%



Bush WS7641 £350

The lowest-scoring CRT is simple to use and cheap (but you will have to fork out extra for a stand). The picture is very soft – so good for watching a bit of fast-moving sport but not so great at picking up the close-up detail.

SCORE 48%

How to buy

Things to keep in mind when shopping for your new TV

Sales staff often use screen resolution and contrast ratio figures to impress customers. But instead of being wowed by the 'higher the better' numbers orthodoxy, try these simple approaches to get a better idea of the real picture quality.

■ Retailers have a habit of playing cartoons on TVs in the showroom.

Simple images and bright colours tend to look great, whatever the quality of the TV. But don't be fooled – ask to watch a darkly-lit drama or a football match. Blocky images and jerky movement will soon become apparent on TVs that process signals poorly.

■ Watch the TV from an angle. The colour on some flat panels

starts to fade when not viewed head on. CRTs don't tend to suffer from this problem but LCD sets are particularly susceptible.

■ Keep an eye out for screen reflectivity. LCDs tend to reflect the least – plasmas are not quite as good. CRT screens are made of glass and tend to reflect more light than either.

Which should you choose?

HD-ready vs HD-compatible

Many of the flat-panel TVs we tested are HD ready: they have the screen resolution and the digital sockets needed to

reproduce HD signals. HD-compatible TVs have a lower screen resolution but they do have the right socket.



Best HD-ready

SONY KDL-S32A12U £1200 This isn't a Best Buy but boasts a very dynamic, bright and sharp high-definition picture. Some scenes look so good that they produce an almost-3D effect.



Best HD-compatible

SHARP LC-32P50E £700 This doesn't qualify as HD-ready but it has an HDMI socket and displays great HD pictures. Its processing power compensates brilliantly for the low resolution.



CRT HD-ready TV

SAMSUNG WS32Z409 Most manufacturers are concentrating on HD flat panels, but Samsung is launching the HD-ready, 32-inch CRT TV later this month. We'll test it as soon as it's released.

WHICH? EXTRA

You'll find more information about all the TVs tested for this report at our exclusive, members-only website. We'll be testing even more models

before the World Cup kicks off next month. Another dozen sets are currently being tested, including new IDTV plasmas from Pioneer.

www.which.co.uk/tvs



Facts & scores

Interesting nuggets of information uncovered by our tests

HD value

For £700 from Richer Sounds, this HD-compatible Sharp TV will display high-definition pictures better than most HD-ready sets and is great for watching sport. A rare flat-panel bargain.

Fantastic value

This Philips CRT boasts a picture quality that beats most of the flat panels at a fraction of the price.

LCD rear projection

Rear projection TVs are usually let down by poor viewing angles. Sadly, this Sony is no exception and it can't be wall mounted either.

Wall mounting

All the plasma and LCD TVs on test can be wall mounted but only the Philips and Hitachi come supplied with the necessary fittings. Universal wall-mounting kits can cost anything up to a whopping £350 extra.

MODEL

- 1 **PIONEER** PDP-436FDE
- 2 **PANASONIC** TX-32LXD52
- 3 **PANASONIC** TH-42PV500B
- 4 **TOSHIBA** 42WP56P
- 5 **SONY** KDL-W40A12U
- 6 **PHILIPS** 32PW6720D/05
- 7 **TOSHIBA** 32WLT58
- 8 **SHARP** LC-32P50E
- 9 **SONY** KDL-S32A12U
- 10 **JVC** AV-32E50
- 11 **LOEWE** Individual 32 S
- 12 **PHILIPS** 28PW6520/05
- 13 **TOSHIBA** 28YT56B
- 14 **PHILIPS** 32PF9830/10
- 15 **LG** 42PX5D
- 16 **LG** 32LX2R
- 17 **BUSH** RF6683VPL
- 18 **HITACHI** 42PD6600
- 19 **PHILIPS** 42PF5520D/10
- 20 **SONY** KDF-E50A12U
- 21 **HITACHI** 32LD6600
- 22 **PHILIPS** 32PF5520D/10
- 23 **BUSH** WS7641
- 24 **PHILIPS** 32PF7520D/10
- 25 **SAMSUNG** PS-42P5H
- 26 **DAEWOO** DT42A1
- 27 **GOODMANS** GLCD32WDVBT
- 28 **PHILIPS** 42PF7520D/10

a Doesn't have the necessary resolution but does have

USING THE TABLE

We tested best-selling and new models from leading manufacturers.

Specification

Price For Best Buys

we give the cheapest widely available high-street price as we went to press, except for models that are available online only (prices are in *italics*).

Prices for other models are a guide to what you can expect to pay. **Screen** Diagonal measurement in inches of the TV screen.

SPECIFICATION				FEATURES				WHICH? TEST PERFORMANCE				SCORE %
PRICE (£)	TYPE	SIZE (cm) WXHXD	SCREEN (in)	SCARTS	AUDIO OUT	HD READY	IDTV	PICTURE	HD PICTURE	SOUND	EASE OF USE	
2,200	Plasma	124x63x10	43	3	✓	✓		★★★★	★★★★	★★★★	★★★★	72
1,160	LCD	85x57x15	32	3	✓	✓	✓	★★★	★★★★★	★★★★	★★★	67
2,300	Plasma	115x73x17	42	3	✓	✓	✓	★★★★	★★★★★	★★★★	★★★	66
1,300	Plasma	110x74x13	42	2	✓			★★★★	n/a	★★	★★★★	64
2,300	LCD	113x65x19	40	3	✓	✓	✓	★★★	★★★★★	★★★	★★★	62
500	CRT	86x55x55	32	2	✓		✓	★★★★	n/a	★★★	★★★	61
1,200	LCD	80x55x16	32	3	✓	✓	✓	★★★	★★★	★★★	★★★	61
700	LCD	81x58x16	32	2	✓	see ^a		★★★	★★★★★	★★★	★★★	60
1,200	LCD	80x25x10	32	2	✓	✓	✓	★★★	★★★★★	★★★	★★★	60
450	CRT	84x60x56	32	2			✓	★★★★	n/a	★★★	★★★	59
2,300	LCD	82x58x12	32	2	✓	✓	✓	★★★	★★★★	★★★★	★★	59
300	CRT	77x50x50	28	2	✓			★★★★	n/a	★★	★★★★	59
350	CRT	81x49x50	28	2			✓	★★★★	n/a	★★	★★	59
1,995	LCD	101x61x13	32	3	✓	✓		★★★	★★★★	★★★	★★★	57
1,800	Plasma	125x65x10	42	3	✓	✓	✓	★★★	★★★	★★★★	★★	56
1,000	LCD	95x53x13	32	2	✓	✓		★★★★	★★★	★★	★★★	54
230	CRT	80x50x50	28	2	✓			★★★	n/a	★★	★★★	51
1,500	Plasma	105x72x10	42	3	✓	✓		★★★	★★★	★★	★★	50
1,500	Plasma	123x68x11	42	2		see ^a	✓	★★	★★	★★	★★★	50
1,400	LCD ^b	118x82x40	50	2	✓	✓	✓	★★★	★★★	★★	★★★	50
900	LCD	92x52x12	32	2		✓		★★	★★★	★★★★	★★	49
1,000	LCD	94x49x13	32	2		✓	✓	★★★	★★★	★★	★★★	49
350	CRT	90x56x56	32	2	✓			★★★	n/a	★★	★★★	48
1,100	LCD	94x51x12	32	2		✓	✓	★★	★★★	★★	★★★	47
1,600	Plasma	107x74x10	42	2	✓	✓		★★	★★	★★	★★★	47
1,150	Plasma	126x65x10	42	2		see ^a		★★	★★	★★★★	★★	44
750	LCD	92x52x12	32	2	✓		✓	★★	n/a	★★★★	★★	41
1,500	Plasma	124x68x14	42	2		✓	✓	★★	★★	★★★★	★★★	40

either an HDMI or DVI input **b** Rear projection LCD

Features

Scarts The number of sockets available to connect extra audio-video equipment to your TV. **Audio out** A dedicated socket for

connecting your TV to a hi-fi to enhance its sound. **HD-ready** A ✓ means the TV has the minimum screen resolution and sockets to enable it to

receive and process high-definition broadcasts.

IDTV Integrated digital TV with a built-in Freeview digital tuner.

Which? test performance

Picture/HD picture/ Sound/ Ease of use Ratings for picture and sound quality plus ease of use, based on technical measurements and expert user assessments.

Score

35% Picture quality
20% Sound quality
20% Ease of use
10% Text
10% Features
5% Reception and power use

Stars of the big screen

The star performers in the TV projector market will allow you to re-create the big-screen cinema experience in the comfort of your own home

TV projectors are the nearest thing to a big-screen cinema experience for your home. All you need is a large darkened room, some popcorn and one of our Best Buys.

Projectors can screen pictures twice the size of a 42-inch plasma TV and the best produce excellent images. They can be connected to DVD players, digital TV receivers and computers, allowing you to watch anything, from widescreen movies and sports events to slide shows and holiday snaps. Weighing in at just a few kilograms, most can be easily transported from home to the office for those deal-clinching business presentations.

However, before you buy, make sure you actually have enough room to use the projector. For best movie watching results on a 70-inch screen, we positioned the projectors from 2.8 to 3.5 metres away. The room also

has to be darkened, so projectors aren't really suitable for everyday viewing. Then there's the screen itself. A smooth wall, painted with white emulsion, will usually suffice. However, if it's in a relatively well-lit room, you may need to buy a more reflective screen, which will cost from £200 to £300.

There are two main types of projector: liquid crystal display (LCD) and digital light processing (DLP). Each has its pros and cons. LCD tends to offer stronger colours but can suffer from a 'chicken wire effect', a bit like viewing through a wire mesh. DLP projectors can usually screen darker and deeper blacks but are susceptible to the 'rainbow effect' – a flickering band of primary colours, seen by some viewers on the edge of bright objects on dark backgrounds.

TV projectors can screen pictures twice the size of a 42-inch plasma TV



76% Panasonic PT-AE 900E £1,250



This HD-ready model displays great images, be they photos, graphics or movies. It has a high zoom range, allowing you to set it up further away from the screen – handy for bigger rooms. It's also easy to set up and has a useful Scart socket. And it features a joystick-like lens shift control, so you can easily position the image on your wall.

WORTH KNOWING All projectors have an internal fan to stop their lamps overheating but the noise can prove distracting. Our Best Buys are among the quietest in the table but the Panasonic is the most unobtrusive.

Cheapest online price Widely available **Luminance** 1,100 **Resolution** 1,280x720 **Weight** 3.6kg **Zoom** 2.0



73% Hitachi PJ-TX200 £1,400



This beautifully designed HD-ready model from Hitachi is great at displaying all types of image.

It's hardly troubled by fan noise and provides the sharpest photo images of all the Best Buys. If you don't want to waste energy, though, turn the projector off when not in use – it's fairly power hungry when in stand-by mode.

WORTH KNOWING The lamp bulb has a longer-than-most projected life span (4,000 hours compared with the usual 2,000 to 3,000). New bulbs cost around £300 each and can need replacing every couple of years.

Cheapest store Comet **Luminance** 1,200 **Resolution** 1,280x720 **Weight** 4.7kg **Zoom** 1.6



71% Sony VPL-HS60 £1,700



This HD-ready Sony Best Buy is a cinephile's dream and, thanks to smooth colours, the best projector for watching movies. However, although it has an ANSI luminance rating for brightness of 1,200, our tests revealed it was actually the least bright on test. This doesn't detract from watching movies but it does undermine graphics displays, which need bright images and high contrast.

WORTH KNOWING The Sony VPL-HS50 is a previous Best Buy (*Which?*, July 2005, p52) that's still available on the high street. It's of a similar spec to this model but £500 cheaper.

Cheapest store Comet **Luminance** 1,200 **Resolution** 1,280x720 **Weight** 5.6kg **Zoom** 1.6



Facts & scores

Interesting information uncovered by our tests

Energy saving

This Panasonic is the most energy-conscious projector on test. Its power consumption is low, so it wastes less energy and money than other models.

Fantastic value

The Benq MP620 is half the price of our Best Buys, yet is the best projector for viewing both graphics and photos. However, the tiny remote control doesn't feature illuminated keys.

Most portable

At just 2kg, this Toshiba is the smallest and lightest on test. But the far superior Acer PD125D weighs only 400g more and its picture quality is much better, especially for photos.

What you should look for

HD ready

Just like TVs, projectors with the appropriate digital inputs and screen resolution can display high-definition signals



Brightness

ANSI lumens is how brightness is measured. Anything over 1,000 lumens (like our three Best Buys) is suitable for both business use and home cinema

Sound

Some projectors (but none of our Best Buys) come with built-in speakers. But for the best sound, connect your PC or DVD player to an amplifier and hi-fi speakers

Remote controls

Look out for illuminated buttons, like those on all our Best Buys. Without them, remotes can be difficult to use in a darkened room

Positioning

How to get the best possible picture from your projector

For best results, a projector should be placed directly opposite the centre of the screen. If this obstructs your view, you can place it parallel to the screen's centre spot, above or below the line of sight. This may distort the edges of the picture but a feature called keystone correction will digitally straighten vertical edges. The feature won't work on horizontal distortions, though, so don't angle the projector from either side of the screen.

MODEL	SPECIFICATION		FEATURES		WHICH? TEST PERFORMANCE					SCORE %
	PRICE (£)	SIZE (cm) HXWxD	DVI/HDMI	HD READY	GRAPHICS	PHOTOS	MOVIES	FEATURES	EASE OF USE	
LCD PROJECTORS										
1 PANASONIC PT-AE900E	1,250	34x11x27	✓	✓	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	76
2 HITACHI Illumina PJ-TX200	1,400	34x12x30	✓	✓	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	73
3 SONY VPL-HS60	1,700	35x14x36	✓	✓	★★★★	★★★★★	★★★★★	★★★★	★★★★★	71
4 EPSON EMP-TW520	1,150	41x13x31	✓	✓	★★★★★	★★★★★	★★★★	★★★★★	★★★★★	69
5 SANYO PLV-Z4	1,300	39x13x31	✓	✓	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	67
6 EPSON EMP-TW20	700	38x12x30			★★★★	★★★★	★★★★★	★★	★★★★★	58
7 NEC VT48	520	31x12x26			★★★★★	★★★★	★★★★	★★	★★★★	54
DLP PROJECTORS										
8 TOSHIBA mt 700	1,650	37x14x31	✓	✓	★★★★★	★★★★★	★★★★	★★★★	★★★★★	65
9 ACER PD125D	690	28x11x24	✓		★★★★★	★★★★★	★★★★★	★★★★	★★★★	60
10 BENQ PE7700	1,560	38x12x30	✓	✓	★★★★★	★★★★★	★★★★	★★★★	★★★★	59
11 BENQ MP620	650	24x10x29	✓		★★★★★	★★★★★	★★★★	★★★★	★★★★★	58
12 SHARP XR-20S	830	32x11x28			★★★★★	★★★★★	★★★★★	★★	★★★★	58
13 INFOCUS X3	720	25x11x33			★★★★★	★★★★★	★★★★	★★★★	★★★★	56
14 TOSHIBA S8	600	24x11x21			★★★★★	★★★★	★★	★★	★★★★	42

USING THE TABLE

We tested popular LCD and DLP projectors from leading brands available for under £2,000.

Specification

Price For Best Buys we give the cheapest widely available high-street price as we went to press. Prices

for other models are a guide to what you can expect to pay. Prices for models available only online are in *italics*.

Features

DVI/HDMI Sockets enabling the transmission of high-quality digital signals.

Score

50% Picture quality
20% Ease of use
15% Noise/power use
15% Features